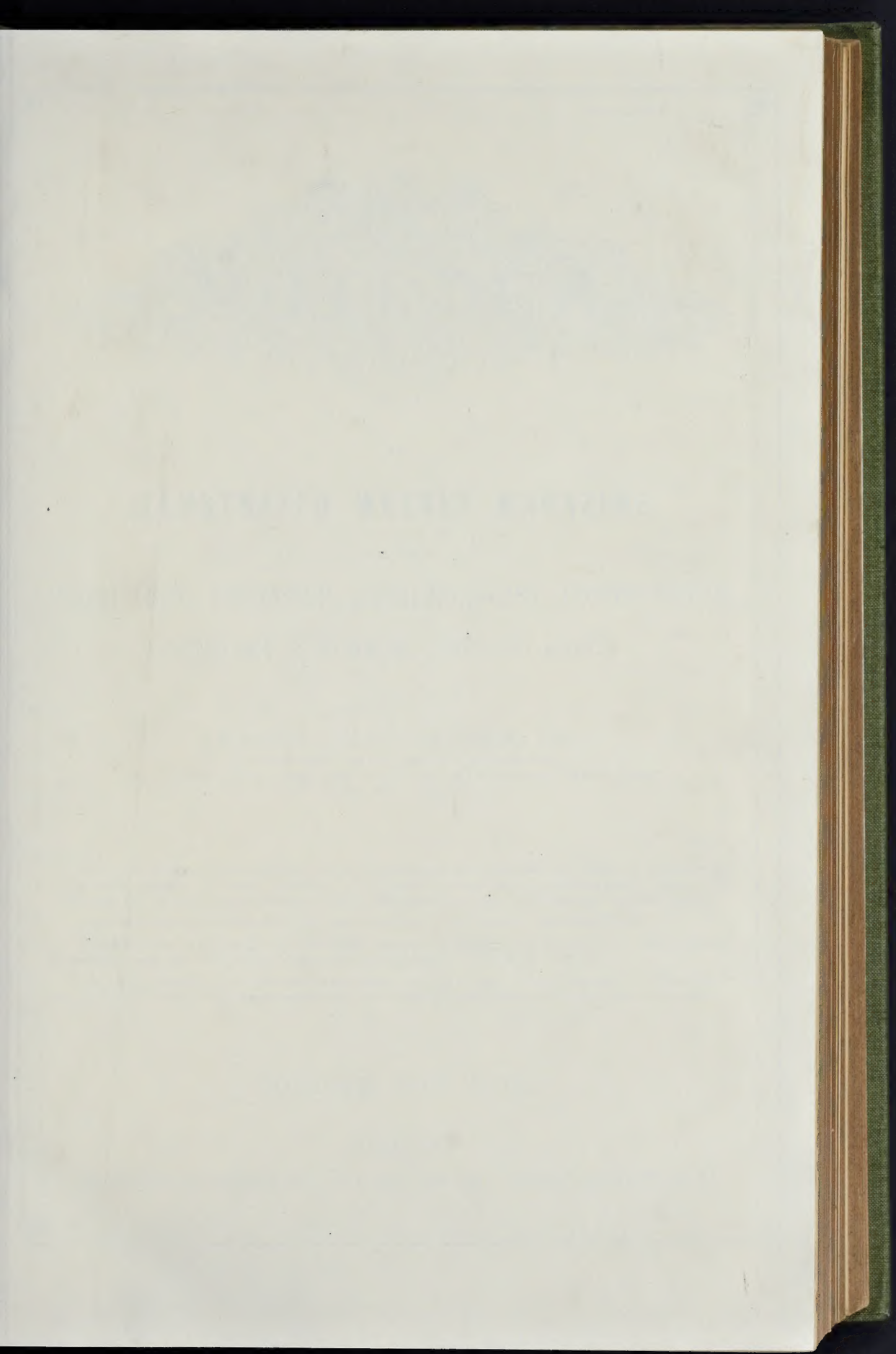


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AN

ILLUSTRATED WEEKLY MAGAZINE,

FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR,
SANITARY REFORMER, AND ART-LOVER.

CONDUCTED BY

GEORGE GODWIN, F.R.S., F.S.A.

LATE VICE-PRESIDENT OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS;

*Honorary Member of various Societies; Author of "History in Ruins," "Town Swamps and Social Bridges,"
"Another Blow for Life," &c.*

"Every man's proper mansion-house, and home, being the theater of his hospitality, the seat of self-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private princedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

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VOLUME FOR 1870.

LONDON:

PUBLISHING OFFICE, No. 1, YORK STREET, COVENT GARDEN, W.C.



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The Builder

*Eighteen Hundred
and Seventy.*

WITH our last number we completed the twenty-seventh yearly volume of the *Builder*, more than twenty-five of which have been issued under the direction of its present conductor. We were then alone. If imitation be, as some have said, the most refined shape of flattery, we certainly have reason to feel flattered. We have pursued our path with heart and will, furnishing an amount of information which may be more rightly estimated looking back through all our volumes, than week by week. Where

error needed exposure, or adverse opinions were necessary, we have never flinched from the truth; dealing tenderly, nevertheless, we hope, with those with whom we may have differed. As we have done so we will do. We are too old in the service, and too fully persuaded that we possess the sympathies of our public, to consider fresh professions necessary.

The year 1869 will long remain memorable as having been marked by some of the most remarkable triumphs ever effected by the engineer, the architect, or the builder, since the close of the Great Roman Imperial Period. The strongest impulse given to monumental construction by the pride, the piety, or the military energy of the greatest sovereigns who have arisen in Europe since the Gothic invaders swept away the last relics of the degraded Roman Empire, has never produced, within so short a time, works of such unprecedented magnitude, as the co-operative, commercial, hopeful effort of the decade now closing has originated, carried on, or completed. And while the results of the power and the resolution of those royal and sacerdotal founders who have reared the noblest edifices of Christian times have been strictly and exclusively national, the works inaugurated by the spirit of the age have put a girdle round about the earth. It took a succession of pontiffs, and a series of architects, to rear that mighty dome under the

shadow of which 670 bishops are now assembled, in order to perform, if they do as they are bidden, the most comprehensive act of self-immolation which the world has yet witnessed. The Eucorial, the Palace of Versailles, the wonderful creations of Mafra—the palaces, the churches and the fortresses, that recall the names of the greatest monarchs who have reigned over the respective countries which those edifices adorn, exert a certain influence on the culture and the convenience of Europe. But the piercing of the mountain barrier that forms the back-bone of the American continent by a railway that brings the Atlantic sea-board into organic relation with the coast of the Pacific, and the cutting through of that thirsty tongue of shifting sand, over which the legislator of the most ancient nation that yet preserves its individuality, though dispersed over all the regions of the earth, led the tribes which he formed into an army and a state, are events which have a direct interest for the entire human race. Mighty as are the changes which even our eyes have seen since Stephenson first turned the escape steam of the boiler into the chimney of his locomotive,—merely to get rid of that superfluous vapour, to the dying energy of which he afterwards found that he was mainly indebted for the speed which his iron horses attained,—they may prove to be as nothing in comparison with those now looming in the future.

The year 1870 opens, indeed, under unusual auguries. The long-continued doubt, suspense, and dismay which have so long possessed the minds of men accustomed to industrial enterprise, seem to have reached a climax. If men are not convinced that great changes are imminent, it can only be because they have lost the power of expectation. At least, it cannot be denied that many long-open questions are now closed or closing; that many sources of hesitation are removed; and that the outcome of a future as to the course of which the past can furnish but little reliable guidance is more and more clearing itself from the mist.

The year 1869 has not fulfilled the hopes and the desires of all those interested in public enterprise by the revival of public faith. On the contrary, so long has been the stagnation following the commercial tornado of 1866 that some of the most hopeful, as well as the most thoughtful, men are beginning to put the question,—Will enterprise ever revive? Have we entered on a secular period in which no man will trust his neighbour? Are our canals all out; our railways all constructed; our ports and harbours all perfected; our cities enlarged and over-built beyond the demands of their inhabitants; our inventive faculties discouraged and laid up in ordinary, so that there is nothing to be done with any spare money that becomes palpable on squaring up the accounts for the year, but to risk it as an investment in the ever-tempting quick-sand of foreign loans?

It is true that, a few weeks since, a more cheerful feeling was prevalent in the great centre of financial life than we can remember for the past three years. The fit was transient, and the alarm of those who, in busier times, gave life and vigour to speculation, or to whom the paternity of prospectuses might be ascribed has, perhaps, culminated with the arraignment before the Lord Chief Justice of the once fabulously honoured potentates of the discount market. The ringing cheers which welcomed the close of this long-veiled question may, perhaps, have had a more real cause than the critics of the press have yet allowed. To applaud the clear delivery of justice by a venerable magistrate would be, no doubt, a solecism. To hail the acquittal from a criminal charge of the very men who, a few short months before, were saluted on their provisional committal for trial by every form of execration, and every varied dissonance of catcalls, appears, at the first blush, but a fresh example of the unreasoning caprice of the mob. And yet a deeper and not altogether reprehensible feeling may have sought an instinctive vent in both the groan and the cheer. That enforced idleness, which is worse than almost any sacrifice of the fruits of past toil, found voice on the former occasion. On the latter, it is far from improbable that the hope that with the clear statement of what the law of association really covers, and with the destruction of all vague theories on the subject, the uneasiness which has caused such long paralysis might be relieved, may have elicited a very hearty cheer from men to whom the individual fate of the directors of the Limited Discount Company was a matter of comparative indifference.

In speaking of the financial disaster of 1866, we took occasion to remark that its consequences would be unprecedented. Unfortunately, that remark has been fulfilled, in perhaps the most trying mode that is possible, by the long persistence of mutual distrust. Men have doubted not only one another, but the law itself. The latter doubt is now, in great measure, set at rest. In what shape enterprise will present itself, so as to guard at once the promoter and the subscriber, is not yet clear. Such a method of management is now the great desideratum. Judging from the tendency of all the recent changes in the laws that regulate credit, it may be thought that the two features which must be prominent in any such digested scheme that shall command public favour in 1870 are,—on the one hand liability actually limited, by the issue of low-priced shares, fully paid up in the first instance; and, on the other hand, by the guarantee of the known personal honour, skill, and integrity of an efficient manager, or of two or three efficient committee-men, whose functions, with respect to the manager, shall resemble those of auditors. In fact, an adaptation to our own

habits of the Continental system of the *Société de Commandite* is that which appears to us to be called for at this moment. It may be long before the exact method of obviating the dangers which now deter men from all joint-stock enterprise is hit upon. Once found, however, there is little room to doubt that the disposition to make use of it will be so developed as to change the face of affairs, and restore activity, at any rate, to Great George-street.

In the meantime the facilities for conducting business of all sorts in the metropolis have, during the outgoing year, been notably increased. The transfer of the telegraphs to Government, which, though not yet accomplished, has been legalised within the period under review, can hardly fail to give a great stimulus to business of every description. The opening of further sections of the Metropolitan Railway has tended to enlarge the area available for business residence, and to economise the time of all those who reside in the localities served by the circular route. From Westminster to Kensington, and so round to the Edgware-road, and to the City, the communication is now extremely convenient. The complaints made in our pages as to the bad atmosphere of the tunnels have met with due regard; and, although it is very much to be regretted that the up and down traffic is not led through separate tunnels, in which case good ventilation would be almost or quite effected by the mere passage of the trains, still London derives a great and increasing benefit from the subterranean channel of traffic. The completion of the line to Blackfriars may be expected at no very distant time. The absolute necessity for the continuance of the railway towards the Mansion House, and the Tower, and so round again to Moorgate-street, will become only more apparent when the line is opened to Blackfriars; and the formation of a line from Baker-street to Charing-Cross is one of those desiderata the fulfilment of which is only a question of time.

Metropolitan improvement has not been confined to railway extension. We have been active under the sky as well as under the earth. The long-crying nuisance of Holborn-hill has been abated. Making every allowance for any error of detail, a well-considered, adequate, picturesque viaduct has replaced that old Waterloo of the London horse-master, and the flood of traffic now rolls tranquilly over the level platform with an immense economy of time and of cost.

Royalty honoured with its presence the opening of the new Blackfriars Bridge, and proceeding thence, her Majesty was the first to make use of the viaduct over the valley of the Fleet. Together with these two great bridges, the foot-way along the river Embankment has been thrown open to the public. The too-long delayed works of the Metropolitan Extension Railway have retarded the opening of the river side carriage way, as well as the formation of the park and garden which will reach from Charing-cross to Blackfriars. But even the limited and interrupted promenade which is now accessible to the pedestrian has been a great boon to all those whose business leads them to pass from Westminster to the Temple. While questions as to the architectural proportion of the piers and staircases of the quay-wall will suggest themselves to the men of cultivated taste, no doubt can arise as to the effectiveness of the work in the main. Paris herself cannot boast such a river wall. We must go as far south as Naples to admire, in the magnificent coast road that fringes that unrivalled bay, a water-side drive and promenade superior to that which London will possess when the Thames Embankment is completed.

A hardly-contested fight, even yet, possibly, undetermined, though we should scarcely suppose so, has raged over the site of the Courts of Law. One regrettable result has been the procrastination of the commencement of the building. Nor, noting the confusion which now appears to exist in certain administrative quarters, between parsimony and economy, can we feel sure what progress even the incoming year may witness in a work so urgently demanded as the erection of a Palace of Justice worthy of the City and the nation. If the time that has elapsed should have given the opportunity for a change in the style of the building, we should find in that a full return for the delay.

In the energetic discussion which has taken place on the above, and some similar subjects, it has been matter of considerable satisfaction to see that the propriety of dealing with architectural questions on architectural principles is

becoming, to some extent, recognised by public opinion. Education in matters of taste is somewhat on the advance. On the other hand, we have to deplore a movement in the opposite direction in Government quarters. As if to discredit the efforts made by the more enlightened portion of the press in favour of the establishment of a permanent administrative Department of Public Works, a Commissioner of Public Works has unfortunately taken a pride in saying what would lead to the impression of his own entire unfitness for the office. Let us hope that his acts will be better than his words, and he may even now prove more valuable than his predecessor, Mr. Layard, whose words were a great deal better than his acts. The chief result of his rule was delay in every quarter.

Our readers have, from time to time, been made acquainted with the progress and the never-ceasing activity of the noble educational establishment at South Kensington. The Amphitheatre of London, of which we gave an account, is slowly advancing towards completion. Preparations for the arcades destined to shelter the permanent International Exhibition are in progress. This artistic and industrial centre, to which access is now readily afforded by the Metropolitan Railway system, is one of the brightest spots on which the eye can rest with satisfaction, in glancing at our public institutions.

We have also to remind our readers of the sharp archaeological controversy which arose on the first experiment on cleansing the bronze monuments in Westminster Abbey. The remark of the Dean of Westminster, to the effect that he had a double duty to discharge, that of conservation and that of exhibition, and that the two duties seemed at times to clash, may be taken as a summary of the entire dispute. The work of cleansing has gone steadily on—not, perhaps, without occasional mishaps, but, on the whole, to the advantage of the most regarded of our national sanctuaries.

The past year has also witnessed preliminary steps towards the formation of that great requirement of the City and of the country, a National Armoury. The admirable, though limited, collection of Sir S. Meyrick has been exhibited, on loan, at South Kensington. The very interesting historic series at the Tower of London has been carefully rearranged by the most competent hand; and the director of the South Kensington Museum has embodied in his last annual report the recommendation of the *Builder*, that the contents of these two fine museums should be fused into a national collection, worthy of the name. Even if that be not done, the collection already belonging to the nation should be confined to proper hands,—say those of the gentleman who has just now put it into artistic shape,—so that it may be rightly maintained and judiciously added to as occasion serves. Unlike some other institutions, it will provide ample funds for its own development.

Glancing from the metropolis itself, we are reminded that the first day of 1870 is to witness the abandonment by the directors of the Brighton Railway of that blind and suicidal policy which has caused such a sensible reduction in their receipts, and against which we have so persistently raised a warning voice. We observe within the present week that the Metropolitan Railway directors have also placarded a great reduction of fares. While the effect of a grasping and selfish line of conduct has been the destruction of legitimate traffic, we cannot be surprised to see, in other directions, attempts to galvanise railway travelling into unnatural activity. Among them must be ranked the schemes, no further advanced than on paper, for sunken tubes across the Channel. In dealing with these undesirable follies, the *Builder* used the most unpardonable weapon—the sarcasm of practical truth. Our daily contemporaries reproduced our observations, and some of the advocates of the tunnel schemes attempted a reply which we have little doubt that they subsequently regretted. The subject of proper ferry-boats and proper ports for the French and English traffic is one that now rightly engages attention.

Onward, and Eastward, on the route to India, the temporary railway over Mount Cenis has been blocked up by early snow. The Italian half of the great Alpine tunnel is reported as complete; although the Italian engineers are still driving ahead into the French portion of the work. The

degree of accuracy with which, as will hereafter be proved, the line has been run from each end, both as to direction and as to level, will be a matter of the utmost interest to ascertain on the meeting of the headings.

Dropping down the Mediterranean to the mouth of the Nile, the month of November witnessed that which has been the most signal triumph of indomitable energy of which modern engineering can boast. Through good report and through evil report the Chevalier de Lesseps has held on, until the Imperial and Royal guests of the Egyptian Viceroy were able, on the fixed day, to steam from the Mediterranean to the Gulf of Suez. England, of all countries in the world, has the most reason to rejoice that the mistrust of this great undertaking has proved, to so great an extent, to be unfounded. Much, no doubt, remains to be done; but M. de Lesseps has given us excellent reasons for placing some reliance on his word. The expense of dredging, of walling, or of widening certain portions of this marine highway will, no doubt, yet be considerable. But M. de Lesseps states that 80,000 tons of shipping passed through the canal within ten days from its opening. Such a statement is more than a promise,—it is an earnest,—of an adequate income. A profound modification of our marine commerce must follow the general recognition of the capabilities of the Suez Canal.

On the opposite side of the globe, a work of nearly equal importance has been accomplished. The more detailed accounts of the Great Railway across the American continent are such as to confirm our first impression as to the rough and ready mode of its construction. In fact, it rather resembles what we should call a contractor's road than a main trunk railway. Wild stories, too, are told of the construction of many miles of the road in duplicate, in the race between different districts, to secure the Government subvention. But we must remember that in America the railway is the pioneer of civilisation. With ourselves it is the rear guard of social progress—with our Transatlantic cousins it is the van. Indeed, such an enterprise as that to which we refer, may rather be spoken of as the forlorn hope of the settler. We must not forget that there are railways and railways, and that our Parliament-enforced method of building every branch with the strength and dimensions proper for a main line, is a far more wanton waste of money than is involved in the slight and rapid fabrication of a route which will require continual repairs, and perhaps ultimate replacement. Light railways must be made in our own country. Our readers will no doubt remember our repeated observations on this highly important national requirement.

We cannot but recall, with extreme satisfaction, the fact that the Horse Guards have, at length given due attention to a subject which, from the date of the battle of Sadova, has received the unfailing advocacy of our columns. That every soldier should be taught so much of the duties of a sapper as to enable a commander to provide immediate cover from fire for his men, on the moment of their seizing an exposed position, has appeared to us to be a requisite of the very highest national importance. We cannot think that we have regarded the subject too much from the stand-point of the civil engineer. Our labours, public and private, on that subject, have been earnest and persistent, and we rejoice to see that due attention has at last been called to the education of the troops of the line in the exercise of the strictly defensive art of using the pick and the shovel.

Our knowledge of the earliest and rudest stages of the art of the builder has been considerably enlarged, during the past twelvemonth, by the Abyssinian photographs taken by the Royal Engineers under the command of Lord Napier of Magdala. Light as to the character of those megalithic circular buildings which, in our ignorance of the date of the race of their pre-historic builders, we call Druidical, has been obtained by a comparison with the very similar forms of the round Abyssinian churches. In the stronghold of Theodore himself, we have seen that, under the skies of Africa, a hut may be synonymous with a palace.

We must not omit a word of seasonable greeting to Lieutenant Warren (though he seems to us to want good advice also), whose labours, on behalf of the Palestine Exploration Society, have elucidated several points connected with the topography of Jerusalem. At this seasonable time of Christmas, the mind reverts with unusual interest to the most striking of the relics

exhibited, by this association, at the Egyptian Hall; where, hard by a pile of the stone bullets hurled by the engines of Titus, is to be seen a carved and charred fragment of cedar, a portion of the roof of one of the temple cloisters, if not of that very "Solomon's porch" in which One whose birth we now commemorate walked, when "it was at the feast of the dedication, and it was winter."

Amid all the hesitation of the year, it is refreshing to find that the efforts to give ennobling and improving pleasures to the people have neither flagged nor failed. Day after day, through the week preceding Christmas, the largest halls in London have been densely packed with auditors of the Grand Protestant Oratorio,—the Messiah. And 2,035,000 visitors have, during 1869, passed the turnstiles of the Crystal Palace.

The vital importance of the question of education, both primary and technical, is beginning to be felt. We shall continue to urge it as we have long done. The special education of the architect will, of course, be promoted in our pages,—*cetera va sans dire*. So, too, with sanitary reform and the great questions of public health and social economy. The part played by the *Builder* in these fields is so well known as to render any allusion to its future course in those directions unnecessary.

We must be pardoned for one word more, and that not in the character of the architectural critic, but in that of the journalist. It is simply a matter of due courtesy to acknowledge the frequent citations from our columns made by our contemporaries, throughout the empire, of every political colour, as well as occasionally their comments. It is for no mere personal reason that we refer to the subject, but because we hail the evidences thus afforded of the agreement between views we may have long laboured to express, and the opinions of the most influential members of our great literary guild. A weekly journal does not rely, like a daily paper, on the piping-hot novelty of its intelligence: it is rather as being able to treat those events which come within the scope of its pages with judicious clearness, than as always giving the first hint of the occurrence, that a journal like our own must make its mark. And we rejoice to see those of our fellow-labourers who have to consume the midnight oil for the enlightenment of the breakfast-table of their readers thus distinctly recognising our own, as well as their own, proper province.

The year opens with gravity, yet with solemn hope. The past year has brought us no great national catastrophe. It has done much to clear away the wreck of former disasters. If our horizon is not unclouded, it yet constitutes the brightest part of the political heavens. France is in the throes of revolution, as yet bloodless, demanding the end of personal government. Germany is leaning on her sword, and breathing before she attempts to complete her unification. Rumours of disquiet echo from Russia. Spain has established a permanent "provisional" Government, and has enthroned the *pronouncement*. In Portugal the octogenary marshal Duke of Saldanha—a field-marshal of fifty-five years' seniority, seems threatening to throw his sword into the scales which weigh the absolute corruption of the country. In Italy the usual ministerial crisis continues, with little intermission, and will continue so long as the harpy flock of *impiegati*, military and civil, fatten and rot while consuming the vitals of the country. In almost every instance the foreign landholder is paid his dividends out of a fresh loan, invented, under some clever name, for the purpose. How long Englishmen will send their money to these foreign quacksands, while we have room for its employment in the application of chemistry and of mechanics to agriculture; in the construction of branch light railways; in the reclamation and working of land; in the utilisation of the wasted wealth of sewage; in the creation and the working out of the many new industries which the advance of science daily renders possible, it is not for us to say. But whatever doubt as to the future there may be room for at home, our island seems a perfect oasis of light and tranquillity compared with almost any other terrestrial region. With stout hearts and cheerful outlook we welcome the year 1870.

Rouen Cathedral.—A monument, in memory of Richard Cour de Lion, has been erected here in the choir, and his heart has been placed in it.

THE PURPOSE AND PROGRESS OF ARCHITECTURAL SOCIETIES.

THE frequent combination of a number of persons into an associated body, for the purpose of mutual assistance and information in pursuits which could not be so thoroughly carried out by individuals, is (to use a phrase now becoming common) a "note" of what may be called *par excellence* intellectual civilisation. The mere numerical combination of brute force for purposes of attack or defence may, of course, exist in a state of society barely raised above animal life; and combinations for the carrying on of trade to the best advantage do not necessarily imply more than what may be termed a state of physical civilisation, generally entirely self-interested in its origin. But associations for the purpose of mutual information and assistance in intellectual pursuits stand on a somewhat different footing. Not only does their existence imply a far higher mental status of society than any merely commercial union: it implies also a higher moral status, presupposing the recognition of that enlightened and unselfish standard which regards all knowledge and ability, however attained, as something to be used for the good and advancement of society generally, not to be hoarded and made much of by its fortunate possessor as a kind of *point d'appui* for gaining an advantage over his fellows in the race of life. And though, of course, it may be said, and justly, that all which contributes to the general advancement of society contributes also in the end to that of each individual member, and that this is consequently but an enlightened form of self-interest, it may nevertheless fairly be urged in reply, that no such intellectual combination can be efficiently carried out and brought to important practical results, without involving, in the first instance, a considerable amount of individual self-abnegation, besides a notable casting out of the old evil spirit of professional jealousy, one-sidedness, and party feeling, which has been such a sad blot upon the annals of some of those which are specially spoken of as "learned" professions.

So far, then, as the theory of scientific and artistic societies is concerned, their multiplication should be an entirely good omen, auguring an increasing mental activity and an enlightened sense among us of the responsibility of individuals towards society at large. And we should be far from saying that there is not a large proportion, perhaps a majority of such associations, wherein their true scope and value are practically recognised by their members, and which are doing good and energetic work in the general cause. In all probability, in spite of isolated facts having a contrary bearing, this is most especially the case with societies which are rather scientific than artistic, and where the results aimed at, though calling for a high degree of cultivation on the part of the workers, are rather of a practical and physical than of a mental or æsthetic nature. In such societies the gaining of the widest possible information upon all details connected with their special subjects is a tangible and recognised end, almost indeed a *sine qua non*; and when the success of each individual depends not only upon his own talents, but also upon experience and knowledge beforehand of all the possible conditions under which he may have to work, there is the less room for professional jealousy, and the more inducement for a free interchange of experience, which may be of equal value to all parties. It is when we come to associations which have art as well as science for their object, that we have less reason to feel entirely satisfied as to the extent to which they are really made valuable for the advancement of their members. The objects of an association for the advancement of any art are less tangible and less easily defined than in the case of more purely practical pursuits; besides that artists, proverbially an *irritable genus*, have more tendency, if not more reasonable ground, for personal rivalry and jealousy of one another. It is one thing to communicate to others facts external to yourself, the knowledge of which is gained by simple observation and experience; it is another thing to place them in possession of your own innate ideas and conceptions, to be plagiarised, possibly, by those who are themselves deficient in originality.

Is it in any degree owing to such a feeling that architectural societies, which in a great measure are, so far as their prospectuses take us, art societies, have done less for the advancement of their special art than is at all proportionate to

the extent of the machinery set in motion to that end?

We should be sorry to have to admit the general existence among us of so unamiable a quality as professional selfishness: the feeling which leads a man to be content if he "gets on" himself, without any consideration as to the general advancement in the practice of the profession. That there are instances of this, and that architects are not always unwilling to seize opportunities, at sundry times and in divers manners, for damning each other with (or without) faint praise, must, we fear, be conceded. But a great deal of the practical disunion which exists may be traced also to the prejudices so deeply rooted by the Battle of the Styles, the clamour of which is now beginning to die away in the distance, but which has left its results behind it. Whether from these or other causes, however, there is scarcely that unity either among the architectural societies of the kingdom themselves or among individual members of each society, which we could wish to see, and without which the value of such societies would exist rather upon paper than in reality. Even in the central and leading professional body, where at least we ought to expect a judicial and unprejudiced treatment of the principles and practice of the art which it represents, we had not long since practical proofs of the determination of one party therein to set the battle in array against another, in a manner savouring not altogether of breadth and comprehensiveness of artistic feeling. And with regard to provincial societies, the case is becoming a somewhat common one, so far as we can learn through occasional reports. We had occasion the other day to comment in these columns on the formation of a new Northern society in a district where another already existed. We heard some time since of a Midland society, which, having been formed for two or three years without accomplishing anything, was about to be given up again as a bad job, and was only saved in *articulo mortis* by the heroic undertaking of one or two members to contribute something in the way of communications to meetings apparently few and far between. Whether in this case promise blossomed into performance we never learned. In one large town we hear of two opposition societies, one of which, however, seems to confine its energies mainly to simply existing—*stat nominis umbra*. In another, where a tolerably active association has existed for a good many years, several attempts have been made to get up an opposition society, one of which was, if we were rightly informed, strangled in its cradle by the rash proposition of a *pro tem.* committee-man, that each member should bind himself never to accept a commission from a tradesman; a pinnacle of virtue which the remainder, *nati consumere fruges*, were no wise prepared to mount to. In almost all these cases of divided societies in the same town, or of divisions in one society, it is almost impossible not to conclude that the state of things is the result of feelings the reverse of praiseworthy, either morally or intellectually. Were the real object of all the promoters of such societies the advancement of the art of architecture, and of the dignity of the profession, it is almost self-evident that they would have everything to gain in this object by union, and a great deal to lose by division. But, in fact, the state of things is often very much after this manner:—A is disgusted with that conceited fellow B, who is cutting him out of part of his practice; C, who is a mediocrity *enragé*, and makes designs for devils on blotting-paper, is willing to read papers of his own to any extent; he knows their value; but as for coming to listen to that old woman D, who talks about "principles of art," and who has never read Ruskin, he has something better to do with his time, thank you. E really cannot undertake to meet such men as F and G, who drop their H's; and there are unknown quantities up to X, Y, and Z, who are quite willing to see all societies whatever consigned to the Limbo of Vanity, provided their own solid and comfortable business in arbitrations and surveys be not interfered with; and others, who with great show of professional ardour complain that the society accomplishes nothing, and that it is not worth their while to attend its meetings, forgetting that the very condition of accomplishing anything is the active cohesion and co-operation of all concerned. And so it happens that associations, formed with the best intentions, and with every primary prospect of success, are allowed to lapse into meetings of certain cliques or parties, who run

the same round until they are tired of each other, without benefiting either themselves or any one else.

We have said that, when rightly carried out, the formation of associations for mutual assistance in high-class pursuits is both laudable in principle, and cannot but be beneficial in practice. Nor is there, as we believe, any pursuit or profession more open to advancement by means of such associations than that of architecture. The subjects with which architects are expected to be more or less conversant are now more numerous and varied than ever; and though one man can never really master all of them, it is almost necessary that he should have some acquaintance with all: indeed, it may be said that there is scarcely any branch of knowledge, an acquaintance with which may not at some time or other be beneficial to an architect, whose profession touches at so many points on what is accessory to the comfort or the beautifying of life. It is precisely in furnishing the means of thus generalising knowledge, of gaining experience from a larger area than can be covered by any individual mind, that architectural associations may be made in the highest degree useful; may, indeed, be said to be almost indispensable. But let those who belong to, and those who are engaged in forming such associations, look well to their motives and objects. Projects which have once been found useful sometimes become a fashion, and are imitated inconsiderately and uselessly for fashion's sake. It is wasting time to get up a society merely because another town has one, and you will not be outdone; it is worse than waste of time to set one up out of spite and in a spirit of opposition to other members of the profession. It should be distinctly understood, in getting such an association into work, that its *bona fide* object be to facilitate and advance the study of architecture among its members, and raise the status of the profession. To promote friendly intercourse among members of the profession in the same locality is of course an object not to be despised, but not in itself worth starting and sustaining a society for, as an ordinary club would answer this purpose equally; and it is necessary always to guard against allowing an institution set on foot for serious professional purposes to descend to a state of mere complimentary speech-making and dinner-giving. Nor is it sufficient that there should be a series of what are called "papers" following each other at regular intervals. Those who are charged with the conduct of our professional societies should see that what is brought forward is of some practical value; and not allow time to be wasted, and the status of their society to be lowered by the reading of papers written *currente calamo* to supply a gap, and containing, perhaps, ill-digested rambling dissertations on nothing in particular, or on things of no real consequence, flavoured by epigrammatic attempts at wit. Architectural wit, we are bound to confess, seems to us for the most part to be of a very watery nature, if we may judge by specimens which have come before us in print and in MS. What is to be demanded of an architectural society is that it should be really made an opportunity for communicating valuable information on the practical subjects of the profession, and for promoting interchange of ideas as to the principles of design in art. The exhibition by members of drawings of the works which they have in progress, or are contemplating, for friendly criticism by their fellow-workers in the same field, might often prove of great value, and even do something towards producing and fostering somewhat more of unity of style and principle among our designs than is now perceptible. And if by such a proceeding, too, any inroad be made upon that hurtful and unworthy feeling of professional jealousy of which we have too often evidence, if architects be got to think that their duty should be not to out do Smith or Jones, but simply to see that the work is as well done as it possibly can be, and to accept and take into consideration all friendly criticism given with that end, then, indeed, architectural societies will have achieved a great and good work. But they will not achieve this by the formation of cliques and the maintenance of party spirit; nor should they even be permitted to become exclusive advocates, in a party manner, of this or that method of design. Their true object should be to prove all things, and to keep to that which is good; and for such a body to declare themselves bigoted adherents of Gothic or Classic, or any other "ism" is voluntarily to retire from the field where they would be of most use, and to set themselves up as the champions of idle and

hastily caught-up fashions, instead of investigating and elucidating the broad and permanent principles of the art which they profess to advance.

THE STATUES OF EASTER ISLAND.

THE account of Easter Island and its statues, as lately told in our pages by Mr. Martin Tupper, in consequence of the arrival in this country of some of the figures,* has scarcely excited so much attention out of doors as it properly calls for. The facts are so remarkable, and the mystery surrounding them so great, that we are prompted to place before our readers all the materials available for forming a judgment on the points in question. By the kindness of Lieut. Harrison, we are enabled to give a sketch plan of the island, a view of part of it, with its marvellous grove of gigantic heads, and a representation of one of the recumbent figures, with the singular tufa crown, to which reference has before been made. To these we add representations, back and front, of the two figures brought from the island, and now in the British Museum.†

Contemplate the broad fact for an instant. Here on this barren island, not thirty miles round, in the midst of the vast Pacific Ocean—an island, treeless, metalless, and foodless, occupied by a few wretched savages, and 2,500 miles from its nearest continental neighbour—more than 300 of these stone statues, 20 ft., 30 ft., and in at least one case 50 ft. high, some of them standing on long platforms of Cyclopean masonry, have been counted, and how many more there may be in the interior is not known to us. When and by whom were they made? The people now inhabiting the island know nothing of their origin or purpose, and take no interest in them: they have no tradition even of the extinct people by whom they were raised. Transported from other lands, as things now are, they could not have been. Is there any other belief that Polynesia was once a continent,—a submerged continent and an extinct people;—that we have here another,—

"Lyonesse."
A land of old upheavens from the abyss
By fire, to sink into the abyss again;
Where fragments of forgotten peoples dwell."
TENNYSON.

A submergence of vast tracts of lands similar to that suggested with reference to Easter Island probably took place in the Atlantic. Scholars will remember the tradition in Plato's dialogue, entitled "Timæus," making direct mention of a great Island of Atlantis, situated beyond the pillars of Atlantis, situated extensive Atlantic island there was a powerful kingdom. In an evil day, he writes, this island sank into the ocean. Professor Unger, of Vienna, in a valuable lecture on this sunken island of Atlantis, of which a translation is published in the *Journal of Botany*,† gives very interesting evidence in favour of this tradition from the flora and fauna, and in support of the theory that, "in the Tertiary period, or when lignite was formed, Europe must have been connected with North America, and the Atlantic ocean must have been divided at one place or another by a continent." The continental connexion of Australia and Europe during the Eocene period is argued for.

No metal nor even flint is found on Easter Island, but only some hard stones, capable of being fashioned into so-called celts. Were these figures produced with such instruments? The workmanship is rude, but not bad. Some description of those in the British Museum, and now illustrated by us, we have already given, and need not repeat it. Observe the excellent conventional treatment of the arm and hand, and of the jaw and chest in the larger figure. The ears (if they are ears) are very peculiar. The carving on the back of the smaller figure, tufa, is very remarkable; the band in the larger figure is clasped in the two hands. The receding forehead and projecting mouth are very striking. The tufa crowns are also singular, and are in many cases 6 ft. high, and 5 ft. in diameter. These must have been placed on the top of the statues after their erection,—not an easy task.

An esteemed correspondent, an artist, who went to the museum to see these figures, in consequence of the papers in our pages, is disappointed

with their rudeness. He writes,—"As these frightful idols stand in juxtaposition, under the portico of the Museum, with by no means the finest specimens of Grecian art, the contrast is something remarkable, and to be noted; for we may at once see that it is needless to lament the absence of any other records of the people who produced them, for 'Barbarian fecit,' is clearly and unmistakably incised in characters easily to be deciphered by the educated, artistic eye. There is no kind of information which a man would not rather have than not, if it could be obtained by the mere wish; but as there is nothing to be told about these frightful stones except that 'there they are' and from intrinsic evidence that 'they were hewn by savages,' we may be content. For if the submergence theory be correct, as doubtless it is, we may regard the drowning of that continent, and the preservation of these monstrosities as wise decrees of Providence; showing in the one case that that continent was an unfruitful field, and by the remains that the submergence was just."

Our correspondent takes for granted the very point that is in question, a point of the deepest interest, and to the settlement of which the presence of these statues brings strong evidence. Even from the art point of view they may prove important links in art history.

It does not seem certain that we may claim for these figures a very high antiquity: they are very Mexican in appearance, and their age may be not greater than that of the ruined cities of Central America, of which we know. The submergence might have taken place in the Middle Ages, without any intimation of the momentous occurrence reaching us. They may, however, be very much older. Anyhow they represent a most extraordinary phenomenon, and present very extraordinary questions for consideration. We can recall nothing more remarkable than the view we now give of part of the island, with its growth of statues.

INSTITUTE OF PAINTERS IN WATER-COLOURS—WINTER EXHIBITION.

AT this season, when geniality and courtesy are expected to prevail, it would be churlish indeed to be ill-naturedly critical in regard of any means offered for intellectual amusement; and besides, drawings, sketches, and studies abound to such an extent just now, and such a wide average of merit obtains amongst them, that there is little room for anything but in praise to be said of them: so the best notice is one of where more are to be seen, and to invite inspection. It would be difficult to say anything new of some of the very best of them, and quite unnecessary to call attention to shortcoming where no attempt has existed at perfect performance, in the worst of them.

As the bells ring the changes, time being money, let us hope, as a harmless aside, that we have passed the bad for the good; and for the good of everybody this happy new year; and if the prosperity of art is any real index to a general state of things, that picture exhibitions—winter and summer—may increase and multiply until they become too numerous to admit of particular notice: a kind wish to more than the painters.

The "supplementary" exhibition (we thank thee, June, for teaching us that word) at the Institute of Painters in Water Colours is sure to be an attractive one; for, to clever, striking examples of Messrs. Absolon's, Corbould's, Warren's, and the better known of the members' skill, there are some choice and very finished performances contributed by the younger of the figure draughtsmen, in addition to a capital display of landscapes, to give it more than ordinary interest. Mr. Andrew C. Gow's drawings are especially noticeable for the precise and elaborate finish which he manages to attain without sacrifice of breadth in effect, or purity of colour, and with very truthful imitation of light. "An Armourer" (66) and "Hamilton of Bothwellhall" (83) are examples that prove the value of these qualities when invested in the mere positive representation of two well-costumed and appointed figures; but where motive or narrative may be concerned, Mr. Gow has shown himself the taming influence of making these technical excellences a chief consideration in his depiction of a beligerent Roundhead drawing on some Cavaliers (360), for there is a want of character and force in this,—

"A controversy that affords
Actions for arguments, not words."—*Hudibras*.
Mr. James D. Linton's studies are very exquis-

* See pp. 930, 982, vol. xxvii.
† See p. 10. † Vol. III., p. 13, &c.

site, none more so than that of a lady designated "Maud" (324), which is but one of some eight or nine that betoken a rare combination of power and refinement. Mr. Valentine W. Bromley delights in picturesque allusions to the past. "The Terrace" (52); "A Lily" (387); "The Lady's Maid" (393), and "A Steel Mirror" (423), are dainty little pictures that apostrophise life 400 years ago at least, and speak of more enduring fashions than those that regulate our dress. How old the world is, and how young are some of its oldest customs.

Mr. Chas. Cattermole, in his several small compositions, exhibits a similar fancy for indicating the long wear of human habits; and this fancy helps him to paint in very bright colours very ordinary incidents: he is always seen to the best advantage on the scale of such works as "My Lady's Pensioners" (416), or, again, in "The Chapel" (425), where the sins that may not be covered by charity are being confessed. "May Day" with my lord and my lady, and the clown, who, in connexion with Jack-in-the-Green, was never known to do anything else; "Hollo! boys" (55), is a record of an obsolete institution, that shares some of the interest attached to fifteenth or sixteenth century incidents; but it is in artfully, if not artificially, disposed heroines of the present era that Mr. C. Green's clear, dexterous manipulation tells to the best effect. "The Sketcher" (403) and another charming young lady, who appears to be making a very elaborate study of something or somebody, "In the Wood" (412), are two of the choice items in the collection. "Juliet's Nurse" (75) and "A Royalist" (349), are two very clever studies, by Mr. H. B. Roberts; and with Mr. R. Beavis's Borderers on "The March—Stormy Weather," driving the cattle before them secured in their last raid (31); Mr. Guido Bach's "Bohemian Medicaments" (97), and various other studies, including more of Bohemians, very easily and largely done, Mr. A. Bouvier's "Wallachian Girl" (101), and Mr. E. H. Corbould's autographic ink sketch illustrating a black-letter edition of a nursery rhyme, that speaks of the dogs that barked in their antipathy to beggars (123), are of those things that, when found, will be made a note of.

Mr. H. Tidey's two children, "Daisy" (213) and "Dolly" (233), will meet with more admirers by reason of their agreeable naturalness than would many a more pretentious work, with less claim to be considered truthful.

What bright, fresh-looking little children Miss Emily Farmer selects for her study: the little dot who is drawing tones from a concertina, and making "Music" (90) visible, and she who is "Saying Grace" (364) before a feast-of-reason dinner, are music and reason most gracefully and cleverly portrayed,—types of such mundane enjoyment as Mr. G. G. Kilburne's "Puritan Preacher" (19), in a dry hard manner would be most likely to deprecate; but Miss Farmer's reflections are more pleasurable than the solid, stolid representation of the preacher, excellent as it is in its way.

But the landscapes, studies on shore and on sea,—buildings, exteriors and interiors, call for an equal share of attention. It must be delightful, indeed, to such an adept in the art of transcription as Mr. Wm. Bennett, to fix Nature, as it were, in his questions of her; to learn her answers, and to put them down in such a quick handwriting,—short-hand, perhaps, but everybody can read it. Who can talk so lightly of old corrugated trunks, fresh young leaves, and the dewy grass that grows on the earth,—the grave of the young and aged alike,—without thinking more than he says? No one can speak more in a few words than Mr. Bennett, or, in a rough way, more feelingly. "Sketch of Royal Oaks, Windsor Forest—Autumn" (79). Mr. Edmund Warren honestly announces his more direct communing; he relates the "Whispers of Winter" (100) in a beechen grove, with falling leaves to punctuate the minutes of his meeting: rather a dark picture, but an honest one,—for, Time will come, and Time will go, and we can't go on for ever.

Messrs. H. G. Hine, J. G. Philp, J. Mogford, H. Mapleton, J. W. Whympere, W. L. Leitch, J. C. Reed, and Messrs. Pidgeon, S. Prout, Rowbotham, Telbin, Hargitt, Harry Johnson, Mitchell, A. Penley, Richardson, and Wood, are all admirably represented; and Mr. Carl Werner and Mr. C. Vacher retain their riches as wise men of the East,—and clever men anywhere.

Mr. James Fahey, amongst some eight or ten examples, exhibits a very masterly drawing, "Blackgang Chine, Isle of Wight" (281); Mr.

Shalders is as clever as ever in his studies of sheep; and Mr. D. H. M'Kewan quite monopolises a right here of painting "gallery pictures;" a right that is not to be waived any more than Mr. Edwin Hayes's as a wave-painter; see—sea in many instances. Mr. Mole is as indicative of peace and rural felicity as ever: industry and content are the lessons he teaches, and they are good ones,—nicely and quietly taught, but, apparently, never conclusive.

Messrs. W. W. Deane & J. H. D'Egville paint Venice in her own colours, seen with artists' eyes; and their drawings very much add to the value of the collection.

CO-OPERATIVE STORES, EDENFIELD, BURY.

The new hall in connexion with Edenfield Co-operative Society has been opened.

Early last year, the committee having decided to build new stores and six houses, a plot of land was secured for the purpose near the toll-bar, on the Bury-road. Plans were procured from Messrs. Maxwell & Tuke, and the building was begun in May, the work being let separately to local tradesmen for the sum of 2,463*l.*, exclusive of heating apparatus and fittings, and this sum has only been exceeded by about 10*l.*, which must be a source of gratification to the committee. The total cost, including fittings, is 2,800*l.*, which sum, however, does not include the cost of land. The design of the building is extremely simple. The fronts are of pitch-faced parpinto, with Holcombe stone dressings. Towards the front are three shops; the grocer's 22 ft. by 31 ft., at the end of which are shoots and bins for flour, &c., which are tipped from the warehouse behind upon a higher level. The draper's shop is 26 ft. by 24 ft.; the butcher's, 18 ft. by 16 ft.; and the dogger's shop, which is in the side street, is 20 ft. by 12 ft. There are also in this street the cart-entrance to the warehouse, a room 43 ft. by 21 ft., and the entrance to the assembly-room on the first floor, which is a room 65 ft. by 31 ft., with plain hopper ceiling and plaster moulds. Attached are secretary's room, board-room, ante-rooms, tea-room, &c., the whole being heated upon the super-heated principle as applied by Mr. Longbottom, of Pleasington.

ON EARTHQUAKES.

EARTHQUAKES are movements of the superficial crust of the earth, consisting for the most part of one or more rapidly succeeding undulations, accompanied often by sounds, and traceable distinctly in some particular direction, chiefly linear, taking time to proceed from one point to another. The shocks of earthquakes are of three kinds:—

1. The undulatory motion, which takes place horizontally, heaving the ground upwards and downwards.

2. The successive motion, in which the ground is heaved up in a direction more or less approaching to the perpendicular.

3. The vorticeous, or twisting motion, which is a combination of the two preceding ones, several undulations taking place contemporaneously, and this interfering with the other, producing a complexity of rotatory movement, like the surface of the sea. Of these three kinds the first are the most common and the most harmless. From the second more is to be apprehended; but the vorticeous movement is the one which has been felt in the most violent and disastrous catastrophes on record. (Danbary on "Volcanoes," p. 509.)

Generally after the shock of the earthquake the great ocean wave reaches the shore, and completes the destruction. The sound of the explosion is conveyed through the earth at the rate of from 7,000 ft. to 10,000 ft. in a second in hard rock. When an earthquake begins under the ocean it occasions five distinct series of waves or undulations. But sounds sometimes occur when there is no earthquake. The oceanic wave raised at Lisbon travelled to Barbadoes at the rate of seven to eight miles, and to Portsmouth at the rate of little more than two miles, in a minute. The velocity of the shock varies with the elasticity of the strata it passes through. In the great earthquake in Calabria in 1783, most damage was done at the junction of the deep alluvial plains with the hard strata of the mountains. The earthquake that happened in 1812 in Guadeloupe was felt over an extent of 3,000 miles. A shock is sometimes perceived in a mine that is not felt at the surface, though in

some instances miners have not been sensible of the shocks felt on the surface above. The raising and depressing of land almost imperceptibly is always going on. The coast of Denmark on the Sound, the island of Saltholm, opposite to Copenhagen, and that of Bornholm, are rising; the latter at the rate of 1 ft. in a century. The coast of Memel, on the Baltic, has actually risen 1 ft. 4 in. within the last thirty years, while the coast of Pillan has sunk down 1½ in. in the same period.

The most extensive district of earthquakes comprises the Mediterranean and the adjacent countries, Asia Minor, the Caspian Sea, Caucasus, and the Persian mountains. The chief focus of the vast volcanic district in central Asia appears to be Thian-Shan, including Lake Baikal. Africa is almost entirely free from them, and they are extremely rare in the great eastern plains of South America. 313 earthquakes are recorded to have occurred in the valley of the Danube since the commencement of the fourth century.

The smallest number of earthquakes occur in Russia, and in the Ural Mountains they are almost unknown. The whole chain of the Andes, especially the Cordilleras, are exposed to every kind of subterranean disturbance felt along a line of 1,000 miles.

In argillaceous strata, it frequently happens that the fissures caused by earthquakes close up again; but in more solid rocks they remain open for ages.

Mr. Mallet gives us the following order of the phenomena of an earthquake:—"First we have the earth sound-wave, and the great earth-wave or shock; the sound wave through the air; the sea-wave occurring at the time, called the forced sea-wave, and the great sea-wave, all originating at the same moment, and produced by one impulse. The sound-wave through the earth, and the great earth-wave, or shock, arrive first, and are heard and felt on land, accompanied, as far as the beach, by the small sea-wave called the forced sea-wave; these are almost instantly succeeded by the sound-wave through the sea; next arrive the aerial waves of sound, and these continue to be heard for a longer or a shorter time; and finally, the great sea-wave rolls in upon the shore. The velocity of the land-wave, and that of the accompanying sea-wave being ascertained, it would seem possible to determine the distance (out at sea) from the spot affected at which the earthquake originated. But the former will vary with the nature of the rock through which it is transmitted; for the harder and more elastic the rock is, the greater will be the velocity of the earth-wave produced, and *vice versa*." The velocity of the earth-wave through limestone is about 40 miles per minute; sandstone, 57 miles per minute; marble, 73 miles per minute; or through clay slate, 140 miles per minute.

In the "Histoire des Progrès de la Géologie" (vol. 1.) some statistics are given regarding 3,432 distinct earthquakes that have occurred in Europe and the adjacent parts of Asia and Africa, between the commencement of the fourth century and the year 1844 inclusive. Of these the dates of nearly 3,000 are known, and they have been found to be thus distributed in the different months of the year:—

December	370
January	366
February	275
March	265
April	215
May	210
June	219
July	216
August	236
September	231
October	232
November	232

There have thus been 1,712 recorded eruptions between the 1st of October and the 31st of March, and only 1,355 from the 1st of April to September 30th. This general result is remarkable as being in conformity with the more detailed observations, and also because it appears that in each particular year the same order was observed; but it must not be regarded as important with respect to the general phenomena of earthquakes in other districts where other results may be obtained. In Upper and Western India, between 1800 and 1842, 162 earthquakes are recorded.

Mrs. Somerville (Physical Geog., p. 161) states that 255 slight shocks have occurred in Great Britain, of which 139 took place in Scotland; the most violent of these have been felt at Comrie, in Perthshire, in 1839. Of the rest, 14 took place on the borders of Yorkshire and

Devon, 30 in Wales, and 31 on the south coast of England. They were all preceded by a sudden fall of the barometer, and unusual stillness. Those who have felt an earthquake describe a feeling of dread or horror produced upon them. The lower animals especially feel this. Humboldt says the noise often heard in "rolling, rattling, clanking like chains, occasionally like thunder close at hand; or it is clear and ringing, as if masses of obsidian or other vitrified matters were struck in caverns underground." Noises have been heard at 700 miles' distance from the place where the earthquake took place. An earthquake has damaged the Great Pyramid of Egypt, though that country has been very free of these convulsions for a long time. Sir Charles Lyell says "the energy of subterranean movements has always been uniform as regards the whole earth,"—a comforting assurance.

The first earthquake on record occurred B.C. 1191, when the law was delivered to Moses on Mount Sinai (Exodus xix. 18). Forty-one years after that one took place in Central Italy, which swallowed up a city and produced Lake Ciminius in its place. China was visited by an earthquake B.C. 595. In 425, a very severe one occurred in Greece. B.C. 224, the Colossus at Rhodes, one of the "Seven Wonders of the World," was overthrown by an earthquake. B.C. 83, more than 30,000 people perished from this cause in Palestine. Antioch was destroyed A.D. 115, and in the same year an earthquake was felt in China. In 262 an earthquake devastated Rome, Libya, and Asia Minor, attended by an eclipse. About 555, an earthquake was felt at Constantinople, and in the same place two years afterwards. In 684, more than 500,000 acres of land in the Japanese island Sikokf were swallowed up by the sea. In 859 another earthquake occurred at Antioch, when 1,500 houses were destroyed. Wenderover tells us that in 974 a great earthquake shook all England. A correspondent of the *Spectator* says that in 1081 one occurred in this country which was attended "with heavy bellowing." In 1089, there was "a mickle earth-stirring all over England," according to the *Chronicle*. Florence, of Worcester, says that in 1110 "there was a very great earthquake at Shrewsbury. The river Trent was dried up at Nottingham from morning to the third hour of the day, so that men walked dry shod through its channels." Matthew Paris says that in 1165 "there was an earthquake in Ely, Norfolk, and Suffolk, so that it threw down men who were standing and rang the church bells." He speaks of others in 1187 and 1247. In the latter, the sea became preternaturally calm for three months. In 1248 another was felt in the West of England. Holinshed says that in 1185 "a sore earthquake chanced through all the parts of this land, such a one as the like had not been heard of in England since the beginning of the world; for stones that lay couched fast in the earth were removed out of their places, houses were overthrown, and the great church of Lincoln rent from the top downwards." In 1217 one occurred on St. Valentine's Eve, and did considerable damage in London. It is stated that three months prior to the shock the sea ceased to ebb and flow on the English coast. On September 12, 1275, Glastonbury Church was destroyed in this manner, and in 1361 John Harding records in his metrical chronicle:—

"On St. Mary's Day,
The great wind and earthquake marvellous,
That greatly gave the people all affraye,
So dreadful was it and perious."

In 1381 Fabyan says an earthquake occurred, "the like thereof was never seen in England before that day nor since." And the next year Harding writes:—

"The earthquake was, that time I saw
That castles, walls, towers, and steeples fell,
Houses and trees, and organs from the hill."

This happened on the 21st of May, and was followed three days after by a "watershake," by which the ships in the harbours were driven against each other with great violence. ("Book of Days," i., 232.)

In 1456 a terrible earthquake devastated the country round Naples, many towns were injured, and 60,000 lives lost.

On May 21, 1382, Stowe says "there was a great earthquake in England at nine of the clock, fearing the hearts of many; but in Kent it was most vehement, where it sunk some churches and threw them down to the earth." A song written at the time is contained in "Political Poems and Songs relating to English History," i., 1859. The spelling is modernised:—

"And also when this earthquake,
Was none so proud he was agast,
And all his jollity forsook,
And thought on God while that it last;
And as soon as it was over past,
Then was as evil as they dead are;
Each man in his heart may cast,
This was a warning to beware.
Forsooth, this was a Lord to dread,
So suddenly made men agast,
Of gold and silver the took none heed,
But out of their houses full soon they passed;
Chimneys, chimneys, all to burst,
Churches and castles foul 'gan fare;
Pinnacles, steeples, to ground it cast,
And all for warning to beware."

In 1531 Spain was visited, and Lisbon suffered much. In that city 1,500 houses were thrown down and many buildings destroyed. Of the great earthquake 200 years later we shall speak hereafter.

Barton, in his "History of Earthquakes," tells us that in 1571, on the evening of February 17, the earth near Kinston, Herefordshire, began to open, and a hill called Marcle Hill, with a rock under it, made at first a mighty bellowing noise, off, and then lifting itself up began to travel, carrying along with it the trees that grow upon it, the sheepfolds and flocks of sheep abiding thereon at the same time. In the place from whence it removed it left a gaping distance 40 ft. wide, and 80 ells long. The whole field was nearly 20 acres. Passing along it overthrew a chapel, and removed a yew-tree which was growing in the churchyard from the west to the east. Another earthquake was felt in Yorkshire, Worcestershire, and several of the adjacent counties in May in the same year.

In 1580 (April 6th) a severe earthquake was felt in London. People rushed out of the theatres, part of the Temple Church was thrown down, and two apprentices were killed at Christ Church by a fall of a stone during the service. Much damage was done in Kent by this earthquake. Queen Elizabeth caused a form of prayer to be used by all householders. In 1638 (March 28th), 180 towns and villages of Calabria and Sicily were reduced to ruins. In 1680, Lyme Regis suffered by an earthquake. An earthquake was severely felt in London and other places September 8th, 1692. Evelyn says, "At Mine it has made some demolition. I happened to be at my brother's house at Wotton (Surrey), when the shaking was, and at dinner with much company, yet none of us at table were sensible of any motion. But the maid who was making my bed, and another servant in a garret above her, felt it plainly, and so did my wife's laundry-maid here at Deptford. In London, and particularly in Dover-street, they were greatly affrighted." In the next year the great Sicilian earthquake destroyed 100,000 persons. In 1747 a great earthquake destroyed Calais, and there is an absurd statement that only one of the inhabitants was saved; but Sir Charles Lyell has shown that 200 escaped.

On the 8th of February, 1750, an earthquake was felt in London. Several chimneys were thrown down, and walls rent. A shepherd at Kensington heard the noise rush past him, and instantly saw the ground wave under him like the face of the river; the tall trees of the avenue where he was nodded their tops very sensibly, and quivered. (Philos. Trans., xlv.) Walcott, in his "Westminster," says that during this earthquake, felt between twelve and one o'clock, the Thames was greatly agitated, and the barriers were greatly alarmed, for they thought that Westminster Hall was coming down. Another earthquake was felt March 8th in the same year. The houses near the Thames were most shaken. It is stated (Philos. Trans., xlv.) that near London there was a continued and confused lightning till within a minute or two of the shock; dogs howled, fish jumped 3 ft. out of the water, a ball of fire was also seen. Martin Folkes, P.R.S., stated that he did not on this occasion perceive that lifting motion which he was sensible of on February 8th, but he felt very quick shakes or tremours horizontally. A boatman on the Thames felt his boat receive a blow at the bottom, and the whole river seemed agitated. In the Temple Gardens, the noise was greater than the loudest report of cannon. It resembled distant thunder in the air, but was not a subterranean explosion. A vast ball of fire was observed, and frequent flashes of lightning. The shock lasted a minute. Walcott says great stones were thrown from "the new spire" of Westminster Abbey, and in several steeples the bells were struck by chime-hammers. Horace Walpole, writing to Sir Horace Mann, says, "I had been awake, and had scarce dozed again when on a

sudden I felt my bolster lift up my head; I thought somebody was getting under my bed, but soon found it was a strong earthquake, that lasted near half a minute, with a violent vibration and great roaring. I rang my bell, my servant came up frightened out of his senses; in an instant we heard all the windows in the neighbourhood flung up. I got up, and found people running into the streets, but saw no mischief done; there had been some,—two old houses flung down, several chimneys, and much china ware. Admiral Knowles, who had lived a long time in Jamaica, and felt seven there, says this was more violent than any of them. It has nowhere reached above ten miles from London. A person, who came into White's the morning of earthquake the first, and heard bets laid as to whether it was an earthquake or the blowing up of powder-mills, went away exceedingly scandalised, and said, 'I protest they are such an impious set of people that I believe if the last trumpet were to sound they would bet puppet-show against Judgment.'

Another was felt on the 18th of March, in the same year, at Portsmouth, Southampton, and the Isle of Wight. In the next month Cheshire, Flintshire, and Yorkshire were startled in a like manner, and in May one was felt in Dorsetshire, and another in Somersetshire in July, Lincolnshire in August, and yet another on September 30th in Suffolk, Leicester, and Northampton.

The great earthquake of Lisbon happened on November 1st, 1755. A work published in 1757 gives the following account of this terrible disaster:—

"The year 1755 proved very wet and rainy, the summer cooler than usual, and for forty days before the great earthquake clear weather, yet not remarkably so. The 31st of October the atmosphere and light of the sun had the appearance of clouds, with a notable obscuration. The 1st of November, early in the morning, a thick fog arose, which was soon dissipated by the heat of the sun, no wind stirring, the sea calm, and the weather as warm as in England in June or July. At thirty-five minutes after nine o'clock, without the least warning, except a rumbling noise, not unlike the artificial thunder at our theatres, a most dreadful earthquake shook, by short but quick vibration, the foundation of all Lisbon, so that many of the tallest edifices fell that instant."

We may remark that the people were in the churches, for it was the festival of All Saints, and a multitude perished when the great church of St. Paul fell. The account continues, "Then, with a scarcely perceptible pause, the nature of the motion changed, and every building was tossed like a wagon driven violently over rough stones, which laid in ruins almost every house, church, convent, and public building, with an incredible slaughter of the people. It continued in all about six minutes. At the moment of the beginning some persons on the river, near a mile from the city, heard their boat make a noise as if run aground or landing, though in deep water, and saw at the same time the houses falling on both sides the river. The large new quay, called Cays Depreda, was overturned, with many hundreds of people on it, and sunk to an unfathomable depth in the water, not so much as one body afterwards appearing. The bar was seen dry from shore to shore; then suddenly the sea, like a mountain, came rolling in, and about Belem Castle the water rose 50 ft. almost in an instant, and had it not been for the great bay opposite to the city, which received and spread the great flux, the low part of it must have been under water. As it was, it came up to the houses, and drove the inhabitants to the hills. About noon, there was another shock, when the walls of several houses which were still standing were seen to open from top to bottom more than a quarter of a yard, but closed again so exactly as to leave scarce any mark of the injury. 60,000 people were buried, crushed, or drowned. At Colares, a distance of about twenty miles from Lisbon, three distinct shocks were felt, accompanied by the emission of a quantity of smoke, and the fountains were affected. At Coimbra, several buildings were destroyed, and at Oporto the shocks were felt for six or seven minutes, during which everything shook and rattled. At or near Cadiz, the destruction was great, and a terrific wave came 90 ft. in height. It was felt at Gibraltar and Madrid; at the latter place, the indications were very decided. At Seville, the cathedral was damaged. The seaport of Setubal, twenty miles from Lisbon, was engulfed, and disappeared altogether. Near Morocco the earth

opened and swallowed up a town with 8,000 inhabitants. This earthquake was felt in France, near Angoulême. A subterranean noise was heard, after which the earth opened and discharged a torrent of water, mixed with red sand. In Italy, shocks were felt at Turin and Milan; and the waters of the Mediterranean were greatly disturbed. Agitations were noticed on the lakes of Geneva and Zurich, in Switzerland. Movements were felt in Germany, Holland, Norway, and Bohemia; also in the British Islands, particularly in Derbyshire and Berkshire, and movements of the water were observed along the coast. Mr. Mallet states that it was also felt at Loch Lomond, in Scotland:—"The water, without any apparent cause, rose against the banks of the Loch, and then subsided below its usual level: the greatest height of the swell being 2 ft. 4 in." The time of the shocks in England was from 9.30 to 11. Parts of Africa were affected, especially on the Mediterranean coast. These various places we have mentioned are so far distant that the effects of the earthquake of November 1, 1755, were distributed over very nearly 4,000,000 of English square miles of the earth's surface." (Hist. and Philos. of Earthquakes, p. 333.)

On February 8, 1761, a shock was felt along the banks of the Thames, from Greenwich to Richmond. Chimneys were thrown down at Limehouse and Poplar. It was felt also at Hampstead and Highgate. Another shock, more violent, took place on the same day between five and six, the air being very warm, and strong lightning flashed for some time before. Persons fled to the streets, thinking their houses were coming down. In St. James's Park and other open spaces at the West-end the tremulous vibration was most distinct, and seemed to move in a south and north direction.

On June 7, 1773, the city of Santiago, in Guatemala was destroyed; 6,000 families perished. On February 5, 1783, the Calabrian earthquake took place. The ground for miles appeared like the sea. Immense ravines were formed: one measured a mile in length, 105 ft. in breadth, and 30 ft. in depth. Another was three-quarters of a mile long, 150 ft. broad, and more than 100 ft. deep. (Lytell's "Principles," p. 459.) In this earthquake 40,000 persons perished. Dolomieu, who saw the city of Polistena, in Calabria, after the earthquake, says:—"The scene of horror almost deprived me of my faculties; my mind was filled with mingled horror and compassion. Nothing had escaped; all was levelled with the dust; not a single house or piece of wall remained; on all sides were heaps of stone so destitute of form that they afforded no idea of there ever having been a town on this spot." The Prince of Scilla and 1,430 of his servants perished.

In 1805 (July 26th), another severe earthquake devastated Calabria;—20,000 persons perished. In 1816, on the evening of the 13th of August, a shock was felt over nearly the whole of the north of Scotland. The shock lasted only six seconds, and travelled from S.E. to N.W. Heavy articles of furniture were removed, bells set ringing, &c. At Inverness the walls of many houses were rent from top to bottom.

In July, 1843, shocks were felt on the Cornish coast; and on the 22nd of December, in the same year, considerable shocks occurred in Brittany. In January, 1845, an earthquake was felt at Arendal, in Norway.

Three years before, a report was circulated that London would be destroyed by an earthquake on St. Patrick's Day (March 17th). It was founded on certain doggerel prophecies pretended to be pronounced in the year 1203, and preserved in the Harleian Collection. Numbers of persons left the metropolis. But, upon reference to the British Museum, the so-called prophecies were not to be found, and it was evidently an attempt to impose upon public credulity.

Several earthquakes occurred in 1851. One of these, on August 14th, destroyed the towns of Melfi and Barile, in South Italy, with 1,000 people.

On November 9th, 1852, slight shocks were felt in the north-western counties.

In 1857 (December 16th), Calabria was again visited by a most destructive earthquake, and 10,000 persons perished.

On October 6, 1863, a shock was slightly felt in London, but more in the centre and western parts of England.

On the 18th of November, 1867, the island of St. Thomas, which, twenty days previously, was the scene of a terrific hurricane, was visited by an

earthquake. In this case also a great wave, 40 ft. or 50 ft. high, came towards the harbour at the rate of fifty miles an hour. It was, however, happily broken by the rocky headlands, and did not go inland more than 100 yards above the usual high-water mark. The disaster extended to other adjacent islands.

The coast of Peru on the 13th of August, 1868, was visited by a terrible earthquake, accompanied by a wave which destroyed a vast quantity of property and many lives. At Caldera no shock was felt;—the town stands some height above the sea,—but at Copiapo, about fifty miles distant, some houses were seriously shaken. At Iquique, a few minutes past five in the afternoon, there was a low rumbling sound. The natives knew what was coming, and fled from the houses, and very few lives were lost by the earthquake; but the sea receded with great rapidity for a considerable distance, and met a vast wave 40 ft. high rolling steadily on at the rate of about fourteen miles an hour. It surged over the town and neighbouring beach; everything in the lower parts of the town was swept away. Most of the people had fled to the higher parts of the town, and so escaped, but more than 150 were swept off. The loss of property is estimated at 500,000. Twenty miles north is the port of Mollendo. Here the sea receded, and came back in the same manner, and thirty people were drowned, and a great deal of property was destroyed.

At Arica (population 4,000), a town containing some of the handsomest and most substantial of any buildings in Peru, the sea had a dull appearance, and the gulls were said to quit the bay with loud screams. At 4.45 p.m., the first shock of the earthquake was felt. Mr. Nugent, the vice-consul, says:—

"When I felt the first shock, I went to the room where Mrs. Nugent was to tell her not to be alarmed, but as I got there, a second one came, so violent, that I carried off the children, and we all rushed out of the house. Scarcely had we reached the street, when it all came down, everything around us was tumbling down, and my wife said, 'Let us go and stand on the ruins of our house,—nothing can touch us there.' I had, however, long made up my mind that if ever we had a severe earthquake, the sea would come in, and I said, 'Let us make for the high ground.' We passed up the centre of the street; everything in ruins, numbers of dead, and the wounded lying under the walls, shrieking for assistance. Blinded with dust, and scarcely able to breathe from the sulphur in the air, we stopped at the first rising ground. The whole town, with the exception of a few of the second-story houses, was shaken down. They stood high above the ruins. The quay and mole were crowded with people, who appeared to be panic-struck, for the sea had gone out from the bay, and there was a great wave coming in; presently they took flight, but at least 200 of them were swept away. Wave succeeded wave, at intervals of about a quarter of an hour, and long before dark there was not a vestige of the lower part of the town remaining. During all the night the shocks of earthquake continued, and the noise was like distant cannonading. The water in the few wells that could be got at was so hot (sulphuric), that it was quite undrinkable. So we passed the night on the hills."

The waves carried off the engines on the railway, and destroyed the Custom-house and its contents. The six vessels at anchor in the bay were all lost. Besides these, the *Waterloo*, United States gunboat, battered down, and took every precaution that seamanship could suggest against the approaching danger. But she was whirled about by each wave, till one larger than the other carried her off and left her among the sand-hills far from the beach. She was landed perfectly upright without a scratch, and not a man was lost. The American Admiral determined to offer her for sale, as the expense of getting her 400 yards over the country, and launching her, would be very great.

Many slight shocks have since been felt along on the coast of Peru. The effects of this earthquake have been felt along the whole coast, from 8 deg. to 42 deg. south latitude. Juan Fernandez was visited by the great wave. We are indebted for these facts to the report communicated to the Board of Admiralty. A despatch from her Majesty's Chargé d'Affaires at Lima states that the earth continued in movement for a whole month, to the 13th of September. People hoped that there would be no more shocks, and they were warranted in this hope by former

experience; for, according to the chronicles of the unfortunate city which has now been in ruins three times, formerly by the "terremoto" of St. Ursula, in the seventeenth century, and then in the year 1784 the earth kept in motion for thirty days. The rebuilding of Arequipa will probably be the work of a century, and the cost 40,000,000 dollars; the loss of 6,000 houses and 200 farms and factories may be computed at a higher sum. The despatch goes on to state that, contrary to expectation, several shocks had been felt since the 13th of September. 7,000 or 8,000 people left Arequipa for the interior. At Arica the French hotel was displaced bodily by the waves, and ultimately left on the ruins of another house.

Mr. E. G. Squier (an archaeologist) says there is nothing incredible in the story told by General Kilpatrick, United States Minister to Peru, that during the recent earthquake at Arica, 500 mummies were thrown on the surface. He says:—"The desert hills behind Arica, as indeed those surrounding the few habitable spots on the Peruvian coast, are literally stuffed with the desiccated bodies of the aborigines. They are but thinly covered with the light and nitrous sands, and are often exposed by the winds. I have seen dozens of them at Arica, lying on the surface, wrapped in coarse grass matting, or in their crumbling nets, for most who lived here seem to have been fishermen. I have carefully examined hundreds of the so-called mummies without finding the slightest evidence that their preservation is due to other than natural conditions of soil and climate."

On the 25th of March, 1868, a slight earthquake was felt in various parts of Wales, and on October 30th, at 10.40 p.m., a distinct shock was felt in the West of England and in South Wales. Some of the correspondents of the *Times* describe it as a trembling of the earth as if a laden wagon was passing along the street. Up to the time of the shock the weather was cold, but the thermometer rose 15 degrees on the Saturday. Three shocks were felt in Leamington. Dr. O'Callaghan noticed them, and he had, on more than one occasion, felt the shocks of earthquakes in the West Indies. Dr. Barker, of Clifton, said:—"My own impression was that of a heavy blow from beneath, the impulse of which was communicated upwards, through the chair on which I sat. I was not conscious of any lateral movement, nor of anything that could be called vibration." Mr. Farminster, of Swansea, said his "experience of it was a trembling of the house, with a rumbling noise for about five seconds, and then a very perceptible awaying to and fro of the room myself and family were sitting in." Mr. Ward-Jackson, of Great Malvern, said "it began with the usual rumbling and vibratory sort of sound, followed immediately by three distinct vibrations, proceeding as nearly as I could judge in a direction from N.W. to S.E., lasting about nine or ten seconds. The night was fine, calm, and mild."

Another gentleman stated that his "bed felt as if it were lifted up with a tremulous motion." The shock was felt at Liverpool and Manchester.

Another correspondent of the same paper said, "My chair for an instant shook violently, and I perceived what I might have taken for a furious blast of wind, but it was too instantaneous, and it seemed to come from the earth rather than from the air. The shock was not violent, nor did it seem to last so long, as that which affected a considerable area in the south of England early in the morning of October 6th, 1863. On that occasion, I was awakened from my sleep with the impression that a stack of chimneys on one side of my room had fallen down, and that I should see the wall opposite to my bed crack open."

In Leicester, the window frames rattled, and also various things in the houses, so violently as to disturb the inhabitants from their slumbers. At Blackheath, near London, a correspondent of the same paper states, "My daughters came down from their beds in the greatest alarm, and said they had had their beds shaken under them, and that they were convinced it was an earthquake. A servant in the house, who was also in bed, stated that she had felt the same shaking, and each of them from the sensation experienced a feeling of sickness."

Nor was this all. Another shock was felt at Holyhead at five minutes to four on Tuesday morning, November 3rd, 1868. The *Birmingham Post* stated that several persons living in the vicinity of Raglan-street, Coventry, said that on Tuesday night they felt the shock of an earthquake. Slight shocks have also been felt this year.

There is a very able paper in *Blackwood's Magazine*, July, 1869, on the electric theory of earthquakes and volcanoes. The writer explodes the absurd theory that at twenty miles below the surface the central heat is so great that the hardest granite is in a state of fusion, and that our planet consists of a molten mass nearly 8,000 miles in diameter, covered by a semi-molten crust only twenty miles in thickness, and of which crust only two miles have a temperature under the boiling point. The mean density of our planet is nearly five and a half times that of water, whereas the average density of the strata which we know is less than three times that of water, so that the central fire theory cannot be right. This latter theory is founded on the statement that in some mines and artesian wells the temperature gradually increases. But in one deep mine in Cornwall, at a certain point, the temperature begins to decline. Now, the theory advanced by the writer is this, that there is a zone of electric action in the crust of the earth corresponding with—but superior in intensity to—that which every one sees to exist in the surrounding gaseous envelope of the atmosphere. The electric currents ceaselessly passing to, and fro in the subjacent rocks will necessarily develop heat, and in some kinds of rock, more than others. In metal mines the shaft is sunk through metalliferous strata, or through those kinds of rocks most permeated by electric currents. The increase of subterranean temperature is probably restricted to a narrow zone immediately underlying the surface, with a cold, dense stratum of rock underneath. Earthquakes may be, then, described as thunderstorms in the earth. When the electric action in the crust of the earth is developed to an excessive degree, and the conductive power of the rocks becomes inadequate to pass the currents with sufficient rapidity, an earthquake takes place. In severe shocks these vibrations swell into waves of commotion, extending long distances. The cyclones or rotatory storms in the atmosphere are due to electricity, and the earthquake which takes this form is always the most destructive, and clearly of electric origin. According to this theory, volcanoes are vents,

which the subterranean electric action makes for itself, being eruptive; while earthquakes are vibratory. In the latter case, the subterranean explosive force cannot make its way to the surface, but produces terrible vibrations.

In the tropical regions, the zone of electric action is most active, and hence earthquakes and volcanoes occur there most frequently. We cannot go further into the facts given in the paper to support this opinion; but we think the theory that earthquakes and volcanoes are attributable to disturbances in the outer rim of the earth's crust occasioned by electric action analogous to those which have their seat in the atmosphere, is well worthy of attention.

JOHN P. GOTT, JUN.

KENSINGTON NEW PARISH CHURCH.

Of the ancient parish church of Kensington (written "Chenesiton" in Domesday-book, and "Chensnetuna" in other ancient records) nothing is known. Faulkner, in his "History and Antiquities of Kensington," says:—"This church was probably dedicated to St. Mary, and when it was annexed in the year 1111 to the Abbey of Abingdon, it received the additional epithet of Abbots, and is now called St. Mary Abbots' Kensington." The first vicar of Kensington, named in Newcourt's "Repertorium," is Roger de Bosthorp vel Westhorp, A.D. 1260.

It appears that in 1683 the inhabitants, finding their church too small for the increasing population, built a new aisle on the south side; and then, in 1695, determined on pulling down the north aisle and chancel, and building others of larger dimensions. In 1696, however, a resolution was come to to pull down the whole church, with the exception of the Gothic tower. This was done, and a new structure erected, but with so little skill apparently, that, by the year 1704, the wall having cracked, and the timbers being found too weak, a large part of the church was taken down to the ground and rebuilt. In 1772 it was again thoroughly repaired, and the ancient tower was taken down, and the ugly brick affair the present generation has known was erected in its place. The parishioners seem

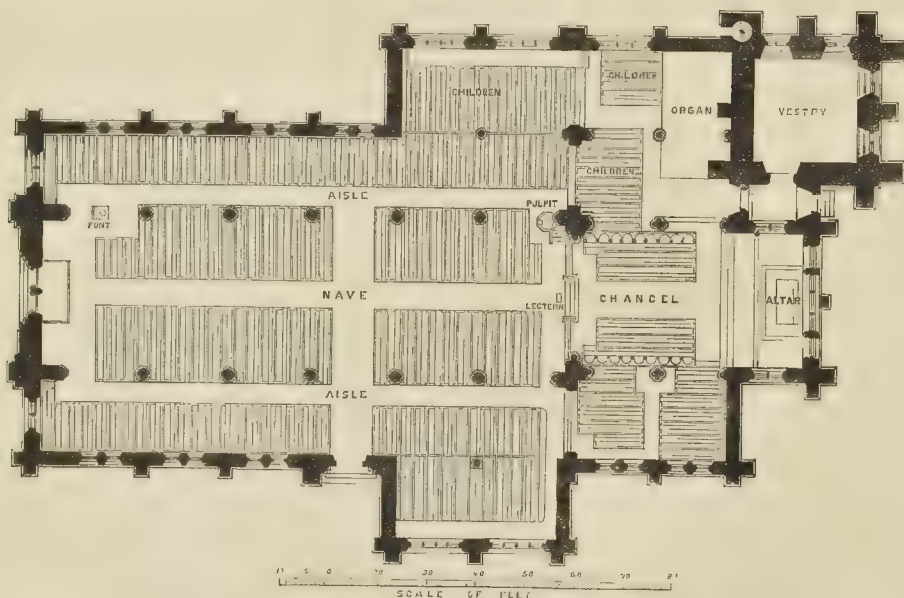
to have been ill-served by those they employed, for in 1811 the building had fallen into a bad state, and they had to spend 5,000l. upon it to make it fit for the purpose. After that it was, of course, repaired and decorated on various occasions, and has now been taken down to make room for an entirely new church. It was an ugly, styleless brick building, with little in it to interest. Weaver has preserved a few of the epitaphs that were in the older church, including one in memory of Richard and Elizabeth Schardburgh, 1153, and another appertaining to Philip Menwtis, "one of the secretaries to the Kings Henry VII. and Henry VIII.," who died in the year 1510.

The church recently taken down contained a number of inscribed tablets and other memorials. Some particulars of these were communicated to the *Gentleman's Magazine* by the conductor of this journal at the time his father was engaged in the restoration of the church for the parish, more years ago than he cares to specify. Doubtless a place will be found for many of the memorials in or about the new building. We may mention that in pulling down the old church a few fragments of moulded stonework, apparently of the date of the thirteenth and fifteenth centuries, were discovered built into the walls.

We give a view and plan of the new parish church now in progress, from the designs of Professor G. G. Scott. It is in the Geometrical style, will be built of stone, and accommodate, in the nave and aisles, transept and chancel aisles, 1,143 adults; in the choir, 80; and in various parts of the church, 377 children; making a total of 1,600.

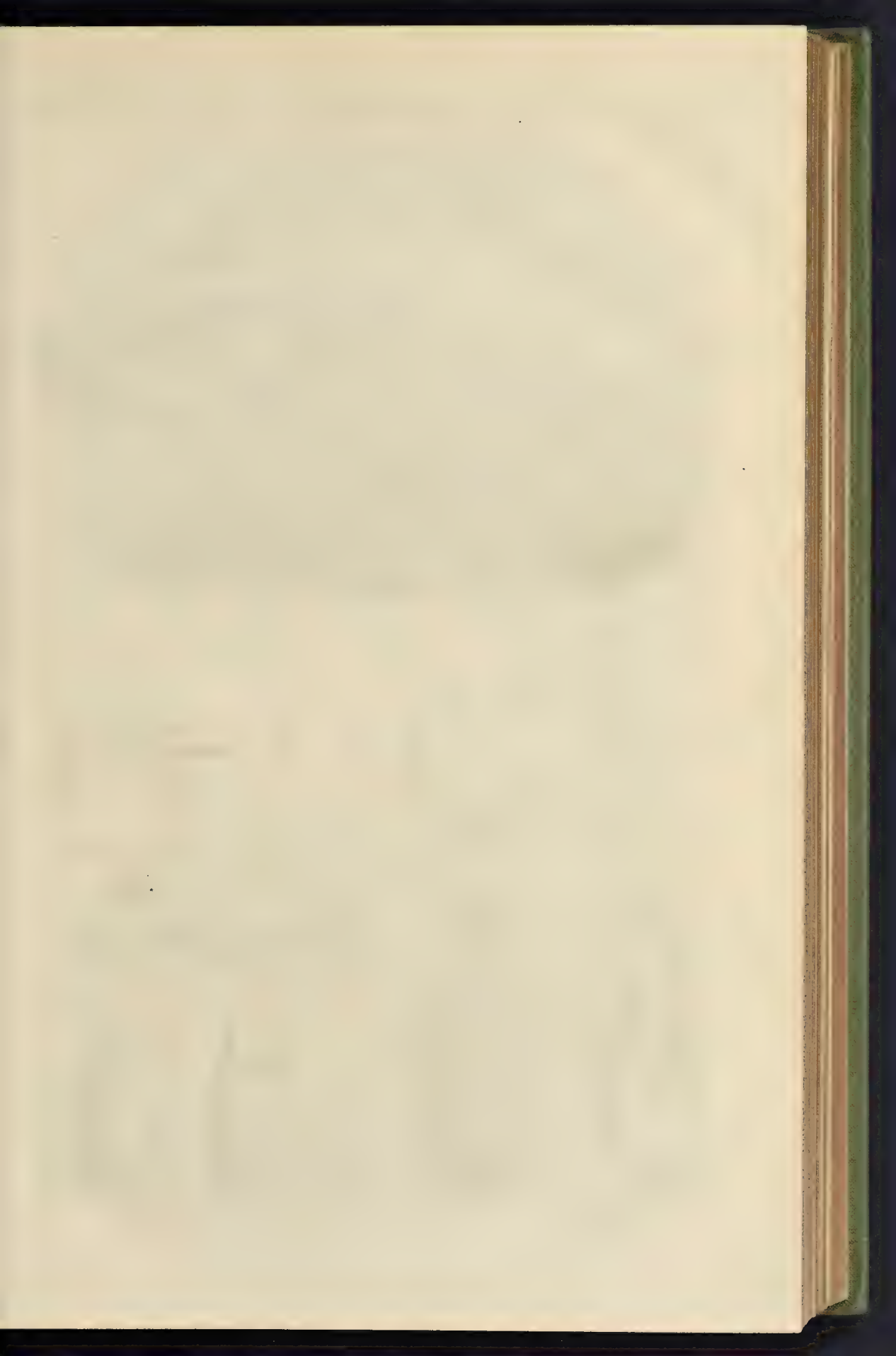
The present contract for the erection of the new church includes only the chancel, chancel aisle, and first stage of tower, which will be carried out by Messrs. Dove Brothers, of Islington, for the sum of 8,375l.

It has been proposed to fill one of the windows with stained glass in honour of John Hunter, who was a houseowner in the parish; and Newton, who was also a parishioner, has, of course, been mentioned as more imperatively demanding a proper memorial.

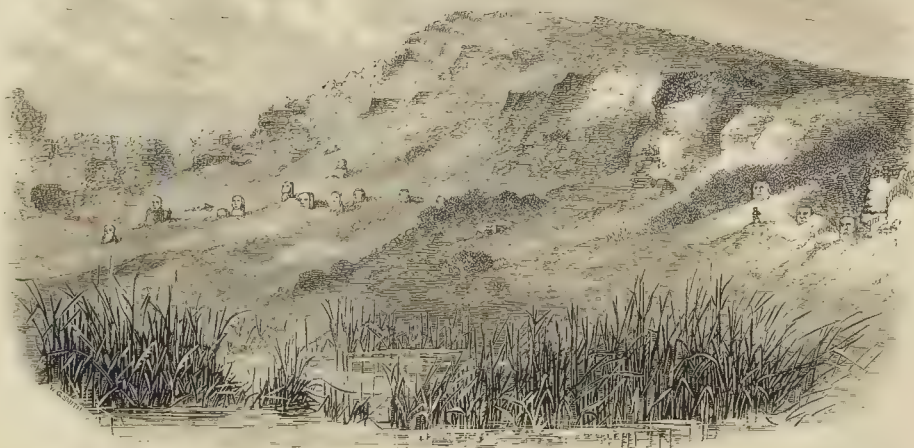


CHURCH OF ST. MARY ABBOTS, KENSINGTON.

Plan.



THE SCULPTURED IMAGES IN EASTER ISLAND.



View of Part of Island, with Buried Figures.

Map of Easter Island,
Mid Pacific.
About Thirty Miles round.



EXPLANATION.

- A. (Nearly 120 figures between these B. & C. points.)
 B. (Nearly 150 figures between these C. & D. points.)
 C. (Nearly 150 figures between these D. & E. points.)
 D. (Nearly 150 figures between these E. & F. points.)
 E. Terauo-Kon.
 F. Terauo-Otuiti.
 G. Point from which Sketch was taken.
 Between this and H.,—Village, Crater where Hats are made, and Mission-house.



Prostrate Figure and Tufa Crown.

Back and Front View of Two of the Figures now in the British Museum.—Scale, $\frac{1}{2}$ in. = to 1 ft.

[See p. 4, ante.]



CHURCH OF ST. MARY ABBOTS, KENSINGTON.—PROFESSOR G. G. SCOTT, R.A., ARCHITECT.

ANTHOLOGIA TECHNICA.

MANY inventions are turning up year after year for which would-be inventors claim the credit of original thought. In the building art, as well as in other branches, not a few of the claims put forward by individuals in the interest of the profession, are scarcely entitled to be heard except on the score of judicious revival and application. Many attempts have been made of late years to devise methods of making buildings incombustible, but none have been successful or new. Comparing the present with the past we will instance a discovery related in the *Literary Journal* of 1785, of St. Petersburg, which states that Catherine granted a premium to an inventor for making a pasteboard which no fire could consume, nor water soften; he proposed it as a necessary lining to the dwellings of his country, and for clothing ships of war. The properties of this great invention are hardly a secret at present. The incombustibility was obtained by a preparation of alum. The ancients knew the secret more than a thousand years ago. It was used in the time of Solylla at the siege of Athens. Listen to what Q. Claudius Quadrigarius says:—"Solylla then brought his forces to set fire to a tower which Archelaus had placed there. He came, he piled faggots, he set them on fire, and after an obstinate labour he could not make the tower take fire, as Archelaus had covered the planks entirely with alum."

The idea might be still improved upon if men were not ashamed to acknowledge their indebtedness to those who have lived before them. When our buildings are rendered fire-proof, incendiarism and insurances will be at a discount.

Grecian beauty by many is supposed to be an ideal, notwithstanding the expression of it in the ancient sculptures. But it is a fact that the finest living female models have existed in Greece. Count de Choiseul mentions in his *Travels in Tenos*, one of the Grecian isles, that he found women full of grace and beauty, the finest proportions in shape, and the greatest and most pleasing regularity of feature. In the isle of Naxos, however, the females were uncouth in figure.

It is a question whether beauty or proportion depend altogether on races of people, or is influenced by climate and modes of life. In the British Islands we have seen ourselves types of female form and beauty in the peasant ranks, perfect and matchless. There is little need of our artists going to Greece or Rome for the study of types alone.

At the close of the last century there was a curious watch in the possession of Mr. Francis Marsh, counsellor at law, Dublin, said to have belonged to King Charles I., given by this unfortunate monarch to his chaplain, Jeremy Taylor. It was a plain gold watch, with a single case and a gold dial-plate. The figures on the face were raised. The maker's name was *Jacobus Markirich, Londini*. The watch was highly finished. It had originally no chain, but went by means of catgut. Bishop Taylor had a new case made for it, covered with green velvet, and studded with gold. This studding represented the bottom of a mitre, and a motto was added,—"Nescitis Horam." The watch at that time was in perfect order, and a celebrated Dublin watchmaker declared that there was a likelihood of its keeping good time for the next fifty years. It is said that there is another watch which once belonged to King Charles, in the possession of some person in England. Do any of our readers know anything of either of these two old timekeepers?

As antiquarianism and architecture are associated, and as the history of art is the history of civilization, the present note will not be out of place. Ledwich, the Irish historian and antiquary, supplies the following annals as evidence of the origin of the much-disputed, though never finally settled, derivation of the word "Ireland":—

A.D. 870. King Alfred, in his Anglo-Saxon translation of "Orosius," styles Ireland "Ira-land."

A.D. 891. Three Irishmen, says the Saxon Chronicle, came in a boat from Yr-lande: so the Cotton MS. has it.

A.D. 918. The same Chronicle calls Ireland "Yr-lande."

A.D. 1048. Harold lies to Yr-lande.

A.D. 1077. The Danes were shipwrecked on Yr-lande.

A.D. 1080. Adam Bremensis names Ireland "Ir-land."

A.D. 1098. Odericus Vitalis calls the Irish "Irenses."

A.D. 1105. Glanvill, in his "Life of St. Canute," styles them "Iros."

Ledwich laboured hard to deduce that from the original Celtic Ir-in came the Ira, Iros, Irenses, and Yr-lande of the Icelanders, Danes, Anglo-Saxons, and Germans, and the Iris of Diodorus Siculus, and, by a transposition of in-ne, the Ierne of the other Greeks. Ledwich, however, though he proved the derivation to his own satisfaction, did not satisfy his contemporaries or successors. The Petries, Donovans, O'Currys, D'Altona, and a host of others pulverised the poor doctor's hypotheses into powder, without, however, succeeding in establishing a more accepted theory.

Anything concerning Shakespeare is precious, and is admissible everywhere; for what has the immortal bard left untouched in the domain of nature and art? In a Dublin magazine, published in 1793, a writer supplies the following bit of information in relation to Shakespeare:—

"There lived in Drogheda, about fifty years since, one Guy Harrison, who boasted of his descent from Shakespeare. He said he was his grand-nephew, and delighted in speaking of his name. I had this anecdote from a gentleman who often conversed with him, but who was too young to take much interest in anything that related to the immortal bard. Harrison kept a little shop, in which he sold thread, tape, lace, and other small haberdashery—his circumstances were indigent. Should not some inquiry be made concerning the family of Harrison? Perhaps, if he had any children, some of them may be still living."—P. R. L.

We wonder if at this date an inquiry among the oldest inhabitants, or a search through the parish registries of Drogheda, would bring to light any trace of the descendants of Shakespeare. It is strange that Malone, his great Irish commentator, did not drop across this "wait" in his day; if he did, he would likely have hunted up the particulars when such a good chance for doing so existed.

The following Latin lines are written in the margin of page 179 of "Barton's History of Leicestershire." The volume is in the library of St. Patrick, Dublin:—

"Robertus Buxton hic jacet
Pauca notæ, paucioris ignotus—
Cui vitam dedit et mortem
Melancholia."

These lines, as it has been before remarked by another, bear a striking resemblance to the lines of Gray, in his "Elegy in a Country Churchyard," beginning:—

"Here rests his head upon the lap of earth," &c.

The volume is evidently the author's own copy, for his pedigree is thus mentioned:—

"Robert Burton, Bachelor of Divinity, and student of Christchurch, Oxon. Author of 'The Anatomy of Melancholy.' Born 8 of Febr., 1678."

Underneath, on the margin, appears the following:—"Obiit anno 1699."

The School of British Sculpture is not quite so recent as some imagine. The ecclesiastical edifices and monuments in Great Britain and Ireland furnish a proof of a high degree of excellence in stone carving. There is a great mixture of the northern element in both the Anglo-Saxon and Celtic races. In Mallet's introduction to the "History of Denmark," Wormus, Sibbern, and a few others relate the surprising skill of the Northerners in carving, and this, too, with no better tool than a knife. They were also expert at painting in colours with different clays. The Germans were also adepts at this work, according to Tacitus.

The Celts had the same propensities, and they made considerable progress in the art of design. In one of their ancient canons is mentioned how they adorned their skins with ornamental punctures of birds, animals, and flowers. Among the British there was a class of master designers, entitled "The Artifices Plagiarum," who not only taught, but practised, the art of drawing.

The Dutch have been great navigators, and as soldiers they have shown considerable bravery on several occasions. They have also bent back the sea, and built cities upon swamps. Holland has also furnished some ripe scholars. In 1739, one Vander Muelen, who must have been a man of distinction, published at Utrecht a Latin dissertation on the "Rise and Fall of the Roman Empire"—"*De Ortu et Interitu Imperii Romani*." Not ever having seen a copy of this work, we

are unaware whether Gibbon is in any way indebted to the Dutchman in the material of his great work. It would be worth the trouble of a search, if there be a copy in the British Museum or other public library.

The Holborn Viaduct is a remarkable work, but, like other important works, the greatest difficulties to its construction are now unseen. Sixtus V. embellished Rome, perhaps, as much as Henry IV. or Louis Napoleon did Paris, taking times and circumstances into account. Our mightiest works are far in the distance, and we shall yet think our river bridges and roadway viaducts small affairs to boast of. Sixtus restored the fountain of Massa, of which the source was twenty miles from Rome, near the ancient Praeneste, and conducted it by an aqueduct of 13,000 paces on arcades. The New River, for the supply of London, was accounted a great work in the time of Sir Hugh Myddelton, but what is it to-day? Art is still in its infancy, and even telegraphy waddles in its swaddling clothes. CE.

ROSSO ANTICO MARBLE.

At a meeting of the Royal Institute of British Architects, November 1st, the attention of the members was called, as we stated at the time, to the introduction of Greek Rosso Antico marble into this country.

Mr. Seddon, on that occasion, pointing to several specimens, said:—"It is brought from a quarry in the Bay of Skutari, on the coast of the Gulf of Laconia, near the port of Gytheion, in the Morea, N. Lat. 36½." Long before it had acquired in Italy the name of *Rosso Antico*, it was known as *Red Laconian* to the ancients, whose excavations are proved by the large blocks cut by them, and never removed, on account of the difficulty of transport across mountains and ravines; but the quarry whence these small specimens are extracted is situated close to the sea, sloping down into the sheltered and tideless Bay of Skutari; with a village of the same name above. This quarry has not been opened for any excavations of importance, and there is as yet no machinery for lifting large blocks which could be cut, or for shipping them. The marble becomes richer in colour the deeper it goes into the bed of the quarry, and is found in large quantities. Lysandros Kallangioglou, honorary corresponding member of this Institute, a Greek architect, who is known to Professor Donaldson, sent a notice, with some specimens, to the Exhibition of 1851, by order of the Greek Government. He said:—"The largest pieces of this marble are the fourteen steps in the Church of St. Prassede, in Rome, which were intended to be carried to France, to ornament the throne of the Emperor Napoleon I. It was thought till lately the place whence they came was unknown; it was, however, near the sea at Skutari."

Within the last three months this same gentleman has, in a letter, expressed his hope that this red marble, so much sought by the Romans, who made great use of it, should be again employed for works of decorative architecture, *soubassements*, interiors of churches and palaces, inlaid ornaments, chimney-pieces, standing candelabra in halls, &c., and also says that the opening of the quarry would be the beginning of a great working, very easy, and not expensive, from its admirable position, especially as there are facilities for water transport to London or any other port direct from the spot. Rosso Antico is extremely hard and impervious to the effects of climate. Its proximity to iron produces its hardness and colour. It has been used by Baron Triqueti in the Memorial Chapel at Windsor, and by Lord Walsingham for decorative panels in his billiard-room. The latter is perfectly satisfied with its identity and beauty; and, having carefully compared it, sees no difference between it and some ancient pieces in his possession, which he thinks it is more than probable came from the same locality.

Professor Donaldson remarked that very little was known with regard to the marble Rosso Antico, although considerable quantities were found in Rome in use for decorative purposes, amongst the objects of art on sale in that city. Milizia describes it, in his "Architettura," as consisting of two qualities, more or less coralline in depth of colour, with occasionally white or black spots; he mentions the figure of Wolf wrought in this marble in the Gallery of the Borghese Gardens. Rondelet also mentions Rosso Antico, stating that the two columns in

the Salle d'Apollon, in the Louvre, are of this material, and once formed parts of the tomb of Charlemagne at Aix-la-Chapelle. Professor Donaldson added, that there were several small-sized statues of the same marble in the Galleries of the Vatican and Capitol at Rome, and that much of it had been used in the churches there, being considered from its hardness, beautiful colour, and rarity, as very valuable.

If, therefore, the specimens exhibited were of the same or like quality, the material would be a valuable acquisition for decorative purposes. Baron de Triqueti has since written a letter to the quarry owner, which may be usefully translated. He says:—

"After you had consulted me on the nature of your marble, and I was fully convinced that you possessed a quarry of true Rosso Antico, which is so rare and so sought after, you had the goodness to offer me gratuitously all that could be useful for the service of her Majesty the Queen, for the decoration of Wolsey's Chapel, Windsor; it is therefore my duty to give you an account of the use I have made of the blocks you sent me, and acquaint you with my observations. It is incontestable, and every one versed in mineralogy will directly admit, that your marble is the identical Rosso used by the Greeks and Romans. It is a calcareous substance, coloured by oxide of iron, containing sand of an extreme fineness, which gives it grain. It is divided by parallel layers of white; moreover, it is very often intersected by blackish veins of delicate network; while the general appearance of the marble passes from a red, almost scarlet in colour, to that of 'lie de vin,' or 'sang-de-bœuf' (wine-les or blood red), probably according to the quantity or nature of the oxide it contains. I shall not waste my time in mentioning the ignorance of those who think the name of Rosso can apply only to those fragments of marble worked by the ancients. That is not worth speaking about. My experience in marble enables me to see that the small blocks I have used were taken from the uppermost layer of your quarry, and consequently show the unfavourable side rather than the beauties of the material. I had it sawn to use for slabs or bas-reliefs. Your Rosso saws very easily; it is rather less hard, than more so, than the statuary or Sicilian, and the expense of sawing is not more. The surface of the Rosso is very smooth and equal, and is worked with the greatest ease, with chisel, &c. It wears the edges of tools on account of the sand it contains, but not enough to cause any difficulties in working.

Being sensible of the confidence placed in me before you were acquainted, and wishing besides to inform my colleagues, sculptors or architects, of the qualities of this fine material, I have used it in the execution of four bas-reliefs of small dimensions for Wolsey's Chapel. I executed with my own hand four subjects, from the rough to the completion, which I had polished, as is necessary in the sculpture of coloured marble. I then executed two heads in profile, of Tiberius and Herod, after antique medals. This work is quickly done, and the result admirable. I then executed the reverse of two medals, in which greater delicacy was necessary,—Judea Capta and the Roman Wolf medals of Titus,—and was equally contented with the material. The admixture of sand in Rosso, which is so remarkable in the antiques of the Vatican at Rome and the Louvre in Paris, gives an advantage to the sculptor over the marble-worker, by giving solidity to the result and power to the subject. The dark red tone of colour marks the outlines with the force and severity which are so admirable in reddish-coloured bronzes; in short, I found your Rosso possesses the qualities requisite for successful sculpture. Many slabs which are used in the ornamental part of Wolsey's Chapel have taken a sufficient polish; others, less good in quality, have not.

Artistic persons, to whom these details may be interesting, will, I think, easily obtain admission into the chapel, and can see and judge for themselves of the quality and beauty of the Rosso from your quarry. I am convinced, by going deeper into it, that you will obtain blocks incomparably more beautiful. I hope to be enabled to make use of some; and I am persuaded that the discovery of your Rosso Antico,—the true Rosso, I repeat,—is destined to be of great service in architecture and sculpture."

An Enlightening Landlord.—Lord Cheesha has at his own cost just had all the cottages of his tenants at Latimer fitted up with gas.

THE VENTILATION OF SEWERS.

SIR,—I beg the insertion of the following remarks on a subject of public importance in connexion with the drainage of towns.

It is well known that offensive smells find their way into houses from sewers. The public health often suffers from these noxious emanations. Yet nothing is done in many towns to remedy this evil, beyond placing what are appropriately called stench-traps at the inlets of the sewers, with the view of making them as air-tight as possible; and the consequence is, that the sewers become full of foul gases, which, at all times, in spite of the stench-traps, and especially in favourable conditions of the atmosphere, escape and generate, or aid to generate, fever and disease. In short, the atmosphere of towns is vitiated by the noxious emanations of unventilated sewers, and this is one of the greatest objections to the present system of sewerage. How many, by breathing this polluted atmosphere, are drawn to the dram-shop, the drag-shop, and the grave? Our cemeteries are prematurely full. How many of those who lie there are victims of slow poisoning by an irrational system of unventilated sewers? and how much ill-health among the living is owing to the same cause? Few diseases afflict humanity which are not aggravated by foul air.

How can this evil be removed? By ventilating sewers on the same principle as coal-pits. Connect the sewers of a house with the kitchen chimney (where there is a fire all the year round), and you have an "upcast." Remove the stench-traps from the inlets of the sewers, and they become "downcasts;" or, in other words, a current of air will pass down the inlets of the sewers, along them, and up the chimneys, carrying away all offensive smells to be dispersed in the air above the houses, and these gases, being lighter than the atmosphere, could not descend again. By this means sewers would be cleared of the mephitic gases evolved from the sewage, and which, under the present system, escape into houses and streets. The cost of this plan would be inconsiderable, and it would not be necessary to apply it to every house.

This plan is on the principle of ventilating sewers in detail. It is opposed to the plan of having a small number of large chimneys erected solely for the purpose of ventilation, which has been tried and failed, for the simple reason that it only removed the gases from one place to another, and created a nuisance at another place. What we want is to prevent the accumulation of sewage gases, to keep them out of our houses, and to pass them off directly into the atmosphere, where they would be diluted and dispersed, and thus rendered harmless. And this cannot be done more effectually than by ventilation in detail. The more "downcasts" and "upcasts" or inlets and outlets there are, the more freely will the air pass through them and overpower their noxious gases.

I may here mention that I have heard it objected to my plan that by ventilating sewers through the kitchen chimneys you run a risk of bringing sewage gases into the house, and I have been told that ladies would not like to go into the kitchen if the chimney were connected with the sewers. This is a mere prejudice similar to that which once existed against the use of coal in houses, for burning which in the city of London a man was hanged in the reign of Edward I.; and Stowe relates that as late as 1600, "The nice dames of London would not come into any house or room where sea-coal were burned, nor willingly eat of the meat that was either sold or roasted with sea-coal fire." The pipe of the water-closet is, however, infinitely more objectionable, as under the present system it is a sort of chimney to the sewers up which gases rise in the same way as smoke ascends chimneys. This objection, too, proves my case. It evinces a dread of sewage gases, and shows the force of habit, which makes people indifferent to a serious danger which has long existed, although they dread an imaginary one. People do habitually what they would dread to do occasionally. They go fearlessly into one small room called a water-closet where there is a continual escape of sewage gases. Yet they would not like to connect another larger room, called a kitchen, with the sewers for fear of an occasional escape. But there is no fear even of that. When a chimney smokes particles of soot are forced down, but the atmosphere has no power to force down gases lighter than itself. And as the chimney causes a draught, which is increased in the day time by the fire, it would if connected with the

sewers cause a large quantity of fresh air to pass through them, and render it very improbable for any offensive smell to be received in the house.

ROBERT ELLIOTT.

THE BISHOP OF LINCOLN ABOUT ART.

At the annual meeting of the Lincoln School of Art recently, the Bishop, in distributing the prizes, urged that art was a most important element in the work of education. It appeared to him that if art did not raise men to a higher stand, it did not fulfil its mission. Art had a moralising, a humanising, and a spiritualising influence. They should endeavour to Christianise art and science, and impart to them something of a higher character. It was the province of religion to spiritualise art, and it was the province of art to illustrate religion. He would endeavour to elucidate this. In the large foundries of this city men were engaged in a laborious work—perhaps it might be called a work of drudgery—but when they were gathered together in the hall of this institution they were raised high above more mechanical work. They could not too highly estimate the advantages of this institution. It not only prevented the gratification of sensual indulgence, but it provided a salutary preventive of crime, and liberated them from the domination of their carnal appetites, and thus introduced them into a higher latitude and a nobler element. As they were aware, some of the greatest artists were engaged in manual exercises. The first introduction of Hogarth was as an engraver of bills, but, owing to being brought into a school of art, of considerably smaller pretensions than this, he became one of the most successful delineators of the various phases of human life. He also referred to Quintin Matsys, to whose memory a monument was erected at the west end of the magnificent cathedral at Antwerp. If he (the Bishop) remembered rightly, too, one of the most distinguished landscape-painters the world had produced, Claude Lorraine, whose pictures they always gazed upon with pleasure, was the son of a pastry-cook, and for many years languished in obscurity. He was, however, brought into a school of art, and from a pastry-cook became one of the greatest of painters. He rejoiced to find that this school had far out-stripped in the race such places as Lambeth and Newcastle; that it took precedence of Liverpool, Manchester, Sheffield, Birmingham, Dublin, Bristol, and other places; and that it had even eclipsed the two Universities. He had, therefore, a right to congratulate them. But he would remind the students of this—that a grave responsibility was attached to them; the credit of the institution was committed to their trust, and they would be answerable for maintaining the present position of the school. As had been said by a conqueror of old, to his soldiers, "Ye are my wings, on which I fly to victory," so Mr. Taylor might say to his pupils, "Ye are my wings, on which I fly to glory;" for, without the labour of the pupils, what would become of the industry of the instructor? As he (the Bishop) was about to distribute prizes to his younger friends, he wished to impress upon them that nothing could be done without indefatigable diligence. Many persons erroneously supposed that they could grasp success in a moment, and they accordingly did not give themselves the trouble of submitting that careful, indefatigable labour which was absolutely necessary to the artist if he would achieve success. If the students would be successful as artists, they must never let a day pass without labouring at art. It must be with them in their walks, and in their private meditations. They must never depart from it, and it would never depart from them. If they did this, then, by God's help, they would be successful. Something had been said of the delightful views, seen by the educated eye, even in the flats of Lincolnshire. He was satisfied that there were beauties in this English Holland. He might, perhaps, be allowed to make a reference to a relative of his own, the late Post Laureate, who left his beautiful home amongst the Lakes to visit him at Cambridge, and who told the speaker, in reply to his inquiry as to what beauties he could see in the flats of Cambridgeshire, that he lived in a beautiful country in order that he might see beauties everywhere. The late Sir Joshua Reynolds had said that he saw no beauties in Raffaele and Michelangelo until he had studied their works, and then he appreciated them, and became enamoured of their beauties and excellences. The great use of material objects was

to lead them to the study of ideal objects. They might copy objects exactly, but if they did no more than this, they would, like photographers, be merely machines, working machines. They must endeavor to have an ideal in their minds, and to arrive at the ideal would they must go to that which was spiritual and unseen. As Michelangelo, who was not merely the greatest of sculptors and painters, but one of the greatest of poets, had written:—

"Heaven-born, the soul a heavenward course must hold:
Beyond the visible world the soars to seek
(For what delights the sense is false and weak)
Ideal Form, the universal mould.
The wise man, I affirm, can find no rest
In that which perishes; nor will he lead
His heart to aught which doth on time depend,
'Tis sense, unbridled will, and not true love
That kills the soul: love better what is best,
Even here below, but more in heaven above."

ARCHITECTURAL ENGINEERING.

THE numerous instances of failure in engineering structures of late years seems at length calculated to point to the expediency of further researches in relation to the principles upon which that so-called science is conducted.

An inquiry of this nature would be likely to embrace the present condition of many important erections which subserve the exigencies of public requirements; and probably foremost in this list might be reckoned the tubular bridge across the Menai Straits. The condition of that structure has for years past been such as to cause considerable apprehension in certain directions, and it is fairly questionable whether the circumstances may not be grave enough to render the subject entitled to more than passing comment. It may be customary, as we may be aware, in analogous cases to await the occurrence of some actual catastrophe; but instances may suggest themselves of sufficiently threatening importance to admit of departure from more jealously observed rules.

From the statement of late authorities upon the progress of engineering science, the development of it would be made to appear coincident with the more extended application of iron to structural purposes.

As a constructive art, perhaps, the value,—or, it may be said, the more essential features,—of scientific engineering might be capable of being closely identified with the direction intended, subject or open to improvements in the method of its application corresponding with changes which may have been from time to time introduced in connexion with its production and manufacture.

The practice of modern engineering could, in accordance with these views, and in an important sense, be said to depend upon the theory and determination of the elastic properties of iron. As one of the more singular qualities of this material, it has been discovered that its resistance is not constant or uniform when exposed to dissimilar strains. This is true of its molecular cohesiveness when pressed as of its adhesive properties when pulled. It seems to possess no elements of constant strength, even where it may not be subjected to dissimilar strains. A bar of iron, which might remain intact under a gradually applied strain of 50 tons, would give way under a suddenly applied strain of 30 or 40 tons, as the case might be, and steel has, under strains of this description, been known to have possessed fewer elements of strength than iron, it being susceptible of ready fracture by a trivial blow, if suddenly applied.

It is not without a certain recognition of these qualities that the art of building in iron has been sought to be more widely extended, and their recognition does not necessarily exclude the consideration of other associated properties of iron of a more or less favourable character, perhaps, and which may deserve to be attentively weighed in instances of its adoption.

The stability of suspension structures, which are believed to well exemplify the general properties of iron, as well as affording instances of its more favourable appliance, is eminently dependent upon the assumed elastic properties of the materials of which such structures may be formed, and probably there may be but few constructions in which iron is seen to be largely employed which do not exhibit at some parts, if not at cardinal parts, the elements of the suspension principle.

From the inherent qualities of iron, it would seem to have been derived that greater advan-

tages may be claimed as to its adaptation in proportion as it may be applied constructively to sustain pulling or tensile strains.

Occasions may be adduced, no doubt, of its employment in other forms as in the roof of the new terminal station of the Midland Railway, in vertical supports, compression arches, and in the more recently projected system of continuous tubes.

What we would more especially note at this point is that it would appear to have been unequivocally shown that the action or ultimate strength of equal quantities of iron and in replicate forms varies as to the method in which it may be employed, and that the difference is in favour of its application in its tensile capacity.

The variation in the degree of energy or strength of resistance which iron is seen to possess when it may be employed respectively in the form of a normal or inverted arch, while embodying one of its more obscure properties, may be taken to indicate the economy and expediency of certain modes of its adoption as a building material.

A beam of iron placed over a certain span would, in proportion to its length and weight, be accumulating the elements of eventual rupture; while one-twentieth part of its substance, if suspended above it, would by connexion with the beam admit of the passing over of superadded loads. It was proposed, we believe, some two or three years since, by Mr. Cowper, of the Institution of Civil Engineers, to construct bridges with inverted instead of upon normal arches in iron, as an intermediate class of erection between suspension and ordinary arch-formed structures of the nature in view; but Mr. Peter Barlow observes that if the back chains of a suspension bridge were removed, and a compression tube applied uniting the extremities of a curved suspension chain, four times the quantity of metal would be demanded to obtain equal rigidity, and it appears that this costly element would not be altogether escaped in inverted arch bridges.

The deflection of beams or girders from their own weight alone, and their increased deflection by superadded weights up to the point of rupture, is said to coincide with the development or generation of series of strains whose direction may be shown, and which, arriving at certain localised parts, may be seized and conveyed away by appropriate connexions and means to the relief of the structure, as electricity may be carried away from accumulating points by conductors. It is asserted that no reliance may be placed upon the section of metal required in cases of large span, and that by no calculation can the point be arrived at with certainty when distortion will commence; but the observation is more intended to apply, as regards iron structures, to those not included in the suspension system.

Architecturally considered, all attempts to blend modern engineering theories with more established usages of building have resulted less happily, perhaps, than could have been desired.

Especially with reference to disasters incident to the construction of roofs, perhaps where iron may have been largely employed in conjunction with masonry, more particularly may this be noted. The distrust which at one time culminated in the proximate fall of the building which was erected for the purposes of the International Exhibition of 1862, at South Kensington, may be well borne in mind. The apprehension to which that circumstance gave rise has been scarcely diminished to the extent that could be wished by analogous occurrences of later date. In this direction it would seem, in an engineering point of view, that eminent scope would be afforded for further inquiry into the merits of the system embodied in the St. Pancras Station.

No ordinary arch-formed roof in iron of great span would appear to be intrinsically or necessarily safe. The rupture of the tie-bars, by the tendency of the limbs of the arch to spread, or the contraction of the span and demoralisation of the members supporting the structure by a negation of the action which they may have been originally intended to fulfil, are among some of the causes tending to disturb and imperil the stability of modern iron roofs of the description alluded to.

These elements of instability are observed to have been well avoided in the St. Pancras roof. This structure is in the form of an obtuse pointed Gothic arch, composed of two immense limbs of built-up ironwork, uniting in the centre of the span, at a height of 160 ft. from the springing, and may be considered to be altogether inde-

pendent of the architectural elements by which it is surrounded. The ribs, comprehending a span of 245 ft., are continued in a series of twenty-five principal and a corresponding number of inferior ribs, which constitute the main frame-work of the building; and apart from its being the largest roof yet constructed, it possesses claims of scientific importance as the direct antithesis of that system which is advocated by the engineer's brother, Mr. Peter Barlow, as to the economical and practical adaptation of iron to structural purposes. Reverting for a moment, and in view of the late occurrence at King's College, to the self-inflicted rupture of continuous horizontal girders or beams, such members, if altered to the form of an arch, would have the point of probable rupture translated to new localities, and admit of a certain margin of useful effect.

The direction of the tendency to rupture might then be regarded as having been diverted down the opposing limbs, accumulating and being retained or conveyed away at their base. Should sufficient extent of metal, however, not be provided at the extremities of the limbs within which the accumulating and applied strains could be taken up, the structure would rupture at these parts from compression. To meet this a pyramidal extension may be noted at the base of the arched limbs of the Midland roof, and may be compensated for in other arched form structures in iron by spandrels and other substituted means.

The study of the science of engineering has been compared by Mr. Fowler to the study of the science of medicine. The resemblance, however, would not appear to be intended to be too widely conveyed, and it forms no part of our duty to seek to inquire how far or not the comparison should be extended.

Mr. Fowler observes, that "although we know from history that men have existed from the earliest times who have been distinguished by great mechanical capacity, remarkable skill in working materials, profound science, and constructive knowledge; yet it is only during the present century that civil engineering can be considered to have become a distinct and recognised profession. Now, however, it has assumed the position of an art of the highest order. Perhaps we may, without arrogance, be entitled to claim for it the title of a true science. Many attempts have been made to define and describe a civil engineer in a few general words, but all such attempts have been more or less unsatisfactory."

While some might, perhaps, regret the irresolution which has been declared as to the discovery of some more intelligent designation of an important body, a less unsatisfactory approach may be made in this direction in proportion as their labours extend over a wider experience. Be this as it may, it would appear but a capable hardship, should a science confessedly of such immaturity be led in order to steer altogether clear of any imputation of arrogance, while retaining all the elements of a science, postpone its claims, for the time, to the dignity and confidence of a true one. It is a science which, perhaps, cannot yet be said to be so free as might be wished, from occurrences that may associate themselves in some degree with the attempts to which Mr. Fowler has referred, if not to point to the expediency of a suspension of judgment as to the position which should be assigned to it amongst leading arts.

The annals of engineering, although voluminous, do not appear to bridge over any wide historical interval, as Mr. Fowler has remarked, but it is said rather to be founded upon the discoveries of comparatively recent times. Mr. Humber says as the reader escapes from the preamble of his subject that "he will then come to the period when the rude constructions of the inhabitants of China and the Himalaya mountains of India suggested the mode of passing over chasms and rivers by means of a suspended way." From this point one is briefly led to the erection of the first iron bridge over the river Tees. After the erection of this structure, it is stated that more than half a century had elapsed, when we arrived at what is regarded as the culminating point or crisis of practical engineering embodied in the erection of the Menai Bridge.

The degeneration of this structure has long attracted attention in engineering circles, and may be calculated shortly to invite a consideration of the means by which it may be strengthened or superseded by an improved connexion. As we have already noted, the science of construction in iron or architectural engineering is said to have taken its more prominent features

if not its accepted date, from the period of the erection of this structure. But many of the conclusions which were then arrived at no longer coincide with the tendencies of modern engineering with reference either to the ascertained strength and properties of materials or their mode of application.

Mr. Clark states that "with respect to the use of the present suspension bridge for the proposed traffic it was found difficult to devise any means of sufficiently strengthening it that did not involve an almost entire reconstruction, and great difficulty was similarly found in attempting to render any suspension bridge sufficiently rigid for railway traffic by means of ordinary trussing. When the passing load is small compared with the weight of the chains and of the structure itself, there is, indeed, no difficulty; but the construction of a platform, 450 ft. long, sufficiently rigid for railway traffic, almost amounts to the construction of the tube itself." These difficulties will be seen to have been overcome, and the conclusion which was arrived at altogether set aside in presence of the span of Niagara Bridge, which is nearly twice 450 ft., and has yet been rendered sufficiently rigid for the purposes of locomotive traffic, to the exclusion of all resemblance to a tube, and affords a notable economy of material as compared with the Menai structure.

There are also more modern instances of improvement. Since the time of Brunel, who did with reference to the flexible adaptation of iron what Sir Charles Fox did with that material in another form in the Exhibition of 1851, the application of iron to building purposes has undergone wide and important changes, and the science of engineering cannot yet be said to have reached any determinate form. It is a quality of engineering science to adapt its designs to special circumstances, and consequently it never ceases to be experimental—a circumstance which is greatly to be regretted, perhaps, in the interests of that science. This may be instanced in the curious and interesting succession of bridges lately erected over the Thames in cases even where the circumstances and the requirements were alike; and it is this experimental feature which, in our view, somewhat detracts from the practical value and importance of the science, and would in a measure naturally be the case where every newly-projected undertaking can be regarded as upon its trial.

From more recent investigations upon the strength and durable properties of iron, it is possible that its application in a structural point of view may be brought more and more within the limits of an exact science, but until that time arrives those who may be concerned in important architectural works will be more solicitous as to the ultimate advantages of its more extensive adoption.

Standing alone as an independent and important branch of constructive science, the art in view may advance more truly to its aims, and eventually claim that recognition which Mr. Fowler appears at a loss to imagine should by some portions of the public be withheld from it, and which might well be attributed, as his words could at the present moment be taken to suggest, to bewilderment either in or out of the profession.

THE LABOURING CLASSES IN AMERICA.

THOMAS CONNOLLY, stonemason, who went to America on the part of brother-workmen, we believe, to report on the position of the trades there, has written a sensible letter to the *Telegraph*. We reprint a part of it referring to the houses of the poor and the labouring classes—

The rich can be well housed everywhere; but how fares it with the poor of New York, of whom there are quite as many in proportion to the inhabitants, as in any other city of the world? You will find as many idlers around the liquor-stores, as many beggars and Arabs in the streets, and more people crowded into the tenement houses than I ever witnessed in the most populous parts of London. In fact, all the working people live in those tenement houses from five to seven stories high, of which there are some 20,000 in New York. In most of these houses as many as thirty-six families live; and I was in one of about 24 ft. frontage, which contained fifty-two families. The people here are packed as close as herrings in a barrel, and are in some parts twice as many to the square mile as in any city of Europe. In their construction not the slightest attention is paid to light or ventila-

tion. They are usually four rooms in depth—the centre ones lighted from the front and back rooms. You have to grope your way up the staircase; for it is without light from top to bottom. The water is plentiful enough, and always on. New York receives 60,000,000 gallons per day from the Croton River, about thirty miles off; but from the rocky nature of the ground upon which many of the houses are built, it is impossible for the drainage to be perfect; and were it not that New York is swept by the clear sea breezes, I do not hesitate to say that most of those houses would be hotbeds of misery, disease, and death—more especially in the houses where the poor tailor is worked to death, where the son of St. Cripian has to work far into the night to earn a living, and the poor seamstress, "weary and worn," as in the old country, is "plying her needle and thread" to provide a scanty living for herself, and, perhaps, her little ones. Another Peabody is waited here; and some say that he will be found in Mr. A. T. Stewart, who, by a happy coincidence, is a native of the British Isles. I learn that he contemplates building homes for working people at some distance from the City, and constructing a railroad to them. I hope, for the sake of my fellow working-men here, that the statement may be true; but, in my opinion, they could do a deal for themselves if they had the will; for across the rivers to Brooklyn and Jersey there are some twenty ferry-boats running every five minutes, and in those places homes are better and cheaper. But men will be near their work if they can, even at the sacrifice of health and life. Those miserable, uncomfortable, unhealthy flats in the tenement houses are let at from 30 dollars to 40 dollars per month; so that a working man with a wife and a couple of children cannot get the poorest house accommodation for less than 12 dollars per month. The houses are all heated with stoves, in which anthracite coal at 12 dollars a ton is burned, and on which the cooking is all done. Every family has its own stove, which they remove like any other piece of furniture, when about to leave; they economise fuel, and heat the rooms much better than open fireplaces; and they could be used with much advantage where fuel is dear in England. It fares little better with single men and women, who, through emigration, are in vast numbers here; they live in boarding-houses, which are nothing more than one of those tenement houses, fitted with beds in every room, except one, on the ground floor, which is set apart for meals. The inmates pay from 6 dollars to 7 dollars a week, and I admit that the food is very good. There is meat at every meal; breakfast before they go out at seven in the morning, dinner at twelve, and tea at six p.m.—no supper, like working men in London. A large bell summons all to meals, and if you fail to attend you get nothing till the next time. On Sundays or holidays you keep your bedroom, or go out. Food here is about the same price as in England, but not so good. Without entering into details, I

which I must reserve for future letters, when I describe the condition of the trades, my present conviction is, that a working man in any trade here does not enjoy so much social comfort as a man of the same trade in England, with both in full employment.

THE SPACE AT THE MANSION HOUSE.

WITH reference to the memorial of the Royal Institute of British Architects pointing out the necessity and desirability of leaving the triangular piece of ground as it is, rebuilt on, and the refusal of the Metropolitan Board to accede to this request, it has occurred to me that the Metropolitan Building Act, 1855, compelling streets to be of not less width than 40 ft., ought effectually to stop the present scheme for building on it.

NEMO.

EXPERIMENTS ON TIMBER.

An engineer writes,—

Having been permitted, through the courtesy of Messrs. Bayly & Fox, timber merchants and owners of saw-mills and crescenting works in Plymouth and at Oreston, to be present at the inspection of a number of pieces of wood prepared to test the value of various processes for the preservation of timber for sub-marine work, I send you the enclosed statement of results, thinking it may be interesting to many of your readers. The experiments have been made at the Great Western Docks here in still water, 20 ft. deep. The wood has been constantly covered for nearly two years and a half. The blocks have hung one over another on a chain which passed through them; a distance of about 10 in. being kept between each, and the whole attached to a heavy mooring, and sunk. Having again sunk the whole, it will be very interesting to note the effect which longer immersion will have upon them. My own opinion leads me to think the value of the crescenting process over any other will be more apparent each year, and that at the end of a further term of two years there will be little, if any, of the unprepared pieces of pine remaining.

The timber was sunk in the Great Western Docks, Plymouth, on the 19th of June, 1867, and examined on the 9th of December, 1869.

Preparation of the Timber for Experiment.—The timber to be crescented was dried under a shed, with full circulation of air, for six weeks, then crescented under pressure, from 45 to 50 gallons of oil to the load being absorbed.

Timber to be kyanised was dried as above, then steeped in a solution of corrosive sublimate during 24 hours for each inch in thickness. Three pounds of sublimate per load (50 cubic feet) being used.

Timber for the sulphate of copper process was dried as above, then steeped for 14 days in a solution of sulphate of copper, 1 lb. to 8 gallons of water being used.

Timber unprepared was also dried as above.

Description of Wood.	Scuttling.	How prepared.	Condition on Examination.
Quebec Yellow Pine.....	10 x 10 x 5	Crescented.....	Perfectly fresh and sound.
Ditto.....	"	Kyanised.....	Very slightly worm-eaten.
Ditto.....	"	Unprepared.....	Much worm-eaten and reduced in size.
Ditto.....	"	Sulphate of Copper.....	Much worm-eaten.
Quebec Red Pine.....	10. 10 x 5	Crescented.....	Perfectly fresh and sound.
Ditto.....	"	Kyanised.....	Ditto
Ditto.....	"	Unprepared.....	Much worm-eaten and reduced in size.
Ditto.....	"	Sulphate of Copper.....	Much worm-eaten.
Memel Timber.....	10 x 10 x 5	Crescented.....	Perfectly fresh and sound.
Ditto.....	"	Kyanised.....	Very slightly worm-eaten.
Ditto.....	"	Unprepared.....	Much worm-eaten.
Ditto.....	"	Sulphate of Copper.....	Rather worm-eaten.
American Oak.....	6 x 6 x 5	Crescented.....	Perfectly fresh and sound.
Ditto.....	"	Kyanised.....	Ditto
Ditto.....	"	Unprepared.....	Slightly worm-eaten.
Ditto.....	"	Sulphate of Copper.....	Very slightly worm-eaten.
American Elm.....	6 x 6 x 6	Crescented.....	Perfectly fresh and sound.
Ditto.....	"	Kyanised.....	Ditto
Ditto.....	"	Unprepared.....	Much worm-eaten.
Ditto.....	"	Sulphate of Copper.....	Very slightly worm-eaten.
English Elm.....	6 x 6 x 6	Crescented.....	Perfectly fresh and sound.
Ditto.....	"	Kyanised.....	Much worm-eaten.
Ditto.....	"	Unprepared.....	Very slightly worm-eaten.
Ditto.....	"	Sulphate of Copper.....	Perfectly fresh and sound.
English Oak.....	6 x 6 x 6	Crescented.....	Very slightly worm-eaten.
Ditto.....	"	Kyanised.....	Perfectly fresh and sound.
Ditto.....	"	Unprepared.....	Ditto
Ditto.....	"	Sulphate of Copper.....	Very slightly worm-eaten.
English Beech.....	10 7 x 2	Crescented.....	Perfectly fresh and sound.
Ditto.....	"	Kyanised.....	Ditto
Ditto.....	"	Unprepared.....	Much worm-eaten, with growth of weed.
Ditto.....	"	Sulphate of Copper.....	Slightly worm-eaten, with growth of weed.
Swedish Timber.....	12 x 8 x 5	Crescented.....	Perfectly fresh and sound.
Ditto.....	"	Kyanised.....	Ditto
Ditto.....	"	Unprepared.....	Much worm-eaten and reduced in size.
Ditto.....	"	Sulphate of Copper.....	Much worm-eaten, with growth of weed.
Pitch Pine Timber.....	10 x 10 x 5	Crescented.....	Perfectly fresh and sound.
Ditto.....	"	Kyanised.....	Very slightly worm-eaten.
Ditto.....	"	Unprepared.....	Much worm-eaten, with growth of weed.
Ditto.....	"	Sulphate of Copper.....	Slightly worm-eaten, with growth of weed.

THE METROPOLITAN RAILWAY.

DESPITE the complaints that have frequently been made, and are still occasionally made, of the management of the Metropolitan Railway, the number of passengers who have availed themselves of its trains has steadily increased from the date of its opening. In the first year the number of passengers carried over the line was 9,455,175. During the year just closing it is estimated that the number of people conveyed over the system—very much extended since the last-mentioned date—will be no less than 40 millions! The whole number of passengers who will, it is estimated, have made use of the line up to the end of the year 1869 is just over 150 millions! These figures are too large to convey any very definite impression to the mind. The greatest number of workmen who have been carried by the trains appropriated to their use in one week has been 18,675, and the number carried in the half-year ending June 30th was 342,174. A good deal is being done to improve the ventilation of some parts of the tunnel, and of one or two of the stations. At Portland-road, for instance, the tops or coverings have been taken off the two domes, and by this means a constant supply of fresh air is admitted into the station. At Gower-street a still greater improvement has been effected by the purchase and demolition of two houses, one on either side of the line. In this way open access has been provided to the platforms, and this, which was until lately the worst, will now be one of the best ventilated stations on the underground portion of the railway. The construction of the St. John's-wood branch was a great aid to ventilation; and a scheme has already been sanctioned by the Board of Directors for making an opening in the roof between Gower-street and King's-cross.

MRS. TAIT'S ORPHANAGE, ST. PETER'S, THANEY.

THE foundation-stone of a permanent home for orphans, initiated by Mrs. Tait, wife of the Archbishop of Canterbury, has been laid on a site near the Archbishop's marine residence, Stonehouse, St. Peter's. We understand it will be in the Gothic style, and will be 100 ft. long and 60 ft. wide. The dressings will be of Doulting stone, the internal walls being built of brick, faced with flints obtained in this neighbourhood. Red bricks will be introduced as bands and relieving arches; and the entire building will be covered with tiles. Accommodation will be provided for about sixty orphans belonging to the Canterbury and London dioceses, who will, under the direction of Mrs. Tait, be in the care of sisters from St. Peter's, Clapham. A chapel will be erected, 59 ft. by 18 ft. The cost of erection will amount, it is estimated, to nearly 6,000*l.*, of which 2,600*l.* have been obtained up to the present time. The building is to be finished and ready for occupation by April, 1871. Mr. J. P. Seddon is the architect; and Mr. Thos. Williams, of Kentish Town, is the builder.

THE GRANITE COLUMNS OF THE HOLBORN VIADUCT.

SIR,—The publication of the report of the engineers appointed to examine the piers of the Holborn Valley Viaduct Bridge over Farringdon-street, affords to the proprietors of the Ross of Mull Granite Quarries, from which the red granite of the piers was quarried, the opportunity of explaining the cause of the giving way of these stones, and inquiring publicly what departure from Mr. Haywood's original design is referred to in the report of Messrs. Clark, Bidder, & Harrison. I send you copy of tracing of the piers, furnished to me by Mr. Haywood's orders nearly three years ago. This tracing was furnished in order that I might give an estimate to him of the probable cost of these piers. You will observe in this tracing joints are shown at 12 in. from the bottom of the Ross of Mull granite, and at 9 in. from the top of the same granite. As it has been proved that the fracture of these 12-in. and 9-in. stones has been caused by hollow beds, and the improper use by the contractors of detached bits of lead, instead of a continuous sheet or ring of that metal, the matter that I wish now to elucidate is, that these comparatively thin stones upon which the whole weight of the superstructure would be imposed formed part of the original design, and the reason for that being the case.

When the design was shown to me in February, 1867, and the time (about twelve months thereafter) within which the work was to be finished was named, I represented that it would be much easier to have the work done in the time were the piers circular in form instead of the form shown in the drawing; the reason of this being, that the time taken by the masons in preparing, and by the machine-men in polishing, would be considerably shortened by the adoption of the circular form. To this Mr. Haywood would not consent; therefore the thin and, unless carefully laid, weak pieces of stone were retained in the design.

I have frequently admired the patience with which the inhabitants of London submitted to the great inconvenience of the opening of this noble Viaduct being so long deferred, mainly that the piers of this bridge should be angular instead of circular, and the great simplicity with which Mr. Deputy Fry explained that the delay was from the difficulty in getting possession of the ground, ignoring the fact that the arches of the roadway both east and west of Farringdon-street were completed many months before the bridge, the land for which was to be had for the taking. Mr. Fry has been rewarded by the 500 guineas' worth of plate, and the public by the sight of fractured piers.

The proprietors of the Ross of Mull granite quarries are too well aware of the excellent qualities of the stone to fear much loss from the exaggerated reports of the damage done to these piers. We knew that when the truth came to be known, it would be found that the stone was not at fault.

The massive columns of Blackfriars Bridge were taken from the same part of the quarries; and I have been informed by Mr. Carr, the engineer of that structure, that he ascertained by experiment with a polished piece of Ross of Mull granite, 3 in. in diameter, *swampy bedded*, that the crushing point was nine tons per square inch, or one hundred times more than the weight borne by the fractured piers at Farringdon-street.

P.S.—It is necessary I should explain that although the fractured stones were taken from the quarries at the Ross of Mull, the proprietors are not in any way responsible for the quarrying, dressing, polishing, or fixing of these stones, these operations having been undertaken by the contractors for the Viaduct.

LANDLORD AND TENANT.

SIR,—The case of *Davies v. Remmett*, reported in your last issue, in which the jury found a verdict for the landlady of a house let furnished, but more or less uninhabitable by reason of defective drainage, the tenant relying on an implied warranty, is instructive, as confirming in degree the obliteration of a nice distinction in our truly feudal laws of landlord and tenant,—laws made evidently by legislators who occupied the former rather than the latter position. That there is never any covenant or promise implied at law on the part of the landlord on letting an unfurnished house that it is reasonably fit for habitation, is clearly established; but that, on the contrary, there is such an implied warranty on letting a furnished house, is imagined by many to be settled law; and so Lord Campbell ruled. Judges, however, differ on the second point, and have since differed, the balance now being against the tenant. Cole, in "*Woodfall*," last ed., says,—"*It was once decided that there is an implied condition in the letting of a furnished house that it shall be reasonably fit for habitation, and not so infested with bugs as to make it uninhabitable. But such decision is not to be relied on: it has been greatly shaken, if not overruled, by subsequent cases.*" Archbold, third ed., reiterates the above cases, adding, "*That, at all events, if the house be let (furnished) upon lease, there is no such implied warranty. And the better opinion seems to be, that the only implied agreement upon the part of the landlord is for quiet enjoyment, in the ordinary legal sense of that term; that is, without disturbance by the landlord or any person lawfully claiming under him. An agreement letting for only one year, or for a less term, may, of course, amount to a lease; and, to be on the safe side, as Lord Wensleydale observed, in an important judgment touching an unfurnished house, 'When parties mean that a lease is to be void on account of unfitness of the premises for the subject for which they are intended to be used, they should express their meaning.'*" E. L. TARBUCK.

THE THEATRE.

Covent Garden.—In respect of art, the pantomime at this house, "*The Yellow Dwarf*," stands at the head,—an easy first. It is, in fact, a remarkable work. The first scene, "*The Wicked Haunt of the Yellow Dwarf*" (painted by Dayes & Caney), with its weird rock-cut figures, and the extent of its cavernous depths, is an artistic production; though how a Haunt can be wicked, unless the H is there by mistake, we do not know. The same artists also supply an effective scene of the Royal Gardens, and a view of the Crystal Palace from the Gardens, for the harlequinade. The Gardens of the Palace, by Mr. Telbin, jun., the Haunt of the Houri by Mr. Hawes Craven, and the Transformation-scene by Mr. Julian Hicks, would each make an exhibition cheap at a shilling apiece the first two, and half-a-crown the third. This last, termed the *Roses of Fairland*, is brilliant and refined. When we add that the groupings have been arranged by Mr. A. Harris, the words written by Mr. Byron, the costumes designed by Mr. Matt. Morgan, and that all the parts are pleasantly filled, Mr. F. Payne's *Tutti-frutti* being the most remarkable, we shall have said enough to send many to Covent Garden who do not usually care for pantomimes. Mr. W. Telbin, we ought to have mentioned, has supplied a view of the Thames Embankment and the Houses of Parliament, which is a perfect picture.

The Surrey.—We must give a warm word of praise to Mrs. Charles Pitt for the improved taste observable in the Surrey pantomime this year. The scenery, by Mr. Albert Calcott, and the dresses are altogether admirable. The transformation scene is gorgeous.

Intended Theatre, Leicester-square.—The proposed elevation of the theatre about to be built, it is asserted, on the north side of Leicester-square, and described in our pages some weeks ago, is a very poor affair, as unlike a theatre as it is possible to conceive.

BREAKAGE OF GLASS IN BLANK WINDOWS.

BELIEVING I have now discovered the real cause of breakage of the black enamelled glass in blank windows at Longleat (referred to in my letter of the 20th March last), I feel it my duty to ask you to make it known through the *Builder* for the benefit of others.

I examined some of the damaged squares during a hot day, about Midsummer, and found them very hot to the hand in the centre, but comparatively cool round the edges, where they were inserted in the stone mullions. I was at once struck with the conviction that the breakage was caused by unequal expansion, the central portion expanding more than the edges, producing a fracture of this kind, the glass seldom falling out. I have since inserted a number of squares in wood fillets flush with the stone mullions, the glass being stopped in as in ordinary sashes. These stand well, none of them being broken. W. BUCKENHAY.

FATAL ACCIDENT AT THE NEW THEATRE, BRISTOL.

MOST of our readers will have heard of the terrible accident at the new theatre in Park-row, Bristol, which resulted in the death of eighteen persons, and the injury of several others. The entrance to the pit and gallery is down a passage about 20 ft. wide, leading from Park-row. There is a steep gradient from the level of the road, and at the bottom of the passage there is a sharp turning leading at right-angles to the gallery on the left. The door to the pit is situated also on the left-hand side, but about 2 ft. higher up, and consequently nearer the roadway. It is impossible to compute the exact number of persons in the passage; but it is stated by several policemen who were near the spot that nearly 2,000 persons were endeavouring to gain admission either to the pit or gallery—the crowd extending some distance into the roadway. As the minutes wore on the crowd grew denser, and the pressure from the outside packed the mass in the passage closer and closer altogether. Directly the doors were opened those behind pushed forward, heedless of the cries of those in front of them. A policeman, desirous of restraining the advance of those behind, called out "*Fire!*" A panic was the result. Men, women, and children immediately made a frantic effort to drive back those coming in. People were pushed down and

trampled under foot, and when once down it was almost impossible to recover their footing. In some of the newspapers we have seen the width of the passage, 20 ft., referred to as increasing their surprise that the accident occurred. The fact is, however, that in this width of passage was the element of danger, increased by the steep descent. Any arrangement which permits a mass of people to be clustered together as they were here is a bad one. The French for years have shown us an example by forming the persons waiting into a narrow queue, which is controllable at any point; but the lesson is lost upon us. Every day it becomes more obvious, especially in the face of the existing mania for building theatres and music-halls in London, that proper regulations and strict supervision are needed with reference to the erection of public buildings.

LEEDS BRIDGE COMPETITION.

GREAT dissatisfaction is expressed on the ground that, although it had been stated no one connected with the corporation would compete, their surveyor, with whom various competitors had discussed their views, has been allowed to do so. Exception is taken, too, to Mr. Barlow's selection of three designs, all requiring, according to his own showing, important alteration. The joint engineer of Blackfriars Bridge, who is a competitor, has published some strong and pointed assertions on the subject.

ETYMOLOGY OF THE WORD "HOLBORN."

THE recent opening of the Holborn Viaduct has naturally awakened fresh interest in the etymology and application of the word Holborn. Among others, the *Illustrated London News* has lately taken up this subject; it is also incidentally alluded to in Mr. Trollope's magazine, *St. Paul's*, in the article called "The Thames." Both writers adopt the old opinion which considers it a corruption of *Old-bourne*. This appears to me a great misconception; I do not deny that it has been called *Old-bourne*, but not correctly so, as I think.

The prefix *Hol* in Holborn really means a hole or hollow, as in the analogous cases of Holbeck and Holbrook: places in England, named in a similar way, *bourne* or *burn*, *beck*, *brook*, being synonymous words for a small stream of moving water.

Holborn is thus mentioned in Domesday-book, the old Norman survey of England, compiled by orders of William the Conqueror; it is there recorded that "the king has two cottiers at *Holeburne*, who pay twenty pence a year to the king's vice-comes [sheriffs]." There can be no doubt that *Holeburne*, in *Ossulstone* hundred, Middlesex, is meant for the Holborn of the present day; and it would, therefore, appear that "Hol" is the older, and more correct form than "Old;" the use of which latter form served to mislead Stow, the chronicler.

Old, the Saxon form of *Old*, could not have been corrupted into "Hole" so near to Saxon times as A.D. 1086, when the great survey was completed.

A. HALL.

RAILWAY AND TRAMWAY BILLS, 1870.

THE budding-season, so to speak, of the Private Bill business of the coming session is now past, copies of the Bills to be petitioned for having been lodged as required by Standing Orders on the 23rd of December current. The number of Bills deposited, 239, is considerably larger than the number lodged last year—212; but the number of Bills involving new works is considerably smaller. The latter class of Bills are outnumbered by the additional Standing Order that the plans of such works, with books of reference to the property involved in the construction, have to be lodged in the Private Bill Office on or before the 30th of November.

In the approaching session ninety railway Bills will be petitioned for, and twenty-two tramway Bills. Many of the railway Bills relate to abandonment of authorised works, extension of time, and "capital" arrangements; but comparatively few are for new works, and of these only a small number are for schemes of engineering importance. Amongst such may be named the Tay and the Severn Bridge schemes, and the East and West Metropolitan Junction Mansion-house Railway scheme, to the character of which attention was directed in a previous

number of the *Builder*. The street and road tramway Bills include some half a dozen for the metropolis; two each for Glasgow, Manchester, and Birmingham, with others for Dublin, Leeds, Worcester, Plymouth, Wallasey, and other places. The remainder of the Bills relate to gas and water supply, local improvements, piers and harbours, canal and river navigations, roads and bridges, markets, and miscellaneous. The proportion of the comparatively small number of Bills petitioned for that is to perish in the bud, or to be thrown out upon Standing Orders, remains to be seen.

THE INSTITUTION OF CIVIL ENGINEERS.

THE Report read at the annual general meeting, held December 21st, showed that the actual numbers of the four classes,—honorary members, members, associates, and students,—were 16, 655, 920, and 143 respectively. The ordinary receipts for the past year had amounted to 7,032*l.*, being only 141*l.* less than they were in 1868, notwithstanding the loss of dividends due to the sale of stocks necessary to meet the expenses of the new building. The expenditure in the same period (exclusive of the new building) had been 3,786*l.* During the financial year ending on the 30th of November last, a sum of 8,498*l.* 5*s.* 6*d.* was paid on account of the new building and its accessories, making, with the sum of 9,711*l.* 16*s.* 10*d.* expended up to the date of the previous annual meeting, a total outlay of 18,210*l.* 2*s.* 4*d.* This outlay had been entirely defrayed out of the funds of the Institution, viz., 10,246*l.* 1*s.* 8*d.* by the realisation of investments, 2,206*l.* 16*s.* 2*d.* from the Locke Gift and Bequest (which have been received too recently to be invested), and the balance, 5,754*l.* 4*s.* 6*d.*, from the surplus income of the last two years. It should be mentioned that the building fund proper had only contributed 5,712*l.* 5*s.* 10*d.* towards this outlay. The remaining balance of 12,497*l.* 16*s.* 6*d.* had been obtained from the general funds,—an amount which the building fund fees, on election, would not be able to reimburse for the next quarter of a century. The nominal or par value of the several funds under the charge of the Institution, on the 30th of November last, was,—1*l.* general funds, 7,566*l.* 1*s.* 8*d.*; 11*l.* trust funds, 12,119*l.* 15*s.* 8*d.*; and 11*l.* cash balance, 268*l.* 9*s.* 9*d.*, making a total of 20,044*l.* 7*s.* 1*d.*, as against 29,335*l.* 18*s.* two years ago, when they were at a maximum. This showed a decrease in the interval of 9,793*l.* 10*s.* 11*d.*; but it was to be remembered, as previously stated, that in that period a sum of 18,210*l.* 2*s.* 4*d.* had been paid on account of the new building.

On Tuesday, January 11th, Mr. Vignoles will deliver his address as President.

CONTRACTS FOR ROADMAKING, SEWERAGE, &c.

SIR,—You have been calling attention on several occasions to the great discrepancies between the tenders for works of this kind, and they have certainly become rather notorious; but in justice to those who have sent in tenders for these works, I think it only fair to say that in many cases the plans and specifications are prepared in so vague and indefinite a manner as to account for very great differences in the estimates. In many instances which have come under my own notice, there have been no definite particulars as to the manner in which materials have to be laid down and consolidated, nor as to the quality, thickness, depth of socket, or mode of sighting, jointing, and laying drains, pipes, nor of the method of filling in, ramming, and formation of surface. It is no wonder in all such cases that very serious misapprehensions should occur, and I am often surprised that they are not more frequent.

There is no class of work which requires more strict and definite description than works of street-making and sewerage, as they are almost entirely covered in, and the first errors cannot be detected in time to be remedied by the contractor, even if he should be liable under the terms of his contract.

All works of a permanent character should be carried out in the very best manner, and of the very best materials, and it is simply an expensive economy to execute them in any other way. A liberal price should be given for such works; and the contractors, while they are

entitled to have the fullest and most minute details of the work set before them, should also be bound to keep the work, when executed, in perfect repair for six months after completion.

THOMAS D. BARRY, Assoc. I.C.E.

ACCIDENTS.

AT Barking during a gale a large portion of the steeple of the parish church has been blown down. The north-east corner for about 12 ft. down was blown completely off and fell through the roofs of the nave and north aisle into the church, while the peal of bells in the tower is covered by a portion of the rubbish. The steeple is very old, and has been cranked for some time. The damage amounts to several hundreds of pounds, and the repairs are entrusted to Mr. Scoopes, Needham Market.

A portion of the Pier in course of erection at Eastbourne was blown down in a recent gale. The columns and girders for some 60 ft. of the pier had been completed, and 60 ft. beyond this another cluster of columns had been placed, but not connected with the other portion of the pier. The gale was so violent that these columns were torn up; indeed, some were snapped in two, and striking the girders, which had not been planked, hurled some into the sea, while others were bent, and hung over the head of the pier. This mishap will cause a considerable delay in the completion of the pier.

At the Paragon Stables, Paragon-street, Hull, the roof of one of the central stables has fallen in. The stable comprises two rows of stalls, and, fortunately for the horses (sixteen in number), the *abris* fell between the two rows. Thus the horses were all entirely unharmed. But two of the stablemen were found to be missing. One of them was afterwards dug out dead; the other, faint on being extricated. He was conveyed to the Infirmary. The accident was caused by the giving way of a wall which had become weakened during the recent stormy weather.

ZINC ROOFS.

SIR,—Will you or some of your correspondents kindly inform me "the best composition for covering over a zinc roof, which, from expansion and contraction, cracks and admits rain?"

I have tried tar and sand, which partially answers, but believe I have read in some of your early issues of a composition which would form a coat of varnish on metal, impervious to rain, incombustible, elastic, inexpensive, and deadening the sound produced by heavy rain or hail-storms.

Any suggestions meeting these requirements will be welcomed by me.

ENGINEER.

THE ST. PETERSBURG EXHIBITION.

SIR,—In answer to the inquiry contained in your paper of December 18, regarding the St. Petersburg Exhibition, I beg to inform you that the Russian Consulate in London has received official notice that the said Exhibition will be a purely national one. There must, therefore, be some mistake in the American statement.

I have lately resided from St. Petersburg, where I have resided for a number of years; and should any of your correspondents desire to be informed as to the economy of the Russian Empire since the introduction of the vast reforms,—reforms which have changed entirely the former aspect of affairs in that country,—I shall be happy to correspond with them.

JAMES HUGHES.

CASES UNDER THE BUILDING ACT.

NOTICE TO SURVEYORS.

ADIN SHEPHERD, of East India Dock-road, Poplar was summoned to the Thames Police-court, Stepney, for having erected a building, two stories in height, intended to be used as offices, at Limehouse Dock, Rummel-street, Poplar, without having given notice to the District Surveyor, as required by the 38th sec. of the Act, the building being irregularly constructed (the same builder having also committed a similar offence in making alterations and additions to another building in the immediate neighbourhood of the above). The case was heard before Mr. Benson on the 18th ult. The defendant did not appear, and was convicted in the penalty of 5*l.* and costs.

David Allen, a small builder (also the owner), of Kirby-street, Poplar, was summoned for having built three cottages at Goodfield-place, Poplar, without giving the required notice. In April, 1868, notice was sent to build four cottages; two were carried up and completed, and before he commenced the other two he was notified when he informed the District Surveyor that it was not his intention to build any more. On the 2nd of December, 1869, the District Surveyor directed three houses built adjoining the two for which notice had been given in April, 1868. This case was also heard before Mr. Benson, at the Thames Police-court, on the 18th ult., when the defendant was convicted in the penalty of 2*l.* and costs.

Regular Building.—At the Clerkenwell Police-court, Mr. Charles B. Thompson, of No. 28, Clifton-road, Hornsey-road, was summoned by Mr. John Turner, the District Surveyor of the Eastern Division of Islington, for having erected at the rear of each of the three houses belonging to him in the Moray-road a building constructed contrary

to the rules of the Metropolitan Building Act,—viz., having walls only half a brick thick, and being covered with wood. Mr. Thompson did not appear. Mr. Cook, the magistrate, having said into his order, that each of the buildings should be amended, and awarded 22s. as costs.

Also Mr. Richard Hunt, the occupier of a house situated in the street, near the Sixteen-road, was summoned for the fees due to the District Surveyor for surveying the erection of the house he resided in, and which the builder had failed to discharge. The magistrate made his order that Mr. Hunt pay the fees and 14s. costs.

THE PROPOSAL FOR WIDENING LONDON STREETS.

Sir.—The illustration to Mr. Taylor's suggestion was only intended to make plain his meaning as to the space gained. The architectural treatment of the buildings would be open to a wide range of choice in colonnade, arcade, &c., in various styles. The least satisfactory plan would be, I think, that proposed by Mr. Forbes. A row of houses supported only under their party walls would be anything but beautiful. With respect to girder construction being made conspicuous, it seems to me that this or any other case the iron girder is so unmistakably and uncontrollably a thing of utility, it can never be prominently introduced with success in that ornamental art known as architecture.

As the fronts of the houses are already supported by concealed girders, it would be an unnecessary expense putting others. All that would be absolutely required would be the pushing backward the top of the girders.

With regard to the objection that a covered way as proposed would result in the nuisance complained of in the case of the Quadrant, Regent-street, I do not think it at all a matter of course that the Quadrant is the only case of its contiguity to the Haymarket alone; and will the Haymarket be a gay market, the neighbourhood will suffer, columns or no columns. In respect of the shops being darkened, in the Rue du Rivoli at Paris, the evil does not appear to be felt, and certainly from furnishing protection from sun and rain, allowing ladies to alight under cover, &c., there would be compensating benefits.

Of course, Mr. Taylor does not pretend his proposition is without drawbacks. He only advocates it as the best way of solving a difficult problem. P. E. MARRY.

ACTION AGAINST AN ARCHITECT FOR ALLEGED NEGLIGENCE.

Andrew Armstrong v. Alfred Jones.—This was an action in Court of Exchequer, Dublin, to recover from the defendant, an architect and civil engineer of that city, damages for alleged negligence in preparing plans, specifications, and working drawings for, and in superintending the erection of, a dwelling-house and premises for the plaintiff at Temple-road, Upper Rathmines. The case was at hearing for several days.

Baron Fitzgerald, in the course of his charge to the jury, said that in substance as a complaint that the defendant had been guilty of a breach of duty. The defendant was employed by the plaintiff as an architect to prepare plans and specifications, and to superintend the erection of those plans and specifications, for the building of the plaintiff. It appeared to him that when the defendant accepted this employment he became immediately under the obligation to exercise, both in the making of the plans and specifications and in the superintendence of the work, reasonable care, diligence, attention, and skill; and if there had been any default on his part in that superintendence, from which actual damage had arisen to the plaintiff, then the defendant was responsible. A very serious question arose upon the contract. It appeared that for the completion of the whole contract Mr. Bolton was to be paid 3,224*l.* 1*s.* 9*d.* The mode of payment was to be by instalments, but the right to receive any instalment could only be conferred on Mr. Bolton by the defendant's certificate, given under his hand, certifying that it had been done to the amount of 25*l.* at least. These he was to be paid on the 15th of the month so certified. It was also provided by the contract that none of the certificates should be given unless the work was done to the satisfaction of the defendant, and in conformity with the contract. There was to be a final certificate, however, which would be conclusively binding on both parties—that was on Mr. Bolton and the plaintiff. The allegation of the plaintiff was that the defendant was responsible for want of due care, attention, and caution in the giving of these certificates. That allegation was the subject of the other three counts which they had to consider. The contention of the defendant was that he was only to be held responsible for an honest and *bona fide* performance of his superintendence, not independent of care and skill. That appeared to him to be a question deserving of much consideration, but for the purpose of determining between the parties in the shortest and most inexpensive mode, he should ask them to treat it as that the defendant was responsible for the want of care, skill, and attention in the performance of his duty. If he was wrong in that he would be set right; but, in the meantime, he would ask them to treat it. If they found that there had been want of reasonable skill, care, and attention in the superintendence of the work, then would arise the question of what actual damage arose to the plaintiff from this default of the defendant in this duty of superintendence. The measure of damages could not, by possibility, be what would be the performance of his duty in the condition required by the contract—that would be as against the party who was paid for the performance of the work. The plaintiff had suffered by reason of the negligent performance of his duty of superintendence. It appeared six certificates had been given—1st, 27th April, 1867, for 600*l.*; 2nd, 3rd May, 1867, for 600*l.*; 3rd, 10th May, 1867, for 600*l.*; 4th, 17th May, 1867, for 600*l.*; 5th, 24th May, 1867, for 600*l.*; 6th, 31st May, 1867, for 600*l.*. There were certified in all 3,600*l.* now the damage had been paid 2,925*l.*. On the 31st of July, 1868, the sixth certificate was given for 600*l.* on the contract, and 300*l.* for extra, together 900*l.*, out of which the sum payable was 700*l.*. Now, as to the giving of the sixth certificate, it was given after six, and the plaintiff could have refused to pay it—he was not compelled by the

powers of the contract to pay it. It would be almost impossible to say that the giving of the certificate was not a gross want of caution, and very negligent, to say the least of it. Now, the plea of the defendant was that this certificate was given by the leave of the plaintiff. It was a question whether this plea ought to have been allowed, but for the purposes of the present trial it was not necessary to consider it. It would be impossible to say that he did not pay this with full knowledge that 2,625*l.* had been already paid, and he or his attorney had the actual possession of the draught of the contract by which he was required that he was not compelled to pay, and yet he (Mr. Armstrong) made no complaint until February, 1869. He had now gone through the questions they had to try, and as they were so familiar with the evidence as he was, it was unnecessary for him to review it. His lordship then left the following questions to the jury—1st. Were the houses and premises at Temple-road in any respect built of inferior or insufficient materials, or erected in an unskillful or unworkmanlike manner, or permanently injured or diminished in value, or were any deviations or omissions from the plans and specifications made? 2nd. Were they, or any of them, made or done by the authority or permission, or by reason of want of reasonable skill, care, and attention of the defendant in his superintendence of the works? 3rd. The damage arising to the plaintiff from such default of the plaintiff in said superintendence. 4th. Whether the certificates, or any of them, were given to the builder in respect of works which were not done to the satisfaction of the defendant, or according to the contract. 5th. Whether the certificates, or any of them, were given to the builder without taking into consideration deviations and omissions made by the builder in the work, and without making any deductions in respect thereof from the sum mentioned in such certificate or certificates. 6th. Whether the giving of such certificate was by reason of the negligence and want of caution of the defendant in his duty of superintending the works? 7th. The damage thereon arising. 8th. Whether the 6th certificate was given through negligence and want of due caution on the part of the defendant in superintending the work. 9th. Whether the plaintiff, with full means of knowing the default of said 6th certificate, acquiesced in and adopted the same.

The jury, after an absence of an hour and a half, returned, having in a verdict, with an answer to the allegations to each question, and assessing the damages on the 2nd and 3rd questions at 75*l.*, and on the 6th, 6th, and 7th questions at 5*l.*, with 6*d.* costs.

CAB MEN AND CAB STANDS.

It appears to me that these hardly-used men might be kept out of the public-houses, if a small kitchen,—wooden houses on wheels,—were attached to each cab-rank; tea and coffee might then take the place of gin and brandy, and cost less. SENECA MILLER.

CONCRETE BUILDINGS AND THE "INCLOSURE COMMISSION."

In assenting to the grant of public money for the erection of farm buildings and labourers' cottages, the Inclosure Commissioners rightly feeling the importance of obtaining durable buildings for the heirs on whom the rent-charge would fall, have heretofore not considered themselves in a position to recognise concrete as a suitable building material. It may be of consequence to some of our readers to know that they have just now accepted as satisfactory a number of farm buildings, on a large estate, in Wiltshire, on [the report of Mr. Godwin, whom they had directed to inquire into the subject, and who has also, at their request, reported on the general principle, and on such precautions as should be taken in dealing with future applications for leave to erect buildings of this nature. Great advantage would follow lessening the cost of healthful cottages, and we look on the use of proper concrete as likely in many districts, and under proper regulations, to effect this. The commissioners, by the step they have taken, show an enlightened willingness to go with the age.

THE DEAN OF GUILD COURT.

FALL OF A RAILWAY STATION AT EDINBURGH.

Sir.—Will you have the goodness to give a place in the first number of the *Builder* to this communication, which is intended to be an answer to a letter which appeared in the *Builder* of December 18, regarding the fall of a part of the Caledonian Railway Shed here, and in which the writer states this:—

"In my opinion the whole responsibility and the entire odium of the matter properly belong to a wretched remnant of municipal authority who have Edinburgh which goes under the name of the Dean of Guild Court."

It will be sufficient to say that the jurisdiction of the Dean of Guild Court does not extend unfortunately to that part of the city in which the building is placed, and it has no control whatever on the buildings erected therein; its superintendence extends over the ancient and extended royalty, the Canongate and Portsburgh only, and the Court can, therefore, be no more held responsible for the fall of the building in question than they could be for the fall of Babylon.

In a previous paragraph the writer narrates his belief to be,—

"That the cause of the accident was due neither to the iron castings which gave way, nor to the timber-work of the superstructure, but to the deplorably unsatisfactory character of the foundation. The whole thing is built, not upon sand, but upon genuine and unmistakable rubbish."

Now, if that was the conclusion he arrived at, he was bound to lay the blame—if blame there was—on the architect or engineer in charge; but he, prudently it may be, or for want of courage, does not do so, but goes out of his way to lay it on an institution of whose powers he appears to be ignorant.

Allow me to tell you something concerning the constitution of the Dean of Guild Court, as it will afford observers the assurance that the cheese-monger element, by which, from his readiness to entertain the idea, it is presumable he is pained, by a hereditary or more intimate taint, does not form any of its composition. It consists at present of the dean, who has been connected with plans and buildings for forty years; three trader councillors, builders, who are at the head of their profession in Edinburgh; two merchant councillors, one of them recently the chairman of the Chamber of Commerce, and the other a merchant; and one a writer to the signet,—seven in all. These members act gratuitously; they have no salary or fees; then there are two advocates, senior and junior assessors, who have salaries, and who sit in the court when legal points arise; but such points are rather of rare occurrence. Now, a court so constituted has evidently within itself the kind of knowledge which is required for dealing with the matters that come before it, and it has been found both useful and effective, and would have been more so, if its powers were more ample than they are. It has now subsisted for more than four centuries, and it must have had much that was good and necessary in it; and were it superseded,—say, by handing the jurisdiction to the sheriff,—he will, in nine cases out of ten, have to call in experts,—perhaps the very men who act gratuitously now,—to assist him and report, and he and they will be paid handsomely, and the suitors will be involved in correspondingly large expenses.

ONE WHO KNOWS.

GREY HAIR IS NO ECLIPSE.

Sir.—Allow me to say a few words in behalf of our grey-haired artisans. There seems to be with a large section of employers of the present day a somewhat unaccountable aversion to them, an aversion that deserves censure.

Apart from the philanthropy of the subject, we deem it a duty to defend the fair fame, and to uphold the rights that belong to the aged; but more particularly so when the class affected has so strong a claim to advance in its favour as that of being the recorder of the architectural and engineering genius of the present century.

That the artisan should be despised for his locks having silvered with the years that gave him experience, and perfected him in the peculiarities of his art, appears rather anomalous, when we consider that in nearly all other professions the hoar of time is of itself an essential recommendation.

Often have we seen the young aspirant, with the theories of a hundred brains floating in his head, fall to zero when required to give those theories a practical turn; and often have we seen the unassuming veteran perform the most difficult undertakings with an ease and perfection that can only be acquired by lengthened experience. As a rule, the experience of the aged craftsman fully compensates for any defects in his movements; and his periodical returns of accomplished labour will hold no inferior place, when viewed beside the corresponding productions of his more youthful shophmates.

A CRAFTSMAN.

THE BLOCKADE OF FLEET-STREET.

INCOME OF THE MIDDLE TEMPLE.

Sir.—The congestion of Fleet-street continues, nay, increases, and the dangers of the middle passage are worse than ever. Nothing but a new street will ease the traffic. Now, it appears to me that the simplest and cheapest plan would be to make a broad, straight street from the foot of Blackfriars Bridge, through the Temple, to St. Clement's Church. This would relieve Fleet-street of all the traffic going westward from the bridge, and would be a shorter line than at present. As to the expense, it would be comparatively trifling, as the houses in Whitefriars

are of a very inferior class, and, as to the Temple, the land, in fact, belongs to the nation, the Society of the Temple paying an insignificant sum of 20*l.*, or something like it, as quit rent to Government; while the rental received by the benchers for chambers is something enormous, amounting, according to the best information I can obtain, to about 13,000*l.* a year for the Middle Temple alone. For the sort of residences provided for the members of the Inn, let any one go and see the miserable dog-holes where they locate, and judge for himself. Besides this, every barrister called is a clear profit of 100*l.* to the society. What becomes of all the money? is a question that has often been asked and never answered; but we all know that when trustees receive large sums of money and do not account, imputations are not wanting. The whole thing is one of those vast corporation abuses of bygone times, which the ensuing Parliament must inquire into and reform. The immense sums now received from members were never intended to be squandered away in sumptuous feasts to illustrious strangers and the private friends of the benchers.

RICHARD PATERNOSTER.

COMPETITIONS.

Madeley Union (Shropshire).—The Board of Guardians for this Union recently invited competition designs for a new workhouse, to accommodate 210 inmates, from nine architects having experience in the subject. The drawings were sent in under motto, on the 1st December, and on Friday, the 17th ult., the building committee selected the design designated "Idoneum," and elected its authors, the Messrs. Hadden, of Hereford and Great Malvern, "as architects for carrying out the proposed new workhouse."

FROM SCOTLAND.

Aberdeen.—An accident has happened at Ferryhill, Aberdeen, by which seven men were injured, three of them very seriously. It appears that while a number of masons and labourers were employed with a contractor named Milne for the construction of an ice-house for Mr. Garron, Ferryhill, some of the supporting beams gave way without warning, and the building, which was just being completed, fell with a great crash. The ice-house was about 30 ft. high. The roof was all but flat, and the men injured fell, along with the roof, to the ground, and were more or less buried among the rubbish. They were extricated with all possible speed. The injuries of some of them were of a dangerous nature, but one received only very slight bruises. Another serious accident has since occurred at Torry, near the city. For the purpose of lifting the concrete blocks to be used in the new south breakwater, at the harbour, which is about to be constructed a little to the north of Girdleness Lighthouse, a travelling crane had to be erected. The contractors for the erection of this crane were Messrs. James Harvey, jun., & Co., engineers. With a weight of 17 tons the strength of the crane was tested by the contractors, and no symptoms of weakness, it is said, presented themselves. A similar test was going on, when one of the cross-beams supporting the platform on which the crane was erected gave way, and the machinery, accompanied by six men, who were employed on the platform testing the crane, were precipitated from a height of from 25 ft. to 30 ft. A member of the firm escaped without injury, and one of the unfortunate six men who fell among the debris received only a slight wound on the side of the head. The others were all more or less seriously injured.

Elgin.—When the side windows of the parish church of Elgin were filled with ornamental glass in summer, four memorial windows for the east end of the building were not ready. They have now reached Elgin, and two of them have been put into their places. The ornamentation of the whole is Classical, in harmony with the style of the church, which is of Greek architecture. The ground-work is grizzle. The grounds of the bordering and leading forms are deep ruby, and blue; and the ornaments and labels, with inscriptions, are relieved in light tints of gold and white, turned up with light green, purple, &c. The glass is rough, and crystalline in texture. The two upper windows are in memory of General Alves, a distinguished soldier, who was much attached to his native town of Elgin, and who left a sum of money to erect a memorial of himself in the parish church.

Dundee.—A Unitarian church and schools are being erected at Consitution-road, from the designs of Mr. Alexander Johnston, of this town, architect.

Caputh.—The parishioners of the parish of Caputh, to perpetuate the memory of their late minister, the Rev. R. H. Scott, have erected over his grave in their burying-ground a monument of Aberdeen granite. The complete monument is 9 ft. 4 in. high, and consists of a carved cross. The die contains, within the outlines of a shield, the simple inscription. The monument was executed from an original design by Mr. Hutcheon, of Aberdeen.

Books Received.

Papers read before the Associated Arts' Institute.

An interesting brochure, consisting of papers read during the past session, 1868-9, by Messrs. R. Westmacott, Soden Smith, R. Redgrave, H. Ellis Woodbridge, W. Cave Thomas, Montgomerie Rankin, and Lemon H. Michael. It is edited by Mr. P. Scarlett Potter, who acts as secretary of the Institute. On the 9th, a paper "On the Cultivation of Artistic Feelings," is to be read by Mr. H. E. Woodbridge.

Midsummer Eve: a Fairy Tale of Loving and Being Loved. By Mrs. S. C. HALL. Hotten, Piccadilly. 1870.

MR. HOTTEN has published a beautiful edition of Mrs. S. C. Hall's charming "Midsummer Eve." It is illustrated with no fewer than 200 engravings from drawings made by Macleod, Stanfield, E. M. Ward, Elmore, Frost, Noel Paton, Hulme, Goodall, Thos. Landseer, Creswick (now, we regret to say, no more), and other well-known eminent artists. The story is one of the most elegant and fanciful that its admirable author has written, full of human sympathy and wholesome teaching. It would be a good thing if the hanging-committee for each year at the Royal Academy could be made to read its closing chapters. It is a beautiful gift-book, and can scarcely fail to be long regarded as such. The volume is dedicated to the author's old friends, Sir Thos. Duffus Hardy and Lady Hardy, whose recent elevation in social position gratifies all who know them, and can appreciate worth and talent.

VARIORUM.

It is of very little use just now, with hard frost dominant, to say that tourists will find *Bemrose's Guide to Derbyshire*, a complete *Handbook for the County*, a very good one. Still, as the publishers now send it out, we will not withhold that opinion. The editors of it, Mr. J. Hicklin and Mr. Alfred Wallis, have evidently taken much pains, and have made it more than an ephemeral companion. It includes a number of very good illustrations.—*Sprague's "Diary, with Tables for Architects, Surveyors, and Builders,"* is a capital little pocket-book for its purpose. We do not pretend to have checked the correctness of the tables and calculations. A list of the District Surveyors, under the Metropolitan Building Act, has been added.—*"The City Diary and Almanack"* (W. H. & L. Collingridge) contains, in addition to the matter ordinarily given in a diary for the desk, a large mass of official information with regard to the City, not to be found in any other publication. It is a complete guide to the various business offices of the Corporation and City generally. There is ample space for daily entries, upon good paper.

Miscellaneous.

Commencement of the Sittingbourne

Water-works.—The great depression in the brickmaking trade in this neighbourhood has thrown a large number of labourers out of employment, and produced great distress and want. To alleviate this to some extent, the local sanitary committee have urged on their arrangement, and obtained the authority and sanction of the Secretary of State to go on with the work, as also to borrow a sum not exceeding 5,000*l.* to defray the cost. There are now upwards of 100 able-bodied persons in receipt of relief from the public rates, amounting to about 3*l.* per day, which, it is hoped, will now be utilised to the ratepayers by the commencement of this work, which will be carried out under the superintendence of Messrs. Easton, Amos, & Anderson.

Architectural Society of Northampton.

The ordinary meeting of the committee was held on the 13th ult., the Rev. Lord Alwyne Compton in the chair. A sub-committee was appointed to advise upon the best manner of laying out any money which may be contributed towards the restoration of Earl's Barton Church,—a desire having been expressed that the Architectural Society will undertake the supervision of the work. The chairman stated that a meeting of the committee for the restoration of St. Sepulchre's Church had been held, when it appeared, from the report prepared by the secretary and treasurer, that, assuming the correctness of the estimated expense, it will be possible to complete the works, and to clear off all the debt on the former work, by an expenditure beyond what is already promised in the way of subscriptions, of about 700*l.* The debt for which the members of the original committee are responsible is about 1,000*l.* The committee, therefore, determined to obtain tenders for the work, as they feel that the subscriptions already announced are not likely to increase till the committee commence some part of the work. The report of the sub-committee on the plans by Mr. Slater, for the restoration of the churches of Bozart and Strixton, was read and adopted.

The American Railroad Style for India.

A small item of news from India, remarks *Chambers's Journal*, has occasioned some sensation in the engineering world. The Governor-general, Lord Mayo, has sent to the United States for an engineer accustomed to the rough-and-ready way of constructing railways in that country, and at a cost far below that which an English engineer would consider possible. India is yet in want of thousands of miles of railway; and if, by Lord Mayo's experiment, they can be made cheaply, the benefit will be great to all concerned, including English engineers, who may perhaps learn a useful lesson therefrom, and lay down cheap railways in Australia. By the way, Australia has offered to supply the Indian government with all the horses required for their army at 25*l.* apiece.

Mechanical Puddling.—Messrs. Witham, of Leeds, appear to have devised a mode of mechanical puddling by which all the really heavy work is done by the aid of mechanical appliances. The new furnaces, too, work with about 13 cwt. of coals, compared with 20 cwt. for the same kind of work in the best-constructed furnaces of the common description. Each of the patent furnaces is worked by two men, opposite each other; but by means of the mechanical arrangements at the top the men are enabled to move their rables into all parts of the furnace, with comparatively little trouble, and with nothing like the ordinary amount of manual labour. The *Iron Review* says that a considerable number of these furnaces will be erected before long in the North of England.

The Consumption of Gas.—It is commonly supposed that the amount of illumination obtained from gas is in exact proportion to the quantity of gas consumed. The investigations of Professor Silliman, of New York, however, go to show that the amount of illumination is increased far more in proportion to the gas expended, as it increases according to the square of the volume of gas. Thus, if twice the quantity of gas be burned, the illumination ought to be improved fourfold. If three times the quantity of gas be used, the illumination ought to be nine times better. Professor Silliman is, we believe, the sole authority as yet for these conclusions; but he has a high reputation in science, and no doubt his experiments will be rigidly tested.—*Daily News.*

Discovery of Ancient Greek Liquid Measures.—An interesting and important archaeological discovery has been made at Gythio, in Laconia, consisting of a cube-fashioned stone, with five conic apertures, corresponding to the five well-known liquid Greek measures, of which hitherto all but the respective volume was known. To remove every doubt, the margin of each is inscribed with the corresponding designation.

Gas Explosions.—Two alarming gas explosions have just occurred, one at Great Yarmouth, and the other at Bury. The explosion at the former place completely destroyed a large steam ropery, and severely injured three of the workmen. It was caused by leakage of gas and incautious use of a candle. Two men were also considerably burnt by the explosion at Bury.

The Builder.

VOL. XXVIII.—No. 1405.

Gleanings in Glastonbury.



HO shall profess to glean at Glastonbury, where harvest-men have preceded who are not wont to bind up sheaves carelessly? Yet, it is not easy to leave the site without putting pen to paper to record impressions that must always remain dear to a lover of architecture who visits it for the first time. The town is now reached easily from London in some five hours of continuous travelling, except by those whom a passion for an express train on the main line betrays into an interval of three hours' waiting at the change at Temple

Combe. The face of the country, however, perfectly explains how our pilgrim forefathers could only reach the place by foot or on horseback; and how, still earlier, it had all but the complete peculiarities of an island. The eminences that cluster about the most conspicuous peak of the Tor rise out of level plains extending seawards, that, rich with pasture above, have peat below cut constantly to a depth of 10 ft.,—as once out of the waters of the Bristol Channel. The cultivator over this characteristic district seems as interested and occupied with water as with land. Embankments, cuttings, pumps, control the ever-present element; the decoy duck has still a place for its function here, and a visitor of even a week may have more than one chance of seeing a crane in a state of nature. In the flatness, extent, and verdure of the district, with its flmy horizon of the Mendip hills, an artist pleases himself with tracing a resemblance to the Campagna of Rome, and recognises representatives of the Alban range, and a miniature of his beloved Soracte. As the railway passes on over the turf country, the permanent way assumes a type of very qualified permanence; and the mounded ballast tells of how much more solid material is expected to be absorbed by the foundation.

It was this same gulf that, we are assured, absorbed in its insatiable maw all that is not still left scantily standing of the great Abbey Church of Glastonbury,—to form a road to Wells across the marshes. The site of the Abbey, however, and its dependencies, was always high and dry, unassailable by incursions of the sea that have sometimes even reached its precincts; well presented to the warmth and light of the sun; and half encircled by hills, of which the slopes of old, as now, were abloom with apple orchards, that provide the cider most dear to natives, but, oh, how hard to palate of unaccustomed visitor!

There is very much interest and very much beauty in what still remains of the Abbey, but it is the older and more completely preserved chapel of St. Joseph, so called with a persistency there is no contending against, that we recognise a really classical example of a style

at its perfection. It may be fairly said that when Norman architecture had achieved this work, there was no further essential and elementary development required from it. It was equal to the responsibilities of structures,—of cathedrals,—of the greatest extent and importance, and had reached a point of elaboration and finish that could only announce a dead pause or a distinct and direct transformation. Resources of construction and ornament are employed with a variety and consistency that constitute definite style, and are of a quality that pertains to a very high style indeed.

The style of this chapel is usually designated Advanced Transition, a title which may mean anything, and therefore really defines nothing. There are few terms more infested by equivocal implications than the term Transitional, and never is it more so than when pressed into service, as we shall see, in such a case as the present.

The rebuilding of the structure of which we have the beautiful remains is recorded under year 1184, as taking place on the site "where from the beginning the *vetusta ecclesia* had stood." The restricted area seems to imply that the reconstruction was scarcely extended beyond the originally consecrated ground; the very title *vetusta ecclesia* proves,—implies, at least,—that there was a more modern church near it which may well have been more extensive. We have a trace of this in a notice in the Saxon Chronicle of an affray between the monks and the first Norman abbot, Thurstan. The disturbance, which seems to have turned upon a proposed supersession of the accustomed chant, commenced in "the chapter-house." Armed laymen were introduced, and the monks fled into the choir and locked the doors. There they were assaulted by "the knights" or the "Frenchmen," who gained the upper story—probably a triforium—and shot arrows at them as they clung to the altar, while others burst the doors. Three monks were slain and eighteen wounded. The site of this church is now probably occupied by what remains of the Early English Abbey Church, of which at a later date the western end was united by an intermediate structure to the Chapel of the Virgin or St. Joseph. The east wall of the chapel was then broken away, and steps were inserted leading up from its lower level to the larger church.

The plan of the chapel, as originally independent, measured on the exterior along the line of full projection of turrets and buttresses, appears to have been comprised pretty accurately in an oblong of 40 ft. by 70 ft. By deduction made of thickness of walls and buttresses on either side, the interior width is diminished to 23 ft., and length to 53 ft. or thereabouts. The smallness of the scale of the best plan available makes it scarcely worth while to attempt absolute exactness. The plan of the interior is probably a double square of 25 ft. broad in the clear, diminished by the projections of the vaulting shafts in front of the wall.

The interior was divided into four severies, vaulted quadripartite, and effectively equal, the chord of the diagonal groins measuring 25 ft., or just double the breadth of the severies. The diagonal ribs,—it can be accurately made out,—were semicircles; they sprang from triplet shafts, of which the abacuses ranged with a string-course at 15 ft. above the pavement of the chapel, which ran level with the window-cills, and just above a blank arcade against the lower division of the wall. The curves may possibly have been slightly stilted; but the full height from the pavement to the intersection of the groins probably could not have exceeded 31 ft. or 32 ft.

The window, including its mouldings, was made just equal in height to the wall below the string-course, including the bench-table that bears the bases of the shafts.

The windows occupy the centres of the severies, and centre truly with the four divisions of the wall below; the second of these, from the west on either side, is occupied by a doorway, but agrees in width with the others, where the intermediate wall above the bench-table shows a range of shallow hollowings of channels, against which once stood the range or shafts of the blank but enriched arcade.

The wall on the exterior receives similar decoration, but the fourfold division is made by buttresses, or flat pilasters, instead of grouped vaulting shafts; and here there occurs a source of difficulty, or, at least, an anomaly of arrangement, that cannot be said after all to have been quite satisfactorily dealt with. The natural treatment would seem to demand that a buttress should be placed exactly intermediate between the windows, and so answering to the axis of the vaulting shaft within. But it was manifestly felt to be important to preserve the divisions of the string-course, and the spacings of the blank arcade, the shafts and arches of which divide the intervals very accurately, pretty nearly uniform; and such an arrangement of buttresses would leave the two end divisions of excessive width, as their end margins escape reduction by a buttress, or its equivalent,—the angle turret scarcely advancing beyond the line of thickness of the end wall. The architect, therefore, who did not care to modify his turrets would seem driven to place only his central buttress truly on the line of a vaulting shaft, and disregarding the correspondence in respect of the two others, to set them on either side exactly intermediately between the central buttress and angle of turret. But this would only introduce another difficulty; as regards the windows, there would be a no less serious asymmetry, as only the two central would have a buttress exactly intermediate,—the interfenestral spaces of the other two being very unequally divided,—the buttress in each case hugging them inconveniently on one side, out of consideration to the wider vacancy on the other. Accordingly, on a general view, while the arcades appear spaced uniformly—shafts coming ever neatly and precisely by the angles of the buttresses, the mouldings of the extreme windows east and west are manifestly approached much more closely by the adjacent buttresses than are the two other windows by the centre.

Surely the result as regards the ordination of the architecture above the string-course, whether it resulted by this procedure or not, is neither comfortable nor successful. The buttresses are manifestly displaced—we must apprehend misplaced; and it seems very strange, indeed, that in a building of such careful and refined finish, some struggle was not made to remedy such an irregularity, or qualify its worst unhandsoneness.

On closer scrutiny we find that the disarrangement was not left quite without check, and if the shock to the architectural sense was not quite saved, a symmetry was managed at least at the point where it was most effective, and where it was indeed thought worth compassing, even at the expense of still further displacement.

The enriched doorway is set as nearly as may be centrally, below the second window; the apex of the gable marks the position exactly, and the buttresses to right and left of it come thus symmetrically with both the door and the window above it. The effect is necessarily to push the central buttress unceremoniously out of the centre, and unduly eastward; and, as a further consequence, the most eastern buttress, which has now to divide equally the remaining space, is pressed so closely upon the last window that the light is, in fact, pierced unsymmetrically with the enclosing mouldings within. Hence, as it appears to us, the true origin of the irregularity that Professor Willis adverts to in these terms:—"The section shows that the windows

with one exception are placed in the centre of the interior series. The easternmost window M. has its ornamental inner arch (*escusa* or arch, as it is termed) in the centre of the compartment, but minor inaccuracies in setting out the plan, which it would occupy too much space to explain fully, have forced the centre of the arch so near the buttress that the window light is pierced considerably to the east of that centre to enable it to be freed from the buttress.

If our view is correct, the displacement did not arise from inaccuracies, — in the sense of errors or carelessnesses, — but rather from a studious attention to secure accuracy in the symmetry of the blind arcade that was held of more importance than the deviation of the window light. Neither did this disturbance act by forcing the centre of the window arch towards the buttress, — it was the aggressive buttress, on the other hand, that encroached upon the window arch. Our analysis, indeed, runs counter in result to the whole theory of the Professor as to the cause of that conspicuous deviation, that strikes the spectator at once, between the spacing of the buttresses and intermediate windows. By this theory it is traced to the circumstance that when internal series are equal, and the windows exactly intermediate, the space between the window at either end externally and the inner line of transverse wall, being equal to the extent from the other side of the window to the centre of a buttress, the flush wall space on either side of the window becomes of necessity unequal, and the two intervals between buttress and buttress are necessarily less than the interval from each buttress to the projection of the angle turret that rules with the line of end wall. The theory proceeds that it was to remedy this inequality that the buttresses were spaced without regard either to true opposition to the vaulting system within, or to division of the window spacing without.

This theory, however, as we have seen, does not in any way explain the displacement of the midmost of the three buttresses, nor how it comes that the easternmost window is so unfairly pressed upon, as compared with its fellow in corresponding position westward.

To set down these discrepancies to unexplained inaccuracies in "setting out" is very unsatisfactory in the case of a building which is so remarkable for the accuracy of its plan and execution, — in which not merely the ashlar is worthy of the best Early English masons, but the most intricate mouldings are executed and carved with such, not merely workmanlike, but scrupulous respect for accuracy in dimension. It is difficult to ascribe to such handicraftsmen as we are concerned with here, to call them no more, such inconsequential slovenliness as commencing from the west and pushing each buttress eastward, in order to relieve the inequality of the terminal wall space, at the expense of throwing out all other symmetries, and at last to be taken by surprise by finding that the accumulated differences threatened, so soon past the third step, to throw the last buttress over the window mouldings.

Still, if we admit the architects of this last caselessness, they have quite enough to answer for it, not group line more effectively with a difficulty that it is useless to deny introduces, as they have treated it, a disfiguring unsymmetry, unworthy of the general refinement and dignity of the composition. "Order is architecture's first law," and if it ever is departed from of necessity, it is bound to resort to chains by imposing every possible respect for whatever qualifications of the trespass may be available. The most wonderful example of subtlety and success in this architectural "temperament," to borrow an analogy from the management of a corresponding difficulty in music, is, beyond doubt, the distribution of the irregularity in the Doric entablature, as it is effected in the Parthenon. This is not the occasion to set forth in detail the resources of proportional variation, by which the closer column by the angles, and the axial divergence to introduce ease and relief rather than embarrassment, the result must be left to speak for itself, which it does as satisfactorily as the result of less able treatment at Glastonbury of a not dissimilar problem, evoked protests and discomfort. A better sense was not without a certain influence; the architectural conscience is respected very welcome in the spacing of door and flanking buttresses relatively to the window above it, and most happily in the visible correspondence of the several sets of shafts of the

blank arcades in the number and nice adjustment to their intervals; but it would be absurd to palliate the discord that offends us so soon as rises too distressingly the revolving disarray of members and features that all analogy requires to move in well-concerted sequence.

The remedy — we are scarcely called upon, however, to discuss it — lay between a modification of the angle turrets, and of the treatment of the doorway relatively to its flanking buttresses. We shall carry on the subject in another article.

A BARK AT BARKING.

"BLESSED are those who expect nothing" (quoted O'Connell once, in answer to the taunts of the Whigs), "for they will never be disappointed." We do not know well what the inhabitants of the town of Barking expect. They seem to be resting on their oars at the mouth of their immemorial creek, trusting that Providence will send them money or business, and somewhat indifferent whether, as a preliminary to health, cleanliness will become the new order of the day.

We went to Barking on Saturday, the 18th of December, a day well suited by its meteorological appearance for developing the unsanitary raciness of Barking, and exhibiting it in full relief. Well, let us state in the pages of the *Builder*, — and we do so from careful personal observation, — that the town of Barking is in a most deplorable state of sanitary destitution. That a town so situated, so near to a great river, and quite within an hour's reach of London, should be the seething and abominable cesspool that it is, is most extraordinary; and yet not extraordinary, when we look into and examine all the surroundings.

The town rises from a level swamp, or little better; no portion presents the appearance of being an inch higher in any one point of the compass, nor does the town seem to have ever been laid out with any design, though one portion of it, which forms an angular confluence of streets, is termed the Broadway. This Broadway, as it is called, is about the central eyelet or focus of Barking; but the extra widening of the thoroughfare here only serves to exhibit more fully the shattered frame and broken-down constitution of the town. Roofless houses here and there heighten the picture, and the most populous character would appear to lack in picturesque quality of tumble-down, — at least, if not altered through the town were observable. Scattered through the town are a few of the old timber-fronted dwellings, with the usual coating of lath and plaster, the end of the beams forming the corbels, on which the projecting upper stories rest.

The old red tile covering and red brick features observable in the Queen Anne structures of our cities may be sparsely seen here and there, but the old street architecture of Barking possesses little at the present day worth recording.

Now for its sanitary state; though indeed we do not know well where to begin. Entering Leybush's-alley, we waded through a little sea of mud, and it required the utmost caution on our part in steering our course round pools of rain-water and house refuse. Many of the houses in the privies, some of which have to serve half a dozen of dwellings, are in an indescribable and abominable state. The seats and floors of some of them are scarcely able to bear the weight of a full-grown person, — they are in such a rotten condition owing to the accumulations of filth which lie underneath them. Some of these receptacles, we have been informed, are cleaned told us, even once in twelve months.

In Barrack-lane the sanitary state of the dwellings and the accumulation of filth are quite as bad. Pools of water, ashes, night-soil, the houses of not a few of the unlucky dwellers, poor people evidenced and showed a desire to keep their dwellings clean, but their best efforts in places are almost rendered nugatory by the rooms and kitchens are thrown out before their doors, to lie there till levelled by foot traffic into the usual roadway. The contents of night buckets, washing-tubs, and clearing vessels, all are emptied out in the lane, before the doorways, and drain themselves wherever they list.

Would it be any wonder if deaths by the score took place in these fever-dens and plague-spots?

In a spot called Wallington-buildings, the sanitary condition presented is not better; in fact, in some points it is much worse. For here and in Suffolk-place beside, there is no attempt at drainage or sewerage to be seen. These lanes are situated off Axe-street, and the houses in them are inhabited by poor people, whose source of living is chiefly derivable from their employment in the jute and sacking manufactory. Some of the very poor pay at the rate of 2s. 6d. for their dwellings of two small rooms, and perhaps a kitchen. How a man earning but 10s., or from 10s. to 11s., can support himself and wife and children on this pittance, seems a miracle. We fear that they do not live — they only vegetate. The women sometimes work also in the factory, and the children too, if old enough. Poverty is pictured in the faces of these poor people; and, wretched as is their lot, their life would have its compensating clause if health and cleanliness could be guaranteed to them to some extent by local management on the part of the well-to-do landowners of the town.

In Suffolk-place, before the doors of the dwellings, a channel in the unpaved earth was scooped about an inch or two deep. This improvised sort of Barking drainage was carried for about thirty yards in a line with the front of the houses, having its outfall in a pit of a few feet deep in a kitchen garden at the end of the lane. A very handy method, the reader will say, for the utilisation of the sewage for market gardening purposes.

In this quarter (Axe-street) we spoke to some comfortable people, who expressed a willingness to pay towards the drainage of the town, if some one in authority would begin. One man who rented a house and extensive yard, in which the dung-heap was the most striking object of beauty and value, told us that he got no encouragement to improve on his own premises. His lady-landlord was over eighty years of age. She, poor thing, was thinking now of another world — different from Barking; and, of course, her independent legatees, who were on the "look-out" for a windfall, did not care a rap for the drainage of Barking. Our Axe-street tenant was a tenant-at-will, and he did not care, like other tenants who professed similar views, to improve other people's property, and be liable to be turned out at a month's notice.

The outfall of the town sewage finds one, and one only, opening into the Creek at the Town Quay, at the end of Hea-street. Into this basin the weighty body of Barking's filth and feculence oozes, saving the not inconsiderable portion that sinks into the soil, and becomes permanently embodied in the earth as a subsoil or sub-ferre stratum for the generation of future plague or cholera. Who will gainsay it? The refuse finds a ready market among the market-gardeners and surrounding farmers; but how much, and to what extent, is not the soil of the town and the earth underneath the dwellings of the inhabitants impregnated with foul poison from the want of a system of sewage? It can be easily surmised by rational men, who have some concern about their own lives, the danger that exists here amidst the fearful state of things pregnant with death to themselves and others.

But is there not a sanitary inspector in the town? Well, we asked this question in Barking ourselves, and on reiterating the question again and again, we found out that there was an officer bearing some approach to that appellation, who received the magnificent salary of 20l. a year. Who appointed him we do not know. There is, indeed, a police-barrack, containing a controlling sergeant and a few subalterns under his direction; but this is the sum-total of governmental and sanitary "law and order" system in Barking.

The water-supply of the town is very insufficient, and a great deal of it is supplied from wells in the distance, brought in by water-carriers, and supplied according to the demand. Some of the pumps which supply a portion of the poorer inhabitants with water, which is evidently used for drinking and cooking purposes, are in close proximity to privies. In one or two instances we found a pump which supplied a whole line of houses, back up right against a privy-wall, the cesspool clearly and unmistakably draining its foul poison into the well-hole of the pump. It is a marvel and a mystery to us that there are not more deaths in the town from its sanitary condition; but we

Gas Works Arbitration.—The award in arbitration as to the price of the Dundee Gas Works has been received from Mr. Pownall. The old company claimed for annuities 10,400*l.* and get 6,125*l.*; for expenses they claimed 10,593*l.*, and get 6,400*l.* The new company claimed for annuities 1,250*l.*, and get 2,537*l.* for costs they claimed 5,662*l.*, and get 3,018*l.* The gas commissioners calculate that they will be able to reduce the price of gas in the next two years to 3s. 6d. or 4s. per 1,000 cubic feet.

THE NEW TELEGRAPHIC ARRANGEMENTS.

It appears to be perfectly understood, says the *Times*, that the Chancellor of the Exchequer has fully concluded his arrangements for the payment to the several telegraph companies of the compensation awarded to them, amounting to 5,715,048*l.*, the large funds of the savings-banks and other public departments, together with the tax collections due in January, being available for the purpose. The disbursement of the entire total will be completed some day at the end of January.

A long shelf, divided into a number of compartments, has been erected in the money-order department of the Post-office, for the convenience of persons who wish to write telegrams on the spot. Senders can then affix the necessary amount in postage-stamps to the message, which will be received by a clerk and sent off immediately. The telegraph-office in Bristol, and no doubt other towns, will, we hear, be open night and day the whole year through for the receipt and transmission of messages. The Government authorities have prepared new forms for messages to be written on. A separate space in lines is allotted to each word, and the corresponding charge is printed clearly on the margin, so that the sender can see at a glance how much he has to pay, and the receiving-clerk need be at no trouble in calculating how much he has to charge. Each of the forms thus divided into spaces is prepared for a message of fifty words. In the right hand upper corner of the page a blank space is left for stamps, to cover the charges of transmission. Attached to the form are directions for the guidance of the sender, with a tariff of charges, and full information as to the arrangements for the portage.

Lord Kinnaird has induced the Post-office department to telegraph Greenwich time daily to all telegraph stations in England, Scotland, and Wales. All the Post-office clocks will therefore be regulated by Greenwich every morning, so that when persons go to post their letters they can set their watches according to the correct time of the day at Greenwich Observatory. In Ireland, in the same way, Dublin time will be telegraphed all over the country.

MISCELLANEOUS.

AMONG the accounts of the numerous recent failures of public buildings, I have not noticed in your columns any account or explanation of the sadly ruinous state of the arcaded terrace above the fountains at the Crystal Palace.

Allow me also to call attention to the want of a flight of steps from the Holborn Viaduct to Shoe-lane.

Enamelled slate is generally used for lining urns, but the enamelled face often decays. Could not our makers of porcelain and galleys tiles produce some slabs of sufficient size for use instead of slate? They need not be so large as slate slabs, as a few joints might be allowed.

NEMO.

THE CHURCHES OF SPOLETO, ITALY.

AMONG those Italian cities where almost all tokens of life and power belong to the past, and the present is thrown quite into the shade, Spoleto is one deserving of more attention from the searchers after antiquity than is often, we believe, given to it. Whilst wending our way through silent streets among buildings that might be taken for old palaces never finished, or convents long half-deserted, if ready to admire and enjoy, we cannot fail to feel the charm of romance and memory that dwells in this all its own. Seated on the lowest advancing spur of mountains at the northern base of one of the loftiest Apennine passes, overlooking the fertile valley of Foligno, its aspect is most striking; the strong square-towered castle of the fourteenth century dominates from the highest ridge, below which its streets extend north and southward; and sunset among the Apennines, with such an accessorial foreground, presents one of those rich and solemn Italian pictures to be stored up for ever in memory's choicest gallery.

The first historic notice of the *Spolegium* of antiquity, occurs under date 240 B.C., when a Roman colony was sent to settle there, soon after the first Punic war. Cicero mentions this child of the conquering *ulvis*, as "*Colonia Latina in primis firma et illustris*" (*Pro Ballo*, 21); and the great achievement recorded in the

local *fasti* was the discomfiture of Hannibal by the Spoletani, when he had marched upon this place after the battle of Throsimene, and was repulsed from the gate that still stands, thence called *Porta Fuga* (or *Porta d'Annibale*), with its bas-reliefs commemorating the event. Besides that monument of the Roman period, is preserved another in good condition, a plain massive arch, crossing a street, whose legible inscription tells us it was erected by the senate in honour of Germanicus and Drusus; also have we to notice, under the same category, some fragments of Pagan temples built up in churches, and the ruins of a temple, supposed of Jupiter,—not, indeed, visible, though extant,—over which has been raised within late years a somewhat showy theatre. A Roman bridge, that had remained for untold centuries, buried under the banks of the river Topino, shortly beyond the gate on the northern side, was discovered some years before the change of government, but (discreditably for those responsible), ordered to be again covered up on the rebuilding of that gate which leads to Foligno. Its first interment is supposed to have been caused by a natural change in the direction of the river channel. But it is with things that belong to the Christian era we would here deal; and we may observe that a tower containing monuments of sacred architecture and other art, century, and mostly preserved intact (though some in decaying state), has obvious claims to interest. The Spolegium of Roman origin first made by the Medieval story on occasion of its being captured, and its fortifications in part destroyed, by Totila, during the long raging of the Gothic and Greek wars in the sixth century (*v. Procopius*, iii. 12); after which disaster repairs were effected and improvements made by the victorious Narses. In the year 576 the place yielded, without resistance, to the Lombards, who had already become masters of Northern Italy, and who forthwith chose this for the seat of a sovereign dukedom, whose princes reigned over a wide territory, including Picenum, Sabina, and part of the Abruzzi; their succession lasting till A.D. 788, when the Lombard fell before the Frankish power, and Charlemagne appointed a duke to govern these provinces under his own suzerainty. Henceforth the Spoleto dukedom was no longer hereditary, but conferred by the kings of Italy, in consequence of which arrangement it passed from one great house to another during a long period of troublous time, and in the eleventh century became united to Tuscany, under the sway of Godfrey, husband to the famous Countess Matilda. This second dynasty of twelfth century, yielding to the power of the Pontificate as sustained by one of its ablest representatives, Innocent III.; and thenceforth did Spoleto, with diminished territory, named after its capital, sink into the insignificance of a province under the Papal sceptre, governed by a prelate delegate up to the day of the siege by Italian forces that falls within the history of recent years. The population of the present day is given as 19,936 in the "*Enciclopedia Popolare*," published in Turin.

The only prominent and imposing monument of the Lombardic period left here is the aqueduct bridge that spans the deep glen and crosses the winding river, immediately below the city, on the eastern side, seen from different points of view with the high-placed castle and the irregular sweep of streets and fortifying walls, all combined in a picture most romantic. That great structure is due to the Duke Theodelapins III., about A.D. 604; but in its actual state must be the energetic legate, Cardinal Albarnoz, who built that castle, and reconquered sundry rebellious provinces for the pope, the resident at Avignon; and, indeed, the acute brick arches between the stupendous piers rising from the depths of that beautiful glen and from the wooded slopes on each side, sufficiently indicate such later origin; as the other, now ruinous, arches that cross those piers at less than half their height may be with like certainty referred to the original building. The measurements have been variously given,—by Calindri, as 81 metres in height, 205.99 in length; while gives only 200 ft. for altitude, counting the base to the summit of the two highest, the massive superstructure through which water still flows from the overshadowing mountain.

Turning to the sacred monuments of this

town, we may properly begin, observing order of date, with the far-seen S. Giuliano, a church conspicuous on a height that advances above the city from the picturesque and richly-wooded Monte Luce, a sacred mountain once famous for the many hermitages that rose in its primeval illex-forest, many of which still stand among those shades, though the hermit-race has departed. From the dedication of this forest to Apollo, as a sacred *lucus*, the name Monte Luce is derived. Of those ancient hermitages some have been transformed into pleasant villas; others have till lately been inhabited by a few friars; and their chapels still remain, all modernized, open for public worship only on festivals,—their white walls and belfries gleaming from the dark evergreen foliage so as much to enhance the picturesque loveliness of this once holy mountain. S. Francesco, on one of the loftiest terraces, is a convent with gardens commanding glorious views across Apennine and valley, of a modern church, and quaint buildings with long low corridors, where are now resident four friars, left out of a community of fourteen, who hospitably received us, and treated us to wine with bread and cheese in their refectory, after our long walk through forest-scenes beautiful enough to beguile any fatigue. S. Giuliano was founded by the originator of the eremitic life on this mountain, St. Issac, a Syrian, about A.D. 525, and became at a later Mediaeval period a Benedictine monastery, whose abbots had control over all the hermits in his neighbourhood; but the actual building is not supposed to be in any part older than the tenth century. We were sorry to find it abandoned and evidently sinking into ruin, its interior being used as a barn and lumber-house for the farmers on the estate where it stands, and to whose owner it belongs. Its plain facade has a roof that leans against a high square campanile of grey stone, its single window of three lights, with colonnettes, adorned by the simplest description of mouldings, its round-headed doorway with a discharging arch above, and some rich mouldings on the jambs, reliefs of symbolic birds, the cross, &c. The interior struck us by its gloomy and ghost-like desolation, fit scene for weird pageants or grim adventure; under a triangular roof with bare rafters blackened by age extend nave and aisles, divided by ponderous built-up pilasters, with round arches, in strange irregularity, one arcade consisting of five, the other of three, correspondences of length being secured by greater width of span, the chancel terminating in a narrow apse; and below the high-altar we descend by two ruinous staircases into a crypt, spacious, divided by several files of low columns, different in dimensions, and with barbaric capitals, that support stilted arches, the architectural type reminding us, though indeed inferior, of those beautiful crypts in Northern Italy, among which that of the Florentine S. Miniato may be taken as a perfect model. This of S. Giuliano is almost in darkness, the dim light admitted only through a few loopholes; and indeed throughout this deserted church we notice the scantiest space allowed for windows, and the total absence of glass, similar loopholes played on the inner side being the substitute for regular windows, with sole exception of that three-light one above the portals. The farmer and his wife, who have a cottage near, told us strange stories of mysterious sights and sounds to which labourers, who used to spend the night in this church, could bear witness,—noises like the wailing of human beings, or the tread of many feet, and (once seen) a lurid light flaring in the midst of the dark nave,—portents that so frightened that at last none could be prevailed upon to sleep in the haunted edifice. During the first visitation of cholera at Spoleto the dead used to be buried by night within these walls, and the gases rising from decomposition may have caused this last-named phenomenon.

We may next visit S. Pietro, a large extramural church which, till the eleventh century, ranked as the cathedral, and is said to have been founded in the ninth century. To that very curious symbolic sculptures on its facade, which alone claim our attention, for the interior is but an ordinary specimen of the pseudo-Classical or modern Romanesque. One of the most richly-varied pages of mystic art in Italian churches is that read on its quaintly-fretted front, the argument here before us, carried out in numerous small reliefs, being no other than the story of the judgment reserved for sinful

pauls, that of certain martyrs, and scenes from the life of St. Peter. We see a female on her death-bed, beside which are seated that apostle with his keys, another saint to whom a demon constrained to serve as a reading-desk, supporting the book he reads from, and the Archangel Michael with a pair of scales at hand; again do we see the same female, now a spirit, stretched naked upon a couch while two demons torment her, and the guardian angel is departing with folded wings; in another part, the sorrow truly pathetic; in another part, the weighing of the good and evil deeds by St. Michael in his fatal scales, with what result in this unhappy case is apparent. Underneath, of larger size and in coarser style, are figures of martyrs exposed to wild beasts, in the Roman amphitheatre as we may infer; on another side of the portal, the calling of St. Peter and St. Andrew, to whom the Saviour is approaching on the shore, as they row their boat on the lake; also the washing of St. Peter's feet by our Lord, two evangelic subjects in which it is noticeable that neither is associated with any event or announcement implying the supremacy of that apostle! At the three portals are couchant animals (probably meant for lions), keeping guard at each side; but less intelligible are the reliefs lateral to and above the central doorway: *ovantes*, like those figures frequently seen in Roman catacombs, a ploughman driving his yoke of oxen (probably to represent one of the four seasons, as in such series elsewhere introduced among sacred sculptures), and various animals, the ram, the lion, the griffin, the peacock, a stag in the act of devouring a serpent. A wheel-window, once the chief portal, in the centre of a large panel, at whose angles are the four evangelic emblems, in rude relief, affords the type (perhaps earliest) of an ornamentation and lighting found in so many other instances at this city, that we may consider such details characteristic of Spoleto churches. This ex-cathedral was despoiled of many precious objects by the Saracens, A.D. 847. As to its architectural singularities, and that façade built as a simple quadrilateral without tympanum, arcade, or pinnacles, Runcimer observes, that it stands quite alone, presenting nothing like a *norma* for the style of its period; and Ricci (*Storia dell'Archit. d'Italia*), finds analogies with the Arabian, even the Indian, in its peculiar features so unlike to other monuments of the eleventh century.

Some of the earliest works of Christian painting in Italy, exclusive of those in catacombs, are found at Spoleto; but we regretted to see the signs of advancing decay, the unmistakable tokens of neglect and non-appreciation in the actual state of these curious relics of Mediæval art. We must thank Messrs. Crowe and Cavalcaselle for our first acquaintance with the frescoes in the desolate crypt of S. Ansano, to which these critics assign a date in the ninth century. That subterranean, under an insignificant modernized church, has been long abandoned to solitude, damp, and darkness so profound that the tapers supplied by the sacristan scarce suffice to enable us to see anything properly, either the rude but interesting architecture, or the dim paintings on its walls. Here we again find the stunted irregular columns in two files, the barbaric capitals, and high-tilted arches; and of that pictorial ornamentation that has once, evidently, covered the entire wall-surface, the only subjects distinguishable are, besides a few isolated figures, saints and angels, black-cowled monks, that may have belonged to groups, a scene of martyrdom, in which the victim lies across a sort of frame, whilst the executioner strikes with his sword at the downward-hanging head; also, within an arched recess, perhaps for an altar, a complicated group recognisable as the Crucifixion, though the principal figure on the cross is completely effaced, the subject being, however, inferable from the action of the soldiers and other figures still left dimly discerned by taper-light. Deploable, indeed, is the evidence not only of decay that has done its work, but of the ruin impending over these grotesque, but valuable, art-relics at S. Ansano.

Other frescoes worth preserving (but not likely to be so unless proper steps be soon taken) are the extramural S. Paolo, are referred to the twelfth century, and are compared by Crowe and Cavalcaselle to the miniatures of a code at the Barberini Library about coeval. They are now seen, at some trouble, above the false roof of the church and on the highest wall-surfaces of

the campanile, accessible, thanks to the erection of a scaffold for some works of repair going on at the time of our visit. Nothing could exceed the barbarism of these performances, representing scenes from the Old Testament, the Creation of Eve, the Expulsion from Paradise, with stunted figures, ludicrous countenances, broad black outlines, comparing which with the infant efforts of Christian art in the catacombs, we must infer a rapidity of decline from the third or fourth to the twelfth century that seems the contradiction to all theories of intellectual progress, and would indeed be painful to contemplate if our impressions were not corrected, our feeling elevated, by the remembrance of the marvellous attainment subsequently realised, to vindicate the high claims of art in connexion with faith and intelligence. The S. Paolo Church has a Mediæval façade of small proportions, but good features; and the adjoining convent, from which the friars have been ejected, is being reduced to the purposes of an asylum for aged paupers, its pleasant and salubrious situation rendering it indeed well suited for such objects of charity.

Another extramural church, S. Ponziano, conspicuous on a knoll above the river, as we approach the city from the northern side, is worthy of a visit for the sake of its façade (eleventh century), with symbolic animals, the lamb, the winged ox, and eagle, on the lintel of the chief portal; above these, two eagles with small animals in their talons (probably heraldic); the usual four emblems at the angles of a panel around a wheel-window, and traces of painting that once covered the highest story under a triangular cornice. Here, too, we find the total contradiction between interior and exterior; the inside of this conventional church being in the poorest modern style. It contains, however, a confessional, said to be of great antiquity; in which the relics of S. Pontianus are enshrined, under the chancel. Its cloisters are now appropriated to three communities of nuns.

The cathedral of Spoleto, naturally the first object of attention to the tourist, and the most conspicuous church here, on its terrace high above the city's northern side, was founded by the Longobardic duke Theodelapine, A.D. 617; rebuilt in the thirteenth century by the architect Giovanni da Gubbio; its interior completely renovated by Bernini (in what style may be imagined), A.D. 1611; a classic portico added by Bramante, being now a principal feature of the façade, and the tower alone, though altered and surmounted by a modern spire, remaining of the more ancient of the original buildings; Ricci assigning to it, indeed, an antiquity perhaps anterior to the seventh century, assuming, with Campello, that this cathedral was enlarged, but not founded, by the Longobard duke. Its spire was added in 1519.

It is impossible to stand before this fine old church, and observe the anomalies traceable on its still majestic front, without regrets for that deplorable non-appreciation of the Mediæval manifest here, as in about nine out of ten among the older churches of that central Italian region, included, or till lately so, within the Papal States. What the Spoleto cathedral has suffered during the last 300 years, might be taken as a sample of the remorseless, or tasteless, dealings so common within these Italian limits, to the prejudice of ecclesiastical monuments. Of the seven wheel windows on its front, five have been built up; the portico, with Greek columns, the interior, contrasted with such an exterior, takes one by surprise to an offensive degree. What remains most interesting is the series of symbolic sculptures on this façade; the four emblems, griffins on the summits of buttress-pilasters, couchant lions guarding the three entrances; fantastic caryatides, &c.; also the rich mosaic bordering around windows, and the arcade string-courses, the whole presenting a somewhat over-charged but splendid and imposing structure. Most precious among earlier art-works here is the mosaic in an arched recess, central to the façade, that seems to have had, or been destined to have, two companion mosaics beside it in similar recesses left bare. Though almost in every part restored, it retains a grandly antique character, and its original inscription is still read below, with the artist's name, Palmeri de Saso, and date, 1207; its subject, the Saviour blessing, with the Greek action of the right hand, holding a book in the left, the Virgin and St. John standing beside him at lower levels; the expression of the principal head severe, even grim, but the ideal of dignity not wanting in the treatment of forms

and draperies. Inferior as this is to the mosaic of the latter years of the same century at Rome, it supplies a valuable link between the period of that art's deepest decline and those works at the Lateran, S. Maria Maggiore, and elsewhere, in which we hail its glorious revival. Another remnant of the original structure is the semi-circular apse in which this cathedral terminates, and whose ample field is occupied by those frescoes, the masterpiece of Filippo Lippi, representing the coronation, and principal scenes from the life of the Virgin; masterly, indeed, but damaged to an extent one sees with deepest regret. We may again point out the interesting examples of the early crypt in churches at this centre, all with the same leading features, though some in ruder, others in finer production, as that of S. Gregorio, with altar and apse, a marble pulpit between; and the two mentioned by Ricci, S. Paolo within, and S. Brizio beyond the walls, which that writer refers to the fifth or sixth century, an antiquity for which proof seems deficient.*

THE DIGNITY OF ARCHITECTS.†

ONE of the questions I would consider is,—Should architects enjoy the same distinctions and honours which the professors of the other divisions of the fine arts obtain? Let us inquire, however, in the first place, what is an architect?

In the country towns of Britain we have men calling themselves architects and builders, who, in the evening, are endeavouring with rough horny hands and opaque understanding to draw plans and elevations, and during the day are engaged in the more congenial occupation of hewing stone or planing wood. The result of their lucubrations is a class of buildings which seem to be manufactured by the yard, or moulded by the dozen. Again, in the small towns of our American colonies a genuine architect is a curiosity; for, as is common among the savages who everywhere surround them, every man is his own architect. The amount of taste displayed in their erections leaves a balance in favour of the savage against the civilised man. In other parts of Canada and Nova Scotia we have architects who conduct business on much the same principle as those small country grocers, who sell anything, from a beaver hat and a pair of shoes to brown sugar and screw nails. A business card of one of this class declared that "drawings were furnished and buildings put up at the shortest notice, also ship models of every description made to order." Another combined the business of an estate agent with that of an architect, and specially solicited the patronage of speculators in land. The productions of this latter class contrast as favourably in appearance with the forest from which the materials are obtained, as a stack of grain rivals a field of waving corn.

These men are not the architects whose claims to dignity we would support. For, as it is only in the most cultivated fields and the richest soil that we find the best grain, and only in the most carefully-tended gardens and conservatories that we find the most beautiful flowers, so it is only in the wealthiest, most civilised, and most art-loving countries and cities, that we find architects in the greatest perfection. No ship models or landed estates attract the eye of a great architect. His object is not to plan houses by the yard, to harden his hand with the chisel, or to cloud his understanding with glue. His houses contrast favourably with the trees amid which they are placed, and enhance the beauty of the landscape; his palaces are fit abodes for the purple, the diadem, and all earthly splendour; and his churches lead the mind up to the great God of all, awing the beholder, and solemnising the worshipper.

He is the commander of an army of workmen, compared to which the armies of Wellington or Napoleon were small. He is a great artist. He may be only one among a number of workers, yet his works are distinct, and every jewel that he sets assists in forming the grand diadem of his country's glory. He is a great poet; his lofty ideas are petrified in stone, animating and

* The "History of Spoleto," by Campello, contains abundant detail, and begins the subject from the Delinze; but few would find this book readable, and we know of no edition later than the first, 1672. For the romantic story of the dases, we may consult the "Art de vérifier les Dates."

† The following is part of a communication addressed to us from Halifax, Nova Scotia, and is interesting as showing the growth of artistic cultivation in our colonies.

elevating every generation that sees them; and as each successive year washes over their surface, darkening, and colouring, and eating them away, their meaning becomes clearer, their associations more interesting, their lessons more priceless, and their teachings more lofty.

But, above all, he is the great historian and preserver of the honour of his country; for as it is by the ruins of the Egyptian palaces, the Grecian temples, and the Roman amphitheatres, that we gain the most powerful notions of the civilisation and magnificence of these nations, so if ever the same desolation should befall Britain, it will be to the remains of her buildings posterity will look for the truest evidence of her position.

Although the social status of architects has risen considerably, yet it must be admitted that they do not enjoy equal honours with the other members of the fine arts.* A leading architect is not so generally known, and his position among men of science and literature not so generally acknowledged, as that of a leading artist. His name is not so indissolubly associated with his works, and F.R.I.B.A. is not so valuable as the simple R.A. We have read, also, histories of England, where music, painting, sculpture, poetry, literature, fashions of dress, and even the architecture of coaches are noticed, accompanied with lives of the great men celebrated in each department, and yet not a line is left either for the "noblest of the fine arts" or the men celebrated in it. It is astonishing, too, how ignorant even educated men, distinguished in literature, are of architecture and architects. Macaulay, in his "History of England," says of Sir Christopher Wren, "No man born on this side of the Alps has imitated with so much success the magnificence of the palace-like churches of Italy," as if his chief greatness consisted in being a good imitator! And he also calls architecture "an art in which none but a geometrician can excel." Such are a few of our grievances. Skill, we would not wonder at uninterested people caring little whether architects were or were not as good as painters; but that an art-critic like Fergusson (who, above all others, one would think, ought to exalt them), should, in his "History of Architecture," declare that they are too much honoured and recognised, and that architecture will never be the noble art it once was till they are forgotten altogether, is beyond ordinary comprehension. I cannot conceive how any one living in the nineteenth century, and understanding the workings of its institutions, and the aspirations of its men, can advocate the theory that it is only by degrading the workmen that the work itself will rise in public estimation, or only in ignoring the artist that the art will become more noble.

It may be all very poetical to lament the days when men were quarrelsome (if such a time ever existed); when men of learning, wealth, and power studied architecture as a polite accomplishment, or a pastime to while away the troubles of ennui,—giving to the world their beautiful creations of the fancy and the intellect to be engraved in imperishable stone,—never dreaming of associating their name with them,—never wishing to become great. But these times are all passed away. We honour a man who exhibits great talent, be his profession what it may, and therein is Britain's greatness; for every one strives to be greater than his father, under the certainty of being honoured if he is successful. By what calamity is it, therefore, that architects are to be an exception to the general rule? Is it because it has been discovered that the downfall of a nation has always been preceded by great architectural magnificence, and that architects, therefore, are an indirect cause of a nation's decay, by creating refinement and effeminacy? No. The reasons adduced by Fergusson are:—Firstly, that architecture is a useful art; and, like all useful arts, the names of those who are eminent in them are not meant to be remembered. "No one cares," he says, "who invented all the multifarious processes of modern agriculture, or who designed the 'Harrow'!" and he draws the conclusion that no one cares either who were the architects of buildings which are the admiration of the world. But agriculture and ship-building are only two of the useful arts; and, as his remarks apply to all, how does he account for the names of Watt, Stephenson, Pallissy, Wedgwood, Arkwright,

and many others being highly honoured and venerated as inventors and improvers in several arts? Or would he have these men forgotten also.

He also says, "Every useful art is capable of being refined into a fine art." "Identically the same process which makes the difference between a boiled neck of mutton and a dish of *côtes à l'impériale*, can convert the most common-place building merely designed for shelter into a palace or a temple." According to this theory, therefore, an architect is intellectually no superior to a cook; and a cook displays as much science, skill, poetry, and genius in making a pudding as an architect in drawing plans for a house! Let us apply one test to this hypothesis. Things and men are valuable chiefly on account of their rarity. Diamonds would be comparatively worthless, if they were as plentiful as road-metal; and gold would not be so much prized as iron, if it was in as great abundance. Is a great architect, then, a rare or a common personage? The greatest cooks (if such a term may be applied to them) can be hired by the dozen in every large town; but, among the thousands of architects in Britain—no matter what reputation they may at present enjoy—how few among them will be called great outside the generation that knew them. The very maligned for their desecration of our cathedrals and abbeys, and for covering the country with erections apparently newly risen from the tombs, and with their grave-clothes on.

How few have shown the natural genius of Kemp, who, condemned to work as a common mason, yet had lofty thoughts soaring far above his chisel and his mallet; who, unknown and uncared for, travelled over all Britain and the Continent, working at his trade, making drawings, and breathing in the life of those beautiful Gothic structures which were still considered the works of barbarians; and who, when the fulness of time had come, burst upon the world as a star of the first magnitude, erecting that edifice which shall remain to future generations as much a monument to himself as it is to Sir Walter Scott. Judged by the preceding tests, neither cooks nor engineers, painters nor sculptors, should be put on a level with a great architect, for no artist is so rare as he.

His second reason against architects is "because the names of the Medieval architects have not been preserved, so neither should the names of architects of the present day." He surely does not believe that the *bona fide* Medieval architects were so simple as to keep their names hidden from the people, and that the people were so uninquisitive as not to inquire who were the designers of those beautiful buildings which were being erected in their midst. He surely does not believe that these men never dreamt and hoped that their names would be immortal as long as their buildings should exist, and that future generations would desire the honour which they so richly deserved. The desire of being remembered after death is a feeling too deeply implanted in man to be easily got rid of, and we have no reason for believing that the Medieval architects were any exception to the general rule. The fact that the buildings themselves were so long unnoticed and allowed to fall into decay is sufficient to account for the names of the architects not being preserved. The revival of Gothic architecture has, at any rate, accomplished one good object, in leading to the perusal of old records in order to discover the names of those who designed these wonderful buildings; and we are glad to find that it has been accompanied with such success that many have been rescued from their temporary oblivion. We hope that the search will be continued till the presiding genius of each of the cathedrals has been discovered and brought to light. And we have no doubt but that a series of the "Lives of the Medieval Architects" will be as interesting and as instructive as any of the "Lives of the Poets" or painters of the past or present century.

If a general were not to be credited with the success of his forces, how many men of rank and talents would join the army. If a doctor were to be separated from his surgery cases, a lawyer from his court trials, an author from his books, an artist from his paintings, and a sculptor from his statues, would all these professions be filled with better

and more talented men, and would our arts and sciences occupy a still higher position than they at present possess? We think not. Neither, then, would architecture. Instead of its being resuscitated with a new fire and vigour, its nobility and nobility would depart, and nothing but veritable dross would remain.

Art architecture, then, be raised as high in dignity as any profession, and the honour will not be lost; for whatever is given to the men they will give it back again with tenfold interest to the country. The empire gains in wealth and importance from the measures of the statesman; the minds of men are opened and enlightened by the studies of the philosopher; the eye is pleased with the pictures of the artist; and the whole nation is refined by the works of the poet. But are people not also improved and refined by the works of an architect, and does a nation not gain in importance and respect through them? England gains in consideration through Shakespeare and his works, and no doubt Egypt gained in respect and importance through her poets; but while in the latter case they are lost in oblivion and their works have followed them, the works of her despised architects still tell of her glory. So though no such calamity may ever befall Britain, may the works of her architects be of such taste, grandeur, and magnificence, that as long as she exists as a first-class power, all strangers, be they from whatever country they may, will go away still more and more impressed with our empire's greatness and worth.

ANDREW DEWAR.

THE NEW HALL OF THE INNER TEMPLE, LONDON.

THE Inner Temple Hall, now rebuilt, occupies the site of the ancient hall of the Knights Templars, but has been greatly extended in all its dimensions. The new hall is 94 ft. by 41 ft., and its height to the wall plate is 10 ft. The previous hall was 70 ft. by 29 ft., and the height to the wall plate, 23 ft.

In digging the foundations remains were met with of a still earlier hall, of smaller dimensions, but of extremely solid masonry, of Norman character. In removing portions of the oldest foundation walls, several carved capitals, and other architectural details, were found built into the interior of the walls. The execution of these was perfectly sharp and clean, as to make it probable that they had never been exposed to the weather, nor even set, in their places, but that, owing, perhaps, to some change of plan, they had been used in as rubble. These fragments are all of late Norman work, coinciding in date with the older portion of the adjacent Temple Church. One of these fragments is deposited in the Museum of the Institute of British Architects.

Owing to the slope of the ground, and to the depth of the foundations, there are both a basement and a sub-basement story under the hall. Under the western end of it is a vaulted crypt, hitherto used as a wine-cellar, but which it is intended to carefully restore to its original form. In rebuilding their hall, the benchers have availed themselves of the opportunity to greatly extend and improve the domestic offices, and to provide commodious robing-rooms, lavatories, &c., for the use of members, and of students, and to obtain better clerks' offices.

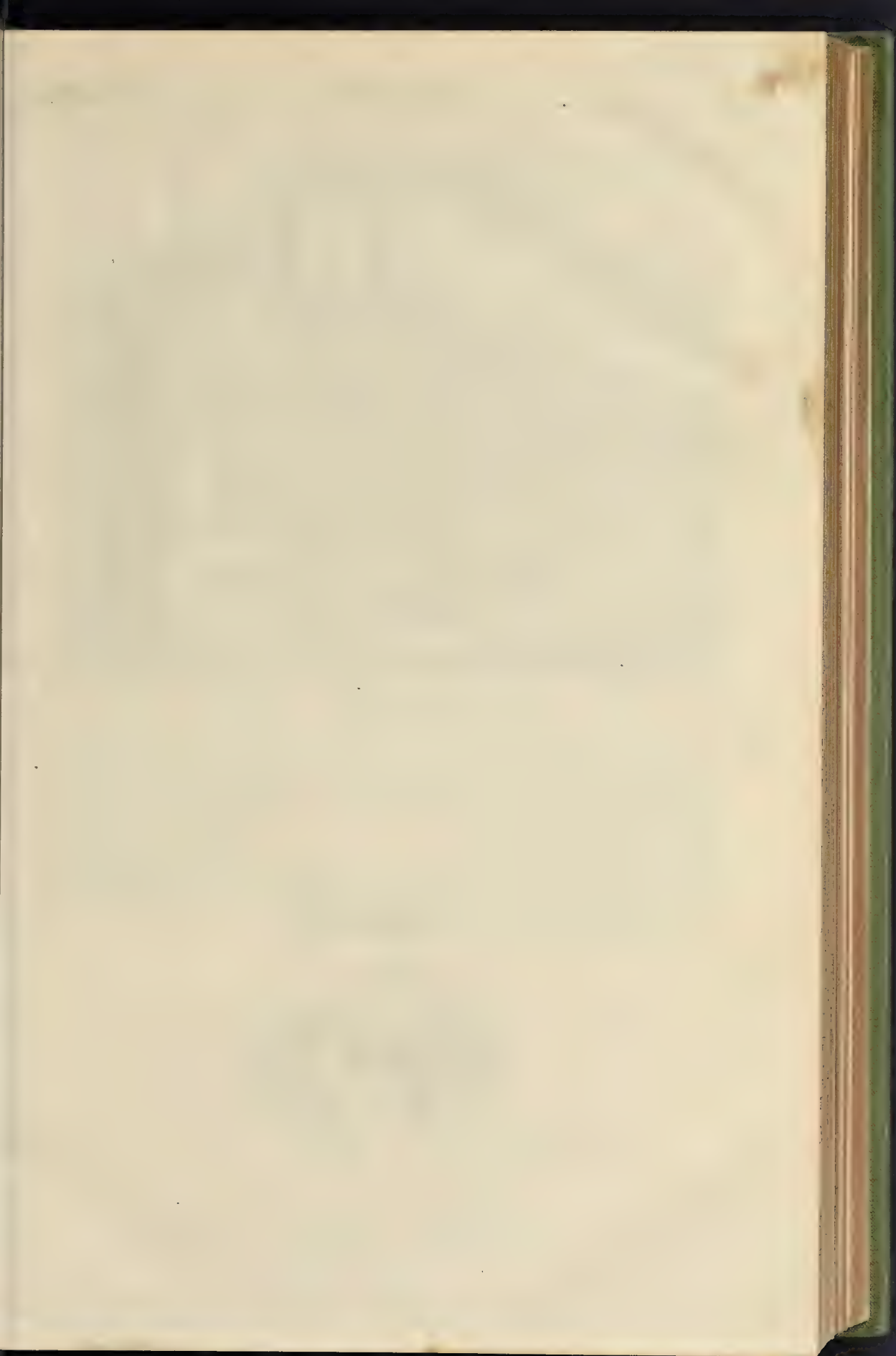
New offices have also been built for the treasurer, and the Parliament chamber has been increased in size. The buildings have been erected under the able superintendence of Mr. S. Smirke, R.A., by Messrs. Trollope, who have executed their work rapidly and substantially.

The exterior masonry is in Portland stone, being a freestone which, when rightly selected, has proved itself to be best suited for a London atmosphere. The interior of the hall is built of the hardest quality of Bath stone. The roof, screen, and wall linings, are all executed in wainscot. The hall is warmed by Messrs. Haden's apparatus, and lighted by Stode's sunburners in the roof, and by sixteen bracket-lights, of burnished brass, against the walls, each having a large cluster of jets: these have been executed by Messrs. Hardman & Co., of Birmingham. The oriel window, at the upper end of the hall, is brilliantly glazed with stained glass, in armorial devices, by Messrs. Clayton & Bell.

The rest of the windows are at present glazed ornamentally in leaded lights and plain glass, but it is believed to be the intention of the benchers ultimately to glass the whole of the windows with richly-coloured devices, illustrative of the history of the Temple.

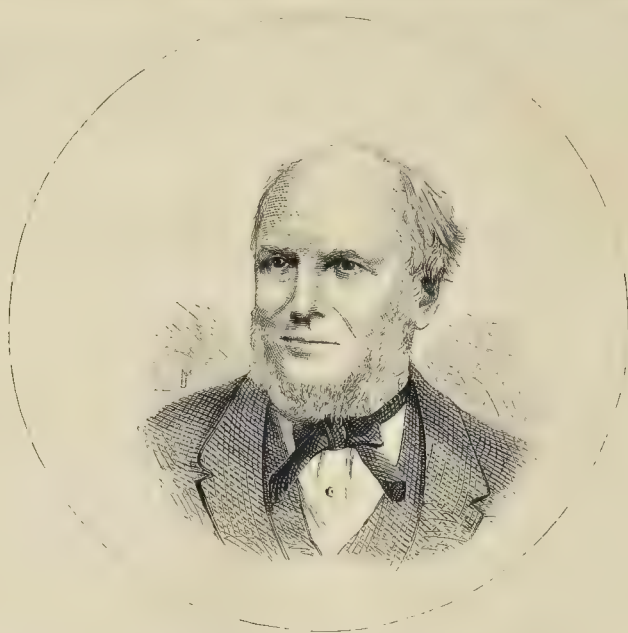
* An exception must be made in favour of France, which very lately has become a knowledge an architect to have executed the complete works of art in the country during the past five years.—A. D.

* If he objects so much to the names being preserved, what must be his disgust at the late enterprise of the *Livier* in publishing their portraits also?—A. D.





THE NEW HALL OF THE INNER TEMPLE, LONDON.—MR. SYDNEY SMIRKE, R.A., ARCHITECT.



MR. BENJAMIN FERREY, F.S.A.

Architect of St. Stephen's Church and Schools, Rochester-row, West.minster.



The New Hall of the
Inner Temple.

M^r Sydney Smirke R.A. Arch^t



THE MASON'S SQUARE IN GLOUCESTER CATHEDRAL.

Mr. J. T. D. NIBLETT has been led to write some observations respecting the very singular, if not unique, *Mason's Square*, which forms a bracket against the east wall of the south transept on the right-hand side when descending into the crypt. Mr. Niblett says,—"I have jotted down some particulars respecting it, and my attention having been now particularly drawn to it, I am induced to send these few further information, and consequent enlightenment. It is formed of a single stone, projecting horizontally 3 ft. 2 in., and being 2 ft. 2 in. in its widest part. It has a long arm and a short arm, like a blacksmith's square of the present day. The whole of it underneath is made to represent groining, and it has a battlemented edge all round. At the base, where it springs from the wall, is an old man acting the part of a Caryatid: he wears an apron, and has some implement stuck into his belt: above him, on the groined ribwork, is a young man in a smock-frock, clinging, as it were, in desperation to the ceiling. This bracket has evidently supported the image of some patron saint: the iron dowels that held the effigy still remain; whilst a battlemented moulding above shows how far the head of the effigy extended, and forms a finished margin to the work. The legend is, that the master mason, who built the upper part of the tower from the springing of the four great arches, found that the apprentice, during his absence, had exceeded his commission, and had done his work so well that in a fit of jealousy he killed him on the spot. But this is the common Freemasons' legend, which Mr. Billings speaks of in his architectural account of Rosslyn Chapel, Scotland, adjoining Hawthornden, the seat of the Sinclairs, hereditary heads of Freemasonry in Scotland. When I was there, two corbels were pointed out to me on either side the west end of the chapel, on the inside,—one representing an old man's head; the other that of a young man, which had a red streak across the brow. In Lincoln Cathedral there is also something similar, but I do not remember what it is like, for it is many years since I was at that grand old minster. I shall be glad of information on this point. These doggerel rhymes are current respecting the Gloucester bracket, thus—

"John Gower,
Built Gloucester College,
Campden steeple, and Chester tower;
But what vexed him right sore,
He never lived to build one more."

Some readings give Bower: both these names are to be met with in this county. *Bower*, n. s., in German, signifies a builder; *bauen*, v., to build. There was an architect in the abbey (the present Cathedral), and he was one of the 13 chief officers of the monastery, and a professed monk. His title was 'Magister Operis.' This bracket had nothing to do with him, I should think, for neither of the figures is a mason monk. Otherwise, one might refer to *Seabrooke*, who began, and the other to *Tulley*, who finished the tower, as commemorated in this monkish distich:—

"Hic quod dignum speculans opusque politum,
Tulij hec ex onere Seabrooke abbate iubente."

which, by the bye, I have never as yet seen satisfactorily translated. Query, does the second word of the second line, which decidedly reads *hec*, do duty for *hic* or *huc*?

I think the bracket was probably due to the piety of the principal mason employed, or the builder who took the contract, and gave money to maintain a lamp and to secure masses for his soul.

The earliest representation of this bracket that I know of, appears in Carter's Etchings in 1785, of size of print, 7½ in. by 6½ in.; a second appears in Britton's Gloucester Cathedral, pl. ix.; a third in John Murray's Handbook.

Gloucester was an abbey of Benedictines. Cirencester an abbey of Augustine Monks. Chipping Campden belonged to the Nuns of St. Werburg, Chester. All three distinct

societies, so that it is doubtful if John Gower built them all, unless he was the Gilbert Scott of the day. The upper part of Gloucester tower was built in the middle of the fifteenth century: the other two towers named are in the Perpendicular style, yet there is nothing to show that they were contemporaneous; there are no records of these other two as to when they were built.

"Bigland and Fosbrooke's City of Gloucester," folio edition, page 127, and quarto

edition, page 251, is an attempt to explain the meaning of this design, referring the reader to Carter, and to a publication by the Antiquarian Society. It is there, entitled "Gower's Monument."

Now, as we are on the subject of Masonry and Free-masonry, I would call the attention of the curious to the masons' marks in the cathedral: they are particularly to be observed on the massive Norman pillars of the nave. The same marks are repeated several times. I have not been able to discover any of these marks on work later than that of the Norman period. For my marks of ordinary masons, as nowadays, that each man may be able to recognise and point out his own handiwork. Some gentlemen of the Craft, I know, think otherwise. One mark is a large and decided capital A, of Medieval form, which would be a case, perhaps, in point, unless it be intended for the initial of the word *Adonai* (in Hebrew, the Lord), used as a charm against the Evil Eye.

SCHOOLS OF SCIENCE AND ART.

Mr. H. Cole, C.B., at Manchester.—A meeting has been held in the Mayor's parlour, Town-Cole, "On the Educational Advantages of Circulating the Works of Art from South Kensington Museum." The mayor presided. Mr. Cole, in that three centuries ago there was hardly a hamlet—1,300 parishes existed then—in which they had not practically something like a picture gallery; their walls were covered with pictures, and now-a-days they could not go into any old finding pictures, which had been intended for the instruction and good of the people. Besides these picture galleries, art was carried into all kinds of employment. Some of those who were present had no doubt been at South Kensington Museum, when the "loan collection" existed, and had attended at Paris in 1867, when a collection of works of art of past ages was brought time, in respect to certain kinds of art, especially in working in metals, the work done was nothing like the work which had been done three centuries ago. A comparison of the metal-work before the Reformation with the metal-work of the present time showed that we were infinitely behind our ancestors. Assuming for an instant that Manchester was able to start a fine-art institution, it was quite obvious that the collection of ancient works of art must be their own fault if they did not make South Kensington Museum fill it for them. He should reject to see a system established by which a great storehouse should be opened in the metropolis, or somewhere else, for which there should be a distribution of works of art to places throughout the whole country as they made provision to receive them. Such a system would bring about frequent changes at the various museums, instead of the present stereotyped works on their walls. The South Kensington Museum sent art collections as far as it could, and at the present time it had sent to Manchester, at the request of Mr. Birley, to the Missionary Exhibition, the Alysianian trophies which had cost the country eight or nine millions of money to obtain. If the Government made a collection of the superfluities which he knew to be in existence, there might be four or five provinces. He thought the people of Manchester ought to hold their member (Mr. Birley) personally responsible, in some degree, if this suggestion was not carried out.

The Manchester School of Art.—The annual meeting of this school, and the distribution of prizes to the successful students, have taken place in the lecture theatre of the Royal Manchester Institution, Mosley-street. There was a numerous attendance. Sir Thomas Bazley, M.P., presided. Mr. Muckley (headmaster) read his report for the past year, which stated that there were at the present time not less than 800 pupils receiving instruction through the agency of the school. I am positive, says Mr. Muckley, that the general standard of our work would be greatly raised if the lighting premises we now occupy are doubtless commodious in many respects, but they lack the most important desideratum; and sooner or later, I am

persuaded, the difficulty will have to be dealt with. A considerable number of the advanced students still continue to pursue their career in the school, with the hope of gaining their livelihood as painters. The present condition of the school has been commented on in the strongest terms of favour by the Science and Art Department; and in some of the stages of its work, all the other schools of the kingdom are recommended by the Department to take Manchester as their model. A large number of books and other prizes has been awarded to the students in national competition, also a prize of 3l. 3s. by Messrs. Oliver & Aotherly, for a design for silk. The chairman distributed the prizes.

The Wolverhampton School of Art.—At a recent meeting of the committee of the late South Staffordshire Exhibition, it was resolved, after much discussion, to give 500l. of the surplus funds to the Wolverhampton School of Practical Art. This amount will enable the trustees of the school to obtain 1,000l. from Government, upon condition that the building be also devoted to education in science as well as in art.

Art in Bradford.—There is a movement in Bradford towards the organisation of an Exhibition of Art in that town. The scheme may require nine or twelve months to mature in.

Science Classes for Hereford.—A meeting of influential gentlemen of this city has been held at the Blue Coat School, for the purpose of establishing science classes under the minutes of the Committee of Council on Education. A large local committee was formed, the mayor consenting to act as chairman, the Rev. E. Rudd as secretary, and Mr. With as assistant secretary, in accordance with the regulations of the Science and Art Department. It is proposed to open more, and St. Peter's schools; also an evening class for young men who may wish to devote their time to the study of science. A special class will be opened for school-masters and others who may wish to qualify themselves as science teachers in the neighbouring districts. The charge will be a nominal one of 2s. 6d. per quarter to those who undertake to attend twenty-five lessons, and present themselves for examination in May next to compete for certificates, prizes, and scholarships. The classes will be conducted under the general management of Mr. With, assisted by Mr. Walter Jeffery, of Gloucester, certificated lecturer in science, and by Mr. Akroyd, second master of the Hereford Blue Coat School.

The Chester School of Science and Art, and City Library.—A public meeting in furtherance of the objects of the Chester School of Science and Art, and City Library and Reading-room, has been held in the large room at the Town-hall. The hall was filled. Drawings of the students and others were hung round the platform. The mayor presided in the absence of the Marquis of Westminster from ill health. The Mayor of Chester addressed the meeting, as also Mr. Backmaster, who said he was glad now to find that there was a prospect of the subject of science and art in Chester being placed upon something like a proper basis; and that the noble room in which they were assembled that evening would be taken for very many years to come for the same purpose to which it was devoted that evening. He had some difficulty in seeing exactly the connexion between science and art and racing, although he believed there was a great deal of science and art in racing; but it somehow happened that the science and art and the racing came very awkwardly together; and it was very desirable, if possible, that some little arrangement should be made by which the advantages of science and art should not interfere with the races, nor the races interfere with the paying of science and art in this place. He hoped whatever advantage they might be of to the place, that the races would not interfere in the slightest degree with what he believed to be the more serious work in which they were engaged. The mayor distributed the prizes.

The Sewage of South Side of the Thames.—We understand that the Native Guano Company, now treating the sewage of the town of Leamington by the A.B.C. process, have applied to the Metropolitan Board of Works to enter into a treaty with them for the concession of the sewage on the south side of the Thames. The question has been referred to the Works Committee.

practically useless. It can easily be imagined that the smell in the bath-room could not but be both abominable and abiding; if it had not been tolerably well ventilated, the house must have been uninhabitable. It is really astonishing how we manage to exist under such very disagreeable circumstances. As is to be expected, illness has not been absent from this dwelling. I have entered at length into this detail, in order that persons acquainted

On the left of the entrance-hall are the porters' and luggage rooms. The coffee-room is 28 ft. long by 20 ft. wide, exclusive of a bay window. The smoke-room is 26 ft. long by 18 ft. wide, and is entered from a corridor on the north-east side, as is also the public billiard-room, which is 30 ft. long by 20 ft. in width. A glass screen divides the corridor at this point. The kitchen, which is 30 ft. long by 25 ft. wide, is lighted from the top by upright lights, above which is a lantern fitted with louvres for ventilation. There is an open corner, 66 ft.

The building is constructed of red brick, with quoins of white brick, and dressings of Holling on stone; and it has been erected from the original competition plans and designs, without any alteration. Mr. Alfred Barlow, of Stoke-upon-Trent, was the original contractor for the building, and the works have been completed by the trustees of his estate. The tender of Mr. Joseph Scarratt, of Hanley, was accepted for the painting and paperhanging. The total cost of the building is about 15,000*l.*, exclusive of Mr. Scarratt's contract, which would be about 450*l.*

The church is one of the most painful of the Georgian barbaresques upon Tudor. It has a squat tower, bays, north and south aisles, an apsidal chancel, and a number of octagonal buttresses, which are of uniform size all the way up, and, of course, do not act as buttresses in any way. But dreary, worm-eaten, and unsophisticated as the town is, it is not half so comfortable as the railway station. This is the most barn-like and desolate of all the many barnlike stations on the Great Western Railway, and to put anything human out of a train there ought to be actionable.

GARGOYLE.

INAUGURATION OF THE GIBRALTAR WATER WORKS.

THESE works are nearly completed, and the inauguration by Lady Airey, took place on the 8th of December. The Sanitary Commissioners, in their address, said:—

"No one will hail with greater joy than your Ladyship the success which the efforts of the Commissioners have crowned, by the blessing of Divine Providence, in searching for, and finding, a supply of fresh water which has been pronounced by several competent analysts to be quite wholesome, and, indeed, excellent. The Commissioners have every reason to believe that the supply will be ample for all the wants of the population, and can be made available on a scale so liberal, and at a cost so trifling, in almost every house, barrack, and quarter on the Rock, as to be regarded as the greatest benefaction which could befall this ancient fortress, so long the renowned possession of the British Crown.

The maximum daily allowance of water to the troops in this inadequate quantity is greatly in excess of that which the thousands of the civil population inhabiting the higher parts of the town are able to obtain. But within a very few months the Commissioners hope that every inhabitant of the Rock, both civil and military, will be supplied with a minimum of ten gallons daily at a lower rate than has been paid for the former scanty supply."

Sir Richard Airey, the governor, in his address to the Sanitary Commissioners, said:—

"It is an inexpressible gratification that the great blessing of providing this water and territory of Gibraltar with an abundant supply of good water should have been accomplished under the administration of the Government—and, in addition, we do not thank the Almighty for this gracious dispensation, we do not thank the Government, we do not thank the Sanitary Commissioners, we do not thank the Engineer, and Messrs. Kyau, the contractors, for the display of energy and untiring exertions which you have exhibited in bringing to perfection these great works—entitling you, individually and collectively, to the gratitude of the present and future population of Gibraltar."

The water was turned on in the centre of the square, where a temporary basin with jets was placed where a fountain to be named "The Airey Fountain," is to be erected. The turning on of the water was followed by a general salute, bands playing "God Save the Queen," and a round of hearty cheers from the assembled spectators.

LEEDS BRIDGE COMPETITION.

Sir,—I observe in your journal of last week that reference is made to the surveyor of the corporation. Mr. Fenwick, to whom, no doubt, allusion is made, has no official appointment under the corporation, but his firm (Martin & Fenwick) have been engaged as arbitrators and valuers in the purchase of property required for street improvements; and, to prevent any erroneous impression, I beg to inform you that I have not competed for the work.

A. M. FOWLER, C.E., Borough Surveyor, Leeds.

MIDLAND COUNTIES IDIOT ASYLUM COMPETITION.

Sir,—From the fact that the conditions of this competition appear to have been very fairly drawn up, and that the committee have asked each competitor to name three subjects of eminence from whom they may select their professional adviser, it is to be hoped that the result of the competition will be more satisfactory than several which have been lately under notice.

As it is impossible for the competitors to address the committee, may I ask them, through your pages, when they have been sent in, to exhibit the various plans which have been sent in.

I recompense which the majority of architects proceed they go through in studying the requirements of the building in hand, and they are surely fairly justified in asking the opportunity to inspect the several designs, in order that they may see how others have treated the subject as well as themselves.

COMPTON.

PHOSPHORIC PASTE.

Sir,—I shall feel obliged if you can obtain me some information on the subject of a phosphoric paste recently taken of in your paper as having been adapted by a French chemist to rendering door numbers, &c., luminous. I wish to know if the thing is practicable, and, if so, where I can find out where to obtain some of the paste.

E. P. B.

RESPONSIBILITY OF SEPARATE EXECUTANTS UNDER THE METROPOLITAN BUILDING ACT.

The Surveyor of St. James's v. Strode & Co. as to Sun-burners.

The District Surveyor is not quite satisfied with the report of this somewhat important case published by us in our number of December 25th, and he forwards to us the following supplementary statement, which we willingly

publish. The case was laid before the Worshipful Magistrate as a civil issue, to raise a question of law, namely, whether the apparatus of "Sun-burners," when hired by the contractor, but as separate traders, and not as general sub-contractors, ought to be made the subject of a notice. In this stating the case, the subject of the apparatus in question should be brought into the

general contract, and the responsibility to the Building Act thus accepted by the general builder, in order to allow the public officer to deal with it in a business-like way. Otherwise, he would be in a position to refuse to accept it, and the gas engineer, as in this case, absolutely declined, for private reasons, to surrender his independence, then he ought, as an essential condition of his independence, to stand in the eye of the Building Act as an independent "builder," giving his independent notice, and ultimately becoming liable for his independent fee.

The District Surveyor produced the notice given by the general builder, and with reference to the appearance of the word "flues" therein, mentioned that the notice was, in fact, drawn from verbal explanations of a foreman by builders all the aid in his power, and that this word expressly referred to certain chimney-flues which the builder had accordingly constructed, the "sun-burners" discovered in the course of the supervision of the works of the general builders.

Mr. Sleight, barrister, appeared for the defence, and affirmed that the "flues" in the notice were the flues of the sun-burners, maintaining also that the district surveyor would not be justified in excluding these sun-burners from the limits of the notified operations, even if, contrary, one notice was not to be understood. On the other matter how many tradesmen might happen to be employed upon portions of it; inasmuch as the purpose of the notice was no more than to direct the district surveyor's attention to the fact that operations were going on. The learned counsel then went into various details of the penal clause under which these proceedings were taken; contending also that the sun-burners were not, and their relation to adjacent woodwork being left to the carpenter, his claim being a rule to do none of the trimming and other cutting away or preparation as regards the structure of the house.

The District Surveyor had no reply, as there had been no witnesses called for the defence; and when Mr. Sleight suggested that the architect of the work was not present to answer any question, and the magistrate reminded him that he would allow the District Surveyor to reply, he declined to call the witness.

Mr. Knox gave immediate judgment; in the course of which he recapitulated the well-known principles by which the law was understood to govern such questions generally. Finally, he considered that at the District Surveyor could not legally call upon one tradesman to remedy the errors of another who was not a subcontractor; but at the same time he could not see his way to the ultimate result of perhaps a large number of separate tradesmen being charged each one a separate fee, for so many were employed in one operation of building. Therefore he would not undertake, in dealing with a case of the present description, to lay down any broad principle whatever; but must confine himself to the conditions of the particular case, according to what might be his impression of hand, and taking care not to draw any hard and fast line, he thought the District Surveyor admitted having received necessary notice so far as to direct his attention to the concealment for which to punish the defendants; the terms of the builder's notice as regards the defendants, the word "flues," and the drawing of this notice by the clerk (which he should not admit to be done in any doubtful case), were elements to be considered; he also understood that the more important part of the fixing of the sun-burners belonged to the general builder (who, he thought, somehow), and that the defendants did little else than supply the apparatus; and, on the whole, in this present instance, he would dismiss the summons.

Mr. Sleight applied for costs. Mr. Knox said certainly not. The District Surveyor was perfectly justified in the course he had taken.

The District Surveyor asks us to add the following note, with which we fully agree:—

The impression left upon my own mind is that this must not be taken as a leading case, and that the learned magistrate seemed unusually anxious to guard against such a conclusion. Looking at the increasing use of "sun-burners" and the extremely dangerous character of the apparatus if injudiciously applied, I cannot help thinking that the time has come when their regulation under the Building Act must be fairly considered. It is to be borne in mind that the invention has come into use altogether since the date of the Act; and that the clause which is supposed to apply (as to pipes for conveying heated air) was really directed at nothing of the kind. It is the misfortune of district surveyors that every question they raise is sooner or later interpreted to be one of fee. This they must bear with; but the real question here is obviously enough one of responsibility, and that of no merely nominal kind. One gas-engineer says of another that his sun-burners are the house instantly on fire: the other returns and I have humbly submitted that in dealing with such engines of possible disaster, the responsible public officer (if he is to be relied upon) ought to have one of two securities, either that the general builder shall distinctly endorse the safety of the apparatus, or otherwise that the gas-engineer shall take the responsibility upon himself, and account to the law personally for his work. In such a case as the present, if the notice is taken as a notice to the public officer of his responsibility for the work notified, then if the gas-engineer gives no notice at all, and the builder very pro-

perly declines to admit the gas-engineer's work gratuitously into his notice, on whom is the responsibility to a coroner's jury to rest? If I were the gas-engineer, I think I should be particularly desirous to get rid of it. All the while, I desire it to be understood that, as regards the argument of the learned magistrate, I cannot help admitting the strong common sense which it displayed.

R. K.

ZINC ROOFS.

Sir,—In reply to "Engineer," we beg to state that we do not think there is any composition which will effectually prevent rain getting through roofs in consequence of the zinc cracking.

The only remedy is to have the roof taken up and laid upon proper principles, allowing for contraction and expansion.

No doubt "Engineer's" roof has been laid by some experienced workman, the joints being soldered, &c.; and we again beg to state that we do not think there is any composition which will effectually prevent the rain coming through.

J. W. TYLER & Co.

CHARLES I'S WATCH.

Sir,—In answer to the query about the missing watch of King Charles I. in your last number, under the heading "Anthologia Technica," the following might, though not very probably, lead to its discovery. Several friends of mine, natives of Battle, say that some years ago a watch and bloody shirt, bequeathed by King Charles to Earl of Ashburnham, were kept in a case at Ashburnham Church, near Battle, Sussex, and exhibited by the sexton; but on the last occasion of exhibiting them, they or the watch only was stolen by the servant of the persons who were viewing them. I cannot learn that it was ever recovered.

R.*

Sir,—In answer to your correspondent, one of Charles I's watches was in the possession of the present descendant of Sir Thos. Lucy, at Charlote Hall, and was stolen from thence when the hall was broken into by burglars some few years ago.

S. COOKE.

ROSSO ANTICO MARBLE.

Sir,—In your number of the 1st of January, you report some observations I made on this subject, at the meeting of the Royal Institute of British Architects, on the 1st of November last year. You correctly quote an erroneous reference I made inadvertently to Rondelet, and which I am anxious to correct. The columns in the Salle d'Apollon, in the Louvre, are not of Rosso Antico, but of red Oriental granite.

THOS. L. DONALDSON.

OLD BOND-STREET GALLERY.

We are asked to mention that a number of gentlemen, exhibitors and others, connected with the former and present exhibitions held here, considering that there is a want of a Permanent Gallery to replace the late British Institution, in which artists, whether members or not of existing societies, can send their works for exhibition and sale, have formed a committee to bring this about. They consider their opinion borne out by the fact that 2,000 pictures were sent to the first summer exhibition, which opened on June 10th; and for the present winter season upwards of 1,800 were received. Further, that 10,000 persons visited the Gallery in the summer season, and that a large proportion of the pictures were sold. "During the present exhibition, although only open a month, and that the dullest in the year, when the majority of picture-buyers are absent from London, sixty pictures have been already sold." It is proposed to hold three exhibitions yearly of paintings in oil and water colours, to take place in the spring, summer, and winter seasons; and they wish it to be understood that neither rivalry nor antagonism is intended to any existing institution or exhibition. In order to aid in carrying out the proposed exhibitions, it

* Parry's "Coast of Sussex" says,—The north channel of Ashburnham Church, Sussex, contains the monuments and the memorials of the execution of Charles I., which were bequeathed by Bertram Ashburnham, in 1727, to the parish clerks for ever. These are things in the least repulsive in their appearance. The most recently fine lines excite astonishment from being as perfect as if new. The shirt of the unhappy monarch lies in a glass-case, lined with red velvet, and has not a speck of dust upon it. The drawers are knit of white silk; there is also and his watch; this has an enamelled case, and flowers Ashburnham contrived the escape of Charles I. from Hampton Court.

Mr. G. F. Chester and Mr. J. W. Benson are the honorary secretaries.

Brighouse.—St. James's Church is now nearly completed. It is built in the Gothic style of architecture, and originally was intended to have a tower and spire; but as this would entail a large additional cost, the project was abandoned, and designs made for a lofty bell-turret, at the western end. The turret has a crocketed gable, with double crocketed pinnacles at each side, and surmounted by a stone cross. The turret contains two bells, one 18 in. and the other 20 in. across the bow, which are the gift of some well-disposed friend of the church, and from the tower of Messrs. Mears & Stainbank. The great window, which faces the turnpike road, contains tracery work, and will be filled with grisaille glass, from Messrs. Lavers, Barrand, & Westlake. Medallions are introduced, with full-sized heads of the four evangelists, and the four major prophets. The east window is left entirely plain, that part of the church not yet having met with a friend so liberally disposed as to adorn it with stained glass; its tracery work, however, deserves to be better treated. The church is divided into nave, north and south aisles, chancel, and organ chamber, which latter opens both into the chancel and nave. The nave is 48 ft. to the ridge, 69 ft. long, 22 ft. wide; north and south aisles 10 ft. 3 in. wide. The chancel is well proportioned for the size of the church, and is 23 ft. long, 18 ft. wide, and 39 ft. high. The chief feature in the interior is the chancel arch, which springs from carved capitals. The nave is divided from the aisles by arcades of five arches on the south side, and four arches on the north, the remaining bay of which is appropriated as porch. The arrangement of the doors is intended to prevent cross draughts of air. Subsequently to the drawing of the designs it was found advisable to construct a choristers' vestry, beneath the vestry proper, access to the chancel being obtained by an outside staircase, covered with a pent-roof. The choir will be supplied with oak stalls with carved finials, the prayer-desk occupying the western stall on the south side. Designs are also told, are about to be carried out for decorating the east wall of the chancel in colour-work; the Decalogue, Creed, and Lord's Prayer being painted on each side of the window, surmounted by tabernacle work. The centre compartment will supply the place of a reredos, which is all that is necessary to render the chancel complete. The pulpit is of Caen stone, circular in form, and supported on a red marble column. There will be seat-accommodation for 600. The pews are of deal, stained and varnished, and open. The heating apparatus has been carried out by Messrs. Thornton, of Huddersfield. The western wall adjoining the turnpike-road is of dressed stone, and the railings, entrance-gates, and gas standards are of wrought iron, the work of a townsmen of Brighouse.

open traceried oak screens, and the stalls for the choir are also of oak, moulded ends and carved poppyheads. The plaster and whitewash have been cleaned off the internal walls, and the whole has been painted. The chancel arch is new. The carved work was executed by Messrs. Farmer & Brindley, of London. The architect for the restoration was Mr. W. H. Crossland, of Leeds and Messrs. Kaseell, of Goole, at a cost of about £2,600, the whole of which, we understand, has been presented by a single individual. The stone used in the ashlar work was from the Steeley and Ancaster quarries; and the roofs are covered with the old lead, which has been recast for the purpose.

the purpose of the church. The Church of St. Stephen, City-road, Manchester, has been consecrated to the service of St. Stephen, the foundation-stone of which was laid in August, 1868, by the Earl of Ellesmere, is seated to accommodate 750 persons, and has cost about 5,000*l*. The ground-plan of the church is oblong in shape, rather wider at the eastern than at the western end, by reason of the shape of the site. The north-east (or east) end of the church is the principal entrance (or, if so oriented correctly) is the principal entrance. The eastern elevation comprises a lofty chancel gable, rising more than 30 ft. from the level of the street, and containing a brick and stone window, about 30 ft. high by 15 ft. wide. Below this window is a brick arcade. The lower part of the chancel is banded with coloured brick. On each side of the principal one are the two gables of the chancel aisles; that to the north having two stories of windows; the choir vestry being upstairs. In the north aisle, each bay is gabled transversely, and in each is a three-light window, with moulded brick and stone tracery. The clerestory is seen above the aisle roof. The upper part of the west end is set back 6 yards and carried on arches; so that while all the available space is reserved for sitting, the main west gable may not too closely overhang the schools adjoining the church. This main west gable is pierced by two three-light brick windows, with round stone tracery above about 8 ft. in diameter. The distance from east to west is short for a church of this size, the nave and chancel roofs are kept the same height, and over the chancel arch is a lead-covered and crocketed belfry, rising nearly 90 ft. from the pavement, and containing a bell by Mears. The exterior of the building is mainly of brick; some of the bricks are moulded, and some are in diapers and arcades. All the gables, awaves, and cornices are brick, stone being only used for the tracery of windows, and where it is constructionally required. The east window is a five-light window facing City-road is the inscription in Milton tiles: "In this place will I give peace to the blind and Hosts." The principal entrance porch is deeply moulded in brick, with stone imports. The lower part, being liable to wear, is plainly bevelled only. Besides this door on the north, there are for exit two others, one at the east and another at the west end. The chancel fittings are of pitch pine and walnut. The arches of the north and south chancel aisles are filled with ornamental wooden screens, with tracery in the upper, and panels and wood tracery in the lower part. The east window is the work of Messrs. Heaton, Butler, & Bayne. The central subject is the Ascension, and subordinate to this are several incidents from the life of St. Stephen. The vestry panels of diapered plaster work are covered with panels of diapered plaster work in relief. The nave, formed of light and dark alabaster, immediately over the table is the inscription "The Word was made flesh." The chancel, lighted at night by rows of gas-jets on the top of the wood screens; the nave and aisles are covered hung from above the apex of each arch. These fittings are by Messrs. Thomson & Co. of Birmingham. The glazing generally (which is by Messrs. Edmundson) is in simple leaded panes, with slightly ornamented brick in the tracery, &c. The blank wall of adjoining bays, which, owing to the proximity of adjoining bays, has no window, is intended to be relieved by paintings of the attitudes. The gallery is recess at the west end, so as not to intrude the oblique roof. The nave arcade runs round the top of this gallery. Below the great west window is a medallion, sculptured by W. Green, representing the martyrdom of St. Stephen. There are to be four other medallions, with lessons from the life of St. Stephen in the triangular spandrels of the arcade with arches. It is intended shortly to decorate

church to a moderate extent with colour. The heating apparatus is by Messrs. Haden. Besides the subcontractors under Messrs. Ellis & Hinchliffe, P. Hodgkinson, and W. Clark, there have been thirteen or fourteen different tradesmen employed on the work. This church completes Mr. Birley's work in this district—he having previously built the schools, parsonage, and schoolmaster's house. The architects were Messrs. Medland & Henry Taylor, of Manchester.

LEICESTER.—The Presbyterian Church here has been opened. It will accommodate nearly 800, and is provided with suitable vestry accommodation; the ground on the north side of the building being reserved for the erection at a future time of a school-room, which will closely adjoin the church, and have a frontage to the London-road. The design is in the Early English Gothic style; the walling externally being of rock-faced Balwells stone, and the dressings of Bath stone. The principal front, that next London-road, has a large five-light geometrical traciced window, with engaged shafts in the mullions; and underneath, the principal entrance door, which has a double recessed and moulded trefoil arch and detached shafts, with moulded caps and bases. At the south-west angle of this front are a tower and spire, the tower having in its principal stage four large arched windows. The spire rises to a height of 120 ft., and is finished with an iron cross. The side elevations of the church have each five bays of two-light windows two tiers in height. The upper tier is traciced. Internally, the church is galleried on three sides, the side galleries being supported by large iron columns, which also support the main timbers of the roof. The principal roof-timbers are exposed to view, and stained and varnished; the panels formed by intersections being plastered and decorated in colour. The cost of the building will be about 3,000*l.* The contractors for the builder's work were Messrs. Osborne, Brothers, of Leicester. The gasfitting is being executed by the Leicester Gas Company. The church is heated by Blake's patent hot-air apparatus. The architect was Mr. Tit, of Leicester.

Ardwick (Manchester).—The foundation-stone of the new schools which it is proposed to erect in connexion with St. Thomas's Church, Ardwick, has been laid. The site of the new buildings is a rectangular plot, bounded by four streets, at the rear of the church. The building, which is two stories high, is of a Gothic character, with a crenelated common brick facings and Darley Dale stone dressings. Over the windows are formed of slightly sunk panels, the arches being headed with moulded stock bricks. The north front has a range of six windows to each floor, the lower being three-light, and the upper two-light; each there is a casement to open for ventilation. The upper windows have projecting gables supported on moulded brick corbells, continued along the eaves. In the east elevation there is a stone traciced rose window, giving light to the upper floor. In the west elevation is the bell-turret, which rises perpendicularly over the large three-light window to the principal staircase. The building has a frontage to Pad-dock-street of 88 ft., and a depth of 39 ft. On the ground-floor is the infants' school-room, 54 ft. by 36 ft., and 16 ft. high, and two class-rooms, respectively, 23 ft. by 9 ft. 9 in. and 16 ft. 6 in. high; and 17 ft. 8 in. by 16 ft. and 10 ft. 6 in. high; also a lavatory and cloak-room, 13 ft. by 14 ft. From the entrance leading to a committee or class room, 8 ft. by 14 ft., which forms a mezzanine floor between the ground-floor and the gallery of the upper floor; this staircase is continued to the gallery. The principal entrance to the east floor is from Thomas-street, by a stone staircase, with oak handrail, and ornamental iron balustrades. This floor comprises a boys' school-room, 69 ft. by 36 ft., and a class-room 23 ft. by 15 ft.; the height to ceiling being 21 ft. 9 in.; the roof principals are in red deal stained and varnished, and have hammer-bell and brackets springing from moulded stock corbels. In the basement there is a kitchen, 27 ft. by 14 ft., with range and boiler, and useful conveniences for the preparations for the meetings. In addition to open fireplaces in each room, the building is warmed by Mc-

Whittaker & Constantine's hot-air apparatus placed in the basement, the heated air being conveyed to the school-rooms by means of flues and shafts. Provision has also been made for carrying off the vitiated air by shafts from the various rooms. The building has been arranged for the accommodation of 300 infants, and 250 boys. Adjoining are play-grounds asphalted and drained, and the usual out-offices. The total cost of the works, exclusive of furniture, will be 2,400l. The drawings have been prepared by Messrs. Royle & Bennett, of Manchester, architects, and the works will be carried out under their immediate supervision. The contractors are Messrs. Thomas Clay & Son, Audenshaw.

Books Received.

The Church Seasons Historically and Poetically Illustrated. By ALEX. H. GRANT, M.A. London: Jas. Hogg & Son.

In this volume readers will find traced the origin and history of the Festivals and Feasts of the Ecclesiastical Year, with notices of the principal ideas and doctrines they incorporate. Many poetical references to the various days are quoted. It includes the results of a good deal of careful reading, and will, doubtless, interest a considerable circle.

VARIORUM.

"After Office Hours" (Morgan & Chase, Ludgate-hill) is a brief statement of a year's work carried on in Christian mission to the costermongers and the free school, Golden-lane, London, under the superintendence of Mr. W. J. Orsman. Good work is being done here and deserves help.—The *Art Journal* begins its new volume with an illustrated account of Hardwick Hall, one of the series of papers by Mr. S. C. Hall, headed "The Stately Homes of England." Incidentally, Mr. Hall mentions that at Shirehamstead hard by, neither the sexton nor his father and grandfather before him had ever seen the rectory of the parish. Mr. Edward Hulme gives the first of a series of papers on the Adaptability of our Native Plants to Purposes of Ornamental Art, with which he is well qualified to deal.—A Handy-book of the Law of Masters and Servants, by H. F. Gibbons, LL.B., Cantab., Barrister-at-law. London: Tegg.

In this useful book are shown the rights, duties, and liabilities of the parties to the contract of hiring and service, with the decisions on the subject, and an index to all the statutes regulating labour, and relating to apprentices, carried down to the year 1869. It is not intended, however, so much for a popular exposition of the law as for a handy book of reference to be used in legal proceedings in the inferior courts, where the more expensive text-books are not to be procured. The work, therefore, only gives a general outline, showing the principles on which the law rests.

"A Manual of Bankruptcy and Imprisonment for Debt, under the Acts of 1869," by G. M. Wetherfield, solicitor. Longmans & Co. An epitome of the law under these statutes is here given in untechnical language, with a comparative table showing the changes made by the new Act.—"Waste Labour on Waste Land. A special Plea." The object of this tractate, issued by the Committee of the Industrial Employment Association, Parliament-street, is to show how immediate and remunerative employment may be afforded to the masses; preventing pauperism and crime; rescuing the young; and rearing up a healthy, virtuous, and self-reliant population.

It is proposed to do by a comprehensive exposition of the policy of applying "waste labour on waste land," and a practical realisation of the motto that "prevention is better than cure," so that the latter is not to be ignored or neglected. Reason can be more appropriate than the threat for bringing such a scheme vigorously before the notice of Government, the Legislature, and the whole public. The object in view has sympathy and our best wishes for its successful accomplishment.—"Employment. Farrah." This tractate proposes another scheme for employing the unemployed, not on waste land, but on public works, including, however, reclamation and drainage, as well as emplacements, harbours, sewers, town-halls, hospitals, winter gardens, public parks, swimming-baths, &c. &c. The workmen are to contribute labour voluntarily, as the rich contribute means for the promotion of such works;

but the workmen to be provided with fitting lodging, food, &c., under a system of management appointed by Government!—"The Swimming Baths of London." By R. H. Dudgeon. This pamphlet gives an account of the swimming-baths of London, showing that they are defective in some respects; and that there is a great want of open-air swimming-baths, which might be supplied by utilising a portion of the water in five of the existing parks, as well as in the formation of new parks. Swimming-baths for ladies Dr. Dudgeon includes in his desiderata, and shows how they could be arranged.

Miscellaneous.

Fall of a House in Limerick.—During a recent hurricane the different dwellings in the Irish and English Towns, Limerick, which, for the most part, are ancient, and teem with inhabitants, suffered severely, chimney-stacks having been blown down, and several roofs taken completely off. The wretched dwelling where the accident occurred is a four-story house, situated at the corner of Hales-lane, at the rear of St. John's parish church, and for a considerable time it has been in a most dilapidated condition, the back of it partly upheld by props of timber. Nevertheless, from the garret to the basement story every room was crowded with its living freight. The poor people, being accustomed to the rocking of the old dwelling, did not think there was any danger, and continued in their rooms, till, in one fearful crash, the entire of the rear fell in, burying in a mass the unfortunate occupants. Aid having been rendered more than twenty people were removed from the debris and immediately conveyed to Barrington's hospital. Some of them were very severely crushed, and upon further clearing away the bricks and mortar the bodies of five unfortunate individuals were discovered beneath, and the body of another, that of a woman, who is known to have occupied the ground-floor, still remained among the ruins.

The Bristol Theatre Disaster.—At the close of the inquest, the coroner having summed up, the foreman said the jury fully concurred in the opinion of the coroner that they could return no verdict but that of "Accidental death." They exonerated Mr. Chute, the manager, from all blame in the matter, but they regretted that those in charge of the doors had not the forethought or presence of mind to open them when the pressure began. They thought that by so doing the disastrous results of the calamity might have been lessened, if not averted altogether; but they believed it was the impatience and eagerness of the public themselves to gain admission that contributed mainly to the accident. The jury also wished to express in the strongest terms their condemnation of the present mode of entrance, thinking that from the steepness of the incline, and the rough nature of the ground, it was unfit for the entrance of three-fourths of the people who frequented the theatre. They believed that the accident was very much increased in consequence of the cross-stream of persons, mentioned by Mr. Hall, gaining an entrance, some to the pit and some to the galleries, and they fully concurred in the recommendation made by Mr. Hansom, that two entrances should be made, with a passage between for the policemen.

Appeal for an Artist.—Mr. Herbert Smith, an artist of considerable merit, and of the highest character, has been suddenly stricken down by paralysis, and entirely deprived of the means of supporting himself and family. A committee of gentlemen has been formed for the purpose of setting on foot a scheme for the help of the unfortunate artist, who will probably never again be enabled to resume his labours: it is proposed to devise some plan, by which he can be relieved, through the sale of his unsold pictures, by means of a sort of art-union. Mr. Charles Mercier, of 21, Albert-gate, would give information.

Free Library at Doncaster.—A new free library for Doncaster has been opened with considerable ceremony in the building which was formerly the grammar school of the town. The library has been formed by the gift of the books of the Subscription and Mechanics' libraries, and volumes have also been presented by gentlemen resident in the district.

The Proposed Darien Canal.—The opening of the Suez Canal has given a stimulus to the kindred proposals, now of many years' standing, to cut asunder North and South America by a similar ship canal across the Isthmus of Darien, or of Panama. A concession, it seems, was granted, years since, to the Société Civile du Darien by F. de Francesco Martin, minister plenipotentiary of the Confederation, appointed to contract for a canal from San Miguel Bay to Caledonia Bay, in accordance with a law passed on May 28th, 1859. The contract with the Société Civile du Darien is said to have been signed on December 10th, 1860; and the concession is declared to be still valid. If we mistake not, there is also a concession for a canal at Panama in the hands of United States men. The experience and knowledge of the subject possessed by Dr. Cullen, who wrote in the *Builder* some years ago as to the proposed routes, might now be of service in the promotion of the great end in view. The work will be a more difficult one, we fear, than the cutting of the Suez Canal, considering the mountainous nature of the district, and its frequent disturbance by earthquakes.

Mansion, Wargrave, Berks.—A mansion has just been erected in white brick and stone, on the summit of a hill, some 300 ft. above the Thames, which it overlooks for miles. It has a stone portico of eight columns, with pediment. A pair of folding doors enters the vestibule, leading to the inner hall, which, with its columns on each story, its coved and enriched panelled ceiling, and embossed and stained glass light over, has a good effect. The drawing-room is 50 ft. by 20 ft., and has two bay windows, the views from which are very fine. The accommodation includes dining-room and morning-room, each 27 ft. by 19 ft.; billiard-room, 34 ft. by 19 ft.; library, 19 ft. by 19 ft. There are seven best bedrooms (all 12 ft. high), besides dressing and bath rooms, lavatories, &c., and the usual servants' offices. The walls are all built hollow in cement, with iron ties, in the hope of ensuring dryness. Messrs. Pennington & Bridgen are the architects, and Mr. J. R. Ashby, of Henley, is the contractor for the whole of the works.

Meeting of Government Science Teachers.—A meeting of Government science teachers has been held at the Manchester Mechanics' Institute, to consider the recent minutes of the Department of Science and Art in relation to science teaching and Government payment to science teachers. Mr. John Angell was in the chair. The following resolutions, with others, were unanimously carried:—

"That this meeting hereby expresses its regret and dis-appointment at the sudden and unanticipated mode in which the Department of Science and Art (without previous consultation with the various science teachers, who, under the direction and in faith of its guarantee, as announced in its 'Science Directory,' issued in September last, accepted, during the months of September, October, and November, declaring engagements terminating in May next) repudiated its engagements with the said teachers, such repudiation being contained in the minutes dated respectively November 30th and December 13th, and posted December 4th and 15th." "That this meeting hereby expresses its opinion that in all cases where teachers have accepted engagements for the current session on the faith of the instructions and guarantee of the Department of Science and Art, it is honourably bound to fulfil those engagements, subject to alterations adopted with the concurrence of the said teachers."

The chairman and secretary were requested to put the resolutions in the form of a memorial, including the names of teachers present, and transmit the same to the Department of Science and Art.

A Public Library for Islington.—A meeting was held on Wednesday evening, in the Parochial School-room, Liverpool-road, to consider the propriety of applying the provisions of the Public Libraries Act of 1855 to the Islington district. Mr. Savage, the representative of the district at the Metropolitan Board of Works presided. Mr. Lucreft moved a resolution in favour of the adoption of the Act. Mr. Smithies seconded the resolution; Mr. Elt opposed it. After discussion the motion was carried by show of hands—76 to 66.

A Complimentary Supper.—Messrs. Wright & Mansfield, decorators, entertained the workmen of the various branches of their establishment, about 200 in number, at Supper at the Eyre Arms, St. John's Wood, on Saturday evening last. The chair was taken by Mr. Wright, the senior partner, supported by Mr. Mansfield and friends. Various toasts were drunk, and much good feeling shown.

Iron-Plated Forts: Fort Cunningham.

The first experiment in iron forts has been made by the construction of Fort Cunningham, for Bermuda, at the Atlas Works of Sir J. Brown & Co., Sheffield. The faces of the fort present an iron wall, 14 ft. high and 150 ft. long, pierced for seven great guns. The fort contains seven complete casemates, in each of which a great gun may be worked. The front wall is made up of three thicknesses. The face is of 5-inch armour-plates, arranged horizontally. Behind them stand upright a row of massive iron beams, each measuring 16 in. by 5 in. Then comes a third mass of iron, composed of thick iron beams laid horizontally, excepting at the port-holes, where there are four thicknesses of armour-plates. From face to back this wall is held together by a number of strong bolts from the outside to the inside, the bolts being drawn tight by nuts and screws. When permanently fixed the interstices between the plates and the beams will be filled in with iron concrete, so that the wall of the fort will be one solid mass, about a yard thick. This iron wall is supported at short intervals in the rear by heavy upright beams, 12 in. by 5 in., and near the port-holes these beams have an increased thickness. The face of the fort weighs over 700 tons. The space behind for the guns, the gunners, and their ammunition is covered by a bomb-proof roof. The total weight of this work is 1,000 tons, and its cost about 30,000l.

The Steam Omnibus at Edinburgh.

Nairn's patent steam omnibus is similar in appearance to one of the largest horse omnibuses. It has only three wheels, however, of 3 ft. in diameter, and these are solid and of wrought iron, with willow-wood tyres. The power is communicated through the two hind wheels, and the vehicle is steered by the front wheel. The boiler is in front, and the vapor from the furnace passes along beneath the seats outside to the hinder end, where it passes out through a short horizontal funnel above the conductor's head. There are arrangements for preventing the heat from incommoding the passengers, either inside or outside. The vehicle accommodates fifty passengers, and the engine is of six horse-power. The speed can be increased up to twenty miles an hour if desired. The cost is about that of a horse omnibus with the horses. These particulars are given by the patentee, Mr. Nairn, of Leith.

Utilising Waste Heat.—Mr. E. Crowe,

of Middlesbrough-on-Tees, employs a boiler of two horizontal tubes arranged one over the other, and connected by a number of upright tubes arranged at short distances apart along the horizontal tube. The water-line of the boiler is at the diameter of the upper tube or thereabouts, and the boiler below this line is inclosed in a chamber of brickwork, into which, at one end, the products from the furnace enter, and which, at the other end, is connected with the chimney, so that the chamber is, in fact, the flue of the furnace. The sides of the chamber at the level of the vertical tubes are corrugated so as alternately to approach and recede from the vertical tubes, so that the draught is caused to pass in undulating direction. This causes it to impinge more effectually on the vertical pipes, and at the same time sufficient space is obtained for a man to pass through the chamber to clean it from time to time.—*Mechanic's Magazine.*

Explosion of a Kitchen Boiler in the North.

No winter passes without the occurrence of a calamity caused by the explosion of a kitchen boiler in the north of England, through the water in the pipes leading to it freezing, and then, on thawing, rushing suddenly into the heated space. An accident of this nature has occurred in the village of Didsbury, about five miles south of Manchester. The boiler formed part of the kitchen range, and had a feed-pipe communicating with a bath in the room above. The boiler suddenly burst with terrific force. The windows and doors were burst open, and, in addition to fragments of the boiler, fire, and brickwork of the grate being projected into the room, part of the ceiling was brought down. One woman was killed, and another much burnt and scalded.

Reduction in the Price of Metropolitan Gas.

The Imperial Gas Company have given notice to their customers that from the 1st inst. the price of gas supplied by them will be reduced 3d. per 1,000 ft., viz., from 4s. to 3s. 9d.

Agriculture.—Mr. Mechi has been lecturing recently on agriculture to the members of the Framingham Farmers' Club. Mr. Mechi argued that steam power had so multiplied population, by affording increased and more profitable manufacturing employment, that we were no longer in the primitive pastoral period, when the people were few and the acres were many. In 1800 the population was 10,000,000, while the number of acres available for agricultural purposes was 45,000,000. In 1869 the population had increased to 32,000,000, and the number of acres remained at 45,000,000. The hungry millions of the manufacturing districts now demanded from agriculturists a change of practice. He considered it a disgrace that, wanting 10,000,000 quarters of foreign wheat annually, we permitted one half of our acreage to remain in primitive pasturage.

Effect of Exposure on Glass Windows.

We know that the surface of glass which contains soda undergoes considerable change after a lengthy exposure to the air. Bluish glass undergoes no such alteration; but that which has originally a greenish tinge becomes brown after a time; whilst very pure white deteriorates rapidly, showing first a yellow, then a brown, and finally a violet film. Nature says,—"At this season of the year we do not require this additional colouring to the appearance of our already discoloured atmosphere. It has been noticed that some modern stained glass on a foggy day has almost the richness of the ancient. We need not go far for a solution of this. The old glass has acquired in the course of ages a film which takes the place of a permanent fog, especially on those colours which, like the ruby, are formed by a thin coating of the coloured glass on a thicker plate of transparent metal.

Disinfection.

Dr. Lankester, medical officer of health, has made a report to the Vestry of St. James's, Westminster, in which he states that inquiries have been made as to whether they possess any disinfecting apparatus in the parish, and suggesting that several contiguous parishes might join in erecting a common disinfecting apparatus, such as the 23rd clause of the Sanitary Act of 1866 permits every vestry to erect in the parish. He says that a disinfecting chamber could be erected in the storey of the workhouse, into which steam from the baths and washhouses might be laid on for disinfecting clothes, and which might be open to the use of the whole parish. No action has been taken by the vestry in the matter.

Birkbeck Literary and Scientific Institution, Southampton-buildings.

The 13th quarterly report of this institution shows that so great has been the increase in the number attending the evening classes, that it has become necessary to construct larger classrooms for the accommodation of the students. These will shortly be completed. Earl De Grey and Ripon has consented to preside at the annual distribution of prizes, on Wednesday, February 9th. Sir Joseph Whitworth has placed at the disposal of the institution one of the exhibitions which he has founded for the encouragement of mechanical science.

A Newington Guy Faux.

The other day a committee was appointed to inspect Newington vestry-hall, and in one of the strong rooms they discovered a large number of post-office directories, "Kemp's Outlines of Sermons," and a treatise on personal godliness. The floor was covered with rate-papers, under which were loose lucifer matches. The latter ignited beneath the tread of the committee, and the premises had been in the most imminent danger of destruction by fire. The *Parochial Critic* which communicates the incident adds,—"These facts are not very eloquent in praise of the shrewdness and ability displayed by the Newington authorities in selecting their servants."

Worcester Cathedral.

The new bells for Worcester Cathedral, which were founded at Longborough, are now deposited in the north transept preparatory to their elevation. They are thirteen in number; twelve of them will ring in peal, and the thirteenth is the semi-tone bell required for the Westminster chimes. About 3,000l. have been raised by public subscription to defray their cost. They vary in weight from 6 cwt. 3 qrs. 19 lb. to 50 cwt. Each bell is ornamented with a band of Gothic work, and the name of the Apostle after whom each bell is named is inscribed on the waist of the bell in letters of the fifteenth century. The total weight of the bells is 221 cwt. 3 qrs. 22 lb.

Memorial Brass.—Mr. J. G. Waller has just now completed a Brass in memory of the late Mr. George G. Kennaway, M.A. It is a portrait of the deceased in M.A. gown, and is inlaid in black Belgian marble. It is placed in Wynard's Chapel and God's House in Exeter, founded 1420, for poor people. The chapel had been restored by deceased, and endowed with land, and of this the figure holds a plan, together with a model of a building. The figure is about 5 ft. long, the usual size of old brasses. The model, although conventional, has details, such as a bell-turret, taken from the building. It has been executed under the supervision, to some extent, of the Rev. H. T. Ellacombe, and may be regarded as a very satisfactory work.

Hydraulic Cement.—An improved cement, which perfectly resists the action of water, and is designed for the ornamentation of buildings, has been proposed by M. J. A. Dabus, of Paris. The principal component parts are lime, silica, and alumina, the latter being extracted from refractory clays. In order to bring about the formation of the double silicate of lime and alumina, sulphuric and boracic acid are added in small quantities. The proportions of the constituents are varied, according as the cement is required to set slowly or quickly. The proportions of the substance in the anhydrous state are—fat lime of first quality, 67.96 to 74.65; refractory, 27.18 to 42.89; sulphate of lime, 4.76 to 9.06; and boracic acid, 0.10 to 0.40.

The Memorial of Faraday.—The funds for the Faraday Memorial have reached 14,000l. There is now some prospect of the speedy erection of a statue of the philosopher which shall be worthy at once of himself and of his country. The committee should get the best possible advice.

Sculpture for Bolton Town-hall.—The Town Council of Bolton have decided, by a majority of 26 votes to 9, to adopt the model sent in by Mr. Calder Marshall, for the decoration of the tympanum of the new Town-hall, at a cost of 1,000l. There were five competitors.

Conversations of the Institute of the Architects of Zealand.—This Institute held a conversation on the 16th ult., and the president, Mr. James H. Owen, delivered an interesting address. Mr. John M'Cardy, Sir William Wild, and others, spoke afterwards. The *Irish Builder* reports Mr. Owen's address in full.

Proposed Orphanage and Schools.—Designs for proposed orphanage and schools in connexion with the Rev. Dr. Lutherford's Church, Newcastle-upon-Tyne, have been prepared by Mr. T. Oliver, architect, at an estimated cost of 3,600l. for the schools, or 4,500l. if united with the orphanage.

TENDERS.

For additions and alterations to St. Mary's Hall, Brighton. Mr. G. E. Scott, architect. Quantities supplied by Mr. B. H. Nunn:—

Griffiths	£1,870 0 0
Chappell	1,720 0 0
Lynn	1,737 0 0
Parsons	1,893 0 0
Cheeman	1,533 0 0
Lockyer	1,938 0 0
R. Nash & Co.	1,690 0 0

For dwelling-house and offices at Kenley, Catterham. Mr. Charles Kenley, architect. Quantities by Messrs. Blackwell & F. Raby:—

Brown	£2,489 0 0
Peckett & Taylor	2,412 0 0
Jarrett	2,207 0 0
Grote	2,100 0 0
Hunt	2,124 0 0
Nightingale	2,085 0 0
Nash & Co.	2,065 0 0
Hearle	2,031 0 0
Harrison & Edwards	1,968 0 0
Bailey	1,675 0 0

For vestry and other buildings to St. Patrick's Church, Hove. Mr. S. Myers Clarke, jun., architect. Quantities by Messrs. Barrett:—

Lockyer	£495 0 0
Bruton	895 0 0
Manwaring	792 0 0
Nash & Co.	745 0 0

For the erection of six cottages at Roehampton, for the Right Honourable the Earl Spencer. Messrs. C. Heriton, B. & Breerton, architects. Quantities supplied by Mr. Barrett:—

Townsend	£1,978 0 0
Adamson & Sons	1,599 0 0
Brace & Son	1,830 0 0
Easton, Brothers	1,779 0 0
Avias & Co. (accepted)	1,597 0 0

For rebuilding No. 2, Warden's-court, Clerkenwell, for Mr. Henry Robas. Messrs. W. Waymouth, & Sons, architects. Quantities by Messrs. Freely & Son (accepted):—

Freely & Son (accepted)	£264 0 0
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The Builder.

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New and Old Masters in
Burlington House.

Y the noble exhibition of the works of the old masters which has been opened, with the opening year, in Burlington House, the Royal Academy has earned the thanks of students and lovers of the fine arts. Her Majesty the Queen has contributed thirteen pictures, chiefly from Windsor Castle. Eighty-six other contributors, including the Royal Academy, have swelled the total number of the paintings exhibited to 234; among which 152, chiefly of the old masters, include some

of the most famous *chefs d'œuvre* of the painter's art.

We regard the exhibition with a feeling not only of satisfaction, but of a just pride, which is but rarely called forth by any attempt to introduce the English public to the regions of high art. It is a matter of honest self-gratulation to find that, without baring the walls of our National Gallery, or of the yearly lengthening corridors of South Kensington, so many pictures, of so high a class, can again be produced from Royal and private mansions. That they should be thus readily and conspicuously brought before the public gaze is a fresh source of satisfaction. Not that, for the most part, they were previously to be regarded as talents absolutely hidden in a napkin; but it is one thing to catch a glimpse at such noble works in a series of pilgrimages made for the purpose, and another to be able to compare them as they are hung, with no little judgment, in the spacious and well-lighted rooms of Burlington House.

We confess that on looking at the catalogue before visiting the Exhibition, we felt no little doubt as to the judicious character of the arrangement. National and chronological assortment are altogether ignored, nor is it easy to see upon what principle it has been ordered that No. 1 should be a landscape by Richard Wilson, and No. 2 a portrait of the Prince of Asturias by Velasquez. But the view of the rooms dissuades this anticipatory criticism. Whoever arranged the pictures, and on whatever principle, it has been well and wisely effected; and we cannot recall a single instance of the "killing" of one picture by its ill-assorted neighbours (as was the case with Mr. Bierstadt's noble landscape in the Exhibition of 1869), or of mutual injury to the effect of two neighbouring paintings, which was so painfully and palpably the result of the hanging of the "Astronomers," by Bol, over the contested Rembrandt, in the National Gallery, during the same season.

A still more profound source of gratification arises from the proof afforded by this Winter Exhibition of 1869-1870, of the position of more than one English artist in the very van of the army of painters. Who would have believed, in earlier times, that our cloudy skies had

nurtured a genius that could hold its own in the presence of such mighty names as those of the great masters of Italian, of Spanish, and of Flemish art. And yet in a collection containing an easel picture by Michelangelo, paintings and those of the first merit, by Vandyc, Murillo, Titian, Leonardo da Vinci, Rembrandt, Rubens, and lesser but still brilliant lights, no impartial critic can doubt that Gainsborough bids as high for immortality as either of the older European masters. Our regard must be had to composition, as well as to execution; and it is not possible with perfect fairness to compare a single portrait (such as that of Mr. Beaufoy, No. 105, where the balance of the figure is so perfectly posed that you almost fancy that it moves upon the canvass) with a grand group, such as the "Last Supper," with its powerful effect of love, surprise, and horror running through every figure as if by an electric shock. But apart from the rank claimed by a picture on the ground of its size or complexity, looking only at the power of the artist to bring out into actual life,—and noble, pictorial life into the bargain,—the subject he has undertaken to represent, we question whether any picture in the collection, unless it be the "Good Shepherd" of Murillo, surpasses "The Blue Boy" of Gainsborough, which has been lent by the Marquis of Westminster. One or two glorious portraits are there from the pencil of Vandyc, of which that of Madame de Sainte Croix, lent by her Majesty from Windsor Castle, is the most fascinating. Rubens has shown, in his wonderful portrait of Philip IV. of Spain,—in which the features are preserved, and yet the whole heavy countenance is ennobled and almost etherealised,—wherein lay the great secret of his fame. There is a wonderful "Doge," by Titian, which may rank with the best works of that immortal painter. And yet, in the same room, hung amid works like these, the pictures of Gainsborough hold an equal rank.

Another English, or at least British, artist, who is represented (perhaps fortunately) by only two pictures, takes, in one of them, a position of an eminence that would not have been anticipated. Wilkie's "Columbus explaining the Project of his intended Voyage for the Discovery of the New World, in the Convent of La Rabida," has two characteristics of unusual excellence. The figures and faces are purely and typically Spanish; not less are they undeniably professional. The sparsely-locked figure in profile is a soldier and nothing else; the priest is every inch a monk. The great projector looks down on the chart with the firm self-reliance of a man who saw truth where others only dreamed dreams. The pathognomy of the faces is no less admirable than are their nationality and professional character. The colouring is full and bold, and if we observe some want of patience or of education in the finish, we yet recognise a great painting, not for an English gallery alone, but for a European one.

We think that less than justice has been done to Mr. Leslie by placing so many of his productions in so lofty and brilliant a neighbourhood. Neither do we recognise his best works in the collection. Had Lord Leconfield's "Sancho Panza and the Duchess" been the only Leslie in the exhibition, the painter, high as he still stands, would have appeared to far greater advantage than he now does.

A very different judgment will be formed with reference to Stanfield. The numerous collection allows the works of that admirable landscape-painter to illustrate one another with great power and beauty, and establishes the right of their author, not only to high rank in his own department, but to admiration as a true poet, seeking expression for his noble imagination by the aid of the pencil. "The Abandoned" (No. 171), a dismasted vessel rolling heavily on a stormy sea, is a perfect poem in itself. The

"Mewstone" is another painting of the same order: the calm, cruel gleam of the slanting rock,—the mad vertical leap of the spray which it dashes up,—the whirl and trouble of the waves,—the wrathful sky,—the tossing bit of wreck,—the skimming petrel,—the military line of the strange natives on the rock—half bird and half fish as they may almost be considered,—are elements of a very powerful and successful appeal to the imagination.

Many, perhaps the greater number, of Stanfield's pieces here collected represent small peeps or patches of landscape, and may be considered as bearing the same relation to landscape proper, that portrait does to historical composition. In the broad sweep and long perfection of the one landscape, by Rembrandt, lent by Lord Overstone, there is room, geographically speaking, for a whole gallery of Stanfield's scenes. But each is, in itself, a bit of nature, and often a very perfect bit. It should be remarked that the curse of impotence which seems to hang over any English painter who attempts the historical, has not spared Stanfield. His "Opening of London Bridge" can only be tolerated in virtue of its superiority to the two miserable specimens of "composition," the "Christening of the Princess Royal, at Buckingham Palace," and "The Coronation of Queen Victoria, her Majesty receiving the Sacrament," which recall some of the ambitious failures of poor Haydon. Nor had Mr. Stanfield learned to dip his brush in the colours with which the sun of Italy glorifies the landscapes of which the artist has given us the forms, but not the lines. "The Bay of Naples and Vesuvius," looks strange to eyes that are familiar with that azure sea and that unclouded sky. In the "Island of Ichia," the distant mountain fades with much of the aerial distance proper to the spot; but the nearer parts of the picture are too cold and dead for truth. The glowing imagination of Claude, faded although the tints of his limpid pencil have become, tells a far truer story of the sunny south than the English painter has ever realised. Indeed, it is probable that during the real summer months, in which some of the most picturesque effects of Italian life and scenery are to be noticed, few English painters have endured the heat, with the thermometer above 90°. But set the northern artist to work upon Alpine pass, snow-capped peak, or fir-tufted ravine, and, in depicting the scenes amid which he can breathe without oppression, he fully rivals the Italian master, when he lingers in the golden haze of the Mediterranean summer.

If Stanfield has failed in an attempt at the historic painting of an occurrence which is now some forty years old, a very different criticism must be passed on his illustrations of the wars of 1860. The French, as it is well known, do as much to encourage and stimulate the historic painter as we are in the habit of doing—passively and negatively, indeed, but with perfect success—to snub and extinguish him. We can, therefore, understand how it is that vivid and spirited illustrations of French victories are not far to seek. But we find in this exhibition a proof of the noble contagion of this artistic fire. Only one great English battle is represented among the scenes illustrated in the present exhibition,—namely, Benjamin West's ghastly and dreary "Death of General Wolfe." But Stanfield gives us "The Battle of Roveredo," and "The Passage of the Magra by the French," two military pictures of great power and beauty. The former is, perhaps, more like a manoeuvre than a battle, as no consciousness of the hostile presence of the enemy leads the eye from the gunners struggling with their horses in the torrent, up to the puff of smoke issuing from the embrasure; and we arrive at the fact of the defence by chance. But the general effect of the picture is very fine; and in the companion

piece the dark stern cloud that wraps the mountain to the right is instinct with that poetic truth of which this artist so often evinces a thorough perception.

Still looking for English artists, we have two landscapes by Richard Wilson, and two by John Crowe, all dimmed by the lapse of time. Sir Joshua is represented by two academic portraits, one of himself and one of Sir William Chambers (in each of which the original rich colouring is preserved in a manner quite unusual in the president's pictures), and by six other works. Among these the well-known picture of Mrs. Siddons as the tragic muse, may be compared instructively with the Sigiswanda of Hogarth. There is more of grace in the former,—more of passion and pathological study in the latter remarkable work. But Sir Joshua has given us only the actress; Gainsborough has elsewhere given us the woman,—and a woman of rare and queenly beauty,—in his profile portrait now in the National Gallery.

Passing to the main subjects of the exhibition, the works of the old foreign masters, the foremost interest attaches to the unfinished Holy Family, lent by the trustees of the late Lord Taitton. This is one of those famous easel pictures, attributed to Michelangelo, as to which so fierce a controversy raged last year. It is a grand study. Thus much, we think, no competent critic can deny. The work is by the same artist as the "Entombment" in the National Gallery. That artist was a sculptor, or, at all events, had a sculptor's power of modelling and sense of weight. The character of the female faces, which is not distinctively Italian, of either of the best defined provincial types, is precisely that of the marble head, or, rather mask, in South Kensington Museum, which is considered to be an unquestionable work of the great Florentine. This chain of evidence, hitherto, we believe, unnoticed, points clearly to the authenticity of the easel pictures.

Raffaello is but poorly represented. In the *graffito* lent by Sir William Miles, despite the stiffness and baldness of some of the figures, there is a certain inimitable grace of flowing line that seems to bear the autograph of the divine artist, if in a youthful or even a restored work. The "Holy Family" (61), unless it has an indubitable pedigree, would be more safely and probably more correctly described as of the school of Raffaello than under its present great name.

Of Leonardo da Vinci we have a fine "Virgine aux Rochers," in which the face of the attendant angel is especially striking; but in Marco d'Oggione's copy of "The Last Supper," we see by far the most faithful record of this wonderful picture that is now extant. The head of Christ is said to have been touched by Leonardo himself. Unfortunately it appears to have been also touched by some far different pencil. While there is an unrivalled tenderness and sorrow about the mouth, there is an expression of dismay in the eyelids, which is unworthy of the rest of the picture. This ignoble shade may perhaps be due to the presence of a horizontal line, or wrinkle, on the brow, which looks like the work of a restorer. But the painting is in good condition. The effect of the sudden shock which has been given to the disciples by their Lord's denunciation of treason, and the varied expression of passion on the several faces, is one of the marvels of art. Our readers may be glad to know that a book may be purchased containing a photograph of the "Supper," and photographs of the thirteen heads, on a larger scale; but no detached details can do justice to the wonderful whole.

Four fine Titians are worthy of the great Venetian. The colossal figure of the Marchese Tarragnio has an imposing presence. The portrait of the Doge, already alluded to, belonging to Mr. Ruskin, presents not only a noble and life-like head, but is an admirable example of due subordination of the less important to the more important elements of a picture. The portrait of a lady (No. 94) recalls the imperial beauty painted by Paris Bordone, and now in our National Gallery.

Murillo is represented by specimens of his best and his worst,—if, indeed, the hard little group called the "Assumption of the Virgin" be anything but a poor reduction of the noble painting in the Louvre. The special mark of Murillo,—the shadowy softness which the kiss of the sun of Spain leaves on the lips of the Spanish girl,—is replaced, in the countenance of this Madonna, by a harsh, hard touch, which is not that of a sketch. The portrait of Andrade,

with his tumbled shock of coal-black hair, is a bit of real, evil, life. But the "Good Shepherd" is a gem to which words fail to do justice.

Some great names are so represented in the present exhibition as to suffer injustice at their own hands. Such is the case with Velasquez, and with Giorgione. Las Meninas is blarneyed, like a photograph taken out of focus. The portraits of Don Carlos and of Philip IV. are mere bits of court painting,—the latter, especially, clumsily posed on an impossible cart-horse, fades before the grandeur of the idealised portrait of that same sovereign by Rubens. But the portrait of Olivarez, with its appropriately dark and heavy treatment, looks like a daguerotype of a minister of Satan—which, indeed, was not far from being the function of the servants of the Second Philip.

It would occupy too much space to attempt even a glance at others of the ancient masters. Luini rises almost to the level of Da Vinci. Vandyck asserts his claim to rank as the first of portrait-painters—or, at least, to dispute the palm with Titian. But, *pictoribus atque poetis*, the function of the laureate appears often to be oppressive. Vandyck's portrait of Queen Henrietta Maria is his feeblest work in the exhibition. The glamour of the brown-eyed, brown-haired, full-lipped enchantress (26); the regal beauty of Madame de Sainte-Croix; the truth and dignity of the male and female portraits given under the guise of a Holy Family, with a not very admirable child (the Madonna being a favorite model of this great painter); the Earl and Countess of Northumberland, and the Earl of Maclesfield—are such as to bid the portrait-painters of later times marvel and despair.

Glancing round the rooms, for a third or a fourth lingering look, let us recall the chief gems in each. In No. 1, we have the Vandyck lady (26); Hans Holbein's first Lord de la Warr (23); Moroni's fancy portrait, called Michelangelo (20); the Da Vinci, and the Sir Joshua (5 and 7).

In No. 2, we remark the two Titians (57 and 48), the Tintoretto (50), and the Velasquez (46), the Vandyck (40), the Wilkie (35), "The Holy Family" (30), and the Rembrandt (36), in which the head of Zacharias is the finest piece of ideal portraiture that we ever remember to have seen from the pencil of that great master of light and shade. Eckboet's "Haman and Mordecai" should be compared with this exquisite Salutation, and the result of the comparison will be almost decisive as to the authenticity of the "Christ Blessing Little Children," in the National Gallery.

In No. 3 hang the "Last Supper," the "Good Shepherd," and the "Blue Boy," works as emblems of one another in the highest order of merit, as they are dissimilar in every other respect. Then come three Gainsboroughs, and a Vandyck (105, 106, 69, and 88); then two Reynolds's (79 and 81).

No. 4 strikes the admiration with the Michelangelo (151); the noble Claude (142); Holbein's "Sir Thomas More;" Gainsborough's "Peasant Children;" Rubens's portrait of himself, and of Philip IV.; and Sebastian del Piombo's "Vittoria Colonna."

Even after feasting the taste on these gems of the great period of art, we can look with pleasure, in room No. 4, on the "Battle of Roveredo," the "Abandoned," "War," and "Münchendam," and, in No. 6, on the "Snow Storm," and the passage of the Magra.

We trust that the memory of this noble exhibition will be preserved by the preparation of good photographs of every picture before it leaves the Academy. A descriptive catalogue (in which, by the bye, such mistakes should be avoided as speaking of Ixion embracing a cloud in the form of Venus), would be a valuable addition to the contents of the Art Library at Kensington. We congratulate the Academy, the fortunate owners, and liberal lenders of the contents of the exhibition, and the British public, on this most successful opening of the art season of 1870.

Foreign Railways.—The aggregate increase in French railway traffic last year exceeded 1,000,000. The six great companies are now working between them upwards of 650 additional miles as compared with January, 1869. In the first half of December, 1869, the progress made with the great Mont Cenis tunnel amounted altogether to 159½ ft. The distance remaining to be pierced December 15, 1869, was 5,579 ft., so that at the present rate of progress the tunnel will be completed in June or July, 1871.

DRAPERS' HALL, THROGMORTON STREET, LONDON.

A New livery-hall and reception-rooms have been built for the Drapers' Company, and are now fast approaching completion. Our engraving represents the interior of the hall.

Probably few of our readers will recollect much of the old building, as it is in no way attracted attention; and it will suffice to say that the front was a plain brick elevation, representing a three-storied structure, with simple stone dressings.

We understand that it was not originally the intention of the Drapers' Company to rebuild their entire premises, nor, indeed, have they now done so. The main reason for the commencement of the alterations was the want of adequate reception-rooms for the company and their guests, the only room available for that purpose in the old building being a long ill-proportioned picture-gallery, barely 15 ft. wide. Another great inconvenience which the company laboured under was the fact that to pass to the reception-rooms from the staircase, which was on the opposite or east side of the quadrangle, they had to cross an open lead flat. It was therefore decided to build a suite of new reception-rooms, and a new staircase on the same side, which indeed formed the first contract entered into.

By the removal of the staircase an opportunity was afforded to increase the size of the dining-hall, which, from the smallness of its dimensions being only 60 ft. long and 30 ft. wide, had been found quite inadequate for the proper accommodation of the company's library. It was therefore ultimately decided to rebuild the hall of an increased size, with a new connecting corridor, in place of the old open lead flat; and the whole of these works are, as we have said, now nearly completed.

On glancing at the front, before entering, we cannot fail to be struck with its dwarfish appearance, the frontage having a length of 170 ft., with an average height of only 44 ft., and the details being large. The reason of this, however, is discoverable in the unfortunate narrowness of the street, and the consequent inability to obtain proportionate height without damaging the light and air of the opposite dwellings. It is satisfactory so far that the front wall, as it stands at present, looks like what it is, a screen and entrance to a quadrangle in the rear, the main use of the elevation for lighting being in the upper story of the original design, which it was found impossible to execute. This screen (so to call it) is built entirely of Portland stone, on a granite plinth, 4 ft. 6 in. high, and consists of a series of rusticated arches, of a bold character, occupying the whole height to the under side of the frieze, each bay forming a large window, divided by mullions, the impost of the piers running through as a transom. The keys of the arches are richly carved, the mullions also being relieved with some enrichment. Above the windows is an elaborately-sculptured frieze, some 4 ft. high, of conventional foliage, festooned from alternate rams' and lions' heads (the insignia of the company's arms), over the arch key-stone. Above the frieze is a large enriched cornice, surmounted by a proportionate stucco course and balustrade. In the centre of the front is the principal entrance, consisting of a lofty rusticated archway, with moulded and polished red granite reveal. The cornice over the arch breaks forward and is supported on either side by a console, between which and the key-stone are some carved festoons. Over all is an arched recess, containing the company's coat of arms, in bold relief.

On entering from Throgmorton-street, the use of the front wall as a screen is at once apparent, as we get directly into an open quadrangle from which the lighting of the principal rooms is mainly obtained. The architecture of this quadrangle is more severe than that of the main front. The quadrangle is a square of about 45 ft., surrounded by a cloister 12 ft. wide, leading to the various offices, with a range of five arches on each side, but the heights of the fronts are not equal. The east and west fronts contain the cloister arches on the ground floor, a series of windows over lighting the new hall on one side and the drawing-rooms on the other, with a range of windows over them. The north front has one room only, and the south a corridor over the arches. The internal heights did not allow the arches to be entirely open, and from the springing they are filled in with sculptured

panels, which form a very prominent and pleasing feature of the design. These panels are modelled and executed by Mr. E. W. Wyon, and represent on the north side, in the centre panel, "Commerce diffusing Wealth," the immediate panel on the left containing Europe, the one on the right America, with Asia and Africa at either end. The east centre panel contains an effective group of Charity with Faith and Hope on either side, and Prayer and Praise at either end. Opposite to these, on the west side in the centre, we find "History taught by Truth," having on the right History and Astronomy, and on the left Mathematics and Geography. On the south side, the centre group represents "Peace and Prosperity," the attributes of her Majesty's reign, with Manufacture and the Fine Arts on the right, and on the left Pastoral Life and Agriculture. The key-stone of each arch is carved into a head having reference to the subject of the panel beneath. The story over the arches is an Ionic order in low relief, the clear-story consisting of a range of semi-headed windows enriched with some carving.

Leaving the quadrangle, and returning to the entrance gateway, immediately on the right are the vestibule and grand staircase. The former at first sight appears rather ill-proportioned, from its height; but it must be considered in conjunction with the staircase, of which it really forms a part. The ceiling is effectively treated with elliptical groining, in which are introduced four circular stained-glass lights, being the only means of lighting this part of the building. The floor will be paved with Maw's encaustic tiling, arranged to a suitable design, with the arms and monogram of the company in the centre.

From the vestibule a short flight of five marble steps leads into the grand staircase. This is circular on plan, being 29 ft. in diameter to the centre of the columns by which it is surrounded, dividing it into eight bays, the whole surmounted by a dome, the height of which from the ground to the apex is nearly 70 ft. The staircase is a striking feature, the greater portion being executed in marble. The steps, which, from their circular form, are all winders, are in Vere vein, 9 ft. 6 in. long, solid, and moulded. The styles and rails of the wall-lining are of similar marble, the panels being of jasper, bordered with green marble. The moulded string or plinth under the wall-lining is of Grotto; the outer string or plinth of balustrade round the open well of staircase is of Bardilla. The balustrade itself is at present not executed, but it is proposed to form it with balusters of Devonshire spar, of unique character, finished with a handsome handrail to correspond with the string. The pedestals of the columns are inlaid with Rosso Antioch of a very rich character, the columns themselves being monoliths of $\frac{3}{4}$ -diameter Devonshire Ilpeppen marble, 14 ft. high in shaft, and 1 ft. 3 in. in diameter, with veined marble base and alabaster capital. The piers and arches between the columns are of Huddlesstone stone, and where forming the openings from vestibule and landing are panelled and inlaid with Emperor's red and Irish green marbles. The arched recesses facing the vestibule and new reception-rooms will be filled in with mirrors to reflect the perspectives, the remaining two containing niches, which afford an opportunity for good sculpture. The paving on the landing and in the circular corridor is laid with a ground of vein marbles, inlaid with margins and centres of various colours. Over the columns runs a plaster entablature, the frieze broken up with moulded consoles at intervals of about 3 ft. festooned between.

The dome is principally constructed of iron, executed by Messrs. Philips, of the Coal Exchange, in a rather novel manner. It is formed of ribs in one length of two rolled H irons bent to the curve and riveted together on the flange. These ribs rest at the bottom on a continuous iron curb, cast in sections with shoes to fit ends of the ribs, and bolted together. The ribs are secured at top with a wrought-iron ring, from which springs an upper dome formed in the same manner. Between the iron ribs is a framework of timber. Externally the dome is covered in the usual manner, with lead on two thicknesses of diagonal boarding. Internally the ground-work is formed of canvas plaster, enriched with *carton pierre* ornaments, of which may be more particularly noticed those on the face of the ribs, of laurel leaves and berries, very freely and well modelled.

The whole light for the staircase is obtained from the dome by circular-headed iron shades filled with coloured glass round base of dome, and in the upper dome the whole space between

the ribs is occupied by large sheets of plate-glass bent both ways to the required curve, with coloured design. An ornamental pendant occupies the centre of the upper dome at the convergence of ribs, through which the staircase is ventilated. The mode of lighting the staircase at night is by a partially-concealed ring of gas jets on the top member of the cornice behind a metal cresting. The decoration of the dome is effectively treated in rich yet sober colouring; the bronzing of various parts contrasted with the lighter colouring in the panels, giving the appearance of strength combined with lightness in the construction.

Passing through the arches on the landing, we notice a circular corridor separating the staircase from the reception-rooms. Where the arches intersect the wagon-headed ceiling are small circular domes, the upper part filled with tinted glass, lighting the corridor.

Hence we enter the new reception-rooms of two drawing-rooms, and a room generally used as the court dining-room, the whole forming a suite of nearly 130 ft. in length, extending from the staircase to the company's private garden in the rear.

The first room is 45 ft. long by 29 ft. wide and 20 ft. high; the second, 26 ft. long by the same width and height; and these are quite new, the room in the rear being only partially so. The new drawing-rooms are divided into bays by composite pilasters, supporting a frieze band, enriched in relief, from which spring handsome coupled consoles connected with the bands of the ceiling, which by them is divided into recessed coffers, the enrichment of which is pierced for ventilation. The whole ceiling is highly enriched and decorated in a very effective way with blue, white, and gold; but a great deal of the effect of these new rooms will necessarily depend on the taste displayed in the furniture and hangings, for which the rooms are now ready. The doors deserve notice, consisting of a carved cornice and frieze in wainscot, supported by consoles having swags of natural foliage very well carved, we believe, by Mr. Barfield, of Leicester. The doors are formed of mahogany, with wainscot moulding, the upper panels being filled with glass, the lower inlaid with various coloured woods.

The Court Dining-room forms part of the old premises, thoroughly renovated. A handsome oak wainscoting, some 8 ft. high, has been carried all round the room, with new frontispiece to the fireplace and sideboard, a mirror opposite, and doors of the same material. The room boasts of a very good old ceiling of the Queen Anne period, which has not been removed, but has been redecorated, and the centre panel filled with an effective painting of the legend of the Golden Fleece. The cove of this ceiling, formerly plain, has been enriched with a series of shields bearing the arms of the past masters of the company. From the smaller drawing-room we gain the court-room, which also is not new, but has been refronted, and has a new ceiling. The ceiling is panelled in plain bands, and is decorated in colour, and two medallions, taken from the old ceiling, may be noticed as very superior work.

From this room we enter the Great Dining-hall, which at a glance we see to be a large room, square at one end and semi-circular at the other, over which is a half-dome, meeting the ceiling of the other portion, and round the room stand disengaged columns, forming a composite order, in marble. Our view represents the hall as seen looking towards the circular end. The floor-space of the hall averages about 80 ft. by 40 ft., the actual dimensions being 82 ft. from north to south, and 46 ft. across into the recesses, with an average height of 44 ft. The order stands upon pedestals, with plinth of black and gold marble, the capping and base mouldings of Bardilla and disc of green marbles, which, with the panelled recesses, form a continuous dado of marble round the hall. The columns themselves are all monoliths of the same dimensions and marble as those of the staircase, with quarter-diameter pilasters behind each, likewise in one stone. The bases are of vein marble, and the caps and cornice are of plaster. Altogether there are twenty-eight columns and pilasters, out of which twelve are coupled round the semi-circular end, and eight at the north end. Above the cornice is an upper range of semi-headed windows, or clearstory, measuring 10 ft. from the top of the cornice to the cap moulding of the piers, from which springs the cove supporting the ceiling. On this cove and over the columns are a series of consoles, springing in

low relief and developing into the upper portion of colossal male figures, which, with uplifted arms, support the main band of the ceiling. The ceiling itself is panelled with a very pleasing minority of harsh lines. The centre consists of a large circular band enclosing a wreathed quatrefoil, in which, again, is a mixed circular radiating centre, of a flat ogee section, surrounding a large sun-burner which forms an essential point in the ventilation of the hall. The half-dome at the south end, the execution of which was caused by the inability of carrying the front wall sufficiently high, is, as is also the ceiling, executed in "fibrous plaster," with *carton pierre* enrichments, the panels between the ribs containing tinted glass for the lighting of the dome. At the base of the dome, over the cornice, which is supported by the coupled columns before mentioned, is the ladies' gallery, which is bronzed and gilded, and forms a prominent and not unpleasing feature of the whole.

The spaces between the columns are occupied on the west side by five windows; opposite to which, on the east side, are panels of a corresponding size, to be filled in with some of the company's pictures of the English kings. The spaces between the coupled columns under the gallery, and at the north end, are panelled, enriched, and treated in colour. There are also at the north end two circular niches, which, again, afford a good opportunity for sculpture; and we may also notice four circular medallion panels, which are to be filled in with female heads, representing the four seasons, modelled and executed by Mr. Wyon.

It is at this north end that the master will sit at the company's entertainments; and behind him will be placed a large mirror in an arched recess, holding and reflecting the very fine plate belonging to the company. Over the master's chair, above the cornice, stands, in bold relief, the arms of the company with the Royal and City shields on either side.

The three clearstory windows at the end are already filled with very effective stained glass, executed by Messrs. Lavers, Barrand, & Westlake, representing in the centre window, which is circular, the company's arms, combined with those of the nation and City; and on either side the figures of Fitzalwyn, the first Lord Mayor, who was a member of the Drapers' Company, and Henry VI., who granted the charter. We are glad to understand that it is proposed at once to fill the remaining clearstory windows, on each side, with stained glass of a suitable character.

A word may be said in reference to the effective circular lobbies by which the hall is approached on either side, which have a marble dado, and are finished above with decorative plaster.

The flooring of the hall consists of wainscot boards, in narrow widths, on a counter floor of deal, the margin and recesses being formed in Arrowsmith's very excellent "parquet work."

Gasaliers hang from brackets between the columns round the hall, and deserve notice. These were supplied by Messrs. Bessingham & Sons, of Whitecross-street, by whom the whole of the gas engineering throughout the premises has been ably carried out.

The connecting corridor between the hall and principal staircase, is 45 ft. long, 10 ft. wide, and 19 ft. high, with a wagon-headed ceiling. It is divided into five bays by coupled composite pilasters, from which spring bands dividing the ceiling into panels, in which a diaper pierced for ventilation has been introduced, the whole being quietly treated in colour.

The pilasters stand upon a dado, having a Devonshire marble plinth, and the flooring is of a simple pattern in parqueterie.

The only remaining portion of the premises to be noticed, is the kitchen, and domestic offices attached. The former is, we believe, now one of the largest in London, being 66 ft. long, 38 ft. wide, by 20 ft. high, and is fitted with all the latest improvements for steam service, lifts, and so on. The remaining offices, consisting of house-steward's living and business rooms, pantries, sculleries, seem to be conveniently arranged in connexion with the kitchen and hall.

The warming of the principal rooms is effected by hot-water services supplied from two boilers by means of fresh air passing over the pipes, and has been carried out by Messrs. D. & E. Bailey, of Holborn.

The contractors for the general work are Messrs. J. Barnsley & Sons, of Birmingham, the stonework forming a sub-contract, let to Messrs.

Beavers, of the Borough-road. The marble-work throughout is by Messrs. Field & Co., of Westminster; the carton pierre by Messrs. Jackson & Sons, of Rathbone-place. The general carving, with the exception of the frieze in Throgmorton-street, which was executed by Mr. Mabey, has been done by Mr. Seale, of Walworth.

The decoration has been intrusted to Mr. Crace, who has most carefully and tastefully performed his portion of the work, and the whole building has been carried out under the direction and superintendence of Mr. Herbert Williams, of Old Broad-street, architect. Mr. Williams was the first pupil of the late Mr. Samuel Angel, from whose designs Cloth-workers' Hall was built, and has been the company's Surveyor for the last fifteen years. He has produced a set of very handsome apartments. It need scarcely be said a very large sum of money has been expended.

ON THE ENFRANCHISEMENT OF COPYHOLDS OF INHERITANCE.*

ALTHOUGH so many enfranchisements have been effected in recent years towards the abolition of a tenure which has long survived the necessities it was designed to meet, copyholds still exist in such vast numbers as to cause their enfranchisement to be a subject which intimately concerns most of those who are connected with this institution.

The Copyhold Act passed in 1852, enacted that in the case of any tenement to which the next admittance should take place, on or after the 1st of July, 1853, the tenant should have power to compel an enfranchisement in consideration of a gross sum; or the lord (subject to the provisions of the commissioners), might compel the tenant to take an enfranchisement in consideration of the payment of an annual rent-charge. Either of these considerations, or lands, &c., might (as before) be, by mutual agreement, the compensation for the enfranchisement; and enfranchisement rent-charges, as well as commutation fines and rent-charges, need not be variable with the price of corn, but might (as advised in the commissioners' report of 1850) be of fixed amounts. To prevent hardships or injustice in special cases, the commissioners were empowered in one section to suspend proceedings for enfranchisement, and in another to govern cases in which an enfranchisement would prejudicially affect the mansion-house and grounds of the lord. Common rights were to continue to attach to lands enfranchised under the Act; and rights to mines, minerals, sporting, and royalties of other kinds, were to remain undisturbed, except by consent.

The latest Copyhold Act (1858) superseded by fresh enactments a short Act that had been passed in 1853, mainly with reference to cases in which the lords for the time being had only a limited interest. It further repealed all the provisions of the former Acts, by which a tenant might be bound to pay for either commutation or enfranchisement a consideration to which he had not specifically agreed,—provisions upon which the original copyhold commissioners had relied, notwithstanding the many and cumbersome clauses that it had been found necessary to enact for the purpose. It also extended the right of compulsory enfranchisement to cases in which the latest admission had taken place prior to 1st July, 1853, providing, however, that if such enfranchisement were promoted by the tenant, he should tender the value of a fine and heriot, and two-thirds of the steward's fees,—a proviso now of no pecuniary importance.

The schedules appended to the commissioners' reports of late years enumerate transactions of an extent which is indicative of the thorough working order of the commission; and the terms of the reports themselves are varied only by occasional statements of the exercise of the commissioners' discretionary powers in suspending enfranchisements which would have worked a hardship to individuals, the grounds alleged in several cases being an excessive estimate of the value of the interest of the lord.

Upon this important subject the commissioners have published two documents, indicating the terms for enfranchisements. The first of these, issued in the early days of the commission, stated, *inter alia*, that the enfranchisement from fines arbitrary was usually made at from four to

six years' value of the tenement (*i.e.*, about two and a half fines), heriot being paid for similarly at the rate of two and a half heriots on the average of the last three, the quit-rents being valued at twenty-five years' purchase. The commissioners offered this statement as only a rough guide for what were at that time comparatively rare transactions; and, regarded as such, nothing need be said to its detriment. On the other hand, the second document, issued in 1855, and having reference to enfranchisement from ordinary arbitrary fines, presents an appearance of the most refined exactness; three years' purchase of the annual value is set down as the consideration for enfranchisement by a tenant of the age of twenty, five years' purchase for one of seventy, and for each intermediate age a year's purchase is given, to six decimal figures.

Against this table Mr. Rouse, in his "Copyhold Enfranchisement Manual," brings a number of objections, the most noteworthy of which are that the table does not extend to ages older than seventy, and that it makes no distinction between fines arising from houses and those arising from land. If it is, indeed, the case that the copyhold commissioners, when publishing this table, intended that no deviations from it should be permitted in respect of either the nature of the property or the extreme age of the tenant, then the table is certainly open to such objections. But if the commissioners merely wished to give for ordinary cases a sort of mean standard for guidance in respect of age, then on adopting Mr. Rouse's statement of the fines occurring upon an average every fourteenth year, I propose to show in parallel columns that the values of such fines are about as nearly indicated by the commissioners' table as by those which Mr. Rouse has prepared in its place. Pay valuers, however, can have failed to be struck with the oddness of its giving to within the two-millionth part of a year's purchase the actuary's graduation of materials which are necessarily very coarse on account of the singular circumstances that in these holdings the fine paid upon the creation of any tenancy is irrespective of the age of the tenant admitted, and also irrespective of the rate per cent. which the particular property is supposed to yield as an investment, and further that a very similar fine may be repeated at any moment after an alienation.

However, although we all know that such apparent exactness in this matter is merely an extravagant fiction, there is no occasion to go to the other extreme, and to ignore almost entirely the business of an actuary, and trust to the lucky chance of a balance of errors. The proportion of a fifth of the fee-simple value, or a sixth of it, or something between the two, is commonly agreed upon as the consideration for an enfranchisement; but the adoption of this in preference to some other fraction, such as a third or an eighth, is based upon a calculation by some actuary in time past, and a thoughtful valuer must desire to have in his possession a table which shall enable him to make a reasonable allowance for every year's variation in the ages of the copyholders.

Mr. Scratchley, an actuary, and formerly a Fellow of Queen's College, Cambridge, has written a manual on the enfranchisement of copyhold property, but the main purpose of the book seems to have been the promotion of Copyhold Enfranchisement Societies, which should have the good effect of helping tenants to enfranchise and improve their property, by making them advances of money secured through life assurance. As regard the terms for enfranchisement, I do not observe that he does more than give the established formula for finding the value of a series in perpetuity of fines of 11, payable by successive lives assumed to be all of the same age at the time of succession. The formula may be expressed in words as that of the present value of 11, payable on the extinction of a life now of the assumed age. The quotient is the value of the fines of 11, in perpetuity, the first being payable immediately; and this value has, therefore, to be discounted for the term of such life as may be in possession. But he points out that the formula will require modification at the hands of the valuer, on account of the fines from copyholds being also payable at other times than upon inheritance.

Mr. Rouse, in his manual before referred to, has entered upon the subject very fully; and, in addition to the arithmetical portion to which alone this review will refer, his work contains a large amount of, I believe, most serviceable legal information, particularly his digest of the

Copyhold Acts contained in the third and latest edition.

At pp. 97-9, he writes of the value of enfranchisement from fines when payable only on admissions after the deaths of successive tenants; and to such a case, therefore, the above-mentioned formula may be applied. Accordingly, Mr. Rouse for the enfranchisement to a tenant about to be admitted, and aged 44—which is here suggested by him as the average admission age—viz. (assuming 3 per cent. compound interest), 4.2 years' purchase, of which 2, he says, are for the fine now payable, the remaining 2.2 being for the enfranchisement from future fines. He very properly goes on to intimate that if a life of an age younger than the average—one of 30, for instance,—is about to be admitted and to enfranchise, the discount of the second and following fines will be larger; these being more remote, their value will be proportionally less than the 2.2 they were worth in the case of a life of the average admission age, 44,—which is evidently the same in effect as deducting more than the fine of two years' purchase from 4.2, or the value of the fines in perpetuity. And he adds, "Should the value be required when there is a life on the rolls, the value of that life will be estimated in like manner."

It is surprising that after this perception of the principles of the case, Mr. Rouse, in passing from his explanatory remarks to his "Rules," should give for the same case a rule (No. 7, p. 115) which produces a widely different result. He here abandons the assumption of forty-four being the average age of copyholders when admitted; and for the value at 3 per cent. of the series of fines from the present time for ever he names 4.8 years' purchase instead of 4.2, basing the former upon an assumption which he here introduces, that in the case of lands the intervals between the admissions will ordinarily be found to average eighteen years, whilst in the case of houses property he suggests sixteen years. These intervals are, however, materially shorter than the expectation of life at the age of forty-four; and it is not shown why fines payable only after the deaths of the tenants should happen more frequently in the case of tenants holding houses than in that of tenants holding lands. However, the discrepancy in the values assigned by him in the two places to the perpetuity of the fines at 3 per cent. is of comparatively little moment; the more remarkable circumstance is the divergence between his remarks and his rule as to the allowance to be made from the perpetuity in respect of the age of the tenant on the rolls. The plan laid down in his rule is to deduct from the value of the series of fines only a single fine of two years' purchase in the case of the best possible life, and to deduct in the case of any other age a proportionate part of such two years' purchase; that is to say, he makes here no greater abatement in respect of the best possible life, a child, than that which he had properly shown in his previous remarks to be needed in the case of a life of forty-four; and makes, indeed, a smaller abatement than that which was rightly called for in the case of a life of thirty. Both of his plans cannot be right; it is the second which is erroneous. The circumstance that it is possible for a very young life to be admitted on payment of the fine is not apposite to the question, for the best possible life is an extremely exceptional and not the average holding assumed in order to capitalise the fines. For the latter we might take a life of the average age of copyholders at the time that they inherit; and it is therefore on an enfranchisement to a tenant of this average age (as in his previous remarks) that the deduction of the two years' purchase should be made, a specific deduction of a greater or less amount respectively being needed in the case of a younger or older aged tenant.* I have dwelt thus much

* Adopting the notation of Mr. Peter Gray's classical paper on the "Theory of Successive Lives," in the second volume of the *Journal of the Institute of Actuaries*, the value of the perpetuity of the periodical fines of 20, the first being receivable at the end of the year (of age) in which the present tenant, aged x , may die is

$$\frac{2}{1-A_y} \cdot A_x = \frac{2}{1-A_y} \left(\frac{1}{1+E} \right) = \frac{2}{1-A_y} - \frac{2}{1+A_y}$$

While the present tenant happens to be of the average age of tenants at their admission (which we may put for the uniform succession age y in the formula), $x=y$, and we have simply to deduct 2 from the $\frac{2}{1-A_y}$, which is the value of the fines in perpetuity when the first is to be paid immediately.

* From a paper by Mr. Edward Smyth read at the Ordinary General Meeting of the Institution of Surveyors, January 10th, 1870.

upon this discrepancy because, in the ordinary case of fines on admissions after death or alienation, to be next considered, Mr. Rouse has similarly framed his rule and tables with a regard to the best possible life, and its inapplicability is rather more readily seen in the case of fines only payable after the deaths of the successive tenants; but I am not acquainted with any manor in which this is the custom.

With reference to the ordinary case of copyholds subject to fine arbitrary admission after death or alienation, Mr. Rouse points out (p. 85) that the way to calculate the value of the fines "is to find on each manor the average interval which has elapsed between changes of tenants, for such a period of time as will give a fair average; and to then calculate on such average, allowing for the difference in values depending on the ages of the tenants standing admitted. The adopting one fixed average interval," he continues, "would be unjust in many instances towards the lord, and in many towards the tenant; though, for practical purposes, the result of considerable investigation into the matter shows that in most manors the average interval of fifteen years as to land and thirteen years as to house property, will be a just average to be calculated on as between lord and copyholder." He then capitalises the fines from lands at 3 per cent. compound interest, and those from houses at 4 per cent.,—a distinction which seems reasonable.

It may be worth pointing out, however, that some injustice is done to the lord by valuing the manor fines upon the assumption of their occurring at regular intervals, instead of at the fluctuating intervals at which they are really received; for it denies to him some of the compound interest which he can make upon his earlier receipts. But I welcome this circumstance as a very desirable set-off for the injustice which is done on the other hand to the tenants by capitalising the fines as of two years' purchase each, whereas it is now very general to take a rather smaller fine in cases of alienation,—although this, by the way, is exactly the reverse of a common practice two centuries ago, as recorded by some writers.

On the question of the allowance to be made for an existing tenancy, I differ from Mr. Rouse, as before intimated. He says (p. 87), "The difference between the value of an enfranchisement where no life is on the rolls, and that where a life of the greatest value stands admitted, and in which the full manorial interval is calculated as that at the end of which the first fine will be payable, will be one fine, or in the case of fines arbitrary, will be two years' value. It will therefore follow that, if the best life be equal to a reduction of the two years' value, as the value of the life diminishes, the portion of the two years' value to be deducted will diminish." This assumption of the best life being equal to a deduction of two years' value, or one fine, is, I submit, inadmissible. We have seen it to be irrelevant and productive of considerable error in the assumed case of fines payable only after death; and it is impossible to conclude that the incidental introduction of occasional alienation fines can give to the best possible life any theoretical connexion with the present question. And observe the effect. At page 128 the perpetuity of the fines of 2l. every fifteen years is stated to be worth, in the case of a vacant tenancy (speaking roughly), 5l years' purchase at 3 per cent. interest, and we are there directed to charge 3l for enfranchisement if the tenant on the rolls is the best possible life, a female child under 6. But that value of the perpetuity is arrived at (Table VIII.) by taking the fine of two years' purchase payable now, and taking 3l as being the total present value of the fines payable in 15, 30, 45, &c., years. So that in charging this same 3l years' purchase for the enfranchisement in the most exceptional case of this young child, we shall be calculating as if, notwithstanding her extreme youth, the next fine would yet occur at the end of the average interval of 15 years—an assumption which I think indefensible. It does not do justice to the young tenant; she may not alienate at all, but may hold on till death, and, therefore, her most unusually good life indicates a probability of the lord's next fine being distanced beyond the average interval. I submit, as before, that the deduction of one fine is appropriate only to a tenancy which is likely to last for the average period, and this average holding is not to be found in an extreme case—in the scarcely possible tenancy of a child under six. For want of a record of the relative frequency

of the occurrence of surrenders at successive ages, I propose a tenancy at the average admission age,—say 35,—as a practical standard, and make for younger or older ages respectively a reduction larger or smaller than a single fine in proportion simply to the values of life annuities at such ages as compared with that of a life annuity at the age of 35.

THE LATE MR. JAMES WYLSON, ARCHITECT.

THE decease of Mr. James Wylson, architect, which took place on the 6th inst., at his residence, in Islington, will occasion, among a large circle of personal friends and others, a feeling of deep regret at the loss of one who was alike distinguished for the variety of his acquirements and general knowledge, and for his estimable social qualities in private life. In the former capacity, the bent of his inclination was decidedly in favour of the *practical* and the *useful* in science and art; his delight being to study out mathematical problems, or abstruse calculations, which his naturally ingenious turn of thought led him to devote to good account; while, in the latter capacity, those who knew him best could best appreciate that frank geniality of disposition, and that ready flow of lively and instructive conversation which constituted the great charm of his society. When, on such occasions, some new idea happened to be started, or some question appeared to be capable of further elucidation, he was invariably loth to let the matter drop until it had been sifted to the utmost; and he would frequently take down one volume after another, from the well-stocked shelves at hand, to assist in the investigation: nor was it an uncommon thing to discover that many of these volumes had been already enriched by careful references or marginal notes in the handwriting of the owner. From this remark, it may be judged that Mr. Wylson was emphatically a man of persevering research, as well as of method; and such were, in truth, prominent traits in his character. His industry was most remarkable, nor less so his constant habit of "system" in all that he did. He had "a place for everything, and everything in its place." Indeed, but for this, it would have been impossible for him to have accomplished what he really managed to do in an incredibly short space of time; and this without in the least degree passing over things superficially.

Mr. Wylson was at all times, and on a variety of subjects, a ready and accurate writer. Besides his frequent contributions to the current literature of the day, which were always something beyond being merely acceptable, his versatility was displayed in his aptitude for composing poetry (especially of the humorous kind), and for music. In these fancies he would occasionally indulge when corresponding with his friends; and they are privileged to possess, in either the single or combined form, many of these clever effusions, some evidently thrown off on the spur of the moment. This varied use of the pen would appear to have been continually resorted to by him as a source of actual recreation, until the increased pressure of special duties imposed a comparative restriction; for, in addition to what appeared from time to time in print, the amount of manuscript he has left behind him would fill volumes, irrespective of certain important works which he was preparing for distinct publication. He was one of the earliest contributors to the *Builder*; and an article by him which appeared in this journal for the year 1844, upon "Cements," attracted, among others from the same pen, considerable notice. He afterwards edited the "Engineer's Pocket-book"—a highly useful publication; and in 1859 appeared his "Mechanical Inventor's Guide,"—a work containing a mass of condensed information, designed to form a practical introduction to the principles and components of machinery; being further illustrated by copious diagrams drawn by himself, and also a collection of nearly 300 mechanical movements.

A few additional particulars respecting Mr. Wylson's general career will not be uninteresting. He was born at Glasgow in 1811, and served an apprenticeship of five years to an architect in that city, of the name of Weir, with whom he remained for four years longer. In 1836 he removed to Norwich, and for a brief time assisted Mr. John Brown, a well-known architect residing there. Upon arriving in London shortly afterwards, he was engaged by Mr. Sydney Smirke as a senior clerk in his office, where he remained

till the year 1843. About this period the writer of the present notice became acquainted with Mr. Wylson, being, in 1842, one of a few "architectural draughtsmen" who formed themselves into an "association," with that gentleman at their head, Mr. Wylson being both the originator of the movement and its first secretary. When circumstances necessitated his relinquishment of the latter office, he was presented with a handsome pair of silver compasses, expressly designed for the purpose; and, by way of record, it may here be mentioned, that the association first held its meetings in Castle-street, Holborn; next in Southampton-street, Strand; and then at Lyon's-inn Hall (also in the Strand, and since pulled down); and now, in a more developed form, it is known as the "Architectural Association," meeting in Conduit-street, Regent-street.

Mr. Wylson first established himself in practice in his native city, where he designed and carried out many important public and private works, among which may be mentioned, an extensive range of "model dwellings for the laboring classes," the Prince's Theatre (since cleared away, the site being otherwise required), and St. Luke's Free Church. To the pulpit in the latter edifice he successfully applied, in 1855, the theory of the parabolic form as a sound-reflector. He also assisted in establishing the Glasgow Athenaeum; and, for his professional services rendered to that institution, the Board presented him with a life-member's ticket, and also elected him a director. In 1848 he received, out of 100 designs, the first premium for a plan for laying out the lands of Gilmore Hill for building purposes. Previously to his quitting Glasgow, in 1850, to return to London, he was honoured with a public diploma, by invitation from his brother architects; and his first engagement in the metropolis appears to have been a responsible post in the office of the late Sir C. Barry. His course for the future became somewhat changed, when he was chosen, out of fifty-five candidates, surveyor to the National Freehold Land Society, which appointment he retained until the trade in land being seriously affected by the Crimean War, his "department" was annulled. He was subsequently elected (about ten years ago) surveyor to the Conservative Land Society, which office he continued to hold until his death, as also a similar office in connexion with the United Land Company, Limited, which has been only comparatively recently established.

In the discharge of his multifarious duties, as in everything that he undertook, Mr. Wylson, was truly indefatigable,—a man of the strictest integrity, and so utterly unselfish, that there is reason to believe that his removal was hastened by this very conscientiousness; inasmuch as, although subject of late years to severe attacks of a distressing complaint, it was with great difficulty that he could be persuaded, under any circumstances, even partially to relax his efforts; and he may be said to have died literally in harness. His remains were interred on the 14th inst. in the Brompton Cemetery.

J. D. W.

THE SUEZ CANAL, AND THE GEOGRAPHICAL SOCIETY.

A CROWDED meeting of the Royal Geographical Society has been held in the theatre of the Royal Institution, Albemarle-street, to hear from Lord Houghton, "the Society's envoy," an account of his visit to the opening of the Suez Canal. The chair was occupied by Sir R. S. Marchison, the president.

To the undertaking itself, Lord Houghton said, he was not disposed to attribute any vast importance, either geographically, commercially, or politically; and he accounted for the canal not having been made generations ago by the simple circumstance that it was not [then] wanted, and that the connexion of the two seas was not in harmony with the commercial ideas entertained in past times. Having traced the origin of the newly-constructed canal to Père Enfantin, and frankly acknowledged the firmness, ingenuity, and address which M. Lesseps had displayed in carrying out the project, his lordship defended the attitude which Lord Palmerston had adopted towards the undertaking, by explaining, that what he opposed was, not the making of the canal as now constructed, but an arrangement which would have handed over to a French company, and through it to the French Government, nearly a whole province of Egypt, and the employment of what was called "free," but would really have been "forced," labour for

the construction of the works. With reference to the opening of the canal, Lord Houghton said, he made the passage in the *Hank*, and the soundings which were taken all the way were never less than 18 ft. He exhibited a specimen of the rock which "cropped up" so unexpectedly at Serapeum; and expressed a confident opinion that that and one or two other obstacles had been so far removed that we might now regard the canal as in the nature of a railway, upon which had been laid down a single line of rails, that might be doubled at a cost of about a couple of millions as soon as it was necessary. The immediate effect of the canal, he anticipated, would be to encourage a direct trade between Trieste, Italy, Greece, and the Levant, and India; but he did not believe that it would at once materially affect the commerce of England and France.

THE POET LAUREATE'S NEW HOUSE.

MR. ALFRED TENNYSON'S new house near Haslemere is a stone structure of considerable dimensions, approached by a broad carriage-drive to the principal entrance, which is a large porch of five pointed arches, so arranged, however, that visitors cannot alight under it, as it is paved and approached by three steps. The style of architecture does not carry us back to the days of Arthur, nor have we in the new house any strong reminders even of the age of knights of chivalry; its architecture being a free treatment of domestic Gothic of the Tudor period. In the principal rooms the windows are two lights in height (divided by a transom), and divided again into five by mullions; it is virtually two stories high, with heavy slated mansard roofs, with large flats and lead flashing. The upper part of the house is most attractive, having a series of rich dormers, three in front, two at back, and one over the porch. These dormers have two double lights in front, and one on either side to light the third or attic story, each dormer having a stone gable supported by two buttress-pinnacles, the gable itself being enriched with a shield (earlier in character, however, than the rest of the house). The chimney-stalks are very large, square, with bevelled edges, and well carved with diaper work; round the entire cornice is an open paneled parapet, and the ground and first floors are divided throughout by a richly-carved band in panels, only breaking into a series of open quatrefoils over the entrance porch.

THE DISMISSAL OF BARON HAUSSMANN.

THE great architectural autocrat, as our readers must by this time have observed, has been swept away with the Imperial regime, which has been peacefully superseded by Parliamentary rule at the instance of the Emperor himself, who evidently thinks his people are at length prepared for the British mode of government. The Baron gives up his position regretfully and unwillingly. He says he had hoped to finish his work first. But what will finishing mean? He has aided the Emperor actively in converting Paris into something like a city of palaces; but then the middle class and the poor must live; and the cost of living in Paris to such classes is already doubled, or more than doubled; both rents and articles of consumption having been enormously increased by Baron Haussmann's proceedings. It is well to have a magnificent city; and Paris is an example to us in many respects; but see how inconsistent with a free or Parliamentary government such rapid and sweeping architectural and other improvements are! No sooner is Parliamentary government introduced, than down falls the Haussmann who forced them on certainly too fast. The Parisians probably even yet have not experienced to the full extent the evils resultant from their splendid improvements and their gigantic civic debt.

M. Chevreau, late Prefect of the Seine, has replaced Baron Haussmann, which is regarded as a sort of compromise.

Baron Haussmann, above all men, who, as a power, could not have existed in London, thus compliments our Parliamentary system, in a farewell address to some of the Parisians:—

"What consoles me," he remarked, "after so many efforts, is that I feel enjoying the entire confidence of my Sovereign, and possessing your esteem and affection. Ah! gentlemen, it requires courage and devotedness to hold public functions in France, and to consecrate to them efforts and facilities which in the liberal professions would have procured independence and fortune, but which, employed in the service of the State, often lead

only to bitterness and disappointment. In a neighbouring country—the cradle of the parliamentary regime—the case is otherwise. In the presence of a great national work, party spirit is a lent, and political passions give way before feelings of patriotism; and when a man has had the good for one it cost the merit to attach his name to it, a universal protest would be raised to protect him from unfair depreciation and calumny."

PROPOSED UNION OF FRANCE AND ENGLAND.

SIR,—If I am late in thanking you for kindly reporting the production of my scheme to the annual dinner of the Society of Civil Engineers, I can avail myself of the possibility of stating at the same time the wonderful ease with which your article has made through the world.

Not only half a dozen of English papers that I know of, besides many that I may have no knowledge of, have mentioned the matter from your journal, but upwards of twenty-six French papers, Parisian and provincial, have done the same, and all "from the *Builder*," which I feel very glad to acknowledge.

The *Cors Imperial des Ponts et Chaussées* have had a communication of the scheme from myself, and not one objection has been raised against the "perfect," said they, "practicability of the same." The only one objection is consequently the political question, as hinted to by yourself. I know it will be the chief impediment; but I hope some day or other it might be put aside.

Paris.

EUGENE BREL.

PROJECTED HOLBORN DISTRICT IMPROVEMENTS.

A REPORT by Mr. Lewis H. Isaac, the Surveyor to the Holborn District Board of Works, on certain bills, for a new market, and for tramways in the district, has been printed. The Charter-house market is proposed to be erected on the area lying between Cow Cross-street and Charles-street, on the north and east, Charter-house-street on the south, and Farringdon-street on the west. Property behind Cow Cross-street, and Charter-house-street, would be purchased, and frontages obtained along the south side of Charles-street and the east of Farringdon-road. Covered ways would run to the new market and to the Farringdon-street railway station.

The surveyor does not suggest any decided opposition by the District Board to the project, but anticipates strong opposition on the part of the City authorities. The tramway bills are considered in some respects objectionable, as they virtually give a private company a monopoly of portions of the public thoroughfares; and the reporter suggests that it would be far preferable, if possible, for the various authorities to unite in extending granite tramways along the great lines of route.

THE LATE MR. WILLIAM BLAND.

MANY of our readers know Bland's "Arches and Piers." The author of it, a respected country gentleman, living at Hartlip, Kent, died recently, at the age of eighty-one, where few knew him as the author of scientific works that had silently grown into reputation. He was born in Sittingbourne, and educated, first at Caine College, Cambridge, and then at Edinburgh. Whilst at Edinburgh, and during the long evenings, after writing out the lectures of the day, he drew plans for a house his father contemplated building; and one of these, with some slight alterations by a professed architect, being chosen, the house, then called New Hartlip Place, was commenced in the spring of 1813. The mode of warming, Mr. Bland's invention, is admirable. The tank of the house he himself dug during winter, and in the course of time commenced digging the well, out of which he was the last to come when it was finished. It is 138 ft. deep, 100 ft. of which is through chalk. He also made the occasion useful for experiments on the temperature at various depths. In 1827 appeared "The Principles of Agriculture," which reached a second edition in 1863. He next published his "Experimental Essays on the Principle of Construction of Arches, Piers, Buttresses, &c.," a new edition of which appeared in 1862. This was the result of a long series of experiments by means of wooden bricks, and visits to nearly, if not all, the cathedrals and many churches in the kingdom. Simultaneously he was hard at work on the estate in raising and planting trees, and in the improvement of all

sorts of machinery in use on the farm, especially the drill plough invented by his father, and a look for granaries and stables, the principle of which Chubb (from information given by Mr. Bland) has applied to chests.

About the same time he published the first edition of a work called "The Forms of Ships and Boats."

The donation of Roman antiquities made by Mr. Bland to the Chillington House Museum, leads us to refer to the excoavation, some years since, of an extensive and interesting Roman villa in a field at Hartlip, about a quarter of a mile from his residence. This he very liberally excavated at his own cost, throwing it open to the free inspection of the public; and many must remember the uniform kind reception given by the generous proprietor to archaeologists and other scientific visitors, and the hospitality of Hartlip Place. A very elaborately illustrated account of this villa appeared in Mr. Roach Smith's "Collectanea Antiqua," vol. ii., which may be used also as a guide to the valuable collection referred to. In his later days geology was Mr. Bland's favourite study; and the chief metropolitan museums received from him, from time to time, presents of rare fossils from the neighbourhood of Hartlip and Sittingbourne.

THE BOROUGH OF BELFAST.

FROM the Borough Surveyor's statistics, we learn that 25,155l. have been spent during the past year on public works, such as sewers, and the new markets and slaughter houses. Many of the leading streets have been recently sewered and paved in a permanent manner, and three large arterial sewers have been made to relieve the Pound Burn, which has reduced the frequency of the floodings in the lower districts.

The new cemetery and slaughter-houses are now in full operation, at a cost of about 25,000l. Two new public parks are about to be laid out, lands containing 250 acres having been acquired. The new Town-hall is rapidly progressing. Two new covered markets have just been opened. A dead house and coroner's court have been erected, and the handsome Albert Clock Tower is all but completed, so that Belfast is keeping pace with other towns.

THE SEWAGE QUESTION.

Birkdale.—At a recent special meeting of the local board, for the purpose of considering the report, and also the necessary plans and sections, prepared by Messrs. Reade & Goodison, of Liverpool, for a system of sewerage for the district of Birkdale, Mr. Goodison read a long report, entering minutely into the subject, and describing the general character of the district, and the nature of the land through which it was proposed to carry the sewerage. After setting forth the objections to a sea outlet, the report pointed out the advantages that would be obtained by adopting an inland scheme, by which a large area on a flat and extended district would be commanded, and provision made (at a future time) for utilising the sewage by irrigation, into which question the report entered at some length. The cost of the carrying out of the whole of the proposed sewerage works, including tanks and approaches thereto, but exclusive of the land, was estimated at 9,520l. 8s. 9d., including 10 per cent. for contingencies. The report then traced out the source along which it was proposed to carry the sewerage, to the outlet in Fine Jane's Brook, into which the sewage would empty itself, and concluded by earnestly impressing upon the Board the economy of taking prompt and immediate steps for the execution of the proposed works, as delay would entail not only a greater cost to the township, but the development of buildings would be seriously retarded. The report was formally approved of, and ordered to be printed.

Walford.—At a special meeting of the Local Board of Health, Mr. Hambert has reported that he had an interview with Mr. Stone, the tenant of Cassio Bridge Farm, who had mentioned the terms on which he was willing to give up possession of the farm. The amount of compensation he asked for was 1,000l., and the quantity of land on the farm was 210a. 2r. 20p. The chairman thought the Board ought to know what Lord Essex was willing to do, in order that the Board might release him from his liability to dispose of the sewage. The following resolution, "That the principle of irrigation be adopted for the disposal of the sewage," was carried with

but one dissentient (Mr. Humbert). A committee was appointed to ascertain to what extent Lord Essex is willing to meet the difficulties of the Board, in carrying out the proposed system of irrigation; and also to make definite terms with Mr. Stone, and to take all the steps necessary to carry out the irrigation works.

Southover.—The drainage question here, which has been continually cropping up at intervals for some years past, seems now in a fair way of being settled efficiently, if not to the satisfaction of all parties interested. The plans of the work, prepared by Mr. George Fuller, of Lewes, under the direction of Mr. H. Conybeare, C.E., by order of the Home Secretary, are ready, and tenders for the works are to be sent in on or before the 17th inst. The estimated cost of the work, we understand, is 1,600l. The main drain (15-in. pipe) will commence at Spring-gardens, and will run nearly parallel with the Winterbourne stream for some distance, to allow of its being flushed with water at different points. At St. James's-street the drain diverges to the south, and passing through the bottom of that street, goes on to Eastport-lane, and crossing Gardner-street, passes through the gardens between that and the Railway Station, to the south of the Tanyard. It will pass through the south of the Brighton platform, at the station, on to Mr. Godlee's land, and will terminate in the Winterbourne stream, at the same point as does the Lewes Commissioners' main drainage. From this point, the stream will be arched over to the river. The total length of this 15-in. pipe will be 1,100 yards; the outfall, an additional 400 yards. The drain entirely avoids the private grounds of Captain Wyndham, who has been a great agitator in the matter. Another 15-in. drain will commence at the Militia Depot, and run down the High-street, to a junction with the other pipe, at the corner of Eastport-lane, near the King's Head. A continuation of this, but of smaller dimensions, viz., 12-in. pipe, will run along Priory-street and down Gardner-street, when it will join the main drainage; 12-in. pipes will also be laid down the lane opposite Manor House, St. James's-street, and also through Priory-crescent.

Cheltenham.—The last monthly meeting of the Local Improvement Board was chiefly taken up by a discussion on the irrigation scheme, incidentally arising from an offer to farm a large quantity of the sewage of the town. It was reported by the committee that the works were steadily progressing. The proprietors of the Hester's Way Estate, through which the sewage outfall pipe passes on its way to the sewage farm, at Boddington, had applied to be allowed to take what quantity of sewage they required over their estate of 130 acres, at a charge of 5s. per acre per annum, for a term of years; and this application the committee had, by a bare majority, recommended compliance with. Mr. Paul deprecated this course, pointing out that the Board had before received offers at 10s. an acre, but that it was not in a position to deal with the subject until they had ascertained the requirements of their own farm. It was rejoined that the Hester's Way proprietors having to pump the sewage to a higher level, were not in the position to pay the same as the farmers living on the lower level, and that by getting the sewage on this higher level, and availing itself of the machinery which the Hester's Way proprietors would erect, the Board would open up to irrigation a large tract at present unavailable. Mr. Paul did not anticipate any difficulty in getting plenty of land in the Vale, and said he believed that the sewage would be found to be worth, not 5s. or 10s., but 40s. an acre. After a protracted discussion, the recommendation of the committee was negatived by a large majority.

Brighton.—The Council have had a special meeting for the purpose of agreeing on a petition to Parliament for leave to introduce a Bill in the ensuing session authorising the making of the intercepting sewer, &c., for draining Brighton and Hove in accordance with the plan recommended by Mr. Hawkshaw. After a brief discussion, the motion was carried by 26 votes against 9.

Southampton.—At a recent special meeting of the Southampton Council, a report by a deputation sent to Leamington as to the A B C deodorising works there was considered; and the Council afterwards, as a Board of Health, apparently, unanimously resolved "that this Board are willing to adopt the A B C process, and to make such arrangements with the native Quano Company, Limited, as may be agreed

upon." The company offered 500l. a year, besides a percentage of profits, for the town sewage, on a lease of thirty years. The A B C process, our readers will recollect, means the alum, blood, and clay process.

Norwich.—In an article on the Progress of the Sewerage Works, and an underground visit, the *Norfolk Chronicle* says:—

"There is now no doubt but that, whether successful or unsuccessful, the Sewerage Irrigation Scheme for Norwich must be carried through. All the money authorised to be raised by the Act of Parliament, 75,000l., has been borrowed, and of this sum the greater part has been already spent. In the face of this fact, even the inexorable opposition of those unfavourable to the undertaking must yield; and there is only one question about which they can now concern themselves,—the success or failure of the plan. Hence this is a question continually debated. On the one hand it is urged that the difficulties which are encountered are insuperable; that if the works are completed, when the sewage reaches Trowse it will be impossible to pump it on to the land at Crown Point; or, again, if this is stated, that the result will be, from the diffusion of malaria, the creation to the city of such a nuisance as will doom the continued existence of the scheme. In contradiction to this, it is asserted by one of the most skilful and active of surveyors,—or, rather, of engineers,—that the difficulties which so unexpectedly arose are being and shall be overcome, that the sewage will reach Trowse, and, when there, that it cannot fail to be sent to Crown Point; and, further, that experience has proved the innocuous nature of irrigated sewage, when spread upon land. Whilst there are these conflicting opinions as to what will be the result of the plan, there are few, perhaps, who have even the faintest idea of the magnitude and character of the work themselves. It is true that the public are too painfully aware, from the unceasing hum of pumping engines, the inconvenience of open trenches, and the huge shafts paraphernalia observable at various parts, that the work is being prosecuted; but of what is going on beneath the surface they are entirely ignorant.

The whole of the works are expected to be in operation before the end of August next, at a time at which the original contractor should have completed the works, and as he has not yet six months on the low level sewer, it will be highly satisfactory should this expectation be realised.

One word in conclusion. This sketch cannot but confirm the opinion that the work is indeed a gigantic and responsible one, and requires in the person of the gentleman entrusted with its management a combination of no ordinary engineering skill and experience, with a zealous spirit which nothing can daunt. It is a most fortunate thing for Norwich that Mr. Morant possesses these qualities; and, whilst he merits the praise that the committee under whom he acts have so frequently given him, he also deserves the thanks of the ratepayers for taking so grave a responsibility upon himself without calling in the services of a consulting engineer, which could not have been done for a less cost than several thousand pounds. Whilst saying this, we must not forget Mr. J. G. Johnson (the chairman) and the committee, who have taken it upon him so ungrudging and unhesitatingly, as their evident wish and intention is to have the works carried out in a thoroughly efficient manner, and at the same time at the least possible cost; thus fulfilling to themselves and their fellow-citizens a duty from which none ought to shrink."

A portion of the street in front of the Albion Mills, King-street, has suddenly caved in, leaving a hole 9 ft. deep, 25 ft. long, and nearly the width of the street, and, of course, putting a stop to the traffic. On examination it was found that it was caused by the bursting of the old sewer at the top, and as large quantities of water were being pumped into it from the engine employed at the new works, it had found its way through the bottom and down through the chalk, which it had converted into a puddle, to the tunnel beneath, which was within a few feet of being connected, the men working from north to south, and *vice versa*, the point of meeting being where the settlement took place. There were seven men at work in the tunnel, who had a narrow escape. Beyond a temporary inconvenience, the new works will be in no way affected.

Oxford.—Mr. Footman, C.E., of Oxford, says a local paper, recently issued a statement which no doubt had considerable weight with the Local Board in its decision last week, a copy of it having been forwarded to each of the members, and it being resolved not to negotiate for the proposed site at Radley, and also to confer with this gentleman afterwards. In his statement, Mr. Footman pointed out that this site was unsuitable for irrigation, which requires a surface "as level as a bowling-green." A very great outlay would be required to render such land fit to receive the liquid sewage in a slowly flowing state. He estimated that to go to Radley would result in a yearly deficit of 2,600l. To go to Sandford would probably cost 12,000l. more. The latter place was only selected by Sir Wm. Cubitt and others as an outfall for the general drainage, not the disposal of sewage. A sewer 6 ft. in height was required to carry off the rainfall as well as sewage. Mr. Bazalgette thought of going to Ilfley, and irrigating without pumping; but this "would not sufficiently lower flood waters below the basements of houses in the lower parts of the city." Mr. Footman thinks this can be done by a plan he laid before the Board in July, and yield a revenue of 1,500l. a year.

Hexham.—The Tyne Salmon Conservancy Commission have had under consideration the question of Hexham sewage, which, to the quantity of 70,000 or 80,000 gallons a day, flows into the Tyne; and a letter calling upon the Newcastle and Gateshead Water Company, who are about to apply to Parliament for power to use the Tyne water, was adopted, in which they were strongly urged to endeavour to stop the nuisance.

QUAKERS' NEW MEETING-HOUSE AT OLDHAM.

This new structure has a rather ornate appearance, with a vestibule leading directly to a light, plain meeting-room, and also to a large committee-room at one end of it, arranged for being used separately or for being thrown open as a gallery on special occasions. On either side of the vestibule are placed cloak-rooms and other conveniences, those on the left being solely for the use of female members and attenders. The interior of the meeting-room is fitted up with pitch-pine open seats, wainscoting, and minister's gallery, the latter being in no way different from the other seats except from its being ascended by two low steps; and the whole is capable of seating, if required, from 400 to 500 persons. The floor underneath the meeting-house is fitted up as a schoolroom, well lighted, with class-room and other conveniences. The general contract for the whole of the works (except heating and gas-brackets) was taken by Mr. Emanuel Whitaker, of this town, who has completed the same from the designs of Mr. Peter B. Alley, of Manchester, architect. The cost of the building and fittings, exclusive of the land, is a little over 2,000l.

DISINFECTANTS AND DOCTORS.

It cannot be doubted that it is of great importance that the value and proper use of disinfectants should be rightly understood by all classes, and especially at this time, when there is so much sickness, and with weather so variable as to be specially productive of causes of disease.

Taking, as I do, great interest in anything connected with sanitary work, I was pleased to note a few days ago a special report made to the Liverpool Health Committee by Dr. Trench, the medical officer, upon the value and use of disinfectants. After referring to various kinds in use, such as sulphate of iron, sulphate of zinc, chloride of lime, permanganate of potash, quick lime and charcoal-powder, he comes to carbolic acid, to which he gives the preference, not denying that the others named have their uses, and are of varied efficacy. Of carbolic acid, however, he says:—"It is a positive disinfectant, and quickly destroys or restrains every contagious and infectious virus. It is an antiseptic, and arrests and prevents fermentation and decay. It is used with great facility, and is sufficiently volatile to permit its vapour to reach atoms or germs of disease floating in the air. It is cheaper than chloride of lime, and for out-door disinfection and for the disinfection of privies and drains it is more permanently efficacious," &c.; and the doctor goes into very interesting details of the mode of using and the excellent effects produced by carbolic acid.

Impressed very much by the foregoing from so high an authority, I at once commenced the use of carbolic acid, and recommended it to sanitary inspectors and other officials, and to my personal friends. Judge my surprise to see in your publication of the 18th instant an extract from a series of practical sanitary hints recently issued for circulation by W. Hardwicke, M.D., medical officer of health, Paddington district, in which, after enumerating various disinfectants, a decided preference is given to Condy's fluid, as being the best in all circumstances; whilst it is added, "Barnett's fluid and carbolic acid are poisonous and comparatively inefficient," &c.

In a matter of such moment as the right sort of disinfectant to be used, there ought not to be so great a divergence of opinion between two medical gentlemen of reputation, and holding the appointment of medical officer of health to such important constituencies. What one highly recommends as "a positive disinfectant" which "quickly destroys or restrains every contagious and infectious virus," the other says "is poisonous and comparatively inefficient." When doctors disagree, who shall decide? I should like this very important subject to be ventilated through your columns and illustrated by practical ex-

perience: so that those who, like myself, have not sufficient chemical knowledge to judge for themselves, may obtain information from undoubted sources, and be able to apply and to recommend such disinfectants as are at once safe, inexpensive, and efficacious. This subject is not unworthy the attention of the medical officer of the Privy Council.

JOSEPH BIRKLEY.

NEW DRILL HALL AND GYMNASIUM, NEWCASTLE-ON-TYNE.

LIEUT.-COL. POTTER, of Heaton Hall, Newcastle-on-Tyne, has at his own cost erected a building in this town to be used as a drill-hall and gymnasium. The building, which is of brick, and of an unpretending architectural character, is about 130 ft. long. At the east end is a residence for the drill-sergeant; and in addition there are orderly, dressing, smoking, and secretary's rooms, and a large board-room. The drill-hall and gymnasium, which is about 105 ft. long by 50 ft. wide, is open from the ground to the roof, and is divided longitudinally into five bays by cast-iron pillars, which support the roof, and also the timber work of the gymnasium. All the necessary apparatus for a gymnasium is about to be erected in the hall. At the west end of the hall is a gunnery in which will be kept the large guns; and over the gunnery is a gallery for the accommodation of spectators. On the north side of the building is a large armoury and store-room, and also the usual offices. There is an open drill-yard, 70 ft. long by 25 ft. wide, at the west end of the building; and at some future time it is proposed to form a tennis court in this yard. The cost of the building, and the fitting up of the interior, will be about 2,000l.; and besides this there is the cost of the land, the entire outlay being defrayed by Lieut.-Col. Potter. Mr. Kennedy, of Jarrow, is the builder; Mr. Henry Andrews, the clerk of works; and Mr. Oliver, the architect.

WAKEFIELD MODEL PRISON.

THE annual report of the Howard Association mentions that amongst the prisons lately visited by the Secretary is that of Wakefield, the admirable model of discipline afforded by which is comparatively little known. It is the only British prison which, by the use of *steam-power and machinery*, approximates in its nature the large manufacturing prisons of the United States and the Continent, where the industrial capacities of the inmates are called out to such an extent as, in addition to rendering the prisoners thoroughly practised workmen, secures the not unimportant object of largely relieving the pockets of honest ratepayers. During four years (1865-69) the purchases of trade materials for Wakefield Gaol was 39,734l.; the sales (chiefly mats), 47,413l.; net profit, after deducting commissions, &c., 7,783l.; stock in hand, 16,888l. Average number of workers, 1,007; average earnings, 7l. 14s. per annum. The Governor (Captain Armytage) remarked to Mr. Tallack, "If we did not make mats, we could turn our machinery and labour just as well to other purposes; as, for instance, to the manufacture of steam-engines." Such industrial occupation is most valuable. Why should not idle, vicious, unskilful criminals be rendered industrious and self-supporting? The competition with outside workers is at the worst very little (a few pence or farthings per individual), and the advantage gained to both prisoners and ratepayers incomparably counterbalances it. The broadwheel is retained at Wakefield as a useful resort to fall back upon for intractable prisoners. As such, and as such only, it is valuable.

THE "HOLE-BOURNE."

SIR,—Your correspondent, who calls attention to the derivation of this name, reminds us of the wonderful persistence of error. The fanciful and anomalous "Old-bourne" Stow is directly answerable for: it is found nowhere before him. Even he is not consistent, for he calls it "Hil-bourne" in one place, and he makes the brook so called to trickle down Holborn-hill, though such a one he never saw, and the derivation and it belong alike to his imagination. The first writer who corrected this was a well-known correspondent of the *Gentleman's Magazine*, "T. E. T.," in May, 1856, and there the subject is completely exhausted. He shows, beyond all question, that the "Hole-bourne" was the ancient name to that

important stream which arises from the hills of Hampstead and Highgate, and which has been better known as the Fleet River. He proves this from the cartularies of the monastic houses of Clerkenwell, in which it is frequently mentioned; and he shows, that even the record cited by Stow spells the word in the usual way.

About twelve months ago, in letters to the *Times*, I also corrected the common error, referred to the article by "T. E. T.," and mentioned that there was a stream called "Hole-bourne" by Sherbourne in Dorsetshire, and it may be noted that the latter name is also in London.

Still writers copy, and even enlarge upon the old error, and it has been reproduced over and over again, in almost every account of the viaduct which bridges the chasm that gives such force and truth to the ancient name, viz. The Brook in the Hollow. As I am perfectly acquainted with every foot of its course, I can certify to the (very) appropriate construction of its name. It is a piece of word-painting.

Your correspondent alludes to the Domesday record as if the present street of Holborn was spoken of; but considering the length of the street, this is too much to affirm. The words in the record, "Ad Holeburne," must allude to the immediate vicinity of the brook; and there is mention of a vineyard (*vinet*). Now, the steep slopes of the western side of the brook are exactly such as would be suitable for the cultivation of the vine. The aspect is nearly south-east, that of some of the best vineyards, and it would also have the indirect rays of the south and western sun.

It is to be hoped that we may not see this venerable relic of erroneous etymology, "Old-bourne," again resuscitated.

J. G. WALLER.

LONDON-BRIDGE TRAFFIC.

PROVISION of extra accommodation for the constantly increasing traffic on London Bridge, which is urgently needed, has been suggested to be supplied by various methods. Amongst them a plan is proposed by Mr. J. Irwin, who, some time since, submitted a design to the Corporation of London for steel or iron bridges for the accommodation of foot-passengers at street-crossings. His design for London Bridge is based upon the same idea—namely, to carry the foot-passenger traffic over the carriage-road. This he proposes to do at London Bridge by a platform of 25 ft. wide extending along the centre of the bridge, with cross-galleries at each end of the platform, which would serve for street-crossings, and with cross-galleries over each pair of piers, to give firmness to the structure. The gallery would be 18 ft. high, clear, and would be supported upon clusters of Corinthian columns. Two spaces of 25 ft. wide would be left on each side over each arch of the bridge, to allow cross-carriage traffic if required. The piers and abutments would be carried up to the top of the structure in Portland stone, enriched with caryatides. The footways on the bridge would be thrown into the carriage-road, and thus provide for six lines of vehicles, the number for which there is space upon the new Blackfriars and the Westminster Bridges.

One objection to this plan is the asserted insufficiency of the foundations of the bridge to carry any greater weight than they already bear.

DE MORTUIS.

In taking a retrospect of the past twelve months, the old reflection is forced upon us with painful significance that King Death has been busy as usual thinning the ranks of our eminent men in every walk of life. Eighteen hundred and sixty-nine was a particularly fatal year to members of the English Episcopate, and we have also to mourn the loss of a long roll of gifted men belonging to science, art, and antiquarian science; some of them the very brightest ornaments of their professions. To begin with English painters, sculptors, and engravers, the year's obituary contains many well-known names. Among painters, the most eminent was Thomas Creswick, R.A., who may be said to have departed with the old year, his death having occurred within a few days of its close, at the age of fifty-eight. From the age of sixteen, the Exhibition of the Royal Academy had been graced by the presence of his works, and if popularity be an evidence of greatness, Creswick has every claim to that title. It has been

said of him that his works, like himself, were pleasant and cheerful, ever taking the sunny view of nature. The opening of the year was marked by the death, at the age of eighty-four, of Sir William John Newton, whose high reputation as a miniature painter gained for him the appointment of painter in ordinary to her Majesty. Robert Braithwaite Martineau, who will be remembered as the artist of "The Last Day in the Old House," was cut off prematurely in his forty-third year, in February. In the following month passed away James Eckford Lander, R.S.A., who for correct drawing, free colouring, and for general breadth and vigour of painting, had few equals among Scottish artists. Several of his pictures gained great distinction. His "Ten Virgins" and his "Ballie Macwhedde" were engraved by the Association for the Promotion of Fine Arts. For his two Scriptural pieces, "Wisdom," and the "Unjust Steward," he received a prize of 200 guineas, at Westminster Hall. Mr. Lander was fifty-seven years of age. Within three weeks he was followed to the grave by his elder and still more distinguished Brother, Robert Scott Lander, R.S.A., born in 1803. His illustrations of the writings of his early patron, Sir Walter Scott, established his reputation as an historical painter. Of these the most popular are "The Trial of Effie Deane," and "The Glee Maids," while his pictures, "Christ teaching Humility," and "Christ Walking on the Water," are fine specimens of his capacity for a still higher walk of art. The son-in-law of Thomson, of Duddington, the famous landscape painter, Mr. Scott Lander, for a number of years subsequent to 1848, directed the studies of the students of the Royal Scottish Academy. His former pupils have recently honoured his memory by erecting a monument over his grave. Also this month (April), died, at the age of fifty-three, Edward William John Hopley, for many years an exhibitor in the Royal Academy. He was the inventor of a trigonometrical system of facial measurement for the use of artists. John Warcup Swift, the well-known marine painter, of Newcastle-on-Tyne, several of whose works have been reproduced in chromolithography, died in May, aged fifty-four, as well as James Basire, the last of the line of the celebrated engravers of that name; and Orlando Jewitt, the eminent architectural wood engraver. Both had passed the three score years and ten. For about a century and a quarter the name and family of Basire have been intimately associated with the Royal Society, the Antiquarian and other societies, and among their chief works were the "Sepulchral Monuments," and the English cathedrals for Gough. Of Mr. Jewitt's last and best work his series of illustrations to Mr. Parker's "Ancient Rome," we have already expressed our opinion, by remarking that these illustrations "have never been exceeded for beauty, and minute accuracy of detail, and will remain a lasting monument of Mr. Jewitt's excellence as an artist and wood engraver." On the last of June, after a short but very painful illness, Michael Frederick Halliday was smitten down. He was known in professional and other circles as the artist of "Measuring for the Wedding Ring," and other pictures of considerable merit. A few days after we had to record the demise of Mr. F. Y. Hurstone, born in 1800, and for many years president of the Society of British Artists. He obtained the gold medal as student of the Royal Academy in 1823, and gold and silver medals at the Paris Exhibition in 1855. His best-known works are "The Prisoner of Chillon" and "Haidee." Edward Richardson, the sculptor, the restorer of the effigies of the Knights Templars in the Temple Church, died in July, aged fifty-seven; William Crawford, who had a high reputation as a Scottish portrait-painter, in August; George F. Rosenberg, the landscape-painter, and an Associate of the Water Colour Society, in September. In September, likewise, passed away, in his eighty-fourth year, George Jones, the oldest member of the Royal Academy. This veteran painter, who was familiarly known as "Waterloo Jones," bore a striking resemblance to his military idol the Duke of Wellington, and generally wore a hat and other habiliments such as the Duke ordinarily adopted. John Hancock, the sculptor, whose "Beatrice" of Dante exhibited in the Royal Academy in 1850, and other works, gained considerable reputation, died in October. On New Year's Eve died William Essex enamel painter in ordinary to her Majesty and the late Prince Consort, having reached the age of eighty-five.

If we have lost no great English architect

during the year, several able and useful members of the profession have gone from among us. Arthur Aschpiet, who died in January, was not only an able architect, but a voluminous writer on architectural and archaeological subjects, a clever musician, and an excellent poet of the *vers de société* order. He was born in 1807, and studied architecture under his father. Mr. Aschpiet's many valuable works, together with his collection of Etruscan vases, he bequeathed to the Society of Antiquaries, of which he was a member. Mr. Day, architect, of Worcester, died by his own hand, in June. In July we recorded the death of Robert Grace, of Burton-on-Trent, and formerly of Derby. W. F. Farthing, the industrious curator of the Architectural Exhibition in Conduit-street, was found dead in his room on the 20th of this month. Edward Buckton Lamb, the architect of many buildings, died in August, aged sixty-three. The list of survivors includes George du Noyer, a gentleman holding a high position in connexion with the geological survey of Ireland, who departed in January; Thomas Pickersgill, city surveyor of York, in May; and William Jones, surveyor, of Derby, in December. Among inventors and engineers, we find James Chalmers, who gave us the famous target which bears his name; and John Hulme, the inventor of the self-acting mule. James Simpson, for some time president of the Institution of Civil Engineers, and a very able member of his profession, died at Edinburgh, in April, aged sixty-nine. George Smith, for twenty-four years resident engineer of the Belfast Harbour (aged seventy-seven), and Charles J. G. Macdonald, the superintendent engineer of the London, Chatham, and Dover Railway, died last month. The latter gentleman, whose untimely removal is deplored by a wide circle, was brother to Mr. John Macdonald, who has long held an important position in the establishment of the *Times* newspaper.

In addition to this numerous band of professional men, the year's obituary contains the names of a large number of distinguished characters who were variously connected and associated with science, literature, and art. There died in January, at the age of fifty-six, Charles Robert Weld, assistant secretary of the Royal Society, brother-in-law of the Poet Laureate; in April, John Richard Walbran, F.R.S., aged fifty-two, local secretary of the Archaeological Institute of Great Britain and Ireland, author of, among other works, "The History of Ripon" and "Memorials of Fountains Abbey"; and in May, Peter Cunningham, a name well known to our readers from its frequent appearance in these pages, familiarly known also to all who know anything of London; he was the eldest son of the famous Allan, and was in his fifty-fourth year. The British Museum was deprived of two of its most eminent officials in Sir Henry Ellis and Thomas Watts, the latter only, however, dying in harness. The one-while principal librarian was born in 1776, so that he had attained the great age of ninety-three. So far back as the year 1800 Ellis received an appointment in the Museum, he became Keeper of the Printed Book Department six years afterwards, and in 1827 succeeded Mr. Planta as principal librarian, from which post he retired with a pension in 1856. Sir Henry was the author of many standard works, the most notable, perhaps, being his volumes on the Townley and Elgin Marbles. He died in the middle of January; Mr. Watts in September. Amongst the frequenters of the reading-room of the British Museum the varied and great attainments and the constant controversy of Mr. Watts will be long and gratefully remembered. In Professor Beete Jukes, F.R.S., Professor Graham, the Master of the Mint, and Professor Penny, the world of science lost three leading members. Jukes was Professor of Geology to the Royal College of Science, and the author of a large number of useful scientific works. He was born in 1811, six years later than his distinguished contemporary, Graham, whose discoveries and works have been of the greatest scientific importance to the world. Among the most remarkable of these is the law of the diffusion of gases, to which the Keith prize of the Royal Society of Edinburgh was awarded in 1834; his speculations on the constitution of phosphates and other salts, and his discovery of the law of diffusion of liquids, and of the new method of separation known as dialysis, were rewarded by the Copley medal of the Royal Society in 1862. Previous to his appointment as Professor of Chemistry in the University of London, Graham held the Andersonian Pro-

fessorship at Glasgow, and his successor in that post was Professor Penny, who, within a few weeks, followed him to the grave. Penny had by far the largest practice in Scotland as a consulting and analytical chemist. He had acquired the highest reputation as an authority in every branch of applied chemistry. Professor Penny died in November, aged fifty-two; Graham in September; and Jukes in July. The sudden death of John Bruce, F.S.A., in October, was an event that caused the deepest regret in the literary world, on account of his great antiquarian and archaeological labours, as well as of his active kindness and amiable manners, which rendered him dear to all who knew him. Mr. Bruce was at one time treasurer of the Society of Antiquaries, and afterwards one of its vice-presidents. He was one of the founders of the Camden Society, and for many years he had been engaged in the important public service of calendaring the Domestic State Papers preserved in her Majesty's Record Office. Several volumes of his calendar have been printed, and form a perfect model for works of that character. A stroke of apoplexy closed the life of this earnest worker, in his sixty-ninth year. Deputy Lot, who died in July, aged sixty-five, was well known for his antiquarian tastes, and as a prominent member of several societies. John Hodgson Hinde, formerly M.P. for Newcastle, was another eminent archaeologist, and antiquary, and the author of several able works. He died in November, at the age of sixty-four. The name of Dr. John Hogg, F.R.S., is entitled to mention, as also that of William Williams, antiquary.

The year 1869 has proved remarkably fatal to foreign artists of eminence. The year had hardly dawned when Paul Hent, the celebrated French landscape-painter, was called away. He was struck with apoplexy while at work before his easel on a picture destined for the forthcoming exhibition. Another French artist of merit, Adalbert de Beaumont, died in May. He travelled much in Turkey, Egypt, and Persia, and had studied Oriental art in its most varied manifestations. The famous Parisian sculptor, Jean Pierre Dantan, was also struck down by apoplexy in the month of September. He was called Dantan, jun., to distinguish him from his brother, Dantan, sen., who is also a sculptor, eighty years of age. Jean Pierre was born in 1800, and in early years was, like his brother, a pupil of Bosio. His reputation was gained by what the French call "chayes," *id est*, caricatures in sculpture of notable personages—burlesques in plaster, wax, marble, stone, and clay. He executed the most absurd, but wonderfully clever, statuettes of contemporary celebrities, — Victor Hugo, Lamartine, Balzac, Wellington—such extraordinary boots! Lord Brougham—such a pocket handkerchief, and such a nose! Rossini, Meyerbeer, Count d'Orsay, full of fascination. But though Dantan took delight in caricaturing the defects and weaknesses of his own sex, yet his heart was excellent. A proof of this was his great aversion to execute the burlesque of any famed female artist. He used to say that ridicule remained attached to a woman for ever. Malbran was very anxious that Dantan should caricature her. At length he complied, though unwillingly, and only when she gave him the following written request:—"Malbran has asked the sculptor Dantan, jun., to parody her portrait, in order to give the public an occasion to laugh at her." It was done; but when the great singer saw herself thus, with deficiencies exaggerated that she had not dreamt of, she burst into tears, and this incident strengthened the artist in his resolve never again to show a woman what her "harmonistic characteristics" were. Three years later Marie Malbran died (1835), and Dantan, in a thrill of grief, wrote to her husband, "Laughter is horrible facing death. I have broken the parody to pieces with one blow from a hammer." The kindness of heart by leaving 20,000 francs to the City of Paris for founding an annual prize at the Ecole des Beaux-Arts; 10,000 francs to the society for aiding painters, sculptors, and architects; and 600 francs a year to his old friend Sebron, the artist. In the following month, Dantan's brother sculptor, Pierre Hébert, to whom we owe the well-known group of "The Child and the Tortoise" joined him. Hébert, who had reached his sixty-fifth year, was the father of Emile Hébert and Madame Léon Bertaux, both of whom have acquired considerable popularity as sculptors. We must add to the list of sculptors the name of Revillon, who died last week in Paris. Among his works are the large statue of

St. Paul at St. Sulpice, the allegorical figure of Medicine on the façade of the Hôtel de Villi, and the frieze of the saloon of the Théâtre Français. A talented Frenchman, M. Borel, chief engineer of the works of the Suez Canal, died in October, aged forty-eight, just as that great undertaking had reached a successful completion. Belgium lost Baron Leys, one of her most noted painters, at the age of fifty-four. He was the chief of the Belgian pre-Raphaelites, and so highly did the people of Antwerp respect and honour him that he was publicly presented with a golden wreath at a *fête* inaugurated for the special purpose by the Artistic Club of that city. The gold medal of the Paris Exhibition was on two occasions awarded to him. To the London International Exhibition of 1862 he contributed several works of high merit—"Young Luther singing in the Streets of Eisenach," "The Institution of the Golden Fleece," &c. Germany lost her celebrated painter Overbeck, who died at four score in November, and the no less celebrated sculptor, Baron Schmidt von der Launitz, who breathed his last at the very close of the year, at the good age of seventy-four. His most important work is the monument to the three first printers, Gutenberg, Faust, and Schoefer, erected in Frankfurt about thirteen years ago. Italy mourns and throws a memorial wreath over the graves of Tenerani, the sculptor; of Calamatta, the delicate and correct engraver of Raffaele's masterpieces, and Professor of Engraving in the Academy of Milan, who died there in March, aged sixty-seven; and of her greatest architect, Luigi Poletti, who died also at Milan in September, aged seventy-seven. His last work was to direct the reconstruction of the Church of St. Paul, at Rome, which the Pope desired to have finished in time for the opening of the present Ecumenical Council.

CHOIR STALLS IN GERMAN CHURCHES.

THE German churches are remarkably rich in fine specimens of stall-work. Not only the cathedrals and abbey churches, but even the parish churches abound with examples of this article of church furniture. In England and France the stalls usually date from the fourteenth or fifteenth century; but in Germany they are to be found of every date from the twelfth to the seventeenth century.

One of the earliest examples which we have seen is at Ratzburg, where there are a few stalls of the earlier part of the twelfth century. They are not in their original position, and are in a mutilated state; but they are most remarkable and thoroughly Romanesque in character. The uprights which separate the seats are nearly 1 ft. in thickness, and are ornamented in front by two small columns, adorned with zigzag and cable mouldings.

The stalls in the church of the New Münster at Würzburg, of which we have given an engraving in a former number,* are works of the earlier portion of the thirteenth century. Next in point of date are the singularly beautiful stalls in St. Gereon's Church, Cologne, which are probably not later than the year 1300. They are the earliest we know in which figures are introduced. Here the figures stand upon the ends of the stalls. They are about 4 ft. high, and finely carved. The ends of both stalls and benches are ornamented with early Geometrical tracery, richly moulded. In all those stalls that we have mentioned the *misereres* are quite plain or very simply moulded, and it is probable that the practice of lavishing a large amount of ornament upon this portion of the stall was not introduced before quite the end of the fourteenth century, as all the earlier stalls we have seen are very simply treated in this respect. There is a *miserere* in Henry VII.'s Chapel, which is said to be the work of the thirteenth century, and certainly, at first, it does strike one as looking of that date; but, if carefully examined, it will be seen that the resemblance springs only from the trefoil or clover-leaf being used, and in all probability it is of the same date as the rest of the stalls, which are evidently works of the fifteenth century. Even in the fourteenth and fifteenth centuries the *misereres* in Germany were much plainer than they were in England.

Next to the stalls of St. Gereon's, at Cologne, in point of date, are those of the cathedral in that city. They are most noble examples, and are very elaborate. Figure subjects are used in

* See p. 730, vol. xxvi.

the ends, set in equared quatrefoils. None of these stalls which we have described have canopies over them.

The stalls at Hildesheim (of which we give an engraving) probably date from the second quarter of the fourteenth century. They are very elaborately carved, and the ends are highly original in design: figures are largely used. The end shown in our engraving consists of an emblematical representation of the genealogy of our Lord, or, as it is often called, a "Tree of Jesse." Standing upon the curved stem of the tree are the Virgin, and the archangel Gabriel in the act of annunciation. Between the two is a vase with lilies. The whole composition is graceful and pleasing. The birth of our Lord is represented above in the gable. Each of the gablets over the canopies is ornamented with a demi-figure in a circle; the soffits are vaulted. The backs of these stalls are hung with tapestry, bearing the date 1602. There are a double row of stalls, numbering in all forty. The stalls in the western choir at Bamberg are of the same date, and are very similar to those at Hildesheim, but they are not so rich. The stalls in St. Mary's, in the Capitol, Cologne; St. Mary's, Oberwesel; the Cathedral, Erfurth; the Cathedrals at Halberstadt and Naumburg; the Dominican Church at Ratisbon; and the eastern choir of the Cathedral at Bamberg, are all good examples of the middle of the fourteenth century.

Of the latter part of the fourteenth century examples are very numerous. We may mention those of St. Andrew's, at Cologne; St. Ludger's, at Münster; St. James's, at Rothenburg; in the eastern choir of the Cathedral of Augsburg; St. Godehard's, Hildesheim; and St. Catullus's, at Moorburg (of which we will give an engraving).

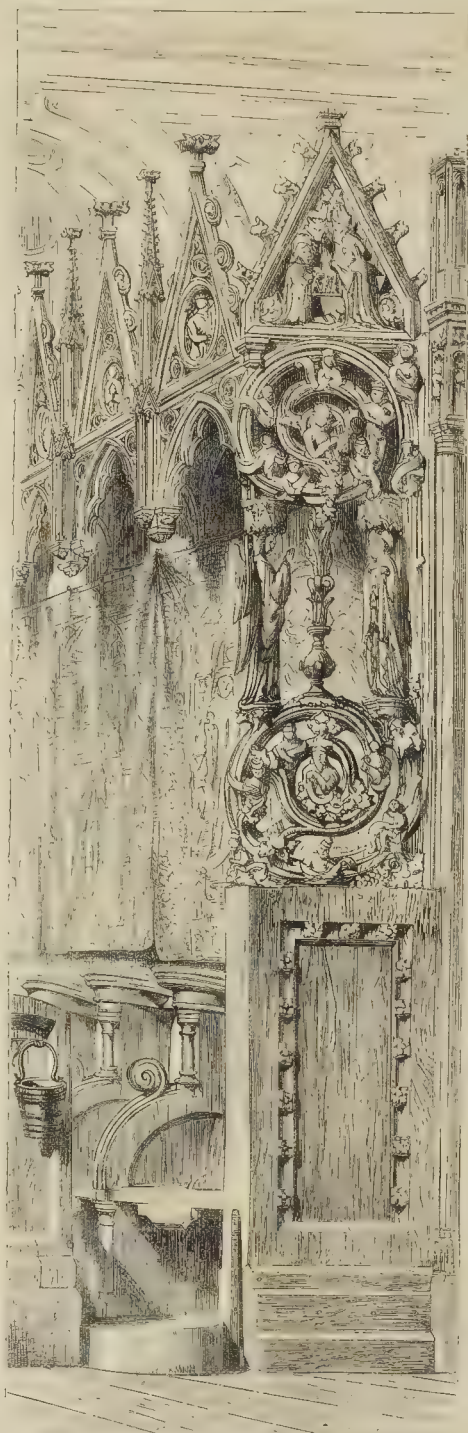
Of the fifteenth century, the examples are still more numerous, and many of them remarkably rich and magnificent; in fact, this seems to have been the century in which this article of church furniture was most carefully studied, and made of even greater importance than its use and position would quite seem to warrant. The superb stalls of the cathedrals of Ulm, Vienna, Munich, Freising, and Augsburg (western choir), and the churches of St. Martin, at Landshut; St. Andrew, at Ochsenfurth; St. Borkard, at Würzburg, amply prove the care and skill which both architects and workmen lavished upon choir-stalls during the fifteenth century.

Examples of the sixteenth century are not so numerous nor so elaborate as those of the former century. The finest examples we know are the stalls in the choir of the Cathedral at Münster, which date from the year 1535. A slight admixture of Italian detail is to be observed in the ends of the benches. In this case there are no canopies. A good example occurs at St. Michael's, at Hildesheim, which were probably erected in the latter part of the sixteenth century. There are canopies over these stalls. Italian detail is largely intermixed with Gothic; in fact, the general effect is rather more Italian than Gothic. In the church of St. Mauritius, at Münster, the stalls are of the same mixed style, and are probably of about the same date.

Well-designed stalls of the seventeenth century may be seen in the churches of St. Emmeran, Ratisbon; St. Lambert, Münster; and the Cathedrals of Freiburg and Ratisbon. They are, of course, quite Italian in detail, but still retain the ancient form and arrangement.

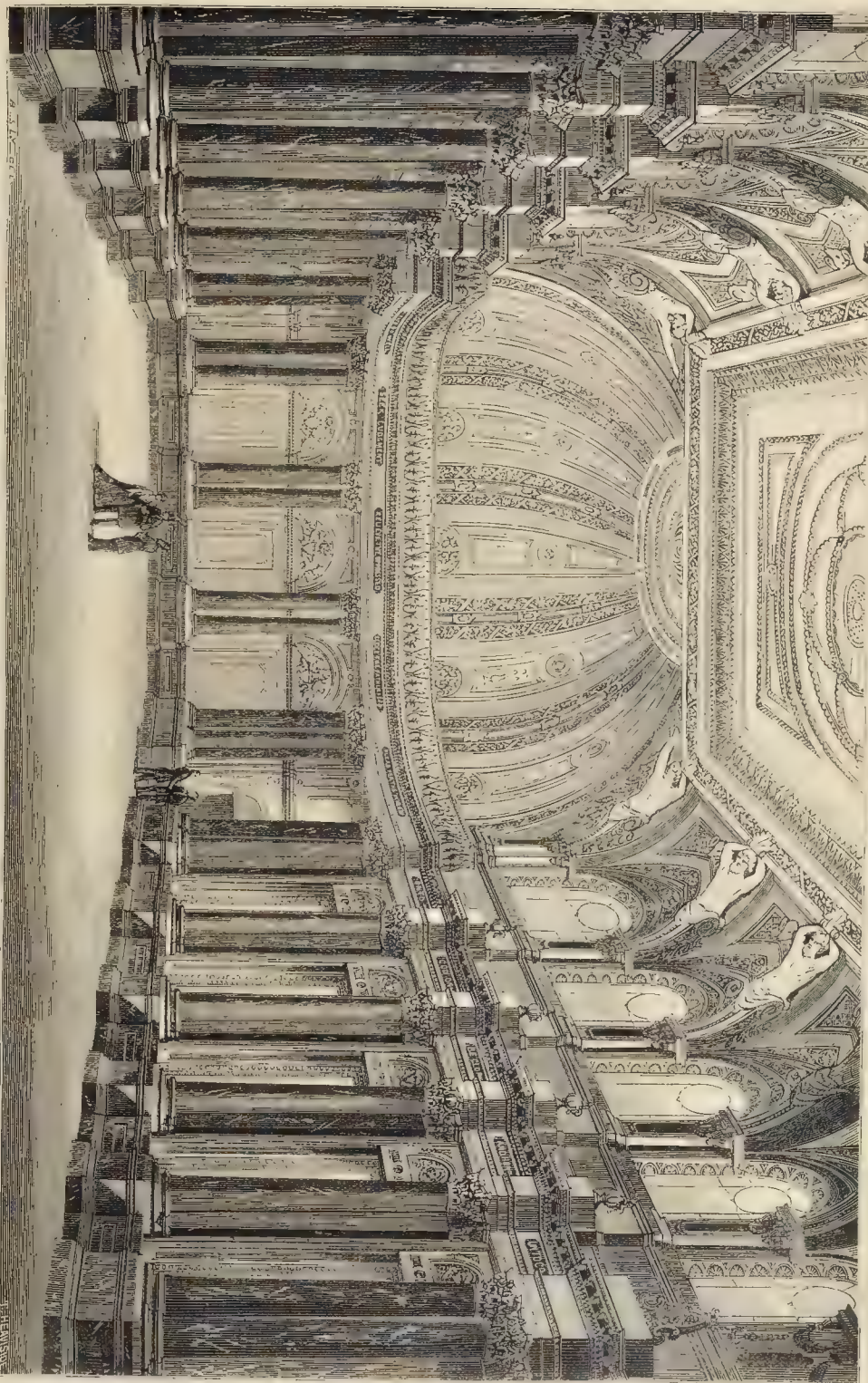
In the eighteenth century the stalls became a confused heap of clouds, cherubim, vases, and shells; in fact, anything but architectural features. Horrible examples of these extravagances may be seen in the Cathedrals of Würzburg, Worms, Linburg, and Mayence.

Proposed Education Bill.—The Education Bill proposed by the "National Education League" may be summed up thus:—1. Local authorities shall be compelled by law to see that sufficient school accommodation is provided for every child in their district. 2. The cost of founding and maintaining such schools as may be required shall be provided out of local rates, supplemented by Government grants. 3. All schools aided by local rates shall be under the management of local authorities, and subject to Government inspection. 4. All schools aided by local rates shall be unsectarian. 5. To all schools aided by local rates admission shall be free. 6. School accommodation being provided, the State or the local authorities shall have power to compel the attendance of children of suitable age not otherwise receiving education.



CARVED STALLS, HILDESHEIM, GERMANY.—FOURTEENTH CENTURY.

THE HALL OF THE DRAPERS' COMPANY, THROUGHOUT STREET, LONDON.—MR. HERBERT WILLIAMS, ARCHITECT.



HUNGERFORD.

I AM afraid I cannot gainsay the generality of the remarks of "Gargyle" in his letter headed "A Hint to Hungerford," in your last week's issue. The good people of the town seem to have but little spirit of progress; but for what little they do show I think they ought to have credit. The "painful" architecture of the old church must be admitted, and it requires fully three miles of that distance which lends enchantment to the view to render it picturesque among the foliage of the beautiful valley of the Kennet. There is, however, another church, a modern one, designed with taste; it is built of brick, the chief local material. It was erected two or three years ago from designs of Mr. A. W. Blomfield, who is also architect of the Church school now building in the suburbs.

The Wesleyans have also just finished a handsome chapel opposite one of the hotels mentioned, and it forms quite a feature in entering the town from Oxford. It was built by Mr. Philips, of Swindon, from the designs of Mr. Wilson, of Bath, architect.

Last, but not least, I am happy to inform you there is every prospect of the "hideous Georgian town-hall" being swept from the face of the earth this year. The civic as well as religious authorities have been exerting themselves, and in all probability a new town-hall and corn-exchange—not "standing in the gutter," but on a new site opposite the present building—will soon be commenced, the plans for which have already been prepared, at an estimated cost of upwards of 2,000*l.*, by Mr. J. P. Spencer, of Wantage, architect.

I can quite endorse your correspondent's censure of the Great Western Railway Company. The station was burnt down a few years ago, and the goods and cattle shed has ever since been made to serve as well for what the company seems only to consider another class of cattle, viz., the passengers. OBSERVER.

A WORKING MAN ON EDUCATION.

SIR,—The speeches of those who legislate for the people are, in general, of some interest to the community. It may be that their sayings do not show great wisdom or much knowledge. Nevertheless, they are the thoughts and opinions of the men who rule us. Perhaps on no question of the coming session of Parliament will there be more conflicting opinions than on that of national education. For the last half-century this great question has been muddled about,—of great importance for a short time, and then for a long time forgotten. Royal Commissions almost out of number have sat, and evidence has been given that the present so-called educational system is altogether unsuited to the wants of a great nation and the age we live in, as under is not one in four of the few scholars that now attend school receive a fair elementary education. The agitation has not been continuous. It has as yet been by fits and starts; something like a bright meteor, shining for a time, then receding to a glimmer, which gets fainter, until it is entirely lost sight of. Whenever the question has been before the people a large amount of opposition has been called forth. The difficulty has always been the balancing of religious parties; and although they are still at variance as to what catechism or dogmas shall be taught, they are still agreed that rather than an unsectarian system shall be established, in which no party shall have a preference or gain an advantage, they will oppose the new scheme, because it is not denominational. And it is now a question whether the breakers which have wrecked so many movements, and kept the working classes in ignorance, shall again bar the way to a thorough national system. In this new movement I believe its success largely depends on the enlistment of working men into its ranks, who are aware of the deficient state of education, and who are in earnest to help any movement to provide a remedy. I believe the working men, who know the issues at stake, look with dismay on the revival of the sectaries, and of their amalgamation. Hitherto it has been their antagonism which has blocked the way; now it is to be their union. I suppose they now feel the old foundations crumbling beneath their feet, and they know the cracked walls must soon follow. Still they are determined to make another effort to maintain ignorance and inefficient education. The misrepresentations of party papers and speakers are again conjuring up all sorts of

imaginary dangers, and are calling loudly for protection to existing rights and vested interests. Quite recently a public man addressed his constituents on the great question of the coming session, and, without doubt, his speech may be taken as a fair *resumé* of the course the Opposition will take when the question comes before Parliament. Although the speech was honoured with a leading article, there never was, in my opinion, a more barefaced misrepresentation of facts placed before the public. The speaker certainly could not have known what he was speaking of, or else he had a very low estimate of the understanding and discernment of his hearers. It must, I think, appear somewhat strange to educational reformers that the advocates for upholding the present system did not think about improvement till the agitation for a national system began; and it is false to state that the League wishes to pull down any efficient school, and build another at the ratepayers' expense, where the one already established is doing its work in a proper manner. The working men's would-be educational friends are, it seems, terribly afraid they should become "educational paupers." It is a great pity the speakers do not give a definition of the word "pauper." But I suppose the word only applies to working men.

Some of us know employers who have sons being educated in the Blue-coat School, receiving board, lodging, clothing, and an advanced education free. I wonder whether there is such a thing as middle-class educational paupers. If so, they do not seem very anxious for independence, as I never yet heard of one who objected to his children receiving the advantage of a free scholarship in an endowed college or school. But I have yet to learn, in spite of all that has been said, that if schools are supported by rates in lieu of fees, and that I, as a working man, pay my share, and my children go to the schools, in sending them I should be a pauper. It appears to me that schools supported by rates are more independent than those that are partially supported by voluntary contributions; and, what is more, they will not be liable to the fickleness and fluctuation of funds, which the present voluntary schools are subject to. Some humiliating tales can be told, of how the present contributions are gathered. The clergyman, in too many cases, is obliged to humble himself to the position of a beggar. I myself once heard one plead to a rich lady for a guinea. He dwelt upon the great advantages of educating the poor; he showed that it promoted law and order; and that it taught them to respect property, and made the rich more secure. I heard the comments of the servants, and I felt even then that a question affecting the well-being of society ought not to depend on the humbling of clergymen or voluntary aid. If the present supporters of schools feel that it is good to give, I believe they can still find the means to aid the ratepayers; and if it cannot be arranged, they can provide rewards for the most efficient scholars. The opponents of the League state "that it is a parent's duty to see that his children are well taught; and if he has to pay for it, he will take care that he gets something good for his money." Only think of a drunken, ignorant parent, who never learned so much as the A B C himself, and who, to gratify his own depraved appetite, keeps his children half-starved, caring about intellectual food! The best of the labouring classes are only half in earnest about their children's education, because they were never taught much themselves, and what they never had or felt the want of, it is plain they will not be very earnest about obtaining for their children. As to the choice of schools, I wonder what power the working man has over the present schools. In the majority of cases, if he does not like one school, or the system of teaching, he is forced to continue at that because there is no other,—he at present has no voice in the election of committee or managers,—so that working men are forced to take that which is not what they desire or want. In this great world of London, schools are not many, but few; nothing is more difficult than to find a school which teaches an average amount of knowledge; and when found there are so many obstacles in the way of admittance: the children must be dressed after a certain pattern; and their hair must be combed straight, not curled or plaited, as that would be imitating their betters. I myself have six children to provide with education; and, although they cost me something like 2*s.* 6*d.* a week, I am bound to admit that I get but a poor return for my money. And, if space admitted,

I could tell of some curious things in connexion with the much-vaunted voluntary system. The question is so great, and the issues so vital to the welfare of the people, that in a short letter there is not space to touch one half of the matter. I have not yet stated why I agree with the National League. I think as so many friends are now so concerned about the education of the working classes, and as some of them are talking such queer things about our wants and requirements, the working men should be allowed to say a little for themselves, and ventilate the question from their point of view and experience. And as the social, moral, and educational well-being of the people has always been earnestly advocated in the columns of the *Builder*, I know it maintains with the poet:—

"That they who seek the mind's improvement
Aid the world in aiding mind;
As every great commanding movement
Serves not one, but all mankind."

JACK PLANE.

ARCHITECTS' ACTIONS.

SEQUEL OF A COMPETITION.

Barker v. Presteign Burial Board.—This was an action recently brought in the Hereford County Court, by Mr. E. H. Lingen Barker, for the recovery of 50*l.*, for services rendered by him in his profession as an architect. The facts elicited by the evidence may be summed up as follows:—

In 1866 the Burial Board of the town of Presteign invited several architects to submit designs in competition for the erection of two chapels, and eventually accepted the one sent in by plaintiff, on condition that it could be carried out for 700*l.* In due course the plaintiff was formally instructed to make the working drawings, to send a copy of the plan to the Lord Bishop for approval, and to have bills of quantities prepared for the builders; a resolution was also adopted agreeing to the payment of 5 per cent. on the outlay for drawing and superintendence. At the time when the advertisement was inserted in the local papers a strike existed in the trade, so that only two builders came forward, and one of these retired from the field at the last moment. The remaining tender, on being opened, was found to be within the prescribed limit, and inquiry respecting its author (Mr. Edwards, of Leominster) showed that he had just carried out a 3,000*l.* contract to the satisfaction of a London architect and a Government inspector.

Nearly a year's delay now took place, in consequence of an informality in the Board's formation, which necessitated its reconstruction. The seven old members were, however, re-elected, together with fresh ones in the places of two who had resigned. The new Board, at its first meeting, directed the clerk to request plaintiff and Mr. Haddon (the author of one of the rejected designs) to *re-submit* their respective plans. This order, however, the clerk did not obey, but asked plaintiff simply to send his plans for the inspection of the Board, "consisting now almost entirely of new members." Plaintiff, suspecting nothing, fell in with this apparently natural request, and sent his plans. Then, without communicating in any way with him, the Board at one meeting rescinded all the resolutions relating to his appointment, and at the next decided upon insisting that Mr. Edwards should find security for the completion of the contract (though no notice of this had been given in the advertisement), and further that he should bind himself to carry out the work for his estimate "without any extras of any description." To the probable surprise and disappointment of the Board, Mr. Edwards agreed at once to these two fresh importations into the case.

The Board then took objection at the next meeting to the sureties named by Mr. Edwards, adjourned for three days, and required fresh names to be supplied in the interim. By the delaying a post, and ante-dating the letter, the clerk is said to have limited Mr. Edwards' power to one day only. Mr. Edwards was absent when the letter arrived, and was therefore unable to send an answer by return of post. The adjourned meeting took place next morning, and a member named Davies, was deputed to ascertain if Mr. Haddon could reduce the cost of his design to 600*l.* Immediately upon his return Mr. Edwards went to Presteign, prepared with the names of two fresh sureties; the clerk, however, informed him that he was "too late;" that it was needless to name these, the Board proposing to employ Mr. Haddon, instead of the plaintiff. The clerk further said, that the Board wished him (Mr. Edwards) to do the work, so that he had better send in an estimate for the new plans. This, however, he flatly declined to do, observing that he had been "foiled enough already." Two days after this a meeting was held, at which Mr. Davies reported that Mr. Haddon would guarantee that the cost of his design should not exceed 600*l.*; and the clerk also reported that Mr. Edwards had stated to him that he had been under a misapprehension respecting the stone, and finding now that he was expected to provide it, he should withdraw his tender. Mr. Haddon's plans were then substituted for plaintiff's, and advertisements for fresh tenders ordered to be inserted in the local papers. On seeing these plaintiff wrote to the clerk, expressing his astonishment, and demanding an explanation; receiving, however, no reply, he wrote a second letter direct to the Board, remonstrating at the manner in which he had been kept in ignorance of their proceedings, stating that he had fulfilled all his instructions; and that if a cheaper plan was all they wanted, they should have applied to him to reduce the cost of his design. It is not clear from the minutes whether this letter ever reached the Board, but formal notice was subsequently sent plaintiff, "to state the amount of his claim." This he did, his account amounting to 50*l.*; the Board, however, made a counter offer of 20*l.* (to avoid litigation), a sum which plaintiff declined to accept.

The defence amounted to this,—That the contract was made conditional upon plaintiff's finding a builder to carry out his design for 700*l.*, and that he had practically failed to find such a one, inasmuch as Mr. Edwards had not fulfilled the Board's requirements as to security, and furthermore had withdrawn his estimate in the conversa-

tion that had passed between him and the clerk. Mr. Edwards, however, indignantly denied that he had either thought of or mentioned such a thing, while, on the contrary, he was fully prepared to carry out the work and procure the stone as the specifications described, and as he had always calculated upon. The plaintiff's counsel, in reply, argued that even if Mr. Edwards had withdrawn his tender (improbable in the extreme, as it was that he would have chosen the time and circumstances alleged), the plaintiff ought still to recover, because the time when that event was stated to have taken place, was a year after the assurance had been given that the work could be carried out for 7000, and the "conditional" element in the contract applied to plaintiff as well as to defendants.

The judge directed the jury that the points for their consideration were—(1.) Had the plaintiff found a builder to carry out his design for the amount named? (2.) Had this builder been given full opportunity for complying with the wishes of the Board respecting the security? (3.) Did they believe this builder's statement that he had not withdrawn his tender? (4.) Had a reasonable, or rather had any opportunity been afforded plaintiff for substituting another builder, or reducing the cost of his design? After a few minutes' consideration, the jury returned a verdict for the plaintiff, and the costs were ordered to follow the result.

Since the hearing of the case, an attempt has been made to procure a new trial on the ground of "excessive damages." The judge, however, without hearing the reply of plaintiff's counsel, refused to disturb the verdict of the jury.

VALLANCEY, THE IRISH ANTIQUARY.

Sir,—I have just seen an extract from your paper in the *Dublin Daily Express* of the 30th ult., headed "Colonel Vallancey," giving a short account of him as the Irish antiquary, and as the Englishman in Ireland devoting his time and attention to the elucidation of the Irish language, and the Irish race. It also says, "The writer made a search through all the metropolitan directories of the three kingdoms, but failed to meet with the name," and, "strange if his fifteen children and their descendants (supposing they were married) have died out. Perhaps in the Army List or in France some of the Vallancey parent stock, or English or Anglo-Irish descendants, may be found."

As one of the descendants, that is, as grandson of General Charles Vallancey, I now write for the information of the writer of the notice in question.

Of the General's four sons, one only, the eldest son, my father, left issue; he, however, had but ten children. Five of his married daughters left issue; and some are now living, though some of their grandchildren are. A sister, a younger brother, and myself, are the only grandchildren of the General's surviving. Four sons of an elder brother, deceased, with three of my own, exist to carry down the name of Vallancey. None of the parent stock are to be found in France, for my grandfather alone remained of the ancient and noble family, the Marquis d'Estoupe de Vallancey. The General's grandfather had to fly from France on the revocation of the edict of Nantes by Louis XIV. The Marquis and his only son, General Vallancey's father, both died in exile in Flanders, where my grandfather was born. He was sent to England when a child, and brought up by a relation on the mother's side. He was educated at Eton College, and early entered the army. The chateau and estate of Vallancey, in Berri, were seized by the Crown, and remained in the possession of the Crown until Louis Philippe's time, when they were given by that king to the famous minister and diplomatist, Prince Talleyrand, and are now enjoyed by his nephew and heir, who has been created by the present emperor Duke de Vallancey. As regards the valuable MSS. supposed to have been left by the General, and to be in the possession of the family, I have never heard of them, nor do I think they exist, but if such there are, they must be in the possession of my brother, who, from always residing in England, while my lot was cast in India, came eventually into possession of any papers of my grandfather's that existed.

Dinan. G. P. VALLANCEY, Lieutenant-Colonel.

CAMBRIDGE CORN EXCHANGE COM- PETITION.

THE six designs received in competition having been referred to Mr. A. Waterhouse, that gentleman reported that he considered, on the whole, the designs of Mr. John Edlin and Mr. R. R. Rowe possess the greatest merit.

"Mr. Edlin's design is in the Greco-Italian style, somewhat similar to that so much in vogue in German railway stations. Its simplicity, its inexpensive detail, its business-like appearance and fitness for its purpose, and its varied skyline are all, as it seems to me, specially commendable points. The exchange itself is rectangular on plan, giving about 9,500 square feet of floor space; the roof is supported by a double row of iron columns, dividing the building into what may be termed a nave and side aisles. There are no galleries. The room is lighted principally by continuous skylight along the centre of the roof of the nave. This, it seems to me, might prove scarcely adequate to the special requirements of the case; but this defect, if it be one, might be easily remedied by merely increasing the width of the space devoted to glass on either side of the roof, so structural alterations would be nothing needful. There are, in this design, no side-lights, except in the gables in the centre of each front, rising above the general line of eaves; each of these is emphasised by a 3-light window.

In the centre of the roof rises a lantern, of wooden construction, square on plan, with a dormer on each of its sides.

Internally the semi-circular roof of the nave has a pleasing effect. Abundant ventilation is provided by a clerestory.

My impression is that this design would prove by far the least expensive to carry out of any submitted to you, and that it could be satisfactorily erected for the sum named,—10000."

Mr. Rowe's design is Gothic in style. The reference says:—

"In my opinion, it is, in point of elevation, the most attractive one submitted; at any rate, so far as the main building is concerned. It is pleasing in outline: the ornamentation is not redundant, and the treatment of the

walls is good, both within and without, especially the arrangement of the buttresses internally, from which spring the roof-principals. It is proposed to erect the walls in white brick, with a certain intermixture of red brick in the arches, which are all either round or segmental in form. Polychromy is also sparingly introduced in other ways."

"Mr. Rowe submits three schemes. The plan (C) seems to me decidedly the best of the three submitted by Mr. Rowe; it gives nearly 11,000 square feet of floor space.

The otherwise pleasing effect of the interior is, I think, somewhat marred by the disjoint line of the circular-ribbed principals, which again are disconnected with the tie-beams of the king-post principals above.

The two sets of retiring-rooms seem quite satisfactory in their arrangements, and the vestibules are good.

This design would cost, I believe, nearly 50 per cent. more than Mr. Edlin's."

A design by Mr. Fawcett received special mention.

The report was laid before a special meeting of the town council last week, and after considerable discussion, Mr. Rowe's design C was adopted.

WORKING MEN'S COLLEGE.

NEW ROOMS.

THE winter convocations was held on the 7th inst., at the College, in Great Ormond-street, and on this occasion the new class-rooms, which have been built by Messrs. Haward, from the designs of Mr. Webb, were thrown open for inspection. These are erected on land at the back of the house in Ormond-street, and are plain in construction, not to say rude. The building is of horse-shoe, or rather magnet shape,—two parallel blocks (with entrance at end of each) connected by a semicircular end, the whole divided into class-rooms which open by an arcade into a narrow corridor that runs round the inner side of the magnet. Some columns, with wide blocks of stone for capitals, in the arcade opening to corridor, afford an opportunity for carving hereafter. The rooms are all lighted from the top, where the large amount of glass will, we fear, under certain conditions of the weather, be productive of inconvenience, and are to be warmed by a stove in the centre of each apartment with a descending flue. Some additional means for the escape of foul air and the prevention of draughts will be needed beyond those at present obviated.

THE METROPOLITAN WATER SUPPLY.

THE Metropolitan Board of Works has been discussing this subject in considering the report of their Works and General Purposes Committee as to it, on a motion by Mr. Freeman,—That the Chairman be requested to seek an interview with the Home Secretary for the purpose of inquiring whether it is the intention of the Government to bring in a measure founded upon the report of the Royal Commission on Water Supply; and also to place before him the Board's general approval of the report. To this motion an amendment was proposed by Mr. Shaw, to the effect that, before seeking an interview with the Government, the Board should ask upon the recommendation made to Parliament by the Select Committee of the House of Commons in their report dated 27th June, 1867, on the East London Water Supply Bills, viz.—That the Metropolitan Board of Works shall have an opportunity of examining the question of a constant supply of water, and of communicating with the companies on the subject, for the purpose of applying to Parliament, if necessary. The Board had also the Notice of Motions given by Mr. Roche, on the 17th December, to consider.

Mr. Roche argued at some length against the recommendation of the Royal Commission that the Board of Works should purchase and carry on the business of the water companies. To do this they would be compelled, he remarked, to borrow ten millions sterling, and the annual interest upon this sum, at the rate of 4 per cent., would be 400,000. Rather than incur the enormous expenditure, he suggested that the companies should be compelled to give a constant supply, under the direction of the Board. Practically, any augmentation of the quantity of water now furnished to the higher and middle classes would lead only to waste; and although there was room for reform with respect to the manner in which the poor were supplied, the vestries possessed ample power to compel the owners of property to obtain an adequate service of water. He argued that a constant supply could be obtained from the water companies at a much less cost than by the plan proposed by the Royal Commission. Mr. New-

ton did not agree in this opinion, and maintained that it was the duty of the Board to affirm the principle, not only that a constant supply was necessary, but that it should be placed under the control of a municipal body. After Mr. Newton's speech, the debate was again adjourned.

We may here remark that Professor Frankland reports that the samples of the Lambeth, Chelsea, and East London Companies' waters, examined by him during the last month, all contained living organisms. The Lambeth water is said to have been "very turbid and unfit for domestic use without previous filtration."

CARLISLE BRIDGE, DUBLIN.

FOR some years past the public have with justice called for the erection of a wide and level bridge in place of Carlisle Bridge, Dublin.

In response, Mr. Charles Geoghegan, architect, has submitted to the public a design for retaining the present structure, and forming lateral extensions to the width of Lower Sackville-street, viz., 153 ft., presenting a perfectly level and uniform roadway throughout.

The estimate, prepared by an eminent firm of Irish engineers, has been furnished for completion of the entire structure within one year, without interruption to the traffic in any way, at 29,000.

The model has been visited by a large number of persons, and the most competent judges of such matters, as well as the merchants, traders, and professional men most interested in the welfare and progress of Dublin, and in all that concerns its facilities for traffic, its architectural beauty, and its pleasantness as a place of residence, have signed a statement of their cordial approval and admiration of Mr. Geoghegan's plan.

THE SANITARY CONDITION OF WAKEFIELD.

IN reference to the complaints to the Privy Council as to the sanitary state of certain parts of the borough of Wakefield, a report to the medical officer of the Privy Council, signed J. Netten Radcliffe, has been made and printed. In a summary, the reporter says:—that the localities complained of (Eastmoor, Westgate Common, certain courtyards in Kirkgate, &c.) were in a highly insanitary state;—that the middens throughout the town are radically filthy; and that there is a want of all proper provision for the removal of their contents;—that great improvement has been effected in the drainage by the completion of the main sewers, but that still much requires to be done for the thorough drainage of courts and alleys; that the state of the Chald and Ings Beck (and Westgate Beck) is scandalous;—that the local authority has neglected in several important respects to carry out the sanitary powers entrusted to it;—that the town is unhealthy, particularly certain low-lying localities, and that this unhealthiness is largely dependent on the insanitary conditions complained of, and upon the imperfect administration of the sanitary laws. Other points are referred to; and the report ends with several provisional recommendations.

THE ARCHITECTURAL EXHIBITION SOCIETY.

AN effort is needed in favour of this society. The council consider that the period has arrived, taking into consideration the increased art education of the public, and the necessity for insisting upon the proper recognition of architecture as a fine art, when a strenuous effort should be made to place the exhibition on a more substantial basis; and this can only be done by obtaining the general assistance of the profession to secure a first-rate exhibition of works in their branch of art, in order that the public may find it as much as possible attractive and interesting, and be able to form a fair judgment of the progress of architecture in this country.

It was anticipated last year, when the Academy took possession of their new premises, that they would have been able to set apart at least one of their galleries for architectural drawings exclusively, and with increased accommodation to provide for a suitable representation of the architectural profession. Such, however, was not the case. Amongst the works exhibited were only fifty architectural drawings, representing the works of about thirty architects.

It is hoped that the profession generally will now carefully consider whether they desire that their drawings shall be collected together annually for exhibition, or, in a great measure, be omitted from the annual gatherings of art works in London. Unless, however, architects are willing to aid and support this society, the council will reluctantly have, after the next year, to discontinue the exhibition, as they cannot otherwise possibly hope to make it either worthy of the profession it desires to represent, or of the attention of the general public. We make this appeal, therefore, in the hope that the profession will give it its united help. Money is wanted as well as drawings.

THE TOWN SURVEYORSHIP OF LEAMINGTON.

SIR,—I have received the particulars of this recent appointment as advertised in the *Builder* of this day, and was highly anxious to see one of the stipulations as to the engagement, namely, that "the Surveyor must not be absent from the town without obtaining the consent of the Board or its Chairman." Surely this advertisement, instead of being headed "*To Engineers*," should have been addressed "*To Men versants*!"

From such a commencement it would appear a desirable berth for a professional man.

C. E.

THE BELLS OF ST. CLEMENT'S CHURCH, SANDWICH.

SOME surprise having been expressed at the sale of the bells to raise funds to repair the Church of St. Clement, Sandwich,—vide the *Builder*, 1st inst.—I have the best authority to state that "the bells were not sold as the first step towards the restoration of the tower, but as the last desperate resort, when all other means, including a public appeal and subscription list, had been tried, and the result was not sufficient to cover the outlay."

Moreover, the following passage from "Boyle's Collections for an History of Sandwich, 1792," is worth attention.

"There are five bells, not very tuneable, and consequently of little use but to hasten the downfall of the venerable steeple in which they hang."

And having myself examined them a few years ago, I am enabled to say that they were only fit for the melting-pot. They were made by John Hodson in 1672, and had no interesting inscriptions.

I may add that the sale of the bells, four in number,—one of the peal being retained,—took place in a former incumency, and that the present vicar, the Rev. Arthur M. Chichester (by whom subscriptions will be thankfully received), "is a resolutely bent on the further restoration of the ancient and massive edifice in all its pristine beauty, and declares most strenuously against anything approaching to modernisation." THOMAS WALLSLEY.

MIDLAND COUNTIES IDIOT ASYLUM COMPETITION.

In reference to a communication from "Competitor," which appeared in your last issue, I shall feel obliged if you will allow me to say on behalf of the Building Committee that it is their intention to exhibit all the competing plans before the final decision is given, and the award made, unless any competitor should intimate to me, under cover of his motto, his objection to his design being exhibited.

W. G. BLATCH, Secretary.

MEMORIAL TABLETS IN LONDON.

SINCE our last observations on this subject, the Society of Arts have caused tablets to be fixed on houses formerly occupied by Benjamin Franklin, 7, Craven-street, Strand, W.C.; Sir Joshua Reynolds, 47, Leicester-square, W.C. Leave has also been obtained to affix similar tablets to the former residences of Lord Nelson, John Flaxman, George Handel, John Dryden, Sir W. Blackstone, and Oliver Goldsmith.

IMPROVING THE ACOUSTICS OF A CRIMINAL COURT.

At the Herford Sessions, an account has been given of proceedings towards the improvement of the acoustics of the Criminal Court, about the state of which there have been serious complaints. A committee was appointed to consider the subject. They soon ascertained where the mischief lay, namely, in the projection of the gallery and the involuntary noise which a large number of people must necessarily create; making the transaction of the business proper of the Court very difficult indeed. The authority of Sir Christopher Wren on this subject was quoted, to the effect that in theatres and concert-rooms the nuisance of involuntary sounds did not so much interfere with the operation of the sound, because just at the most particular crises the audience were more than usually interested to listen; but in courts of law it is quite dif-

ferent,—the greatest excitement was productive of the greatest noises when the greatest silence was most needed. The first necessity of the plan, it was found, would be the removal of the front seats of the gallery, to enable the space devoted to the official part of the court to be so arranged that there should be no difficulty as to space, and more opportunity to enable the magistrates to get from one part of the court to the other without going out of it,—a plan which had been found to answer well at Worcester, Warwick, and other places. The county surveyor was consulted as to the alterations desirable, and has reported on the subject. The expense he estimates at 500*l.*, which includes the cost of a new gallery and increased accommodation.

CHARLES L'S WATCHES.

As "R." in your last number does not seem quite clear upon the story of the watch which was in Ashburnham Church, it may be interesting if I say that the description in your "note" was true, and the only loss, at the time spoken of, was that of the case of the watch, no doubt stolen for its "melting" value. The remaining relics were then taken to the mansion of the Earl of Ashburnham, where, I suppose, they still remain.

Mr. M. A. Lower, F.S.A., the late editor of the Sussex Archaeological Society's Collections, believes the watch belonging to Mr. W. Mitford, M.P., Midhurst, to be the best specimen. This is engraved in the eighth vol. of the Collections, and an account is given also in the third vol. It was presented to Mr. Thomas Herbert when the king was on his way to execution, and descended from him to the present owner.

W. W. T.

THE author of the "Handbook of Eastbourne" sends a note in which he says, the remaining relics were "wrongfully removed thence to Ashburnham House by the Earl of Ashburnham. I say 'wrongfully,' because I have always understood that the watch and the shirt were bequeathed to the Church, to be exhibited there 'for ever.'"

AN INTERNATIONAL COMPETITION.

PREMIUMS of 1,500 francs (60*l.*) and 750 francs (30*l.*) are offered respectively for the best two designs for a Protestant church, to be erected in Crefeld, Prussia, and foreign architects are invited to take part in the competition. The cost of the building is not to exceed 206,000 francs (8,240*l.*), exclusive of organ and bell-tower. Materials and workmanship cost less there than in France. The jury, of five, includes three architects,—one from Düsseldorf, one from Cologne, and a third of Crefeld. The conditions, plan of site, and lists of prices may be obtained by writing, post-paid, to the "*Presbytere de l'Eglise Evangelique de Crefeld*." The designs are to be sent in under motto before the 31st of March next.

ON THE MANUFACTURE OF PORTLAND CEMENT.

BEING in the neighbourhood of Rochester, I took the opportunity of visiting the cement works at Halling, and think the following remarks may be useful to some of your numerous readers. I therefore submit them to you for insertion in your journal.

Portland cement is manufactured from a species of grey chalk quarried from the cliff, and mixed with river mud (generally brought from Gillingham) or clay, and is prepared in the following manner:—The smaller pieces of chalk (the larger being kept for making lime) and a due proportion of mud are placed in a wash-mill, with a sufficient quantity of water to cause them to amalgamate freely; it is then run off into buckets, and allowed to settle for a few days. The sediment thus obtained is then conveyed to a drying ground, floored with iron, and heated by fires underneath, where it is allowed to remain for a day or two. When cold, it is placed in a kiln, and burnt into a hard substance, which is afterwards ground into a fine powder in a mill.

The strongest cement is of a bluish grey colour, sets slowly, and weighs about 122 lb. per bushel.

The quick-setting cement is of a brownish hue; owing to too large a proportion of mud, and being not sufficiently burnt is light, turns out weak; and generally flies or bursts the work.

HERBERT W. DALE.

LIST OF SCHOOLS OF ART AND SCHOOLS OF SCIENCE.

WE are constantly asked from various parts of the country, as well as from London, where a School of Art or School of Science can be found. The "Calendar of the Department of Art for 1870," just now published by Chapman & Hall, for a few pence, gives full lists of the various schools in connexion with the Department. It also gives amongst other information suggestions as to the course to be pursued by those who wish to establish a science school or class with the aid of the Department, and memoranda for secretaries.

DETERIORATION OF LEAD PIPES.

My attention has been called to your paragraph on the "Deterioration of Lead Pipes," which deserves particular notice, as I have no doubt there are many instances of the kind which pass undiscovered. I have just had a closet removed, which was fixed about eighteen or twenty years ago, under the direction of my late father, who at that time had begun to use air pipes connected with the soil-pipe. In regard to the closet in question, it had caused a fearful smell in the house, and no one could discover the cause. On making a thorough examination, I found part of the trap, and the bend beyond, eaten away in the manner you describe. The soldered seam was the part most affected; a 1-in. air-pipe was fixed in the bend of the soil-pipe, and carried up above the roof. I have now put in a cast lead trap, and made the air-pipe 1½-inch diameter instead of 1 in., as before; but in most cases I think 3 in. not any too large. Rain-water supply had always been used.

S. J. BARBER.

SEWERAGE AND STRATEGY.

HAS it occurred to any of our professional defenders what a very weak joint in our armour Barking Creek would be, supposing an enemy in the Thames advancing upon London? The mouth of that Main Drainage sewer is the very key of a position, upon which is rested the safety of our great metropolis. With this stopped up, a shocking flood of pestilence, and an eruption of unutterable gases, would invade every house and blow up every highway; and it is not very difficult to imagine the possibility (in time of war) that the ship's crew of some rapid and impregnable iron-clad might, by a *coup de main* at Barking, fling back our accumulated river of sewage upon unhappy London by merely destroying certain machinery and flinging the debris into a tunnel.

Ought we not to take in peace some precautions against so frightful a possibility of war? Should not a strong defensive work fortify some spot on those desolate and olfactory Essex marshes, so as to hinder a sudden descent upon our main sewer? Or, better still, considering the health and comfort of gunners, should we not make surer of the defences already in existence at Tilbury and Chatham, with, perhaps, the addition of a stationary turret-ship in the Thames, handy enough to serve as a floating fortress, by way of strengthening this weakest point in the defences of London? M. F. T.

A SUGGESTED NEW ROAD: LONDON.

SIR,—The site for the new buildings of the Post-office Department in St. Martin's-le-Grand is now cleared out, but is as yet unbuild on. Is it too late again to suggest, what has been sometimes before mooted, but perhaps never under circumstances more favourable than now?—the formation of a new street due north from the centre of the dome of St. Paul's Cathedral, and which should be carried to the junction of Old-street-road and Goswell-road, by the Charterhouse Gardens. This street, if of adequate width, the Post-office new building on one side, with the buildings of Christ's Hospital, St. Bartholomew's Hospital, and the Charterhouse, or its successor on the other, with such other public buildings as so great an opportunity would invite on either side, and with the beautiful outline of the noble cathedral at the end, might be made the finest street in Europe, and of equal convenience with any. It need not all be done at once; but let all new buildings to be erected be so planned as to suit that arrangement, allowing the present old buildings to remain, to be removed as circumstances may favour.

A. B.

THE FLEET DITCH.

Will one of your correspondents kindly inform me how the Old Fleet ditch was brought under or over the Regent's Canal? When this canal was constructed—I think, but I forget the date of such construction—the old ditch, which I well recollect as a boy at Camden-town in 1840-42, ran as a rather pretty country stream, getting a little *sewer*, though, past the gardens of the Old Castle Tavern, Kentish-town; plashed down a very deep arch at the end of what is now Clarence-road; and emerged again at the corner of Pratt-street, running through Goodall's grounds (Messrs. G., the card-makers); and again going under by the Elephant and Castle, reappearing at Battle Bridge road. How did the Regent's canal, which cuts the Camden-road, interfere with the course of the venerable, albeit dirty, stream? Was the stream culverted under the canal, and where, or taken up by pipes?

Though the source of the Old Fleet is given generally as at Hampstead, there is a very good sized branch which rises at Highgate, near the Cemetery, flows through the Porters-terrace fields, and joins the larger branch at Mansfield-place, Kentish-town. We juveniles, twenty-eight years ago, looked upon the Old Fleet with a sort of mysterious awe.

CAMDEN.

THE WORKMEN'S INTERNATIONAL EXHIBITION.

THREE meetings were held on the 10th inst. to promote this exhibition. The first was a conference of delegates of workmen from different parts of the country, and also including delegates from Odessa, Belgium, and Switzerland, which was held at the rooms of the Society of Arts, John-street, Adelphi. After the conference, a number of the delegates and other friends of the movement dined together at Mr. Carlo Gatti's new establishment under the arches of the Charing Cross Railway Station. Mr. Thomas Hughes, M.P., presided at the dinner. In the evening a public meeting was held at Exeter Hall, in furtherance of the object in view, when various appropriate resolutions were passed.

At Cambridge, on Friday evening in last week, a public meeting was held at the Guildhall to take into consideration the objects of the proposed exhibition, and the appointment of delegates to attend the conference in London. Mr. Charles Edward Brown, deputy-mayor, presided, and the body of the hall was crowded. Mr. Fowler, M.P., addressed the audience.

A NEW PIANOFORTE AND MUSIC ESTABLISHMENT, DUBLIN.

The opening of Messrs. Cramer & Co.'s new pianoforte gallery and music warehouse, 15, Westmoreland-street, Dublin, has been inaugurated by a *déjeuner*, at which a large number of friends were present. The new establishment has been erected in Westmoreland-street, on the site of that formerly occupied by the firm of Marcus Moses & Co. The front is of a mixed style of architecture,—Italian-Gothic, with modifications. The upper portion is built chiefly of white and coloured bricks, pierced by circular hood windows, with limestone dressings, head mullions, and carved bosses, resting on limestone pillars, with foliated capitals. The arcade of the upper floor is one series of limestone columns, with ornamental capitals. The entire front is surmounted by a cornice of the same stone, supported on large consoles. The shop front is composed of two large polished mahogany sashes, with plate-glass windows; the porch at the entrance is also of mahogany, and the flooring is composed of tessellated pavement. The first wareroom is about 50 ft. square, and from this two broad flights of stairs of eight steps each, under two arches, supported by metal columns, with ornamental capitals, lead into a large wareroom. This, which will be the principal wareroom, is very extensive, and a gallery, 10 ft. wide, runs along two sides of it. The gallery is also supported by metal columns of an ornamental character. This apartment is lighted by clear-story windows from the top. All the pillars are painted in imitation of Aberdeen marble by Mr. Battersby, of Stephen's-green, who is decorating the interior. The roof is supported by circular principals, which are exposed and carved. Messrs. Cramer & Company have opened a communication with a portion of the building that was formerly the Agricultural Bank, and also with their premises in Fleet-street, so that the

entire concern is now one of the largest warehouses in the United Kingdom. Mr. William G. Murray, of Dublin, was the architect, and the building has been erected by Messrs. D. Crowe & Son, also of Dublin. The grates, hot-water apparatus, and chimneys have been supplied by Messrs. Maguire & Sons, ironmongers. The firm of Alderman Gregg & Son supplied the gas-fittings. The mahogany fittings and counters have been manufactured by Messrs. Byrne & Sons.

Books Received.

Indian Works and English Engineers: A Letter to the Duke of Argyll, Secretary of State for India. By JOHN BOURNE, C.E. Longmans & Co.

THE objectionable treatment of the civil engineers by the Department of Public Works in India, is here brought specially under the notice of the Secretary of State for India.

"Believe," says Mr. Bourne, "that the indignation which has been excited so widely among civil engineers by the charge respecting the receipt of commissions—and which most of them believe was intended to be understood in one sense, while not incapable of being explained in another—will do more to awaken public attention to the subject of the physical improvement of India than any circumstance which has yet occurred in the history of that country. Of course, the military officers of the department of Public Works cannot expect that the civil engineers will ever again be able to act with them with any cordiality; and by their intended impeachment of both the probity and skill of an educated, large, and influential profession, they have not merely provoked inquiry into the influence of their own skill, and the sublimity of their own virtues, but have opened issues they will never be able to close. The railway works which have been carried out in India by English engineers, spite of a few failures in the bridges of one particular line, have been executed in a skilful and creditable manner, and have been completed in the course of a few years, while the whole works of the antecedent century, during which military men have been alone employed upon such undertakings, have been few in number, and, in general, poor both in design and execution—the native idea generally shining through a thin varnish of European art apparently elaborated from books."

The zeal, talent, and sagacity manifested by several of the military officers stationed in India, however, and especially those of the old East-India Company's service, is recognised by the author. Some of them, he remarks, with much technical knowledge, have united an acquaintance with the country and the language which cannot be possessed by new comers, and whose services it would be a public loss not to utilize by some suitable arrangement. But if the work of improvement is now to be begun in earnest, he adds, it is by an organisation of civil engineers, of sufficient strength to be proportionate to the magnitude of the task, that the duty must be performed; and, in general, military men will be most useful with their regiments in the hills, directing them in the construction of roads and works of strategical importance, many of which are required in India, and which the troops, instead of wasting their time in idleness or dissipation, should be induced to undertake, under the direction of their officers.

A Practical Treatise on Metallurgy, adapted from the last German Edition of Professor Keri's Metallurgy. By WILLIAM CROOKES, F.R.S., &c., and ERNST RÖHRIG, Ph.D., M.E. In 3 vols. Vol. III. London: Longmans, Green, & Co. 1870.

REFERRING to the favourable remarks on the second volume of this valuable work which we made in a leading article on May 15th, 1869, we have now to announce the publication of the third and last volume, which treats of Steel, Fuel, and the Materials for Furnaces; and contains a Supplement, including a Glossary of Technical Terms, and a classified Index. The volume is illustrated with 145 wood engravings. This work supplies a want long felt in England, of a complete and practical treatise on metallurgy. Although the authors have taken the excellent treatise of Professor Keri as the groundwork of their labours, they have given much practical information and many useful processes which are not to be found in Keri. This additional information brings up the treatise to the present time. This is especially the case in respect to steel.

From so elaborate and detailed a work it is not easy to select anything like a fair specimen. We may condense, however, a few of the remarks on the manufacture of steel given in the outset.

Steel from Pig-Iron.

Steel may be produced from pig-iron:—

1. By oxidising Part of its Carbon.—This oxidation may be performed at a glowing red

heat and at a melting heat. On exposing suitable pig to a continued glowing heat with an admission of atmospheric air (Tanner's, Weber's, and Lohmann's methods), the resulting steel will be cheap but variable in its properties. We may here also mention the method introduced by Herzeele and Paulis, in which it is proposed to heat pig-iron in contact with steam, and Eaton's method of heating pig-iron together with carbonate of soda. The oxidation of the carbon in the fused pig-iron may be effected by the application of blast (the production of natural steel in open fires, and Bessemer's process), or of air draught, which is employed in the production of puddle steel in reverberatory furnaces. Steam is seldom employed, in which case (Sabatier's method) the oxidation of the carbon takes place chiefly through the formed oxidised iron. When producing natural and puddle steel special fuel is employed for melting down the pig-iron and for keeping up the fused state during the conversion process; whilst in Bessemer's process the required temperature is sustained by conducting blast into the fused metal, thus causing an oxidation of iron and carbon. The oxidation of the carbon in the fused pig-iron may be effected also by an addition of oxidising substances, such as pure rich iron ores, &c. The most important is Heston's process, in which nitrate of soda is used as the oxidising agent. Uchatius has produced a steel adapted for various purposes by melting in crucibles granulated pig-iron with roasted magnetic or spathic iron ore, and a small quantity of oxide of manganese. By varying the proportions of metal and ore, and especially by the addition of a certain quantity of malleable scrap-iron, a softer or milder steel may be obtained. Tanner doubts the value of this method, as the result is uncertain, and also as the crucibles are more wasted or corroded than in Chenot's method. Obuchow produces cast-steel by melting pig-iron with magnetic iron ore, titaniferous iron sand, malleable scrap iron, arsenious acid, saltpetre, and clay, or by fusing pig-iron with an addition of magnetic iron ore and arsenious acid. A more uniform production may be obtained by replacing the iron ore by finely divided heated pig-iron, and fusing it with finely divided pig-iron which has not been heated, and with an addition of brown stone.

2. By Fusing Pig-Iron in Admixture with Wrought-Iron.—This principle has been advocated by Karsten. These methods yield a more uniform product than the methods invented by Chenot and Uchatius, supposing that suitable raw materials have been applied in both cases. We may here mention Obersteiner's method, which is adopted at Gefle in Sweden, &c., and which consists of a fusion of pig with wrought iron; and Cowper's method, consisting of a fusion of pig-iron with wrought-iron, and with an addition of oxide of iron and ferro-cyanide of potassium. Price & Nicholson's method consists in melting malleable iron with refined metal. Mr. Siemens has applied his regenerative gas furnaces to the manufacture of steel from a mixture of cast and wrought iron on the open bed of the furnace; this (known as Siemens-Martin's process) undoubtedly is the cheapest method and allows the production of large masses.

Steel from Wrought Iron by Carbonisation.

This process may be performed either at the temperature of fusion or below the melting-point.

In the latter case the bar iron is exposed to the action of solid or gaseous carbonaceous matter, which operation is termed cementation; soft puddled steel is sometimes also cemented, to render it richer in carbon and harder, if the steel is intended for the manufacture of rails, &c.

Various methods may be employed. The methods of producing the Indian cast-steel or wootz, the real and imitation Damascus steel, &c., may be mentioned. Wootz is made from malleable iron cut into small pieces, which are charged in quantities of 1 lb. weight in clay crucibles, with about 10 per cent. of dried wood. Musket melts wrought-iron in admixture with coal and manganese. Farrar used an admixture of sal-ammoniac, ferro-cyanide of potassium, and manganese (method of the Damascus Steel and Iron Company of New York); Heath uses carburet of manganese.

Howell's homogeneous metal is the softest and most tenacious kind of cast-steel; it is poorest in carbon, and stands between hard cast-steel and soft iron, as fine-grained wrought iron stands between puddled steel and soft iron. Homo-

geneous metal is most frequently produced by melting very pure malleable iron with one-fortieth or one-fiftieth part of charcoal powder; it is also produced by melting pure malleable iron in small pieces with about 50 per cent. in weight of scraps of cast-steel, or by melting wrought iron with an addition of spiegeleisen; the homogeneous metal sometimes results from the Bessemer process. In the form of plates, and applied to coating vessels, it resists the action of sea-water better than iron plates, and is also employed for the manufacture of rails, tubes, &c.

Verdie terms half-steel (*produit mi*) a product fit for rails; the inside consists of wrought-iron, and the outside is coated with cast-steel.

Classification of Steel according to the Treatment it undergoes.—Steel produced by any of these methods is more or less uniform, and is rendered homogeneous either by the operation of fusion, when it is termed *cast-steel*, or by a repeated welding and forging or rolling, in which case the product will be called *shear-steel*. The term *cast-steel* is also now and then applied to the inferior sorts of steel obtained by melting pig with malleable iron or with oxidising agents, &c. Cast and shear steel may be equal in tenacity and hardness supposing both to be produced from good pig-iron; on the other hand, a more homogeneous product results from melting than from welding and forging, if an inferior pig-iron has been employed in its production. An improvement of the cast-steel is attempted by the addition of certain substances, thus producing, according to the nature of the addition, platinum steel, silver steel, tungsten steel, &c. Steel which shows a pattern upon etching a polished section with acids, is called *damsked steel*. The additions given to the steel either do not act at all, or only in such a manner as to remove injurious substances, such as sulphur, silicon, &c., with which they combine and become scorified; this is especially the case with manganese (Heath's patent); the additions seldom enter into the steel.

Classification of Steel according to its Applications.—Steel intended for the manufacture of tools is produced from the best kinds of raw or cement steel, which may be refined either by fusion or by welding and forging. Steel requiring a certain hardness combined with great tenacity for cutters, &c., is produced from welded cement steel produced from Swedish iron, in preference to cast-steel, which is employed in the manufacture of objects of less importance. In the manufacture of tools it is very necessary always to employ the same quality of steel, which explains the preference given to the approved modes of production, though they are more expensive. This is the reason why in England Swedish iron is still employed for the production of the best kinds of cast-steel; the cemented bars when broken into pieces are carefully sorted and fused as quickly as possible in clay crucibles, but not in plumbago crucibles. In Syria the shear-steel produced from raw steel is also more expensive than cast-steel: it is said to possess more tenacity than cast-steel and equal hardness. At present the puddle steel produced from good charcoal pig-iron has in many cases entered into competition with the raw and cement steel, especially when the steel is intended for the manufacture of tools. As these sorts of steel are worked into the most various small objects, and are also drawn out into very thin dimensions, thus increasing their value very considerably, the application of a superior quality, containing a larger amount of carbon, is required; otherwise the repeated castings required will extract too much of the carbon, and render the steel too soft. Cast-steel is often employed instead of iron for large castings, when it must be cheap, only slightly hard, homogeneous, and ductile, so as to allow an easy treatment. These kinds of steel are not worked to smaller objects, and the castings are usually finished in the steel-melting works. Puddled steel is usually employed as the material for kind of cast-steel; also steel produced from melting pig-iron with malleable iron, and steel produced from pig-iron with oxidising agents, especially Bessemer's steel, are largely employed. This steel will always be superior in quality if produced from superior raw material of constant composition. In most cases the somewhat more expensive puddled steel is preferred to Oberlin's steel, and almost always before *chatina's* steel, as it yields cast steel of greater homogeneity. Bessemer steel, however, is preferable to the puddled steel for the production of large masses, as being more homogeneous,

cheaper, more quickly produced, and requiring no remelting in crucibles. Siemens's steel and Heaton's steel are likely to enter into competition with Bessemer's steel.

Mr. Bessemer, we observe, however, has just patented a series of further improvements.

Miscellaneous.

Acquirement of Property for Liverpool Corporation Improvements.—Mr. J. J. Aston, Q.C., and a jury, have awarded compensation for certain property and land, situated at the corner of St. Anne-street, and south side of Great Richmond-street, opposite to St. Anne's Church, and consisting of dwelling-house, warehouse, and a building, formerly used as a brewery. Only a portion of the property in question was sought to be acquired by the corporation; but the claimant being empowered by the Act of Parliament, called upon the corporation to take the whole, which consists of about 910 yards of land. The witnesses called in behalf of the claimants were Mr. Wylie, Mr. Wordley, and Mr. Hornblower, who estimated the land with the buildings at from 4l. to 4l. 4s. per yard, the total value, including the value of the buildings as old materials, being variously estimated from 4,515l. 3s. to 4,607l. 15s. 3d. For the corporation, Mr. Rayner contended that the land was worth no more than 30s. per yard. Mr. Walter Scott, valuer, said that the value of the slip of land actually required by the corporation, at 2l. per yard, including the damage done to the building, and 10 per cent. for compulsory sale, would be 701l. 16s. Assuming the whole to be taken, he valued the land at 30s. per yard, and the building in its present state at 1,162l. 2s. 6d., which, after deducting the ground rent, made a total of 2,618l. Other and similar evidence was given. The jury returned a verdict for 3,000l.

The Serpentine.—Great complaints are being made as to the slow progress made towards the levelling and purification of the Serpentine. At present little more has been done than to draw off the water and expose the filthy decayed vegetable matter which has so long formed the bottom of the lake. It was at first intended to clear away the whole of the mud, which ranges in depth from 2 ft. to 12 ft. over the whole area of some forty-two acres, level it to a uniform depth of about 5 ft., and cover it with concrete similar to that used for the ornamental water in St. James's and the Regent's Parks; but upon the water being drained off, it was discovered that this plan would be too expensive, and it was consequently determined to remove the greater portion, though not the whole of the mud, and cover the bottom with a mixture of gravel and London clay. In future the lake will be supplied with water from the Chelsea Water-works, and there will be an outlet communicating with the main drainage, and the sewers which formerly used to empty themselves into the lake have been diverted.

Falling in of a Mine in America.—A serious catastrophe is reported from America. A coal mine at Stockton, Pennsylvania, caved in, the shaft and tunnel filled up with earth, and the entrance to the mine choked up. Two dwelling houses were carried down a distance of 40 ft. at the time the earth fell, and the persons in them instantly killed, their bodies being buried in the ruins. Several men who were in the mine at the time are doubtless dead. Ten persons thus far are known to have been killed. The disaster is ascribed to working the mine too near the surface, there being a thickness of only 20 ft. of earth between the foundations of the houses and the mine.

London Association of Foremen Engineers.—By the official report presented at the last annual general meeting, it appears that this institution now numbers 108 ordinary members, all principal foremen of engineers or principal mechanical draughtsmen, and 61 honorary members, mostly engineering employers; whilst the funds invested for all purposes are equal in value to 1,479l. 10s. Mr. J. Newton, of the Royal Mint, was unanimously re-elected president for the eleventh time. As the objects of the association are exclusively scientific and benevolent, it is impossible to do other than approve them. At the eighteenth anniversary festival of this society, to be held on the 19th proximo, at the City Terminus Hotel, Sir William Fairbairn will preside.

The National Education League.—A meeting of representative working men has been held at Birmingham, to confer with the officers of the Education League. Mr. G. Dixon, M.P., presided, and in his address said that in all parts of the kingdom the League was supported by the Liberals, and, as a rule, the opponents were Conservatives. He asked the 20,000 Birmingham men who voted for the Liberals at the last election to join the League, because there was great doubt in the House of Commons as to the wishes of the working classes regarding the question of education. A large number of trade-unionists and other working men took part in the discussion, and an almost unanimous approval of the plan of the League was expressed. Mr. Joseph Chamberlain, chairman of the executive, spoke of the "vexed question of Bible reading," and said that the League did not make the Bible a text-book. The subscriptions have now reached 50,000l., and the members of the League number 9,000.

The Disposal of the St. Pancras Schools at Leavesden.—The Poor-law Board have now determined to add St. Pancras to the Central London School District, and have required the managers of the West London School District to purchase the Schools of the St. Pancras guardians at Leavesden, near Watford. The Board state that they propose to unite the parishes of St. Margaret and St. John, Westminster, to the parish of St. George, Hanover-square, which will introduce an additional number of children for whom accommodation will have to be provided; and whilst the schools proposed to be erected at Ashford were intended to provide accommodation for only 600 or 620 children, the Leavesden school will accommodate 700 children. The builder's contract for the erection of the schools at Leavesden is 37,545l., only about 4,000l. more than the architect's estimate for the Ashford schools. The schools at Leavesden may be completed so as to be ready for occupation in the course of four or five months.

The Contracts for the Oswestry New Reservoir.—Mr. Coker, of Clapham, was the successful tenderer for the new reservoir, having agreed to make it for 550l., whilst his five competitors asked, one of them above 1,100l. more than he had done, and the next above him 600l. more, the tenders being, respectively, as follows: Mr. J. Ward, Whittington, 1,450l.; Mr. Hardacre, Chester, 1,181l.; Mr. Jaynes, 1,455l.; Mr. C. F. Lewis, 1,952l.; Mr. H. Roberts, 1,817l.; and Mr. Coker, 550l. Mr. Coker, however, discovered that he had left out an item of 40l., and wished to amend his contract to 1,260l. The council resolved to offer it to Mr. Ward for 1,200l. Failing this, Mr. T. E. Minshall, C.E., is to examine the specifications and estimate of the borough surveyor, Mr. E. B. Smith, and report to the council. It is asserted that the surveyor could save the town at least 200l. on the transaction, if allowed to employ the men for the local Board.

Fall of a Warehouse at Liverpool.—The north end of a warehouse in Liverington-street, Liverpool, has given way, falling on a two-storied office used by drysalters. A warehouseman, the only person in the office at the time, was buried under the debris, but was dug out after two hours' hard work, much injured, but alive. The body of another man killed by the catastrophe was also dug out of the fallen ruins. It is believed that a large quantity of bags of rice stored in one of the upper floors was the proximate cause of the disaster.

The Accident at Abbey Mills Pumping Station.—The sufferers by the recent sewage inundations at Blackwall, caused by the explosion of the air-chamber at the pumping station of the Metropolitan Board of Works at Abbey Mills, have received a communication from the clerk to that Board stating that they "cannot agree that the Board is in any way to blame in respect to the late accident at Abbey Mills, and the Board must decline to admit any legal responsibility."

The Bishop of Exeter's Palace.—Mr. John Hayward, of Exeter, architect, having been employed by the executors of the late Bishop to survey and value the dilapidations, and having met Mr. Goddard, of Lincoln, on the part of the present Bishop, the sum awarded for dilapidations amounts to 571l., which sum includes repairs to the old town wall (which was purchased only a few years since), as well as the other boundary walls, the stables, and entrance lodge.

City Commission of Sewers.—On Tuesday, the City Commissioners of Sewers held a meeting at Guildhall, under the presidency of their chairman, Mr. Deputy De Jersey. Mr. Hudson, the surveyor, reported the value for rating purposes of the premises of Messrs. Negretti & Zambra, on the Holborn Viaduct, to be 960l.; those of Messrs. H. B. Fearon to be 1,460l.; and the vaults of Messrs. Fearon, beneath the Viaduct, to be 360l. The assessment of various houses in Leadenhall-street, Billiter-street, Newgate Market, and Rose-street were materially reduced by the Commission. A letter was read from Mr. Turner, clerk of Cripplegate Ward, inclosing a resolution, passed at the late wardmote, as to the advisability of setting back eight houses opposite St. Lawrence Church, in Gresham-street, for the purpose of facilitating traffic there. The subject was referred to a committee, as was also that of widening Upper Thames-street, by removing the vestibule of Alhallow's Church. The Metropolitan Drinking Fountain Association, through their secretary, Mr. Leo, asked leave of the Commission to erect a granite fountain in New Bridge-street, Blackfriars, near the entrance to the railway station, the cost of such being about to be defrayed by a lady.

The Peabody Estates at Stockwell.—Mr. George Peabody, having made various endowments for the benefit of the working-classes of the City of London, made a third endowment of 200,000l. Part of this he proposed to convert into land, and purchased between thirteen and fourteen acres of land at Stockwell, of the London, Chatham, and Dover Railway Company. Sir Curtis M. Lampson acted for Mr. Peabody, as Mr. Peabody could not hold land; purchasing it with money supplied by Mr. Peabody; but this did not give any legal or equitable title. In consideration of the sum of 15,625l. the company made over to Sir C. M. Lampson 13a. 1r. 14p. of land, with certain premises and hereditaments, lying northward of the London, Chatham, and Dover Railway at Stockwell, and 3r. 5p. of land adjoining the before-mentioned land. It has now been formally decreed that, Mr. Peabody being an alien and not naturalised, the property in question belongs to the Crown. The Crown, it is understood, will hand it over to the Peabody Trustees with a sound title.

Destruction of the Old Star and Garter, Richmond.—The original building of the well-known Star and Garter, Richmond, has been destroyed by fire, and unfortunately the new manager lost his life, having perished in the flames in the attempt, it is said, to save a favourite dog of his brother's. It was fully two hours before a supply of water could be had. When the hydrants were at first opened, it was discovered there was no pressure at all; hence it was necessary to communicate with the water authorities at Battersea, eight miles distant from Richmond, and, as the fire occurred by night, there was no means of bridging this distance by telegraph or rail, and the only way was to ride on horseback. When the necessary pressure came, the engines at once proceeded to work, but by that time the fire had got complete mastery of the whole of the old building. Very little damage comparatively has been done to the new hotel adjoining. The building was insured. Nothing satisfactory has been ascertained as to the origin of the fire.

Great Central Gas Consumers Company. At a special general meeting of the shareholders of this company, Sir Thomas Gabriel, the chairman, stated that by the proposed Bill the directors were to take power to increase their capital by 30,000l., with borrowing powers to the extent of 75,000l. more, as also to pay a dividend to the shareholders at the rate of 5 per cent. per annum for the 31st December last out of their net profits, and appropriate the balance to the defalcation account; that system to be continued till the whole of the defalcations were cleared off. These amounted originally to 71,149l., but at Midsummer there was a surplus of 32,507l., which reduced them to 38,642l., and that sum they proposed to pay off.

Patent Laws.—The patent laws have been discussed at a meeting of the Manchester Institution of Engineers. The meeting unanimously passed a resolution affirming that "the trade in inventions which is founded upon the grant of patents is of great advantage to the country in promoting its industrial prosperity, and that any abuse which exists in the present system may be rectified by available amendments."

The Sunday Lecture Society.—This society, organised to provide for the delivery on Sundays in the metropolis, and to encourage the delivery elsewhere, of lectures on science, physical, intellectual, and moral, history, literature, and art; especially in their bearing upon the improvement and social well-being of mankind; have arranged a series of thirteen lectures, which will be given at St. George's Hall, Langham-place, commencing Sunday, the 16th of January, when Dr. W. B. Carpenter, F.R.S., will treat of "The Deep Sea: its Physical Conditions and its Animal Life." Dr. Carpenter will also lecture on the following Sunday:—Mr. J. Beavington Atkinson, on "Raffaello and Michelangelo."—Dr. T. Spencer Cobbold, F.R.S., on "Fossils and their Teaching."—Mr. R. H. Horne (author of "Orion"), on "The Old English Mystery, Miracle, and Morality Plays."—and Mr. J. M. Capes, M.A., on "The Fine Arts in their relation to Natural Beauty and Moral and Intellectual Perfection," will follow. Lectures are promised also by Professor Huxley, Mr. Norman Lockyer, Dr. Hodgson, Mr. A. H. Green, M.A.; Rev. Professor Lewis Campbell, M.A.; Rev. Allen D. Graham, M.A.; and the Hon. Auberon Herbert, M.A.

The Thames Embankment Approaches. Mr. Bazalgette, engineer, has reported to the Metropolitan Board of Works that it seems probable the Thames Embankment and roadway to the Mansion House, as well as the Metropolitan District Railway to Bread-street-hill, will be ready to be opened to the public in the course of the coming summer. The only approaches at present sanctioned by Parliament are the Whitehall-place, the Craven-street, Villiers-street, and the Norfolk, Surrey, and Arundel Street approaches. He recommends that Mr. Webster be requested to give a price for forming these approaches in macadam, as he has the contract for forming the rest of the main road. He also recommends that Mr. McKenzie be instructed to lay out and level the several plots of vacant ground, and to purchase and plant trees and shrubs, and to prepare the ground for the same in the course of the ensuing spring.

The Hotel de la Villière.—At the last meeting of the Institute of Architects Mr. J. Hebb, associate, alluded to the proposed rebuilding of the Galerie Dorée of the Banque de France (formerly the Hôtel de la Villière), in Paris (concerning which observations have already been made in the *Builder*), and suggested that the council should communicate with M. Labrousse, who had reported in favour of the preservation of the present structure. Professor Donaldson, in reply, said that it was not considered advisable for the Institute to interfere in such matters out of England.

Sir D. Coutts Marjoribanks's House.—A dinner took place at the Whittington Club, Arundel-street, Strand, on the 8th instant, to celebrate the completion of a mansion built for Sir Dudley Coutts Marjoribanks, bart., in Park-lane, Hyde Park. The chair was taken by Mr. Charles Long, clerk of works, and the vice-chair by Mr. Henry Luscomb, foreman of the works. After the usual loyal toasts, the healths of Sir Dudley and Lady Coutts Marjoribanks and family, of Mr. T. H. Wyatt, the architect, and Messrs. J. & C. T. Anson, the builders, were warmly proposed and drunk.

Assistant Surveyor of Works, St. Pancras.—For this office there were twenty-four candidates, of whom three were nominated for election.—Mr. Johnson, of Bradford; Mr. Allam, of London; and Mr. H. H. Bridgman, of London, and late of Torquay. At the election forty-seven votes were recorded for Mr. Bridgman, giving a majority of nineteen above Mr. Johnson, who stood next. Mr. Bridgman was accordingly elected.

The Manchester Education Bills.—A report by the Manchester Education Bill Committee has been printed, in which the committee state that they have prepared two Bills,—an Education Bill and a Compulsory Attendance Bill,—which are to be introduced into Parliament next session. The committee discuss the various provisions of these Bills in their report.

"The Bombay Builder."—In the number for November of the *Bombay Builder* (published monthly), the editor announced that the next issue, which would complete the fourth volume of that journal, would terminate its career. Considering that the subscription was 30 rupees per annum, we cannot profess much astonishment.

The Archaeological Association of Ireland.—At the last meeting of this active and useful society, the Rev. J. Graves, to whom as honorary secretary it is greatly indebted, read a letter from the Home Secretary expressing her Majesty's pleasure that it should be henceforth called "The Royal Historical and Archaeological Association of Ireland," and that the members thereof should be styled "Fellows of the Royal Historical and Archaeological Association of Ireland."

Railways in Tasmania.—The old Van Diemen's Land is being traversed with railways. An Act of the Colonial Legislature has just been passed for the formation of a main line of railway through Tasmania from Hobart Town to Launceston, or to some point on the line of the Launceston and Western Railway. The Colonial Government are authorised by the Act to give the company a sum not exceeding 300,000l., or 25,000l. a year for twenty years.

The Sessions House, Newington.—The Justices of the Peace have come to the resolution to appoint a committee, with power to obtain plans either from the county surveyor or some other architect, showing the comparative advantages of either a re-construction of the present Sessions House, or of an entire re-building of the courts, the consolidation of the Record Office and Clerk of the Peace's Office therewith being an essential part of either scheme.

Public Mortuary.—The following tenders for the erection of a public mortuary and post-mortem room for the vestry of the parish of St. Mary, Stratford, Bow,—Messrs. Hills & Fletcher, architects,—were sent in. Quantities were not supplied:—

Bird.....	2370	0	0
Alexander.....	233	0	0
Harris.....	231	0	0
Wicks.....	217	0	0
Webb & Son (accepted).....	210	0	0

Discovery of Roman Remains at Maryport.—A few days ago some workmen, while taking down a dry wall at the Roman Camp, Maryport, found a stone resembling a headstone, bearing a Latin inscription, and the cap of a pillar. The inscription on the stone was almost illegible, but the cap of the pillar was in a good state of preservation.

The Ancient Crypt, near Aldgate Pump. We are told that the ancient remains under the houses at the east end of Leadenhall-street are threatened, the houses being about to be pulled down to widen the way. It is to be hoped that means will be found to preserve what is a very interesting, indeed important, remnant of old London.

Cologne Cathedral.—The central association for completing the cathedral at Cologne has just published a list of subscriptions received between the 1st January and 30th November of this last year, in aid of that work. The total amounts to 181,283 thalers, or about 680,000l.

Queen's Hotel, Hanley.—We are asked to say that the sum named in our last as the cost of the building, 15,000l., included fittings and furniture.

TENDERS.

For re-building Nos. 98 and 99, Fetter-lane, for Mr. J. Aston. Mr. J. Grundy, architect. Quantities supplied by Mr. Clement Dowling.

Gooden.....	22,035	0	0
Mitchell.....	2,270	0	0
Cook.....	2,198	0	0
Newman & Mann.....	2,166	0	0
Cole & Sons.....	2,139	0	0
Wilson.....	2,070	0	0
Kelley.....	2,063	0	0
Foster.....	1,967	0	0
Nanley & Rogers.....	1,975	0	0
Atcheson & Walker.....	1,845	0	0

For roads at Gipsy Hill. Mr. John Leaning, surveyor:—

Waterfield.....	2,892	0	0
Spence.....	689	0	0
Hancock.....	682	0	0
Wilson.....	667	0	0
Strickland.....	619	0	0
Emery.....	471	0	0
Harris.....	469	0	0
Morris.....	455	0	0
Thompson.....	354	0	0
Williams.....	446	0	0
Cole.....	441	0	0
Jones.....	418	0	0
Simpson.....	410	0	0
Young.....	423	0	0
Steedan & Cook.....	374	0	0
Gardner.....	355	0	0
Porter.....	355	0	0
Coker.....	347	0	0

ners, capable of undertaking the Superintendence of the Painting, Measuring Work, and Preparing Estimates.—Apply, in own handwriting, stating age, wages, and where and how previously employed, to K. G. & CO care of Messrs. Gibbons & White, Wholesale

And may be ordered of any Bookseller in the Kingdom.

making cutters and sharpening saws. Could take the charge of a mill, and keep a set of books. Good reference,—Address, J. H. G., Fredericksburg, Lower road, Chautauk.

The Builder.

VOL. XXVIII.—No. 1407.

Examples for the Workshop.



I have before us a dozen numbers of a monthly journal entitled *The Workshop*, concerning which we will give our readers a few particulars.* The leading peculiarity of this work is its foreign and international character; for it is issued in four languages, with a view to its circulation in different countries in Europe and the United States. Local and even

metropolitan building and art news are not of sufficient general interest to warrant translation into the tongues of nations having different sympathies; consequently these do not enter into the scheme. Hence this foreign journal deals with generalities and principles, leaving its claim to recognition to be founded mainly on its illustrations, which need no translation. This is, of course, a wise proceeding, otherwise endless confusion would ensue. As it is, when we come upon such passages in the English edition as "This country possesses the most superb examples of ancient jewelry in the world," the readers of the different translations must disentangle for themselves the kingdom or republic accredited with the wealth in question. Again, no foreigner appears able to master the difficulties of technicalities in the English tongue, and we are, consequently, disconcerted with the intrusion of such words as *stoff* for *stuff*, *porcellain* for *porcelain*, *ornements*, *balconets*, &c. Apart from shortcomings of these kinds, arising from its international character, we must pronounce the work worthy, and likely to be useful. The French decimal system of measurement is adopted for the scale of the illustrations. The aim of *The Workshop* is admirable. Artificers of all kinds, and of all the lands in which the four leading languages are understood, are exhorted, from every possible standing-point, as they have often been exhorted before, to

"Do not like dumb driven cattle,"

but veritable artists in the crafts they practise. The *Builder* is put under contribution frequently for information of cosmopolitan interest, we perceive, always with due acknowledgment. Each article contains one upon a topic of general interest, and no more, and this, contrary to frequent Continental practice, is unsigned. This is followed by about a dozen illustrations of objects of art industry, and supplemented with a large folded sheet of details. The objects depicted are of the most varied assortment a furnishing warehouse could produce, ranging from a punch-bowl to a pulpit; as well as of structural use, such as ceilings, chimney-pieces, parapets, and summer-houses. We will take the contents of the first number as a specimen. The opening article is entitled "Our present Need;" then follow designs for ornamentation,

a memorial stone, a centrepiece, a carved ebony sideboard, a seal and paper-cutters, a modern "Moresque" carpet, a modern ceiling in stucco, wrought-iron grilles, specimens of simple wood sawings, modern articles of jewelry; and after these illustrations come a quotation from the *Builder* relating to archaeological excavations in Rome; a recipe for a coat of oil on cement, a note of experiments made by the French Government resulting in the knowledge that zinc when used in cisterns is apt to dissolve, and recommendation that all water-tanks on board ships should be lined with tin, and word of museums for art and industry contemplated in Dresden and Cologne; and finally a great sheet of details opening out wide enough to cover a large space on a joiner's bench. Looking carefully down the leading columns to discover what "our present need" is supposed to be, we find the writer divides it into four branches:—1. The repudiation of naturalism; 2. The extermination of all extravagances and follies; 3. The formation of a sense of the beautiful; and 4. The improvement of the artisans themselves into artists by schools of art in as many places as possible. He says "the actual condition of matters connected with industrial art is so critical that extraordinary measures must be resorted to for its regeneration." He compares taste to the "sick man" known in all continental as well as insular circles, and declares, in the words of our own poet, that there is something rotten in the state of Denmark, thereby implying degeneracy in art, and no offence to the descendants of the old seakings. What has been said over and over again concerning the hideousness of the domestic furniture in the houses of the middle and working classes in this country, also applies, it seems, to that of all the lands in which the *Workshop's* four languages are spoken. Explaining the present position of taste and art, the writer remarks:—

"In ordinary middle-class houses, where the appliances of luxury and art are often unknown, an obsolete Rococo runs off, through all these productions, in a sort of unconscious way, as if it were a thing of course. In tables, chairs, and all articles of furniture in wood, irregularly flowing lines usurp the lines of beauty; and where corners and panels are to be ornamented, a few scrolls are introduced, and that is thought sufficient. On the other hand, in paper-hangings, curtains, furniture, stuffs, &c., flowers and leaves of natural form and colour are preferred. It is different when ducation and luxury, or at least comfort, bear rule. Here, indeed, the Rococo style is also seen, and especially of late; not, however, in mere unconscious existence, but as a style taken up again, and imitated consciously with artistic intention."

But it is this continuous return to old styles and imitations of them that has been the ruin of taste, the author urges. The artistically educated part of the world is divided into cliques, and one set does homage to Paganism, another to Mediævalism; and another, aware of the gulf which separates modern civilisation from the middle ages, cultivates the Renaissance styles. These last have most charms and capacities for him; for in these alone, he believes, is progress possible. Instead, however, of pursuing the road opened out by the great change in art indicated by the term Renaissance, we have wandered from it and got back again to the styles of Louis XIV., XV., and XVI. of France, which are all more or less unconstructive and confused. Moreover, we have gone astray after the art of the Eastern world, with, however, no definite result, except in carpets, curtains, and hangings, to which he might have added, if only as a tribute to the insular popularity of the willow-pattern plate, ceramic wares. He continues,—

"In forsaking the true path, we, the most civilised nation of the world, are grasping after shadows, which constantly elude us, the result being a confusion of styles badly copied or imitated, their characteristic features frequently misconstrued, and adopted more as a matter of fashion, than as a true and living utterance of the necessities and feelings of the age. Their details are often so mixed together that we sometimes see, illustrated in one and the same object, a conglomeration of the world's history, an interval of centuries between its head and foot."

As though such heartless man was not a sufficiency of evil, art is beset with another grief, which is called naturalism. This knack of re-

producing natural forms in objects destined for domestic use, the writer speaks of as the suicide of art. The term "fancy articles" applied to such items as miniature hats, or jockeys' caps, serving for inkstands, candlesticks, and match-boxes, he concludes must have arisen from the fact that such devices were the decrepit fancy of some brainless head." And the substitution of one material for another, or the treating one material in such a manner that it resembles another, as when a porcelain vessel is made to look like a wooden tub, brings down equally severe censure. Of course, there is nothing new in these opinions. For the last five-and-twenty years we have taught the same doctrine ourselves; but here we have it couched in such generalities as will be understood and appreciated by the agile smiling Alphonse in the *atelier* of a French manufacturer, as well as by the broad-shouldered, long-haired Ludwig who labours in a German workshop; the olive-skinned, black-eyed Pippo of an Italian studio; and the ruddy, fresh-coloured English workman.

Having drawn about him the difficulties to be encountered in developing or originating a new style, the writer begins to despatch them, one after another, in this fashion:—

"First, we have to contend with that naturalism which now appears our most dangerous enemy. Art must be cut off from the umbilical cord of nature in order to feel her freedom. She must become the mistress, nature the servant who prepares the materials, while at present the reverse is the case. We must arrive at the persuasion that vegetable or animal types are not to be employed just as nature produces them; but that the genius of Art must take up his position as absolute master, and dispose and transform at his discretion. Hence the necessity for conventionalism, from which, however, does not ensue the adoption of any distinctive past style."

Alphonse will lift his shoulders and eyebrows simultaneously with his cap, as conventionalism is thus presented to him, wishing, wistfully, doubtless, for more light. Ludwig will send a thought or two roaming through the nearest museum of art-treasures, to ascertain whether, what he remembers of its beauties, tallies with this assertion. May be, as the Italian faces the conclusion, the gay remembrance will dart into his mind that he has seen it somewhere before, and honest John Brown, with a sigh or a laugh, according to his humour, will admit there is nothing new under the sun. The more we can elevate our pursuits the more pleasure we are sure to find in them; and when our work is pleasure, it cannot be otherwise than pleasant to work, and a large piece of the sting is taken out of our doom to toil. If all producers in the various branches of art-industry come in time to understand the principles upon which they should work, the why and wherefore, as they are familiarly called, the aspect of everyday life will be thoroughly changed.

Among the illustrations there are several that deserve mention, for different reasons. One of these is a summer-house. Here we have an exceedingly picturesque object that is almost unknown in this country; for the melancholy alcoves that are our nearest approach to it give no equivalent for the fresh charm suggestive of Swiss forests and chalets these structures impart to a landscape. The plan of it is cruciform, and the entrance is formed by leaving the end of one of the arms of the cross open. The enclosure is but lattice-work, though the roof is of slate. Details of the ornamental woodwork of the spandrels, &c., are given an eighth of the full size.

We are attracted by a garden-door. It is a simple piece of woodwork formed of laths, arranged at regular intervals, crossings so cleverly notched, with equal precision, as to form a very pretty open-work design. This is a garden-door in the villa of Josef Bey, Cairo, designed by M. Stadler, of Zurich, with a mixture of Moorish and Swiss sentiment. Ornamental woodwork generally, we perceive, received at the hands of the editors of *The Workshop* much attention, as it behoves dwellers in the neighbourhood of great continental forests to give. Some clear

* The *Workshop*. Edited by Professor W. Baumer, I. Schnorr, and others. James Hagger, 67, Paternoster-row.

woodwork parapets are shown, and finials, ornamental gable-ends, and crests in wood are given, as well as many specimens of furniture. Jewelry, too, is somewhat profusely illustrated, and, in conjunction with crystal manufacture, is treated at length in the letterpress of several numbers. Bookbinding and fancy leather goods, patterns for weaving, carpets, and tapestry also find illustration.

The varied nationality of the work results, as might be expected, in some contradictions. Whilst one writer deprecates the low ebb or the utter absence of taste at the present day in the industrial arts, another congratulates the world upon the fact that the sobriety of trade has prevented manufacturers in some branches from being guilty of the extravagances that have brought high art low. The chameleon looks blue to one and green to another, whilst a third will declare it is black or white; and the same variations in time and chance apparently conduce to equal diversity of opinion on other matters. But there can be but one mind about the propriety of bringing beauty into the workshop. Alphonse, Ludwig, Pippo, and John Brown will each, doubtless, have his own standard of loveliness, as surely as he knows the secrets of his own heart; but when he has looked upon those of his neighbours, it is tolerably certain he will set to work to make his own higher. As a work that has this end in view, we must commend the journal before us; and we shall best advance its interests by pointing out there is room for improvement in the English edition.

THE GIBERTI GATES IN THE SOUTH KENSINGTON MUSEUM.

THE Southern Court of the South Kensington Museum has been temporarily reduced in length in order to allow space for the workmen engaged in the prolongation of the building. A screen forms the present barrier, and the occasion of the change in distribution of some of the contents of the court which has thus become necessary, has been seized for bringing together in one comprehensive group the unrivalled collection of electrotypes, copies of famous works of art, in gold-plate, silver, bronze, and other metals, of which the Museum has so good a right to boast.

Chief among these products of an art which must be called yet in its infancy,—though an infancy like that of Hercules,—is the noble reproduction, by Messrs. Franchi & Son, of the famous central eastern gates of the baptistery of San Giovanni at Florence, executed by Lorenzo Ghiberti, during the first half of the fifteenth century. Permission to take *gutta-percha* moulds of the entire composition was given to the agents of the Museum by the Tuscan Government, when that rule was Grand Ducal. The popular indignation appears to have been roused by the operations of Signor Franchi; opinions being divided as to whether the noble bronzes were being destroyed, or only being prepared for deportation. Those who might have been reassured by the tender care shown by the workmen engaged in the tedious and delicate process of moulding, yet took the practical and thoroughly Italian view, that if copies were sent to England, Englishmen would no longer come to Florence to see the gates. The time-honoured argument "Sirs, ye know that by this craft we have our wealth" prevailed, and the operation was suspended by order of the Government.

Fortunately for us, and fortunately for art in general, there existed in Florence a copy of the gates, in plaster, taken some seventy years ago. Signor Franchi obtained permission to mould this set of casts, undertaking to furnish the Italian Government with a new copy, as that from which he took the moulds would be discoloured by the oil used in the process. The gates have been thus reproduced. The architect has been moulded from the actual structure. It is the opinion of those who are well acquainted with the gates, that the copy produced from the plaster cast is superior to any which could have been taken from the actual bronze, as seventy years' exposure to the weather, even in the climate of Florence, has produced an effect in the diminution of sharpness of outline which was very perceptible on comparing the copy with the original. It is certain that incipient decay has made its mark on some of the wonderfully rich ornamentation of the architect, which is faithfully represented by the electrotypes.

It may almost be said that it is now for the first time that the English public has the oppor-

tunity of seeing this marvellous product of the skill of Ghiberti. Owing to want of space for their fit display, these noble electro-castings have hitherto been inconveniently lodged, and not only hidden from the world, but subject to the hostile action of the damp, which has written its name in unseemly streaks of verdigris over more than one panel. This damage will be removed forthwith, by the use of dilute sulphuric acid, which will be carefully washed off, the moment that the copper begins to show a bright surface. We recommend the results of the experience of Signor Franchi, which is adverse to the use of the sulphate of ammonia, to those who are engaged in the purification of Torregiano's famous grille, in King Henry VII.'s Chapel at Westminster.

The frame of the gates, somewhat meagre and poor in its architectural proportions as is generally the case with the woodwork of Italy,—(it is a design taken from a wooden structure, not from one of stone),—is covered with embossed foliage, fruit, and flowers, in *mezzo* and *alto rilievo*, of the most consummate workmanship. The forms are taken from the actual *fama* and *flora* of Italy, and their disposition recalls (and perhaps suggested) that of the pilasters of the Loggia, designed by Raffaello, of which there are good copies in the Museum. Grapes, apples, nuts, plums, and other fruit, trailing shoots of the vine, and graceful forms of mingled vegetation, are interspersed with sharp-billed birds, with the little Athenian owl in the midst, and an eagle in the centre.

The doors themselves consist of two leaves, each of which is divided into six panels, representing scenes in Old Testament history. Around the panels the border is enriched by alternate busts and whole-length figures, twelve of each to each leaf. The former, and the features of the latter, are said to be contemporary portraits. The likeness of the artist himself, and of his father-in-law, the youngest and the oldest heads represented, are admirable for their force and life, and prove that, if the Renaissance had not in the art of Ghiberti attained to the purity of Greek taste, it yet fully rivalled the skill of the noble portrait sculptors of imperial Rome.

The treatment of the panels is essentially that, not of bronze casting, but of *repoussé* goldsmith's work. It requires no small acquaintance with the sleight of hand which may be attained by the cunning bronzist, in the successive or alternate use of wax, and of sand and plaster, in moulding, to allow the imagination to realise the fact that these bold and complicated groups, containing in nearly every instance some one or two figures that seem almost detached from the surface, together with others, of which the outlines are barely indicated by the extreme delicacy of the relief, are really cast, and not hammered or chased.

The pictorial grouping of the designs of Ghiberti differs no less widely from that of work produced under the canons that regulate the art of the draughtsman, as now fixed, than the execution exceeds in its audacity and finish the capacity of the moulders of the present time. Each of the ten scenes represents, not a single incident of the life, but a summary of the entire history, of the patriarch, or sacred hero, whom it commemorates. Thus the first panel, in the upper part of the leaf facing the left hand of the spectator, tells the story of Adam. A cloud of angels, traced with the most delicate touch in a scarcely perceptible relief, shadows forth the song of the morning stars,—

"When the Creator great,
His constellations a tale,
And the well-balanced world on hinges hung."

The same figure, majestic in its dignity (although grateful to none but the sensuous southern people in any material presentation), in another part of the composition is raising Adam from the dust. Yet again HE appears lifting the graceful womanly figure of Eve from the side of her slumbering helpmeet. Yet again HE watches the angel who is expelling the fallen pair from the Romanesque gate of their lost terrestrial Paradise. Fall as this wonderful sculpture is of repetitions of the same figures, of the human pair, the angelic ministers, and the more awful form of the Creator, the separate and successive incidents of the story are combined in a glorious anachronism, and the magic command over the arrangement of the various subordinate incidents into one harmonious composition is a triumph all the more wonderful inasmuch as it compels us to yield the highest admiration to a work of

which we cannot fail to condemn the principle on which it is designed.

The same irreconcilable harmony, for such it must be considered, is displayed, with varying, but almost always admirable, result, in each of the two panels. In each is to be seen the same charming combination of a full relief of some principal figure, approaching to the character of sculpture in the round, with a faint and fairy-like tracery of landscape, or of figures dying into the background of the composition. This combination of the graceful and the bold, of the female and male elements of beauty, may be found in the works of some of the greatest artists of the immortal period of Greek art, such as Pyrgoteles. It is originally, and perhaps essentially, the style of *intaglio*; but its application to *caméo* or relief is natural and appropriate. We could cite Greek gems in which the effect of this mode of contrast is most masterly, but we can remember no instance of Medival work, or indeed of elaborate grouping of any age, in which the method has been introduced with such admirable success. Combined with what we have called the anachronism of the simultaneous representation of successive incidents, this union between two opposite methods of treatment gives to the great work of Ghiberti a charm that is magic and unique.

The second panel gives the story of Cain. We see the first-born infant hanging on the bosom of his mother, while the grand parent of the Hebrew race tills the earth by the sweat of his brow. We see the boys at play, the young men parting to their several occupations, pastoral and agricultural. We see each bring an offering of the fruit of his toil, while the Lord has respect unto Abel and his offering, although unto Cain and his offering he had not respect. We see the very fall of the fatal blow, from the club wielded by a figure of wonderful vigour and life, on the tossed and twisted limbs of the first slain shepherd. We see the questioning as to the murder, and the exit of Cain to wander to and fro on the earth. Again, in the magic grouping of the scenes, we trace the continuity of the story as if told by a series of dissolving views, the rich effect of the entire panel starting into actual life from this widely blended detail.

The story of Noah is no less fully told. A wonderful air of mythologic antiquity is given to this composition by the presentation of the ark under the unwonted form of an Egyptian pyramid. The window of the sacred legend is open near the summit, and a long wing of birds streams out, until it is lost in the distant clouds. Below is the no less duly recorded door, by which stand the four human pairs, while a lion and a camel swell out into an attractive relief from the mass of their fellow beasts and fellow cattle. Under a shed that might almost be a piece of *applied* work, but yet is redeemed from the poverty of such an effect by the truth of the moulding, lies the father of the vine in sorry plight, his reverent and irreverent offering lending dignity and passion to a scene that, less nobly rendered, would be grotesque. The same family surround the altar of thanksgiving in another part of the panel; and the mind reverts to the signal of promise and of protection from the sterner moral of the bacchanalian lesson.

Abraham bows to meet the majestic three, while Sarah laughs her welcome from the door of the tent. The sacrifice of the promised son, bound and kneeling, in striking relief, on the altar, is arrested by the hand of the angel. Other scenes in the patriarch's history are interposed, and force and richness are given to the composition by the figures of two young men, reclining in conversation, on the ground, who appear to be the servants left behind by the obedient and faithful patriarch when he led his son with the wood for the altar.

Jacob, again, appears in every best-remembered incident of his somewhat shifty and ambiguous career. But Ghiberti has removed the stigma from the memory of his mother, Rebecca, by representing a scene, omitted in our present copies of the Book of Genesis, though hinted at elsewhere, in which the Almighty appears to her in a dream, and tells her how to obtain the birthright for the son to whom it was given by promise and by gift. The fair, lithe forms of the daughters of Heth are such as to lead any one whose blood runs with any hot ripple through the veins to sympathise rather with Esau than with the weariness complained of by Rebecca.

Joseph is illustrated by, perhaps, the least satisfactory of the entire series of designs. A numerous double group in *alto-relievo* occupies

the lower portion of the panel, the cup being found in Benjamin's sack affording a theme for grand pathognomonic treatment, both of countenance and of pantomimic gesture. Jacob is kissing Pharaoh on a dais to the left; but the least admissible part of the composition is an elliptical classic peristyle, inconsistent with the Egyptian scene of the story, within which figures in very low relief, but limned like life itself, are hastily storing up the golden grain of the years of plenty.

Beneath the panels last described is scratched, rather than cut, on the cross moulding, in rude Latin characters,

"Laurentii Cionti di Ghiberti
Mira arte fabricatum."

The adjective is, indeed, appropriate.

Moses and Joshua, David and Solomon, form the subjects whose history is illustrated by the four lower panels. In the last, the reception of the Queen of Sheba by the wise king gives occasion for another of those processional or rather theatrical groups of which we cited an example in the story of Joseph. The group compassing the walls of the devoted city is interesting, from the key which it affords, in the attitude, and Roman helmet and armour, of the captain of the host of Israel, to the personality of one of the helmeted statues.

It is difficult to identify some of these admirable figures. Besides the Joshua thus indicated there is a very noble shield-bearing draped figure, which probably represents Gideon. As to Samson, powerfully treated in the nude, there can be no mistake, though the pillar by which he stands is conventionalised into a mere symbol. Moses is always to be recognised; David, and probably Ezra, the latter holding a scroll, are intelligible; but there is one figure, a young man, in Roman armour, with his hands lifted in prayer, who has puzzled even the copyists of the gates. His eyes are fixed on a small disc, by the side of the coved niche in which he stands, on which a face, and the indications of wings, seem to denote a cherub. The only explanation that we can offer is that the youth is intended for Samson, and the disc introduced as a symbol of the Bath Col, or voice which he heard audible in the darkness of the Tabernacle.

Four reclining figures, niched in the upper and under cross mouldings of the gate, rivet the attention by the resemblance which they bear to the awful Morning and Evening of Michelangelo in the Medicean Chapel. The original idea very likely was taken from the ordinary pose of a classic river god, but the marvellous grandeur of these little unexplained statuettes must have sunk into the very soul of the mighty Florentine, who exclaimed that this masterpiece of Ghiberti was worthy to be the Gate of Paradise.

The gates we have described were the second pair executed by Ghiberti for the baptistery. The earlier pair were divided into panels of a very ancient form—a lozenge intersected by four arcs of a circle,—which had been introduced by Pisano into the pair which he had previously executed. These were subsequently removed from the centre doorway to make room for this second work of Ghiberti, and the three noble gates were thus symmetrically arranged. The date of the work of Pisano is A.D. 1330. Ghiberti, who lived from 1378 to 1455, was occupied on his own gates from his twentieth to his sixtieth year. The earlier pair represents scenes from the New Testament, and the statuettes are those of the Evangelists, the four great doctors of the Romish Church, the prophets, and the sybils. They are described in some detail, although not without errors of considerable magnitude, by Vasari, who does not give any description of the second and more beautiful pair.

A similar combination of the circle and the triangle, or rather the lozenge, is, however, as old as the year 1180, which is the date of the execution, by Bonanno, of the Porta di San Rainero, or gate of Saint Reignier (Renatus) in the cathedral of Pisa, an electrolyte copy of which is most instructively placed close by the glorious inspiration of Ghiberti. It will not do to describe, or even to examine, the earlier and more archaic work, after feasting the taste on the exquisite forms wrought out into such life-like beauty by Ghiberti. Let the visitor have the self-command to examine Bonanno's work first. It will well repay minute attention, and the interest which attaches to it in consequence of the precise determination of date, is of the highest order. The unhesitating

conventionalism of this twelfth-century modelling is surprising, and yet a sort of vigorous treatment underlies it all. The devil in the temptation, with trifid, bird-like feet, and a tufted tail, the figure being about half the size of that of Christ, is a marvel of impotent monkish fancy. The baptism is conventionalised into an immersion in a sort of bath. In the triumphal entrance into Jerusalem, human figures grow out of the gates of the city and the palm-trees in an Arabesque impossibility, that contrasts very quaintly with the formality of the little figure who is spreading a shirt, sleeves and all, for the ass to walk over. The scenes, twenty-eight in number, all illustrate the life of Christ. Rude letters supplement the efforts of the artist to tell of the cruelty of "Brode" or the raising "di Lazaro." On the frieze at the top is represented the "triglion" of the *Te Deum*, with wonderfully quaint angels; and the celestial reign of Christ. This gate would be much improved in effect if it were surrounded by a copy of the rude frame, stolen and transformed from a heathen temple, within which the original actually stands.

The gates of Ghiberti have been repeatedly engraved. They are also represented by a photograph in the portfolios of the Art Library. But the most exquisite record of their beauty is from the well-known burin of the Cavaliere Lasinio, in a series of engravings of the panels, published at Florence. Curiously enough one or two of the details of these engravings are incorrect, a helmeted figure, in one of the niches, being drawn in a sort of turban; but the general fidelity is remarkable, and the series of prints gives a clearer idea of the work, not only than the photograph, but than can be obtained even by actual view, without prolonged study.

From the quaint, monkish figures of Bonanno, down to the admirable *repoussé* work of the famous Milton shield, almost every stage of excellence in metal work is represented by the electrolytes that are grouped near the gates of Paradise. There is chased and beaten armour from the *ateliers* of the famous Milanese armourers of the sixteenth century, a suit worn by Francis I., adorned by masks of lions, and another still more elaborately wrought suit belonging to the same gallant monarch. There are massive tables, lamps, gueridons, and mirror frames of silver, or of silver and ebony, wrought by English goldsmiths for the sovereign halls of Knole. There, in partially oxidised silver, is a portrait statue of Henry IV. of France, in his twelfth year, an exquisite work of art. There are the Coronation Plate of the English sovereigns, the relics of ancient Roman goldsmith's work, known as the treasure of Petrosia, and a silver table, epergne, and fire-dogs from Windsor Castle. Copies, indeed, they all are, but copies so true to the original, owing to the wonderful portraiture effected by electrolyte, that the difference could hardly be detected by any but the most skilful expert. Let those who would know how the arts of the sculptor, the founder, the modeller, the metallist, and the goldsmith, are but portions of the same plastic craft, pay a speedy and a careful visit to this scene of metallurgic triumph.

WORKS AT THE HOUSES OF PARLIAMENT

SINCE last session several alterations of importance have been made in the interior of the Houses of Parliament, under the direction of the architect, Mr. E. M. Barry, R.A.; and various works, to which allusion has before been made in the pages of the *Builder*, have been carried on to completion. The most striking changes effected are in the central hall, the witness-hall, and the three corridors leading from the central hall to the Commons lobby, the Peers' lobby, and the river-front committee-rooms respectively. Our readers will, doubtless, remember the discussions in the House of Commons last session, on the proposals brought forward by Mr. Layard, the late First Commissioner of Works, for the decoration of the central hall, and its embellishment with mosaics. The result was the reduction of the vote by no less than 2,500*l.*, and the effect of this reduction on the design is very evident now that the work is so far completed.

The dull brown-coloured paint has been removed from the stonework of the central hall and its corridors. The stone has been covered with a preservative composition which will enable it to be washed; and as the composition has in no way discoloured the surface, the whole

of the stonework is now clean, and shows the natural colour of the material. The carving has been painted stone-colour, as it was not possible, without great expense, to remove the brown paint from it. The stone archways leading to the Peers' and Commons lobbies, and to the river front, have been enlarged, and light glazed oak screens, with plate-glass above them, substituted for the stonework, in order to admit more light into the lobbies. The windows in the corridor to the river front have been enlarged, and skylights have been introduced into the rooms at the angles of the hall, where gas was formerly necessary in the day-time. In the centre of the groining of the hall an opening has been formed for the admission of light from the lantern above, and in the witness-hall, at the foot of the committee-room stairs, the windows have been widened, and openings made in the walls for the same purpose. The colour has also been removed from the stained glass here and in the Peers' and Commons' corridors, and the effect of the changes generally will be greatly to increase the light in the interior of the building. None of the mosaic pictures are yet completed in the panels allotted to them over the four great archways of the central hall. Mr. E. J. Poynter, A.R.A., is the artist employed for the cartoons of these works of art, which are to be executed at Venice by Messrs. Salviati. One picture, the St. George, is completed, and is now being fixed. The whole of the panels of the groined roof of the hall are filled with mosaics on a gold ground. They represent scrolls of roses, thistles, and shamrocks, interspersed with the royal cypher, crowns, &c. The ribs of the groining have been gilded and decorated to correspond with the mosaics, and as the lower part of the hall is quite white and undecorated, the work at this point appears to be incomplete, as indeed it is, for the reason we have before explained. The architect has already stated publicly that the diminution of the moneys at his disposal was not decided on until after the work of decoration had been commenced, according to his official instructions, at the higher estimate, and he has therefore evidently been obliged to finish the mosaic ceiling, and to leave to a future day the decoration of the rest of the hall to harmonise with it. No alterations have been made in either House of Parliament or their respective lobbies. In the Royal Gallery the eight niches are now filled with statues. Mr. B. Philip is the sculptor, and the statues are wholly gift, with a very satisfactory effect. The statues represent the following monarchs:—Alfred, William I., Edward III., Richard II., Henry III., Henry V., Queen Elizabeth, and Queen Anne. In the Queen's robing-room, Mr. Armistead is proceeding with a series of bas-reliefs of oak, representing scenes from the "Morte d'Arthur." This fine room, with its frescoes by the late Mr. Dyce, is now nearly completed, and will, we believe, be added to the portions of the palace to which the public is admitted, soon after Easter.

Works are still proceeding in the Royal staircase. The stained glass has been altered to admit more light, portions of the doors have been pierced and glazed, and the four groins at the top of the staircase are being decorated with mosaics. In St. Stephen's crypt, the baptistery has been completed, and inclosed with elaborate wrought-iron gates by Messrs. Hardman, and with this work the restoration of the crypt is now finished. The painted decoration of the baptistery has been done by Messrs. Clayton & Bell. Outside the palace, a work of some peculiarity and importance has been carried out at the north-east corner of New Palace-yard, by the construction of a subway passing under Bridge-street to the north-east angle of the street, close to the Underground Railway Station on the Thames Embankment. The subway is intended not only to afford a safe and convenient means of crossing the crowded street, but is also meant to give access to the Westminster Bridge Station of the Metropolitan District Railway, and also to the steamboat pier. The Metropolitan Board of Works is taking active measures to prolong the subway to the pier, and this work it is expected will be completed before Easter. Nothing, however, appears as yet to have been done by the railway company to connect their station with the new approach. The subway is a continuation of the cloister or arcade recently constructed on the east side of New Palace-yard. It passes under Bridge-street, at a level slightly below the surface of the paving of the cloister. It is in form a passage about 12 ft. wide, with

a segmental arched roof, terminating at each end in a square space covered by a stone groin. One of these spaces, viz., that at the north end, will form the entrance to the steamboat approach. In the middle of the length of the roof of the subway, an opening is made for light and air, so contrived as to exclude the rain, and also to form a refuge, in the middle of the road above, for persons crossing Bridge-street. By night the subway is lighted by gas lamps, fixed to the arched roof after the manner of those used in railway carriages. The interior of the subway presents a glazed white surface throughout. This is not formed of white tiles, which, in such a situation, might fall off, or be liable to accident; but the bricks of the walls and arched roof are themselves glazed so that the white lining of the work forms a part of its construction. The subway is perfectly light, and well ventilated, and will doubtless be found a great convenience by members of Parliament and others who, by its use, and that of the steamboat subway, will be able to pass between the Houses of Parliament, the railway station, and the Thames Embankment, without encountering the risk and inconvenience attendant on crossing a dangerous thoroughfare. Flights of steps lead from the north end of the subway to the level of Bridge-street and the Embankment. The whole work is completed, but no arrangements have as yet been made to give the public the benefit of its use. Messrs. Field & Co. were the contractors for the subway, and for the mason's work generally. The decoration of the central hall has been intrusted by the architect to Messrs. Crace, and Mr. E. G. Pressland is the Clerk of Works. It is intended to have everything except the three remaining mosaic pictures completed before Parliament meets, on the 8th proximo.

A NOTE FROM NORWOOD.

In the vicinity of the Crystal Palace, where everything is supposed to be in undeniably good order and good taste, we are sorry to say that there are many things which are out of order and in bad taste. Norwood, Upper and Lower, south and north, the New Town and the Old, wants the scavenger and the gutter-cart, the pavior and the drain-makers; but first it requires a few proper road-makers; and last, though not least, it wants a sanitary inspector, who will do his duty (apposing it has one). It is all very well to walk through a few leading terraces or thoroughfares, and express one's admiration of sundry detached villas of a nondescript style of architecture, with garden-plots and borders to match; but when we enter a town in pursuit of our mission, it is not to lounge along its pleasant broadways, but to plunge into its corrugated defiles and back-lanes, where nature and human nature are at strife.

Norwood was once an insignificant locality, known mostly through its tales of gipsy life and adventure. Norwood is destitute of monumental interest of the past. It has no crumbling castle-wall, or ivied ruin, or memorial rookeries. Its hills and undulating vales and streams, and the vestiges of its ancient wood, sacred to gipsy life, alone remain. But acres and acres of fallow have for the last fifteen or twenty years disappeared, and the once gorse-crowned and woody steeps are now created with the habitations of man. Wandering tribes and flocks and herds have given place to the practical and more domesticated bipeds. Norwood, proper or straggling, to-day, taken as a whole, is a populous district of country; and this growth of prosperity and humanity is owing to the erection and existence of the Crystal Palace.

We do not like to find fault if no fault exist; but we would calmly ask of Norwood folk, are they satisfied that their roadways or footpaths are in anything like proper vehicular or pedestrian condition? Enter the town from either the High Level or Low Level Railway Station, and take the rake of the road from the lower to the higher, or vice versa, and the picture along the line of route, under-foot or in sight, is not sanitary or socially pleasant. The road is in ruts, and the side-channels or water-courses owe more to nature and the elements than to man, for fulfilling their requirements. On the high level thoroughfare the road, it would appear, is making rapid advance to annexing the footpath as part of itself, and both seem thoroughly agreed as to the desirability of the union. The ugly and wretched weather-beaten boarding that encloses the Palace Grounds along the high road, front and flank, gives a most

dreary and jagged look to the approaches to the Palace. But we suppose this cannot be helped at present, as it would take more funds than there is a possibility of obtaining to replace it either with a dwarf wall with a fosse, or an iron railing. In justice to the directors, it must be said they are, and have been, making strenuous and energetic efforts to render the Crystal Palace attractive to the public, and they cannot yet be expected to do much externally.

Not so with the Croydon authorities of Norwood. They might do much, for there is a large amount of property and wealth concentrated in the town. Buildings are still on the increase on all sides, though there seems to be a large number of houses to let or to be sold.

On the Anerley-road, which, by-the-by, is wretchedly sludgy and broken, houses are being erected, and the carcasses of others are under the auctioneer's hammer.

Opposite Westoy-terrace there is a plot of ground which can well bear the appellation of "nobody's land," and seems to be designed for no other purpose than that "rubbish may be shot here." Mark ye, this "dead dog" land faces the centre of a fine row of shops in a populous and otherwise respectable thoroughfare, a stone's throw from the entrance to the Palace, and about fifty yards from the Royal Hotel. This "nobody's land" is partly paved in about breast high, and is a receptacle for every conceivable refuse and offal—canine, feline, and human. Is it in Chancery, we wonder, or does it belong to some gipsy squatters? But let us pass this plague-spot,—this half-garden and whole sink, and leave it to the tender keeping of the sanitary magnates of Croydon and Norwood proper.

All the facilities exist in abundance for making Norwood, Upper and Lower, a healthy place, but whilst the leading thoroughfares are pleasant in dry weather, the lower quarters of the town, and the dwellings of the humbler inhabitants, are altogether overlooked.

In Norwood New Town, a quarter lately sprung into existence, the streets and lanes show perfect sludge of from 6 in. to 1 ft. in depth. We assert this without the least exaggeration. There is hardly any attempt here at a pathway, and where there is, a wooden edging, with plugging or stays of the same material driven into the earth, keeps the footway and the street from amalgamating. Not a flag or a paving-stone is to be seen in this primitive region, although in one of its lowest depths, 50 ft. below the level of the high road, a "Mission House" of some religious sect broke in upon our view.

Down in this dell, dingle, or defile, with an incline of nearly 45 degrees, the brewer's cart is not unknown, and the signboard is conspicuous, and speaks of the brush, though the streets and footpaths do not.

Without enumerating the streets or lanes by name in Norwood New Town, we may simply and truly say that every thoroughfare in it shows perfect mud and sludge, ashes, offal, and everything nasty besides. It has some lamps, "few and far between," and we suppose when the drain takes the place of the open pool, and the ploughed street is flanked by the flagged path, the apparition of the taxman will not be altogether an agreeable sight to the pioneer inhabitants in this quarter.

Norwood with its surroundings is pleasantly situated: it is easy, and is not overburdened with poor. Its labouring population are mostly connected with the building trades.

If Croydon Local Board wishes to do its duty, it should pay a little more attention to the roads, footpaths, and drains in Norwood and Anerley; for we believe it has the local government of a portion of this latter district in its hands also.

Apropos, we see that there is an announcement that tenders will be received for the construction of sewers by the Croydon Local Board. It is to be hoped that some of the first constructed will be in the Norwood and Anerley district.

Crossing-sweepers in tender years, of both sexes, are in abundance in every quarter of Norwood, and the visitor is sure to be importuned to a degree that may either soften his heart or stiffen his knuckles to a demonstration. This, after all, is but the winter result of gipsy waste labour, and the band that cannot work or pilfer must need respectfully beg, with a broom half-mast high, and a courtesy for "ye lady and gentleman."

Our desire has always been to see respectable

homes for our poor and working classes; to see their homes properly constructed and ventilated, with a plentiful supply of pure water and the free air and sun of heaven flashed in upon the walls and floors of the poor man's home. No labour spent by us in this direction will be misapplied or distasteful.

In taking a brief survey of Norwood district it strikes us that the field of building operations has been overrun, not only in the town but in the near and adjacent districts of Forest-hill and Sydenham. A full must naturally intervene for a short while; but it seems certain that all the places enumerated will again rapidly extend themselves in area and population, on account of their situation.

The railway accommodation between London and Norwood is pretty good. Complaints, however, are not unheard on the score of the fares. Reductions are now taking place; and facilities enough exist for sightseers visiting the Crystal Palace from either the West or East end.

WILLIAM ESSEX.

THE arts of enamelling and engraving require so much skill and judgment in their highest applications, that men who have thus successfully applied them have always been accorded artistic honours, and by none were these ever more fully deserved than by the subject of the present memoir, for the art of enamel-painting never attained a higher degree of perfection than at his hands. William Essex was born in London, August 1, 1785. His father was a watch-dial painter and bookseller, in Clerkenwell, and in the former capacity gave that direction to his son's talents which grew to an ambitious desire to extend the application of enamel, and to transcribe the great master-pieces of art in this imperishable material, so that faithful records of them should be preserved, long after the more fragile oil-colour, canvas, and panel should have succumbed to the injurious hand of time. The book department of his father's business enabled him to gratify his love of reading, and to enrich his mind with poetic and artistic lore, and was also the means of introducing the young aspirant to Flaxman, Brayley, Britton, and others, with whom his father was intimate, and who encouraged his early efforts and remained his steadfast friends.

As a child, William Essex was delicate and sensitive, and this delicate and nervous temperament was his through life. It is not surprising, therefore, that he exhibited a taste and talent for music, playing both violin and flute extremely well; nor that, at one time, music as a profession should have almost shaken his allegiance to painting. As a youth, he had very little formal instruction in art; he was, however, placed for a brief period with a very excellent enamel and glass painter, and due to his own talent, industry, and perseverance, the technical excellence of his work at the commencement of his career may in a great measure be ascribed to the chemical knowledge of his brother, Mr. Alfred Essex, who prepared the plates, compounded the wonderfully choice colours, and fired the paintings; but his brother's health unfortunately failing, the whole onus of enamelling, technical as well as artistic, latterly devolved upon him. He had furnaces built at the back of his house in Osaburgh-street, Regent's Park, and henceforward attended to the firing and the entire chemistry of enamelling himself. His earliest enamel portraits of George IV., executed for Messrs. Randall & Bridge, jewellers to his Majesty. These brought him Court notice. He afterwards painted for William IV. and Queen Adelaide, and continued to exhibit from year to year at the Royal Academy and elsewhere. Thus he gradually gained many kind and influential friends and patrons among the nobility, and was introduced by the Duchess of Gordon to paint for the Princess, who, on becoming Queen Victoria, made him her enamel-painter in ordinary.

His portraits of the Queen, his Royal Highness the late Prince Consort, and other members of the Royal family, are very numerous, and he executed very many of the enamels for that regal and interesting historical series of portraits from Henry VII. to the present time which adorn the chambers of Windsor Castle. He also painted many works for Samuel Rogers, and received great assistance, kindness, and

attention from the poet. It is in such works as are exhibited in the Plumley Collection at South Kensington that his wonderful skill is most apparent,—in the "Ecce Homo," "The Cottage Toilet," "Fack, Gervatius, the Virgin, &c.—transcripts in which the very touch and *impasto* of the original are faithfully rendered. Sir David Wilkie was so pleased with the rendering of "The Cottage Toilet" that he painted a picture of Sancho Panza on purpose for our enameller, whose copy of it was purchased by the Duke of Buccleugh. "The Young Lambton," after Lawrence, and "The Strawberry Girl," after Reynolds, also show his consummate mastery of the material. Thus he worked on in this exquisite jewelry of art, his sight holding out in a most wonderful manner, and enabling him to accomplish the most minute work till nearly eighty years of age, then a few years of inevitable decay, his labours not forgotten by the Crown, and his good, talented, peaceful, and laborious life closed in the arms of his children, at Brighton, December 29th, 1869.

His eldest son, of the same name, a young artist full of promise, died some years since.

CONTINENTAL SCHOOLS OF ARCHITECTURE.

The artistic education of England is allowed on all hands to be insufficient. Many Englishmen have been abroad to investigate the methods of art-training now followed on the Continent. Very few Englishmen have undergone complete training in German and French art-schools; so that the evidence concerning these schools is that of English outsiders, who are as ignorant of the most important facts as the public they purpose to enlighten. The evidence we offer is that of an Englishman, a graduate of the Polytechnicum of Zurich, and a medalist of the École des Beaux Arts, Paris.

We shall here sketch the life of a student of architecture in Zurich and Paris.

In Zurich the Polytechnicum course lasts three years. The student qualifies himself for matriculation in the following subjects:—I. Algebra; II. Geometry; III. Descriptive and Analytical Geometry; IV. Natural Philosophy; V. Chemistry.

In the first year he attends lectures on:—I. Differential and Integral Calculus; II. Technical Chemistry; III. Construction; IV. Descriptive Geometry; V. History of Art.

The rest of his time is devoted to:—1. Drawing pieces of architecture; first from Greek monuments, and then from Italian Renaissance. Le Tarouilly's plates are much used for the purpose. 2. Drawing the nude figure from the cast, four hours a week. 3. Ornament, six hours a week.

In the second year the student attends lectures on:—I. Statical Pressures; II. Construction of Roads and Bridges.

He fills up his time with:—1. Composing architectural designs; 2. Landscape Painting; 3. Modelling; 4. Drawing ornaments from the cast.

The third year consists of:—I. Semper's third course on Practical Aesthetics; II. Architectural Designing.

There are monthly and yearly examinations. Thus the student is ever kept alive to his work. If successful in all these examinations, the candidate is entitled to the degree of architect.

In the opinion of many competent judges, the mental discipline of the Polytechnicum is too rigid, and tends to cramp the originality of pupils. Again, the Polytechnicum teaches a great deal more high mathematics than necessary for practical purposes.

Now for the École des Beaux Arts.

The pupil in the École des Beaux Arts is left entirely to his own initiative, and that of private institutions named *ateliers*, where he is taught by his elder comrades, and by a professor, who is generally a "Grand Prix de Rome."

Not unlike the University of London, the École des Beaux Arts is mainly an examining prize-conferring Board. It also appoints a staff of salaried professors, who lecture publicly and gratuitously on all architectural subjects.

The candidate for matriculation in the École des Beaux Arts must submit to a competitive examination open twice a year.

The matriculation subjects are:—I. Drawing from the cast an antique monument, as a tripod or caryatides. Time allowed, eighteen hours. II. Composing a small architectural design, such as the middle pavilion of a town-hall, or a small

law-court (*Tribunal de première instance*). Time allowed, one day.

If approved in the above, the candidate goes on with examinations in:—III. Mathematics; IV. General history of art.

The successful candidate is then named *élève de 2^e Classe de l'École des Beaux Arts*, and works up for his title of *élève de 1^{re} Classe*, which he secures by obtaining:—I. Three honourable mentions in architecture; II. One honourable mention in mathematics; III. One in construction; IV. One in descriptive geometry; V. One in stereotomy; VI. One in perspective; VII. One in drawing from the cast.

The *élève de 1^{re} classe* may then compete for the largest designs, such as public buildings and noblemen's mansions. For these competitions the school offers medals as well as honourable mentions. When the *élève de 1^{re} classe* has obtained twelve honourable mentions, he can compete for the diploma of the École des Beaux Arts, which brings his studies to a close in that school.

No candidate has yet taken less than two years passing from the second class to the first. Few have been less than three years securing the twelve honourable mentions which qualify them for the diploma competition. So, reckoning one year's preparatory studies, a young Frenchman is seven years completing his architectural studies.

The studentship of the "Grand Prix de Rome" is a contest apart from the ordinary business of the school. Every Frenchman under twenty-five years of age is allowed to compete for it.

This competition is divided into three stages. In the first stage a small and easy design—say a funeral monument or a public fountain. Time allowed, twelve hours.

The sixty best candidates are chosen by the jury.

In the second stage, the sixty candidates compete for a large design. Last year the subject was a manufactory of carpets, such as the Gobelins. Time allowed, twenty-four hours.

The first ten candidates in the second trial are admitted for the third and final trial, which lasts three months. The candidates, shut up in separate rooms during four days, have to sketch the general outlines of their plans. Copies of these sketches are handed over to the commission of the school. In the three remaining months the candidates have to work out these sketches, without introducing any material changes, and the drawings are to be finished by the candidate himself in closed quarters.

This system of isolation used in all the competitions of the school stimulates and insures the originality of the candidate.

The training given by the École des Beaux Arts, Paris, is, in our opinion, superior to that of the Zurich Polytechnicum.

One thing, however, is wanting in Paris, and that is, a searching course of lectures on the History of Art, accompanied by competitive examinations in that subject.

"*Arx longa, vita brevis*," is a maxim well understood on the Continent. The English conviction strikes us as: *vita brevis: ergo, ars brevior*. To mistake art for a knack which may be picked up in a year or two, is to mistake mind for body.

No wonder that English architectural art is as exuberant as an unweeded garden. Brimful of ideas and conception, the English architect has never learnt how to marshal them; in other words, he creates, but does not compose, using the word in its high sense of harmoniously setting together things that will harmonise. The Continental student learns to tread his way through history, and to give a reason for his every step.

A great architect ought to be a sound historian and aesthetist, as well as a fair mathematician. It is hopeless to expect substantial grounding in these departments of human knowledge without long and systematic schooling. Where parents in England can keep their children in *statu pupillari* as long as on the Continent is a question for political economists, not for artists. The arts are wayward muses, and only yield acquiescence after assiduous wooing. We hail with joy the English art movement, and firmly believe that, with Continental advantages, English students would quickly come to the front and stand unrivalled, thanks to their indomitable energy and sinew.

LAWRENCE HARVEY.

Graduate of the Zurich Polytechnicum, and Medalist of the École des Beaux Arts, Paris.

THE "CORPS DES PONTS ET CHAUSSEES."

MR. C. VIGNOLES, F.R.S., in the course of his weighty and important address as President of the Institution of Civil Engineers, said,—It was Louis XI, who first established post-houses and relays of horses along certain chief roads. In 1550 the first road guide-book for France was published, describing about 100 routes. In 1566 a regular *chaussée* from Paris to Orleans was made; but for more than a century later the great highways (and for these only had any repairs been hitherto undertaken) were only suited for the rapid transit of horsemen, though wagons or other covered or uncovered vehicles, like the *araba* of Eastern countries, or the *tarantass* of Russia, travelled in good weather over the wild tracks. It was in 1660 that the celebrated statesman Colbert was appointed by Louis XIV. Comptroller-General of Finance, and for many years he exercised powerful and efficient rule over all the ways of communication, employing independent architects and engineers, civil and military (most of whom he appears to have mistrusted, and paid all badly and irregularly). Much of their time and large sums were devoted to keeping passable the chief routes from Paris to the seats of war, for the passage of the Grand Monarque to enjoy the triumphs gained for him by his armies.

At the death of Louis XIV., after several abortive attempts, the charge of the internal communications was taken out of the hands of the Fiscal Department, and the decree of the 1st of February, 1716, marked the date of the actual establishment and definite organisation of the *Corps des Ponts et Chaussées*; a hierarchy of engineers was then created, which, though the duties first attributed to them have since been vastly extended, still exists in its leading features.

As now constituted, this *Corps des Ponts et Chaussées* forms the most important branch of the Government Department in France, designated as the "Ministry of Agriculture, Commerce, and Public Works." It is impossible, in a brief sketch, such as I am attempting, to give more than a faint idea of the importance and many ramifications of this ministry, which includes the direction, inspection, and in many cases the carrying out of what, in this country, are assigned to various and generally independent bodies, or are not looked after at all, at least systematically.

The engineering branch inspects and controls every railway, canal, and navigable river, whether completed and in operation or only in progress. It brings every mill and manufacturing establishment, worked either by water or by steam, under its direction; mines, sunk or open, beds of minerals, quarries and collieries, come under its regulations, and, of course, all steam engines, stationary or locomotive. Also all establishments for electric telegraphs, water, or sewage, and the streets and improvement of towns. A special office is devoted to the management of all the lighthouses, channels, and buoys on the coasts, estuaries, and harbours. The construction and repair of highways and carriageable roads of every class come under its control. Further, it establishes the minute regulations for the preparations, on fixed scales, of every plan and section intended for the purpose of soliciting a concession, and for every stage of the works subsequently executed.

Thus this ministry combines in itself, and becomes, theoretically, responsible for many of the duties performed in this country by the "Standing order" and other committees of both Houses of Parliament, by some department or other of the Board of Trade, the Custom House, the Ordnance Survey Office, the hydrographical branch of the Admiralty, the Trinity Board, the Woods and Forests, the Board of Health, and other public boards and commissioners, by the county, city, and borough surveyors, by the waywardens, and by innumerable local officers throughout the United Kingdom; besides many other duties and functions which in this country we have had no thought of creating for the purpose of control, but which are vested in this ministry by their perfect system of centralisation.

To keep this enormous machine in good working order the subdivision of labour and responsibility has been carried to an extent which is a striking proof of the organising faculties of the French. There are in Paris about thirty-two bureaux, each with its staff of chief, deputy, and clerks, of which fully one-half have their attention devoted exclusively to public works. So of

the almost as many permanent commissions sitting in Paris.

For the public works, the corps has 877 engineers in eight classes, of which 134 belong to the division of mines, and 4,343 conductors, in five classes, of which 149 are mining guards. In addition, there are 275 harbour-masters and other port officers. In the whole, 5,495 employees, at the present time nominally available, and 150 officers are invalided with retiring allowances, there being nearly 200 widows of deceased officers in receipt of pensions. The *École des Ponts et Chaussées* has fifteen professors, mostly from the corps, eight teachers, and thirty other persons on the staff for regulation purposes; at present, however, there are only fifty-five pupils at the school. The *École des Mines* has sixteen professors (mostly engineers), eight teachers, and a large staff besides. There are only nine pupils. The two working mining schools at St. Etienne and at St. Alais have thirteen professors and teachers. We have often heard of the admirable modern management of the streets of Paris. To effect this there are specially appointed sixteen engineers of all classes, and 152 conductors, who have charge of the public streets, roads, foot pavements, promenades, plantations, water supplies, and sewerage, all appointed by the minister, but paid for by the municipality of Paris. I am not now considering the cost, but merely the organisation, which is certainly most complete and effective in its results.

The late Mr. Hosking, Professor of Engineering and Architecture at King's College, laid it down as a maxim that it is "the combination of the workman and the man of science that forms the civil engineer;" and I adopt the definition, as we all must. But the engineer of the *Corps des Ponts et Chaussées* is a highly educated scientific gentleman, and as our esteemed member, Mr. Calcott Reilly, said in a debate a few weeks since,—and there can be no better judge,—“These engineers are all mathematicians.” No doubt; but very few probably are at first practical men. These are found in the class of *Conducteurs des Travaux et Gardes-Mines*, and the young engineers are usually wise enough, till they acquire their own experience, to rely on them, they being generally really workmen.

These conductors of the *Corps des Ponts et Chaussées* are a most valuable and, in the main, trustworthy body. They are entered, first, into the lowest of the six classes into which they are divided at the average age of about twenty-five, after having served an apprenticeship to some master workman. By the time they are fifty they get to rank as principal conductors,* and after a further service in that rank, varying from three to thirteen years, they obtain appointments as sub-engineers, but rise no further from want of sufficient previous education; they may be considered as the corporals, sergeants, and sergeants-major of the corps.

Those of higher grade (the commissioned officers, as it were, of the corps) enter the *École des Ponts et Chaussées* at about twenty-one, and at the end of one, four, or five years, are usually qualified for, and pass their examination, being then appointed as ordinary engineers of the third class, at which period they are not far from five-and-twenty. They then rise through all the ranks of the hierarchy, until they attain the position of inspector-general of the first class (the highest grade), after a service of thirty-six years, on the average. I have not been able to ascertain the rules of promotion, but I infer that the promotion is not altogether by seniority. Neither can I get any reliable information about their pay, except that the first forty engineers-in-chief of the first-class, each having served about thirty-five years in the corps, on the average, appear to be entitled (under what circumstances I know not) to a salary of 320l. a year.

Such are the arrangements in the celebrated *Corps des Ponts et Chaussées* of France. In theory the system is perfect, but it drags along terribly slowly according to our ideas—and we must come to the conclusion that, however powerful to control, it is ill adapted to originate.

This complete organisation is kept up by the strictest supervision. Among other regulations is the preparation annually of a volume or directory of 500 closely-printed pages, chiefly tabular—bulky as the annual list of our army. It is interesting to turn over the leaves, and I shall place in the library a copy of the last publication for 1869, by way of voucher for the analysis I have given you, but there is no record of works executed, except occasional and voluntary con-

tributions from engineers to a separate official publication, by the department, entitled the *Annals of the Corps*, commenced about forty years ago, and still regularly continued. These *Annals* contain papers of the same character as those which appear in our own printed minutes; but they set forth, in addition, every decree and ministerial decision upon points of engineering practice, especially in the working of the conditions in concessions granted. These can only be compared to a collection of reported law cases on these subjects, which in fact they really chiefly are.

The system of interference and control in all matters of engineering has been adopted more or less stringently by every Government in Europe. It has been introduced into most of the States in South America. I have had to encounter it in France, Spain, Switzerland, Holland, North and South Germany, Russia, Austria, and Italy, and in its most annoying and most mischievous form in Brésil.

MESSRS. POWELL'S GLASS WORKS.

A VISIT to the old glass-house in Whitefriars serves to show the advantage of personal superintendence and the kindly feeling existing between the principals and the art-workmen, and illustrates very satisfactorily the progress of the art of glass-blowing in this country. It is seen that by the introduction of patterns of the ancient Italian work, or fresh designs of the same character, the art-workman can obtain remunerative wages, without necessitating great charges for the objects made; for the vase and urn, delicate and elegant though they be, do not need any additionally skilled hand: the materials from which they may be made are of the simplest kind, and the cost therefore is in great part the glassblowers' wages. In the specimens of the purest glass, the materials of which are necessarily the most costly, additional expense is often incurred by the employment of a skilled engraver; but where the patterns are simple though elegant, the cost is still very moderate. The specimens in opal glass are particularly satisfactory.

In another department of these works it is difficult to recognise the same material when it is seen in the form of wall tiles and pavements of peculiarly quiet tones of colour and unglazed surface. These tiles, when cut into leaves or scrolls, form elaborate pavements of most agreeable tone, and with the same opaque glass, cut in shapes in the same way that transparent glass is cut for lead lights, pictures are formed, which may be finished in outline, or elaborately shaded.

In the same show-room there is the cartoon painted by Mr. Moody, of South Kensington, for the east window in Bishopsgate Church, lately executed at these works, and it is an open question how far the depth and beauty of the English colours surpass in effect the more delicate finish of the Munich work at St. Paul's, the cost and expenses of the English work being at the same time much lower.

The Messrs. Powell were the first to produce an improved material for the use of glass-painters, and they seem determined not to rest under their early laurels.

ROYAL HORTICULTURAL SOCIETY: WORKS AT SOUTH KENSINGTON.

WE understand that the 1851 Commissioners (in connexion with the proposed annual international exhibitions to be held by the Commission) have arranged for the completion of the gardens and arcades, without entailing any liability on the Horticultural Society. They will also construct conservatories on the upper arcades, by which the first floor of their permanent exhibition buildings, to be erected on the annexes adjoining the central arcades, will be put into direct communication with the society's conservatory.

These works will be completed before the 1st of May, 1871, the date fixed for the first of the series of international exhibitions.

The exhibitions will consist solely of objects which have some special interest or recommendation; and while pictures and other attractive works of art will form part of each exhibition, only, will be admitted in any one of the series, so as to extend this branch of the exhibition over a sufficient number of years to allow time for improvement, before the same class of objects is again brought forward.

By means of the Royal Albert Hall the Horticultural Society hope to obtain an additional access to the garden, and better accommodation for their shows, meetings, library, and reading-room. The prosperity of the society will, in fact, be materially influenced by the success which may attend this and the other undertakings which her Majesty's Commissioners have entered upon on their estate. The building is proceeding with rapidity, and will be finished it is thought, and ready for opening by the same time as the new exhibition buildings on the annexes. There are still sittings in the hall that may be subscribed for.

THE DISTRICT SURVEYORS' ASSOCIATION.

At a general meeting of the District Surveyors' Association, held at the house in Conduit-street, on Friday in last week, a testimonial was presented to Mr. Chas. Fowler, the honorary secretary of the Association, an office which has been held at different times by Mr. George Pownall, Mr. Henry Baker, Mr. Robert Hosketh, and other esteemed members of the profession. The present took the shape of a handsome silver salver appropriately ornamented, the result of a guinea subscription from some fifty of the district surveyors, and is thus inscribed:—

To
CHARLES FOWLER, Esq., M.I.B.A.
From his colleagues,
Members of the District Surveyors' Association,
In recognition of his very efficient services,
For 3 years, as their
HONORARY SECRETARY,
And as a mark of their cordial regard.
1870.

Professor Donaldson, who was in the chair, with that warmth of feeling which makes him always ready to take prominent part in a kindly act, desecrated on the good services that Mr. Fowler had done, and their often-times onerous character, and presented the salver to him in the name of all his associates, and with their hearty applause. Mr. Joseph H. Good, the excellent treasurer of the Association; Mr. Godwin; Mr. Geo. Gutch, probably the oldest member of the body; and Mr. Charles Mayhew, who, though now retired from the profession, claimed his right as honorary member to contribute,—all bore hearty testimony to the ability and courtesy with which the duties of the office had been discharged. Mr. Fowler, who was altogether ignorant of what had been done, expressed feelingly his surprise as well as his gratitude and pleasure; and the meeting again quietly settled down to its ordinary business,—mutual advice and the discussion of moot points. Few know the large amount of time which many of the district surveyors holding office under the Metropolitan Board of Works give, beyond the work of their several districts, with a view to the rightful and uniform discharge of the very responsible duties of the office.

THE PRESTON AND MANCHESTER INFIRMARY.

THE new Preston and County of Lancaster Infirmary, built from the designs of Mr. Hibbert, architect, is now open to a certain extent (dependent on funds available) for the reception of patients.

The western pavilion forms one-half of the complete plan. The erection of the eastern one is left to the future. Until that is accomplished, the classification of sexes and of cases will be comparatively imperfect. The males will occupy the ground floor, and the females the upper floor of the pavilion. The building, formerly known as the House of Recovery, has been enlarged, and re-arranged to form the administrative department, as well as the dispensary and out-patients' department of the institution. That building and the former limits of the site, north and south, determined the disposition of the new pavilion. First, a corridor, 12 ft. wide and 45 ft. long, with windows on both sides, extends westward from the corridor of the old structure, and affords due separation from and access to the pavilion. Sliding valves, for cross ventilation, are over each window, worked by a simple arrangement below. The warming here is by coiled coils of hot-water piping. The corridors will form a lounge for convalescent patients. At the end of the corridor is the pavilion, extending from the former at right angles to what were the limits of the site, north and south, when opera-

tions were commenced. It is a lofty building, of two stories in height above ground, and the arrangements on each floor are identical. We will begin by describing the large south wards, one above the other. These are each 110 ft. long, 26 ft. wide, and a little over 16 ft. in height, arranged for twenty-four beds, two beds between each window. When fires are not required four beds additional can be placed. Taking the maximum number at twenty-eight beds, there are upwards of 100 square feet of floor area to each patient, and 1,700 cubic feet of air space. The large windows on each side are glazed with plate-glass in order to economise warmth, and open as sashes in three divisions, the lower sashes in the ordinary manner, the upper sashes being worked up and down by a hook at the end of a rod. Valves, sliding bit and miss, 3 ft. long, are over each window, worked easily from below. There are also small sliding valves below each window on opposite sides, to cleanse the lower stratum of air when needed. As the ceiling level are Sheringham's movable ventilators, acting in conjunction with four-air shafts opposite, delivering out above the roofs.

The warming is by two large stoves with open grates, of a construction that has been specially devised. They project from the side walls, and form a large hollow mass, built of brickwork, and entirely within the room. Fresh air is admitted from the outside, is warmed by contact with the firebrick back and sides of the open grates, and delivered through gratings at the top of the stoves into the wards. The rude firebrick construction is cased round with coloured glazed tiles, and covered over with a moulded stone. Fresh air is admitted within the stone fenders to supply the fire and increase the draught. Provision is made by descending shafts for sweeping the smoke-flues in the basement below. The arrangements for lighting are by gas pendants, enclosed in ventilating tubes, terminating in large ground-glass globes, that serve to soften the light. The products of combustion are carried off from the tubes by shafts delivering out above the roofs. At the south end on each floor are glass doors, leading to a loggia below and balcony above, where patients may be wheeled out in their beds, if necessary, for the benefit of the sun and air. Adjacent are the entrances to the bath-rooms, lavatories, sinks, water-closets and other conveniences, screened off from the wards, and separated therefrom by passages, with windows and ventilators on opposite sides, and doors, so as to prevent interchange of air between these places and the wards. On one side of the wards are the bath-rooms, with shower-baths, lavatories, and portable baths on wheels, to bring to the patients' bedside, with provision for filling and emptying, and supplied with hot and cold water. On the other side are the water-closets and slop-sinks, for emptying and getting rid of fecal matter from the bed-pans, and other liquid waste; also a urinal in the men's department. Dust-shafts are also provided herein, for the floor-sweepings. These places are warmed with hot-water pipes, and have the same arrangements for ventilation and gas lighting as the wards. All the waste and soil pipes, together with the gas pendants, are ventilated by shafts and trunks connected therewith, and deliver out of the high mansard roofs above. At the entrance of the large wards are the nurses' rooms and the ward sculleries, with small glazed openings between them and the wards, to allow of inspection of the latter at all times. In the ward sculleries are small ranges with oven, hot hearth, and plate-shelf, for keeping the diets warm; also hot closet for airing the ward linen, sinks with hot and cold water laid on, plate-racks over and cupboards for crockery, &c. Near at hand are separate shafts for the descent of foul linen and ashes to the basement, ventilated and delivered out above the roof; also a hoist from the basement to the several floors above for coals and food. Here also are the bell and speaking tube arrangements, by means of which the nurses on each floor can communicate by signal and word of mouth with the porter and kitchen servants, comparatively remote in the administrative department.

Northwards of the staircase are wards for special cases, two on each floor; and beyond those a ward of eight beds on each floor, 37 ft. by 26 ft., by 16 ft. 6 in. high, all with the same provisions for warming, ventilating, and gas lighting as have been already described, and having the same arrangements of baths, portable baths, lavatories, water-closets, slop-sinks, with

intercepting passages, as have been described in conjunction with the large wards, but on a smaller scale. The wards for special cases contain 2,300 cubic feet of air space to each patient, and 150 square feet of floor space. The north wards, of eight beds each, contain 1,300 cubic feet of air space to each patient, and 120 square feet of floor space. Altogether the maximum accommodation in the pavilion is for seventy-six beds.

In the roof space above the top floor are the cisterns for the hot and cold water supply, and the ramifications of service piping. Here also all the foul-air shafts from the wards, gas-pendants, waste and soil pipes, converge in airtight trunks before delivering into the outer air above the roof. Trays of charcoal for purifying the foul air before exit are placed in these trunks, in situations easily accessible for replacing. All the water-pipes are lapped with felt, and gas is laid on to all the spaces in the basement and above the roof where they traverse, so that with proper care on the part of the administration, no bursting of pipes from frost ought to ensue.

The contract for the erection of the building, independent of furniture, was 9,280*l*. Extra collaring under the pavilion, additional building in the rear of the old structure for the better accommodation of out-patients and accident cases, a ward after operation, together with considerable extension of the original plan of the washhouse department, owing to the introduction of steam-machinery, not originally contemplated, and the unforeseen extent of repairs required by the old building, bring up the building account to 11,700*l*. The engineering departments, fittings, and furniture, the laying out of the grounds, the purchase of the land on the north side from the overseers, and the enclosure of the site, payment of architect and clerk of works, together with the maintenance of the institution up to the present time, bring up the total expenditure to something between 17,000*l*. and 18,000*l*.

THE CONSECRATION OF CROYDON NEW CHURCH.

THE consecration of Croydon parish church, which has taken place, is regarded as a great event, and rightly so.

We gave an account of the new structure on the 16th of October, in our Church Building News; but we may here subjoin a few additional particulars.

The stained-glass windows are at present five in number, and comprise some specimens of both English and Foreign workmanship, those of the former being decidedly preferable. That in the east, over the communion, is a rich piece of colouring; in the twelve apertures between the stone-work are scenes from the life of our Saviour. This was purchased by special subscription, the principal part of which was collected by Miss Hodgson and the ladies of the congregation. The west window, under the tower, was presented by Mr. E. A. Heath, and is of foreign workmanship. The window in the south chapel is the gift of Mr. C. S. Robinson, Duppas-hill. In the south side of the chancel, over the vestry door, is a memorial window, given by Mr. W. J. Blake, of Duppas-hill. The fifth window, which is in the south side of the church, near the once beautiful monument of Archbishop Sheldon, has also been erected by private liberality.

Most of the historical monuments are for ever destroyed, and suggestions for their restoration have been made. Those monuments which remain in their mutilated state are, perhaps, best kept as they are, as relics, not only of the primeval heroes whose effigies they bear, but also of the great calamity which disfigured their artistic beauty. At present they are protected from injury by iron railings, and strangers would lose one chief item of interest in the church and its associations if all traces of the fire were obliterated.

The new organ is one of Messrs. Hill & Son's. It is placed in and completely fills the north-eastern recess at the side of the chancel, and is worked, as the former one before the fire, by hydraulic power in the basement.

The clock is placed on the second floor of the tower, one story above the dials. It is fixed upon stout oak framing, and enclosed in a large glass case to protect the delicate works from the dust. Messrs. Gillett & Bland, in order to produce as perfect work of its kind as possible, have introduced all their latest improvements. The clock strikes the hours upon the large tenor

bell, of 31½ cwt., with a hammer-head weighing 90 lb., and chimes the quarters on the 2nd, 3rd, 4th, and 7th bells, the same as at the Westminster Palace clock. The time is shown upon three dials, each 8 ft. in diameter, which are fixed in the north, west, and south sides of the tower (the walls of which are 6 ft. thick). The figures and minutes are of cast iron, raised and gilded, as is also the ornamental rim round the edge of each dial; and the background is of copper, painted black. The three pairs of hands are of stout copper, with brass backs, to give them extra strength, and, of course, are gilded to correspond with the figures. The hands altogether weigh 140 lb. The machinery for working the hands is below the clock, the centre of the dials being in the ringers' room on the first floor; the hands are driven from the clock by a perpendicular rod, at the top of which is a bevelled wheel, running in gear with another on the clock, and at the bottom of this is another bevil wheel which turns three others, all fixed in the same frame, each having a connecting rod, 9 ft. long, which drives the motion-wheels at the back of each dial, and thus moves all the hands simultaneously. Messrs. Gillett & Bland have improved upon their original patent chiming-machine, in the Boston chimes.

Mr. Scott's design, we may say in conclusion, is very similar to that of the old, and is in the Early Perpendicular style. The edifice is now lengthened to 123 ft. by 80 ft. wide. The lengthening is in the chancel, which, by the way, is now the property of the churchwardens, having been purchased by them (for the parish) from those who had a prescriptive title to it in the old building. The sum put down for this right is 1,000*l*.

The works have necessarily been of an extensive character. The contract of Messrs. Dove Brothers, the builders, is upwards of 25,000*l*.; Mr. Scott's commission as architect, 1,200*l*.; and the total cost is near upon 35,000*l*. The liberality of several of the parishioners, who have supplied various embellishments and appointments, has, however, lightened the cost to the Restoration Committee to a considerable extent.

A work, titled "Croydon Church, Past and Present," by Mr. J. C. Anderson, is being got up in imperial quarto, with illustrations on steel, wood, and photography. The price named by Messrs. Sotheman & Co., of the Strand, is 3*l*. 13s. 6d. The work is printed for subscribers only.

FEVER AND PESTILENCE.

Scarlatina in Dundee.—A meeting of the Dundee Police Commission in committee has been held, for the purpose of considering what steps should be devised for checking the spread of scarlatina in the town. Provost Yeaman presided; and there were also present other members of the town council, and Drs. Pirie and Alexander, medical officers of health. Drs. Christie and MacLaggan also attended. The clerk read a letter as to the sanitary measures adopted in Bristol; and the superintendent of police, Mr. D. Mackay, reported the results of an inspection of lodging-houses, &c. A long communication was also sent from the town surveyor's office by Mr. William Mackison, the sanitary inspector, on the state of the town, with suggestions. Dr. MacLaggan, Dr. Christie, and Dr. Pirie addressed the meeting; and a draft circular and queries to be sent to teachers was read and considered, and amendments suggested upon it. The whole subject having been discussed, the meeting resolved that Dr. Pirie be requested, with the assistance of the other medical gentlemen present, to prepare in the form of a handbill, for circulation among the inhabitants, a memorandum of the measures suggested to be observed by the community to ensure cleanliness and prevent scarlatina. The meeting instructed the sanitary committee to continue their exertions for the purpose of enforcing cleanliness, and securing as far as possible the health of the inhabitants. The medical gentlemen present concurred in stating that the disease was now not only milder in type, but that the number of cases was on the decrease. The sanitary committee, on the 7th inst., having considered the remit to them by the Board, and having heard the medical officer and inspectors, resolved that the following measures be adopted with the view of improving the sanitary condition of the burgh:—The surveyor was instructed to make an inspection of closes and courts within the burgh, and report as to such of

them as require to be paved with flags, or otherwise improved, commencing with the more dense parts of the town. The inspector of cleansing was instructed to flush with water the closes and courts in the most thickly populated parts of the town, and to spread disinfectants upon them, and Inspector Kinneir was instructed to cause such of these closes and courts as require it to be whitewashed. It was considered advisable that a circular be addressed to the schoolmasters in town, recommending them to prevent the attendance at school of children in whose families fever is known to be.

Pestilence in Calcutta.—The *Times'* correspondent, writing from Calcutta on the 14th December, says:—

"While Calcutta is preparing for rejoicing, the pestilence of malarious fever is slowly creeping up to its native quarter. At present the fever is wasting the municipal towns of Burdwan with its 40,000, and Serampore with its 20,000 inhabitants. The very constables are so prostrated that they cannot make the usual mortuary returns. In some villages the whole population has been carried off, or has fled till the landholders cry out to Government to help them, since their rents are gone. Yet the fever is curable, and is not infectious; but the poor people lie on the damp soil, lightly clad, badly fed, and unable to cook or go for the filthy water at their door, or help themselves. Caste prevents them from helping each other. But a special English doctor is wanted to superintend the native apothecaries; and drainage—above all things, drainage. After stating that in some villages near the marches 60 per cent. of the people have died, and in others 50, Mr. Adley submits estimates showing that the worst parts can be immediately drained, at a cost of only 31,000*l.*, so as to yield net rental of 15,000*l.* a year; and that if the whole country were drained land would be reclaimed to the value of 102,000*l.* a year. But legislation is necessary to override the rights of private property, for the landlords will not combine."

PUBLIC ROOMS, SHEERNESS.

PUBLIC rooms, and a concert-hall, 100 ft. by 50 ft., have been built in Sheerness, by a limited company, and will be opened, with a dinner, on Wednesday, the 26th. The style of the building is the pseudo-Italian Gothic of the day. Messrs. Jeffrey & Skiller, of Hastings, were the architects, and the cost is stated at about 4,500*l.* Sheerness now possesses a railway terminus, is two hours' journey from the metropolis, and available from all the large Kentish towns and cities. The pier is used at any height of the tide by steam-packets plying daily up and down the Thames and Medway. The population is not less than 18,000.

We agree with those who think it somewhat strange that while English capitalists are actively engaged in developing the attractions and conveniences of various foreign watering places, only available by English visitors of large means, their attention should not have been turned, before now, to a position lying so close to the metropolis, immediately on the water highway of the world's traffic, and thus to be reached by thousands whose moderate means preclude indulgence in long and expensive journeys in search of pleasure or health.

NEW ASSIZE COURTS, DURHAM.

THE Durham Assize Courts have undergone complete revision under the direction of Mr. W. Crozier, the county architect, and may be considered new. They appear to have elicited the warm commendation of those who have had to use them. We give a view of the Crown Court, a view in the Central Hall, and plans of the various stories, specifying the offices and rooms.

Entering the building by one of the three large entrance-doors from a raised terrace on the main front, a vestibule is found, 40 ft. by 11 ft., running right and left. Out of this vestibule access is obtained to gentlemen's waiting-rooms, and the chief constable's and county surveyor's offices. Passing on through three glazed double doors, a corridor is entered, 40 ft. by 6½ ft. wide, running parallel with the vestibule. At the end of this corridor access is gained to the ladies' waiting-room. After passing across this corridor the central hall is found, one of the main features of the new arrangements. The hall is in the centre of a square formed by the two courts, the grand jury-room and the magistrates' meeting-room. On the south side is the main staircase, leading on the first landing to the grand jury-room, waiting-room for grand jury witnesses, and indictment office. Turning to the right and left you ascend to a balcony extending round the four sides of the hall, and from this access is obtained to the magistrates' meeting-room (formerly the grand jury-room). The hall is 52 ft. by 29 ft., and 30 ft. in height, lighted from the ceiling by three large ceiling-lights, in a deeply-sunk, beam-pannelled,

level ceiling. The floor is laid in panels in granite cement, intersected by borders of Maw & Co.'s encaustic tiles. The main stairs and the hall balcony are both fitted with bronzed hand-rails, the newels having terminals formed of the sceptre, and the letters V.R., and the crown in relief on or bosses on their sides, the ornaments being relieved in gold. The effect of the polished stone columns, in two heights, surmounted with arches over the main stairs, and the columns on the north side of the hall is agreeable. The new grand jury-room, grand jury witness's room, and indictment office, are well lighted; and over these, approached by a side staircase, are four spare rooms, which may be used for references, grand jury retiring-room, solicitors' room, or other purposes. Retracing our steps to the foot of the main staircase, and passing under the first landing, we enter a room to be used as a barristers' robing-room, with lavatories, ward-ropes, &c. The judges' retiring-rooms (fitted with necessary convenience) are to the right and left of the barristers' robing-room. The judges can either enter at the rear of the building, out of the gaol yard, or by the main front entrance.

The courts are entered by three entrances from the central hall:—one for the general public; one for prosecutors, suitors, and witnesses; and the third for professional men. Theselatter, before entering into the courts, pass through an intermediate lobby adjoining each court. The courts are much the same in appearance and similar in arrangement, except that in the Crown Court the dock is a permanent one, and in the Civil Court temporary; the space so temporarily occupied when used for the trial of prisoners, giving, by a simple arrangement, extra space and seats for the bar when used as a Civil Court. The courts are 50 ft. in length, 42 ft. wide, and 30 ft. in height, and are each lighted during the day by two large ceiling-lights, and after dark by large sunlight with eighty-one burners. The ceilings of the courts are pannelled, coved from all sides of the room, and the walls are relieved by main pilasters with imposed pilasters between and arches resting on them, all supporting a cornice from which the cooves of the ceiling spring. The architectural features in the vestibule, corridor, hall, and courts have been carried out in the Tuscan order, to correspond with the original design of the exterior of the building.

The fittings to the interior of the courts are in Dantzic oak and American ash, with red and yellow pine linings; the woodwork of the old courts having been used as the framing or heart to the new, the whole being stained and varnished. Across the entire south end of each court is the bench (including a lobby at each end, one for the judge as an access to his room, and the other for the jurors, changing from waiting jurors to the jury-box). The bench has a wooden-pannelled canopy, ceiling, back, and sides; a pediment behind the judge supports the royal arms; the judges are near to each other, and have ready access for consultations when necessary. To the left of the judge, in the Crown Court, the higher box is for the grand jury, and the lower for reporters of the press. To the right of the judge are corresponding boxes for jurors, the higher box for those in waiting, and the lower one for the jury engaged on the trial. The jurors have a separate passage from these boxes to their retiring-rooms, which are neatly furnished and fitted with all necessary conveniences. In front of and below the judge are desks and seats for the officials. The witness is placed in the angle formed by the reporters' box and the bench, and facing the jury. In front of the court officials is a large table, having in it a movable circular disc, so constructed as to be raised at pleasure to enable models to be shown and described. Round the table are the seats for solicitors. Behind the solicitors' seats are three tiers of sliding seats and desks, each slightly elevated one over the other for the use of the barristers. The second row of these tiers is divided by the interposition of the prisoners' dock, which is fitted with seats for the gaol officials. The dock has direct access from the male and female prisoners' waiting-rooms, which are built in the prison yard to the rear of the Crown Court. A curved passage, which gives its form to the seats, passes round the dock on the court level, giving access from side to side of the court. An entrance is provided on the court level for the governor of the gaol and surrendering prisoners, out on bail, to get into the dock; steps also ascend to the prosecutors' and witnesses' seats, which are behind the passage

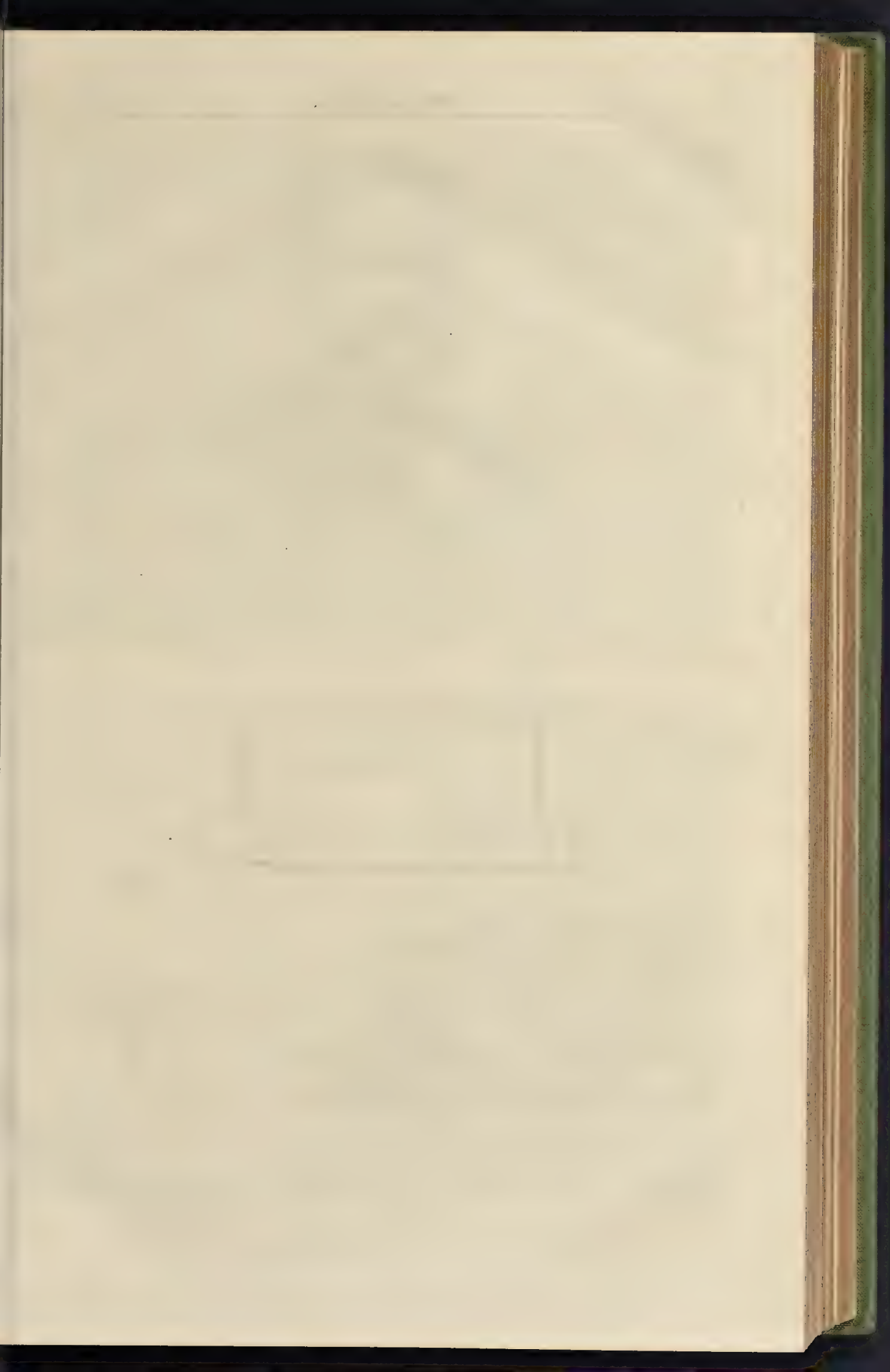
at the back of the dock. Immediately behind the witnesses' seats, and divided from the latter by an iron railing similar to the hall balcony railing, are tiers of seats for the accommodation of the public; these extend backward to the north wall, each tier rising 6 in. over another. The floors of the courts are covered with kamptulicon, to prevent noise.

With reference to ventilation, fresh air is admitted to each court through an air grating under the raised steps in front of the north elevation, and passes along an air course (10 square feet in area) till it reaches the north side of the basement story (which extends under the whole floor of the central hall); it is here met by a water amotizer, which constantly gives out (extending over the whole sectional area of the air course) a mist or spray that washes and cools the air and regulates its hygrometric state, the waste water falling back into a cistern, and being used in the boilers; the air then passes to a fan, 6 ft. in diameter, which is driven by a small steam engine at a rapid rate, and is then forced either through the cold-air chamber or the hot-air chamber, or partly through one and partly through the other, according to the heat required in the courts, and which is regulated in the court as easily as hot and cold water—one or both—are admitted into a bath. The hot-air chamber is completely filled with hot-water pipes, heated from a low-pressure boiler. The air, after passing through one or both of the chambers, as may be necessary, then passes into a mixing chamber, and is distributed by brick, flag-covered, air conduits to all parts of the courts. The air is extracted by means of large air flues, constructed in the roof above the ceiling-level, and connected to a shaft 50 ft. in height at the corner of each court; the ventilation is assisted in the shaft by two coils of steam pipes, one at the public gallery, and the other at the ceiling-level; these coils are heated with steam from a steam boiler, the same boiler supplying power for the engine which drives the fans; the outer skin of the two boilers gives off the necessary heat for warming the central hall. The cost of the works will be about 5,000*l.* Mr. C. Turnbull has been clerk of the works, and has carried out the mason work, which was principally in alterations, with daily workmen; and the following tradesmen have been contractors for the different departments of the work:—Joiner and carpenter's work, G. Gradon, Durham; slater, R. Rule & Son, Durham; plastering, and cement, and tile flooring, W. B. Wilkinson, Newcastle-on-Tyne; painter and glazier, W. Hodgson, Durham; plumber and gas-fitter, James Laidler, Durham; heating and ventilation, Haden & Sons, Trowbridge and Manchester; furnishing, W. Robson, Durham.

Observations that have been made at different times since the courts were in use seem to show that the ventilation is well under control.

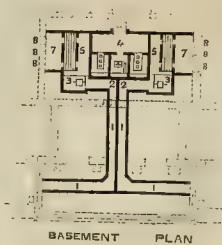
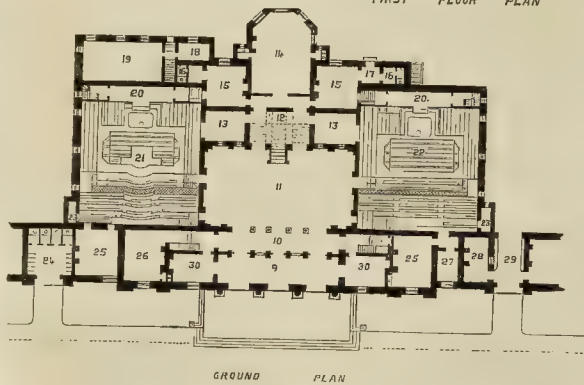
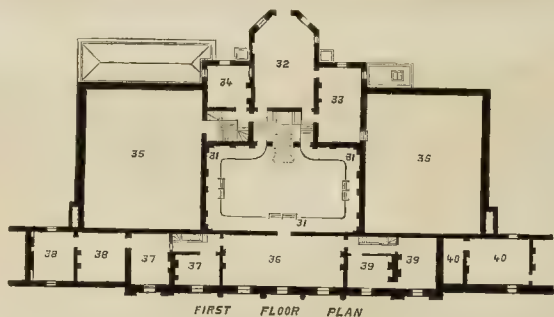
REFERENCES.

1. Fresh-air Conduits.
 2. Sprays or Amotizers for washing and cleaning Air.
 3. Fan-rooms, containing Fans.
 4. Engine and Boiler Room containing Engine for Driving Fans, hot Water and Steam Boiler.
 5. Cold-air Chambers.
 6. Hot Chambers, containing hot-water Pipes.
 7. Air-mixing Chambers.
 8. Channels for Fresh Air, cold or hot, to Conduits under Courts.
 9. Vestibule.
 10. Corridor.
 11. Central Hall.
 12. Main Stairs.
 13. Barristers' Lobbies to each Court.
 14. Ditto Robing-room.
 15. Judges' Retiring-rooms.
 16. Ditto Water-closets and Lavatories.
 17. Porch for Jurors' Entrance from Gaol Yard.
 18. Female Prisoners' Waiting-room.
 19. Male ditto.
 20. Judges' Benches.
 21. Crown-court.
 22. Civil Court.
 23. Extracting Shafts, with Steam Coils at Floor and Ceiling Levels.
 24. Public Conveniences.
 25. Jurors' Retiring-rooms.
 26. Ladies' Waiting-room.
 27. Court Papers, Store-room.
 28. Gaol Porter's Office.
 29. Entrance to Gaol.
 30. Gentlemen's Waiting-rooms.
- First Floor Plan.*
31. Balcony round Central Hall.
 32. Grand Jury-room.
 33. Grand Jury Witnesses' Room.
 34. Indictment Office.
 35. Upper Part of Courts.
 36. Magistrates' Meeting-room.
 37. County Police Offices.
 38. Ditto Store.
 39. County Surveyor's Office.
 40. Gaol Porter's Bed-rooms.



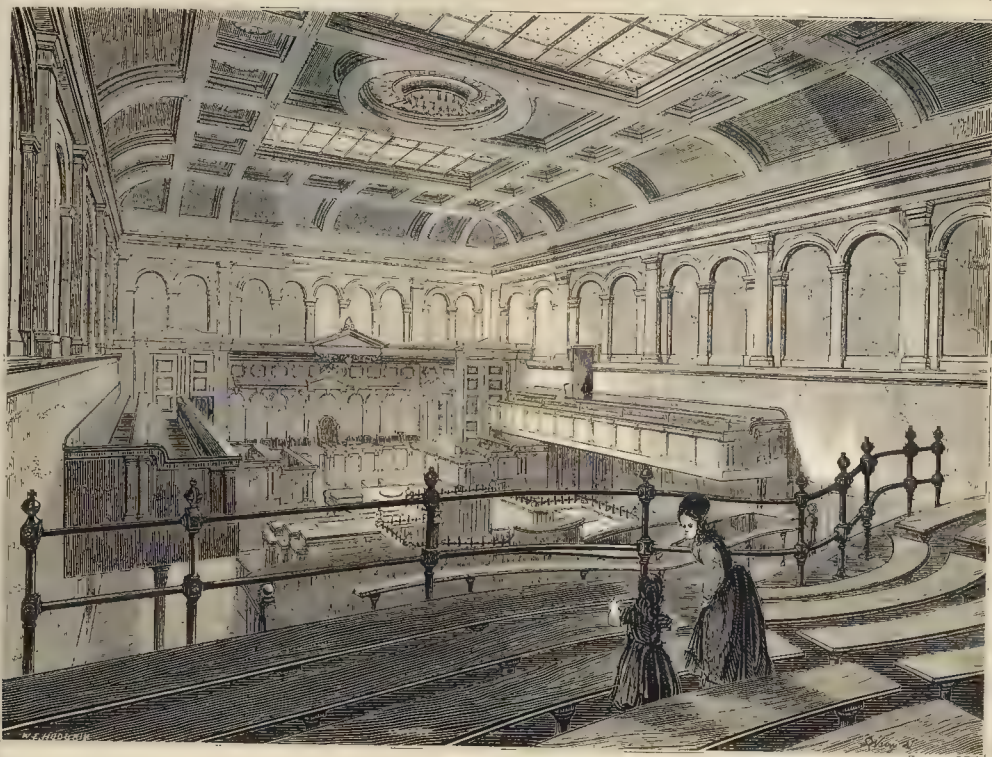


MR. JOSEPH CUBITT, *Joint Engineer of Blackfriars Bridge.*



10 20 30 40 50 60 70
SCALE OF FEET

NEW ASSIZE COURTS,
DURHAM.



Crown Court.



Central Hall.

NEW ASSIZE COURTS, DURHAM.—MR. W. CROZIER, ARCHITECT.

SCHOOLS OF SCIENCE AND ART.

Manchester Academy of Art.—The annual meeting of the members and council of this Academy has been held in the Royal Institution, Mosley-street, Mr. W. K. Keeling, the president, in the chair. The chairman, in opening the proceedings, said they would be glad to hear that the finances of the society were in a more healthy and prosperous state than at any other period since the formation of the academy; that additions had been made to the wardrobe and other properties; and that other costumes were in the course of being made, and that they hoped there would be no longer a necessity of hiring from their London costumer. Some time ago it was suggested that the form of the rules or constitution of the academy were on too extensive a scale, and required considerable curtailments and simplicity. Amended rules would be submitted, and, if approved, would be forwarded at once to Mr. Tidd Pratt for his approval. A subject of more than ordinary importance would probably be brought before the same meeting, viz., the desirableness of admitting ladies as students in the life class for the draped figure. Selim Rothwell (honorary secretary) read the council's report for the past year, which stated that in the life classes last session there were eighty-four nights of study, thirty-three of which were devoted to the nude, and the rest to semi-nude and costume or draped models. The academy at the present time consisted of twenty-three members, twelve associates, and nine students. The latter were steadily increasing in number. It was the intention of the council to hold another *conversations* in the early part of the ensuing year. The limited space of the room for study did not allow of the academy forming a collection of books of reference, models, wardrobe, and furniture, as was absolutely necessary for the requirements of an academy of art. The report was adopted. Mr. W. K. Keeling was re-appointed president; Mr. Rothwell, honorary secretary; Mr. E. Crozier, treasurer; and Mr. H. H. Hadfield, literary secretary.

The proposed Gallery of Art for Liverpool.—This subject has been again ventilated a little in the town council; but Mr. Pictou did not think the present time a propitious one to urge the question, as he had so often done on previous occasions.

The Nottingham School of Art.—The annual distribution of prizes has been made by Mr. Justice Mellor. There was a large attendance, and on the platform were Lord and Lady Belper, Lady Mellor, Vice-Chancellor James, Mr. Mundell, M.P.; the Mayor, the headmaster (Mr. Hawley), the secretary (Mr. Goodyer), and various others. We have so often noted the good progress that is being made at the Nottingham School, that we need not enter more particularly at present into details; but we may remark that in the annual report of the Government examiners, just published, the Nottingham School of Art has received special notice, as follows:—

"We have again to express regret that the study of elementary design, by the filling of geometric forms with ornamental details derived from the analysis of flowers and foliage, has been attempted in but few schools. It may be observed that the Local School of Art of Nottingham, in which this is best done, is also the most successful in its applied designs. In an extensive competition of good designs for lace, &c., we found an opportunity for numerous awards, which were called for by the successful manner of treating the floral forms, judiciously selected as the materials for most of the designs for these delicate fabrics. (Signed) Sir Francis Grant, F.R.A.; J. C. Horsley, R.A.; Richard Westmacott, R.A.; F. R. Pickers, R.A.; Sir M. Digby Wyatt, F.R.A.; E. J. Poynter, R.A.; and Richard Redgrave, R.A.; and Henry Bowler."

The Leicester School of Art.—The committee of this school have unanimously appointed Mr. Wilkeson Pilbory, one of the masters of the West London School of Art, as head-master of the school.

Science and Art Classes at Calne.—A preliminary meeting for the purpose of considering the desirability of establishing a Science and Art School has been held at the Institution, Calne. Lord E. Fitzmaurice, M.P., presided; and after considerable discussion it was agreed to start (in the first instance) with night-classes for drawing, and day-classes for such persons as were desirous of receiving instruction in art, but for whom the Government would not make any payment. A subscription list was opened to meet the preliminary expenses, and Mr. Buckmaster was invited to deliver a public address on the industrial advantages of science and art knowledge, and the conditions on which aid was

given by the Department to night-classes established for instruction in science and art. The inaugural meeting has since been held in the Lecture-hall. There was a good attendance of young men. Mr. Buckmaster addressed the meeting at considerable length, and a brief discussion followed.

The Stoke and Fenton School of Art.—A public meeting of the friends and supporters of this institution has been held in the Town-hall, Stoke-upon-Trent, under the presidency of Sir C. B. Adderley, M.P. There was not a large attendance. According to the report:—

"The average attendance of the students has been, in 1868, on the books, 101; 61.5 monthly. In 1869, on the books, 95; 62.7 monthly. Although the numbers on the books were greater in 1868, the monthly attendance has been higher during the present year. Under the system adopted by the Department of Science and Art, the examinations in March are conducted by members of the committee, and include freehand geometry, perspective and model drawing. In 1868, 37 students were examined, 27 of whom passed successfully, and 7 obtained prizes. In 1869, 28 students were examined, 13 passed successfully, and 1 obtained a prize. The April examinations are held in London, and consist of all the drawings executed by the students during the year. In 1868, the works of 31 students were sent up. 51 were satisfactory, and 4 prizes were awarded. In 1869, the works of 67 students were sent up. 64 were satisfactory, and 9 prizes were awarded. The prizes for the above examinations are in the form of books. A national competition then takes place, of all the works which have obtained prizes, from all the schools in the kingdom. 101 schools of art compete for 10 gold, 20 silver, and 50 bronze medals. Queen's prizes of books are not limited. In 1868, 1 silver medal, 4 bronze medals, and 1 Queen's prize were awarded to the school. In 1869, 1 bronze medal and 1 Queen's prize were awarded. There are also free studentships offered by the Department of Science and Art to the most advanced deserving students, to induce them to continue their studies. In 1868, 9 students were elected to the distinction. In 1869, 9 students were also elected."

The Rev. Sir Lovelace T. Stamer, bart., had offered two prizes for the best and second-best designs suitable for earthenware, value 3*l.* and 2*l.* These prizes have not yet been awarded. The treasurer, Mr. M. D. Hollins, offered two prizes for the modelling class. The first prize, of 3*l.*, was awarded to John Henk, for birds modelled from nature; the second prize, 2*l.*, was awarded to Thomas Longmore, for a modelled design for a vase. Prizes are again offered by Mr. Hollins to the same amount. The Department of Science and Art, in order to afford some slight encouragement to exertions on the part of the masters of schools, offer bonuses to the following amount, namely,—one of 50*l.*, three of 40*l.*, five of 30*l.*, ten of 20*l.*, twenty of 10*l.* In 1868, the master received as bonus the sum of 40*l.*, thus ranking the Stoke School as one of the best in the kingdom. In 1869, however, the committee regret that the master only received a bonus of 10*l.* The diminution of the bonus they can only attribute to the fact that, early in the year, the committee of the Wedgwood Institute, Burslem, being anxious to get up an exhibition of works of art for the inauguration of that institute, prevailed upon the committee to allow Mr. Bacon, the head master (who had had some experience in such exhibitions), to assist in getting up this exhibition.

Edinburgh School of Arts.—Sir William Stirling-Maxwell presided at the annual distribution of prizes to students of the Edinburgh School of Arts, and delivered an interesting address on art education. From a report read on the occasion by Mr. Bouvier Primrose, it appeared that the number of students taught in the central school during the year 1868-9, was 684, being the largest number on record. In addition there had been 1,261 students taught in various public schools of the city, being 204 more than in the preceding year. Among the prizes distributed were one silver and five bronze medals, out of twenty of the former and fifty of the latter, distributed among 103 Government schools. In the course of his address, on the subject of art education, Sir William Maxwell said,—Look at the state of architecture—that art by which a stranger first measures the artistic taste and capacity of a nation. In Edinburgh we may point with complacency to some of our public buildings, the works of Playfair and Bryce. Our western capital has its noble University, now rising in renewed splendour by the Clyde. But glance over to Paris, that great old town which within a few years has been turned into a huge new town, and is now supposed to be the modern Vanity Fair of the world. New Paris, no doubt, can boast of that noble breadth of space and carelessness of cost in which architecture delights, which a military despotism can command, and a municipal debt of 80 millions sterling can explain. But when we recover from the bewilderment into which we are thrown by miles of wide boulevards and legions of mono-

tonous streets, and examine the work in detail, I think the result is disappointment. I see no modern building, new from the ground which will take rank with the old masterpieces. The great achievements of the Second Empire are the completed Tuileries and Louvre and the renovated Hôtel de Ville, and very noble works they are; but, grand as they are, they are nothing more than a skilful repetition of notes struck out in the sixteenth and seventeenth centuries, in which the ideas of olden architects are reproduced, and the H. and L. of the old French sovereigns replaced by the N. of the Corsican. In the chaos of ill-regulated boroughs called London, architecture has still less to boast of. Some fine private edifices in the City and West-end, always copied from old models, and a few colossal railway-stations, impressive by their vastness, are almost all the modern works we have to show to strangers. In my own time, the only national work that, in my opinion, may be considered a great success, is a single wall—the noble river-wall that now faces the northern bank of the Thames from Westminster to the Temple.

The Dublin School of Art.—The pupils have presented an address, with an accompanying gift, to Mr. R. E. Lyne, the head master, as an expression of their grateful sense of all he has done for their instruction, for the welfare of the school, and for the advancement of art in Ireland. In his reply Mr. Lyne said,—

"The pleasure you have experienced in a pursuit requiring in so high a degree a nice combination of the mental and practical, and so well calculated to develop the higher faculties of the mind and augment intellectual enjoyment, must increase along with a growing power of regulating detail by comprehensive generalisation, and the ability to combine in a greater or less degree the lessons of nature with the teachings of the artistic productions of all ages and countries; by such study only can you hope in the future to indicate the refinements and perfections of the age, or produce works that may testify in favour of our own time."

THE SEWAGE QUESTION.

The Thames Sewage.—The Board of Conservators of the River Thames, it is reported, intend to apply to Parliament next session for power, amongst other things, to prohibit the discharge of solid matter into the River Thames from the sewers and drains of the Metropolitan Board of Works, at Barking and at Crossness, and from any other sewers or drains belonging to them or any other body of persons; and to compel the Metropolitan Board of Works to deodorise or otherwise render innocuous the effluent waters or other liquid matters allowed to flow into the river.

Kidderminster and Leamington.—A few members of the Kidderminster town council have visited the Leamington A B C works, which are now dealing with the sewage of that town. The lessees have only got twelve months' liberty at Leamington, so do not feel justified in erecting machinery of great cost. The deputation saw the whole process by which the sewage of a town is restored into its component parts of guano, dried mud, and clear water. A goblet full of the clarified sewage water was quaffed by the visitors. No unpleasant sights or smells, it is said, were discovered. A farmer named Gilbert, informed them that he had dressed 3 acres of land—one with a ton of the native guano (or sewage deposit, after undergoing the A B C process), another with a ton of Proctor & Ryland's manure, and another with 30 tons of stable manure. The guano gave a crop of 18 tons to the acre, Proctor & Ryland's 15 tons, the stable manure 20 tons; but while the cost of the stable manure was 15*l.*, the cost of the native guano was only 3*l.* 10*s.*; the cost per ton of the guano at the works about a guinea, and it finds ready market at 3*l.* 10*s.* It is hoped that by means of the A B C, or some kindred process, the sewage of the town of Kidderminster may be diverted from the pollution of the river to some useful purpose. Some gentlemen are sanguine enough to think that the projected water-guine and drainage scheme may be rendered unnecessary by these means, and two of the gentlemen connected with the Leamington works have paid Kidderminster a visit to see what chance there was of their doing any good by offering to utilise what is at present a curse to the town.

The Pollution of the Trent.—A conference of the local governing bodies of the Potteries, convened by the Mayor of Hanley, has been held at Stoke-upon-Trent, for the purpose of considering the subject of the pollution of the Trent by the towns of Hanley, Burslem, Newcastle, Stoke,

Longton, Tunstall, and Fenton. Mr. Loch, Q.C., M.P., attended on behalf of the Duke of Sutherland, and stated that the condition of the river at Trencham had become perfectly intolerable. After a discussion, Mr. Loch submitted the following heads of a Bill, the expense of preparing which, he said, the Duke of Sutherland would be willing to undertake:—

1. "Clause 1. Prohibits draining into running streams.
 2. Constitutes board representing all boards of health affected by prohibition.
 3. Powers for board to devise means for disposing of sewage by (a) contract with persons or companies, or by (b) purchase of land and erection of works, for deodorising, &c.
 4. Funds to be provided by the boards of health in proportion to district rate.
- Powers to boards of health to borrow on rates or extension of their present powers if necessary. Separate penalty clauses for boards or individuals."

The meeting unanimously adopted the suggestion of Mr. Loch, and resolved to consider the draft Bill at a future meeting.

Sanitary Drainage at South Molton.—In a letter to the *Standard*, Mr. R. Ley, Mayor of South Molton, says:—

"About three weeks ago a paragraph appeared in your paper, stating that a complete system of drainage works had been carried out in South Molton which had proved self-supporting. From that time until now I have been in constant receipt of letters from all parts of the kingdom, numbering nearly a hundred, asking for information on the subject. I have, in fact, been so pestered that it has become quite a troublesome affair to me. Will you, therefore, kindly allow me to state in your columns how we have acted and how far we have succeeded. Our town is situated at the top of a hill, and we are surrounded by land in pasture well adapted for irrigation. We spent something over 2,000*l.* in our drainage works and in tanks for the reception of the sewage. We have sold one lot in perpetuity for irrigation at a distance from the town for 20*l.* per year; another lot for the same purpose, for a term of five years, for 20*l.* per year; and the soil from tanks erected for catching the same, for a term of five years, for the sum of 31*l.* 10*s.* per year. We are about to carry out a water supply for the town, which will doubtless dilute the sewage, and make it more valuable as a manure for pasture land. I have very little doubt but at the end of five years we shall get a larger interest for our outlay, but even at present I think we have nothing to complain of."

THE DARLEN CANAL.

THE inauguration of the opening of the Suez Canal, attended with such unusual splendour, magnificence, and cost, and witnessed by the representatives of the nationalities of Europe, having now passed away, and become a matter of history, allow me to observe that I think Great Britain—one of the first commercial nations of the world—did not figure in a very high or dignified position on that occasion. It is true H.M.'s representative was there, and a few of our distinguished scientific and mercantile men, but we had no high or especial representative like many other nations, although it must be known to the wide world that the success of that great work will confer far greater advantages on us than on any other people, in forming a shorter and direct route for shipping to our vast East-Indian possessions.

As our enterprising neighbours have shown us the way for a shorter route to the East, I was curious to see whether we should follow again in the wake in the canalisation of another isthmus, that of Darien, and I find they are again in the field with a project for that purpose; and the President of the United States, in his last address to Congress, made some allusion to it, although the Americans cannot now so much require it, since the opening of the railway from New York to San Francisco. The canalisation of the Isthmus of Darien has always been a favoured project of the Emperor Napoleon III., who has had lines, more than once, surveyed; but it has also been surveyed by other parties, and its expense estimated at about four millions sterling, or less than one third of the present cost of the Suez Canal.

There are several routes proposed for the canal across the Isthmus at Tehuantepec, Nicaragua, and through the Lakes, Chiriqui Lagoon, and Rio David; the Gulf of Darien, Caledonia Bay, to San Miguel, a distance of only 48 miles (mentioned in the *Builder*, p. 35, ante), and the Rio Atrato, over which a canoe has already passed from sea to sea, and a favourite line of Baron Humboldt's; but I do not think the surveyors have been made with that care and relative merits and advantages, to select the best and cheapest route, and therefore new and comprehensive surveys will be necessary.

In addition to forming a better and nearer route to our western colonies, the Pacific, Japan, China, &c., the line of canal would open up the coasting of Central America, through which it would pass, afford ample room and verge enough for unlimited emigration to a thinly populated

country possessing one of the finest climates in the world and a most productive soil, that will support the wants of man with little labour, and thus spread the blessings of commerce and civilisation westerly as the Suez Canal does towards the east.

Allow me to add, that it behoves the engineers of this country to look better after their interests and their laurels. Are not the leading great undertakings of the world falling into foreign hands? And our own Government are calling in Americans to carry out the Indian railways, and they have actually already employed an American engineer in one of our colonies; this, too, at a time when there is a dearth of employment at home, and men, the pioneers of civilisation, who have administered largely to the accumulation of wealth in this and other countries, are allowed to miserably decay, and capital is now lavishly embarked and frittered away in petty and unsubstantial telegraph schemes, or foreign (anti-British) loans.

B. BAYLIS.

THE STATE OF THE MARKET-HALL, CHESTER.

FROM the minutes of the Corporate Estate Committee, the town-clerk, at a recent meeting of the council, read that Messrs. Johnson and Ellington, engineers, had made a careful examination of the market-hall roof, and in their opinion the breakages resulted from the following causes:—

1. The want of diagonal stays in the roof, which allowed the principals to move laterally, thus disturbing the glass and slates.
2. The want of strength in the T-iron sash-bars and the ridge pieces, as evidenced by the present state of the skylight.
3. The too great width of the glass in proportion to the strength of the sash-bars.
4. The want of more or else stronger clips at the bottom of the squares of glass, which had given way, sliding downwards from the rabbet on the ridge piece.
5. The slating also wanted attention, and there are a good many loose slates.
6. The work of the labourer also wanted painting badly.

There was also a quantity of dirt in the lower gutter, which, if not periodically cleared out, would get into the columns which formed the down-spouts.

Messrs. Johnson and Ellington said they calculated the cost of the alterations and additions to the market-hall roof at 516*l.* In this estimate they had not added anything for the risk of breaking in cutting the squares of glass, but that with care they believed would be small. They also had not taken the slating and painting into consideration, with the exception of painting the whole of the new ironwork and the old sash-bars. Surprise was expressed at the sum required to repair a building only five years old. After some discussion, it was resolved to refer the matter back to the committee, with instructions to communicate with the architect. Alderman French said that though they might get the opinion of the architect, they could not attach any blame to him.

THE PHANTOM OF THE SEWER.

IN your first impression for the new year, Mr. Elliott has given us much sound advice on the ventilation of sewers, which, if carried out, would, ere the close of the year, drive many of our medical men into the Bankruptcy Court. But while we admit that our poisoned houses kill their thousands, let us not forget that our poisoned streets swell still more the undertakers' gains. There is a phenomenon occasionally produced in our streets, which (while the causes are allowed to exist) I would were more often apparent. I allude to the steam which any one may sometimes see, especially in November, issuing from many of our street gullies. What is this steam? whose comes it? and whither does it go? It is nothing less than relapsing and other fevers, in vapoury forms, seldom seen because the state of the atmosphere rarely is favourable to its appearance, but still always hovering about us. If it were to be seen every day, abler pens than mine would, ere this, perhaps altogether have stopped the evil; but it is not so: this phantom fever rises up unseen (though not nameless) among us, spreading infection, disease, and death. There is little doubt whence it comes. Direct from our sewers and drains this concentrated essence of disease arises, polluting the air with its poison, and freely entering the lungs and blood of its victims. The task of preventing this is not beset by any very serious difficulties. We have only by a suitable draught from our traps and gullies into a steady down-draught into them, and the gases

antagonistic to health, and so obnoxious to our nasal organisation, might be brought entirely under control, and if possible be utilised, but certainly destroyed. This project I believe to be very old; but, for the welfare of the public, I ask you again to bring it under their notice.

W. F. C.

THE WESTMINSTER STATUE AT CHESTER.

SOME months ago, as we mentioned, it was reported that a defect had been discovered in the statue, by Thornycroft, of the Marquis of Westminister, which occupies a prominent position in the Grosvenor Park, Chester, and which was pronounced at the time of its inauguration the largest marble statue, from one block, in the kingdom. It seems from what transpired at a recent meeting of the Chester Town Council, that with the exception of a piece which had been let in to the left shoulder of the figure, the statue is out of a solid block of Sicilian marble. The late frost had rendered the piece distinctly visible, and very much marred the sculptor's workmanship. Mr. Thornycroft has explained that the insertion of the piece in the left shoulder was occasioned by the discovery of a flaw when the block was being worked; that such an insertion was common; and that he was engaged on several statues for the Prince Albert memorial, which would have to be completed in the same way. Considering that the block was excellent, with this exception, he thought it would not be judicious to obtain another block from the quarry, which his contract with the merchant would have permitted him to have done without additional cost; and he therefore proceeded with the work, especially as the committee urged him to get it finished during his lordship's lifetime. An arrangement has been come to between the committee of the subscribers and Mr. Thornycroft for the latter to make good any damage arising from the insertion of the piece in the shoulder. One or two of the members of the council expressed the disappointment which was felt by the public at learning that the statue was not, after all, as they had been led to believe, out of a single solid block of marble.

The present Lord Westminister, in a letter, admitted there was a difficulty, but said somehow or other the Greeks and Romans got large blocks two thousand years ago, and perhaps in a thousand years hence we might be able to do the same. He did not consider the flaw so slight a matter as was endeavoured to be shown.

"THE FLEET."

IN answer to your correspondent "Camden," the "Fleet Ditch," or rather let us call it by its true name, the "Holebourne," is carried beneath the Regent's Canal a little to the east of Camden-street, between it and Camden-ray. The Highgate branch has its main sources by Kenwood, forming the five large ponds in that locality. The rillet from the vicinity of the cemetery is very unimportant.

J. G. WALLER.

THE TREATMENT OF SEWAGE WITH CARBON.

SIR,—As the sewage question very properly occupies a prominent place in your columns, may I be allowed to call attention to a very simple process, which for several months past has been in operation in this district (Newcastle).

Having carefully watched the working of this plan for nearly three months, and tested the results in various ways, I am sanguine enough to believe that it will prove very valuable. It is the subject of letters patent, and proceeds mainly on the well-known properties of charcoal. Carbons in the shape of coke or waste cinders are so disposed in a preliminary tank as to retain all solid matter contained in the sewage, the effluent water from which is conveyed through a series of smaller tanks charged with finer carbons; the last of the series containing chiefly vegetable or animal charcoal, or a mixture of both. All the tanks are closely covered in, and the contents of the smaller tanks are from time to time emptied into the large preliminary tank, until the same is full; which, after being drained off, may be emptied, and the contents carted away as a valuable manure. I have been present this week during the emptying process, and can testify that so completely has this carbon done

its work, that not the slightest nuisance has been created.

As regards the value of the manure, I may mention that it was carefully tested this last summer in the growth of swedes, cauliflowers, &c., side by side with the best Peruvian guano, with results which surprised every one. The crop yielded at least 20 per cent. more weight than that from the guano.

The plan is now in operation at the Stoke Parish Workhouse, and the guardians of the said parish, after prolonged and careful testing of the plan, have shown their confidence in the same by entering into a thirteen years' contract with the patentee.

E. JOHNSON.

ST. MARY'S CHURCH, MISTLEY, ESSEX.

THE old parish church of Mistley, in the Italian style, with a tower at each end, having been found to be in a dilapidated condition, involving the necessity of reconstruction, the Rev. C. J. Norman, of Mistley-place, gave a site in the park on the new road recently opened by him from Mistley to Manningtree, and a new church was commenced in December, 1868. It is in the Early Decorated style, and has a total length inside of 100 ft. 6 in., of which the chancel occupies 27 ft. 6 in., and a total width, including the nave, and the north and south aisles, of 51 ft. 6 in.

At the north-west angle stands the tower, vaulted inside with stone ribs and groined ceiling, forming the principal entrance. The chancel and organ-chamber are both terminated with a semicircular apse, and the former is pierced with seven windows, three of which are filled with stained glass.

The church is constructed with Kentish rag-stone walls and Bath stone dressings; the roofs are slated; those over the nave and aisles are of open timber-work, while the chancel has a paneled ceiling, divided with arched ribs, springing from carved stone caps and Parbeck marble shafts. The chancel arch is ornamented with carved stone corbels and Lizard serpentine shafts, and the columns on which the arches for the clearstory rest are of Mansfield red stone. The body of the church is seated with open benches, the passages between the sittings being paved with Burslem tiles, and the chancel with May's encaustic tiles. The structure is heated throughout with hot-water pipes, fitted by Messrs. Dennis & Co., of Chelmsford. The stone pulpit was the gift of Mr. Munn, of Manningtree, and the font was presented by Mrs. Norman.

Accommodation is provided for 540 adults and 600 children, 500 of the sittings being free. Messrs. Wadmore & Baker, of London, are the architects; and Mr. Hawkins, of Monks Eleigh, is the contractor. The amount of contract, allowing for the materials of the old church, is £4,367l.; and for the completion of the spire, 790l. The latter feature will have a total height of 142 ft.

DERIVATION OF THE WORD IRELAND.

KING ALFRED'S word, *Ira-land*, being a translation, carries us back to Greece and Rome for our derivation of the word "Ireland." Onomastic, an early Greek writer, who occupies, with respect to the fabulous Orpheus, the same position that Macpherson occupies with respect to the mythical Ossian, has the word *Ἰρηνία*; archaic Greek for the western islands of the blessed. This was Latinized as *Ierne*, and appears so in Claudian: unquestionably applied to Ireland.

The Greek root *ἱερός* means "holy," as in hieratic, &c.; it is identical with the Hebrew, and has also formed the Latin *ira*, whence our words "ire," "irate," "wrathful." I do not, however, at all suppose that Ireland was really the "blessed or sacred isle" at any time; but Homer and other early poets always fabled the existence of such a place, longed to discover it, and located it just outside the boundary of real knowledge. Thus early Mediterranean voyagers, some, one by one, they exceeded the bounds of previous knowledge by means of more extended excursions, failing to reach the reality, but still pursuing the ideal, ended lastly at Ireland; that place, as latest inheritor of the name, has retained it longest. The native Irish word is "Eire" or "Eirinn"; apparently without any definite etymon, except that *tar* is "west"; but that is not the word.

To the Welsh, Ireland is "Gwerddon," or Iwerddon (green isle): a mere poetical

term; and the Irish are "gwyddyl" — savages. This last term must be deemed an expulsive, indicating national animosity; as the English are the hated *Seisnaeg*, or *Sasunnach*, to both races.

A. H.

DRAINS AND CESSPOOLS, CAREY-STREET.

SIR,—In the matter of the Law Courts site, may I suggest one cause for complaint on the part of its surrounding inhabitants, and which, I believe, is the creator of a deal of the fever and illness that have prevailed, and still exist, round that spot?

Beneath the present waste ground are drains and sewers innumerable, which, from the mass of people that lived over them (of the poorest kind), has the incrustation of years and years of use; and, I have not a doubt, the soil surrounding the said drains in many places is like a cesspool. We all know the effect of opening disused cesspools, in regard to the danger that arises to health, and taking into consideration that the air is constantly flowing through these sewers and drains, absorbing the foetid and putrid matter, and thence percolating into the surrounding houses, there, in my belief, is the cause of fever and death. The whole of last summer the stench round this spot was a caution. I had my own family stricken with fever, and in this street there have been several severe cases since. If this takes place amongst well-to-do people, how must it fare with the poor that inhabit Maiden-lane and other thoroughfares and courts adjoining?

BLEED.

BAYHAM ABBEY.

ON Thursday, the 13th inst., the first stone of a new mansion was laid at Bayham Abbey, near to Tunbridge Wells, by the Marchioness Camden. The workmen, to the number of eighty, were afterwards given a half-day's holiday, and were treated by the Marquis Camden to a supper, under the chairmanship of Mr. French, the clerk of the works, and Messrs. Trollope & Sons' foreman.

The building, designed by Mr. David Brandon, will be completed in about two years. A detached chapel will also be erected in the park, between the ruins of the abbey and the site of the new mansion. These ruins, which are of Early English period, and of much interest, may be seen two days in the week, and are visited by many persons from Tunbridge Wells and the neighbourhood, the distance from the wells being a pleasant drive or walk of five miles.

CASES UNDER METROPOLITAN BUILDING ACT.

District Surveyor of St. James's v. Strode & Co.

SIR,—As you have allowed the supplementary statement made by the District Surveyor of St. James's to appear in your columns, we trust, with your usual impartiality, you will allow us a few words on the same subject; as although generally, and in most of the important particulars, it agrees with your former report and with the facts of the case, there are some remarks which we cannot allow to go unchallenged.

In the first place, we are described as "tradesmen expressly refusing to be sub-contractors;" and further on, as "absolutely declining, for private reasons, to surrender our independence;" the real facts of the case being that we were not asked to be sub-contractors; but, as the case generally, we were simply ordered by the architect to provide and fix the sun-burners in conjunction with the builders, who were ordered to cut away and trim the joints, flooring, and other woodwork, and to make good the same after our apparatus was fixed.

The report says that on Mr. Knox dismissing the summons, our counsel, Mr. Warner Sleigh, applied for costs. This was not so. Mr. Knox simply said the summons must be dismissed, but without costs, and Mr. Warner Sleigh immediately expressed our satisfaction with the decision.

It is quite true costs were asked for, but it was before the case had commenced; and under these circumstances, Mr. Warner Sleigh thought it right to inform the magistrate that the case was one of some importance, and that in the event of his giving an adverse decision his clients had instructed him to ask for a case for appeal. After hearing this, the District Surveyor said he would withdraw the summons for the penalty, and summon us again for the fees only; there being no appeal against the magistrate's decision as regards fees. Mr. Warner Sleigh then said, as his clients had incurred considerable expense and loss of time, he thought it only just to set that, in the event of the summons being withdrawn, their costs should be allowed. Mr. Knox intimated he should certainly allow them; and that moreover, although there was no appeal against his decision as regards fees, he could, and certainly should if asked to do so, state a case on the point of law which governed his decision, to be argued before the judges.

Under these circumstances, the District Surveyor elected to go on with the case, which ended by Mr. Knox dismissing the summons.

Now as to the "impressions" left on the mind of the District Surveyor as set forth in the note at the end of the

statement. He says that the invention, *i.e.*, the sun-burner, has come into use altogether since the date of the Act, and that the clause which is supposed to apply (as to pipes for conveying heated air) "was really directed at nothing of the kind."

We fixed the first sun-burner ever seen in London at the Reform Club, in September, 1863, under the direction of Sir Charles Barry, and many others were fixed in the same year.

The Building Act bears date 1855, and the clause which is supposed to apply states—"No pipe conveying smoke, or other products of combustion, shall be fixed nearer than 9 in. to any inflammable substances."

If the District Surveyor thinks this clause was not directed at sun-burners, where is his authority for any interference at all?

STRODE & CO.

District Surveyor of Whitechapel v. Holland & Hannen.

THIS was a summons taken out, at the Thames Police-court, by the District Surveyor of Whitechapel against Messrs. Holland & Hannen, builders, for erecting a warehouse in Leman-street, Whitechapel, contrary to the provisions of rule 4, section 27, of the Building Act.

Mr. Reginald Ward, Assistant Solicitor to the Metropolitan Board of Works, appeared to support the summons; Mr. Sergeant Sleigh appeared as counsel for the defendants.

The facts of the case were that Messrs. Holland & Hannen had erected extensive warehouses in Leman-street, which were divided above the basement by party walls, so as to contain three compartments, each of them somewhat less than 216,000 cubic feet. The basement running under the whole building, and containing 139,000 cubic feet, was divided from the upper floors by horizontal arches on iron girders, and had no communication therewith, the only access to the basement being from the exterior of the building.

Mr. Ward argued that, having regard to the definition of the words "party wall" given in sections 3 and 17 of the Act, the basement was not divided from the upper floors, as required by the 4th rule, and its contents would therefore, have to be added to each of the upper divisions, so that each would contain considerably in excess of 216,000 cubic feet. It was further argued that rule 3 of the 27th section was not intended to limit the application of rule 4, but that it applied more particularly to buildings occupied otherwise than as warehouses,—as, for instance, to model lodging-houses and chambers with separate entrances.

Mr. Sergeant Sleigh argued that in calculating the cubic contents of each division of the building, the basement should be excluded, the division between it and the upper floor being complete. Counsel also argued that the case fell under rule 3; and as the basement had a separate entrance from without, it was a building separated as required by section 27.

The Magistrate, Mr. Lushington, decided that the basement was not divided by a party wall, and must, therefore, in ascertaining the cubic contents of the building, be considered part of each set of warehouses above. The Magistrate also decided that rule 3 did not exempt the defendants from compliance with rule 4. An order was therefore made upon the defendants to divide the building by party walls in such manner that the contents of each division should not exceed 216,000 cubic feet.

NEW BRITISH INSTITUTION.

THERE appears to have been a split amongst the artists who opened the first exhibition in Bond-street. So now, instead of one, two societies are to be formed. This is greatly to be regretted, and should be avoided if possible. One, of course, will have to yield ultimately, and it may as well be done first as last. Two cannot flourish; one may and should. The title "New British Institution" is wisely adopted by those who have engaged the Gallery at 39, Old Bond-street, seven doors from Piccadilly, and they propose the following rules:—

1. An acting committee of selection and arrangement will be elected by the artists promising contributions from a list of candidates to be forwarded by letter.
2. The claims of every contributor's work will be decided on the ground of merit alone. No rights or privileges in the Exhibition can therefore be allowed to members of the committee, guarantors, or others.
3. No more than two works by any contributor will be placed, and no greater number will be received.
4. A financial committee will have control over expenditure and receipts.

A guarantee fund is being raised, and a strong list of supporters is published. Mr. Gullick acts as honorary secretary.

ABOUT CAMEOS.

THE name of Ronca is known in part of the art world, and his works have been admired and praised by some of the best judges in England. A few years ago he obtained a prize of five guineas from the Society of Arts, for a cameo of the Queen and Prince Consort, and was mentioned in terms of high commendation in the *Art Journal*, of September, 1865. Her Majesty also expressed her approval of his work, and gave him an order, which was very gratifying to him. Yet, M. Ronca remains comparatively unnoticed, but few of the public being aware that we have among us an artist in cameos of superior merit. His designs and workmanship are excellent, and I feel sure that, could his name be brought more prominently before the world, he

would obtain many patrons. By kindly giving this little notice a place in your widely circulated journal, you will confer a great favour, and do more to promote the desired end than any other means that could be suggested. M. Ronca resides at 42, Blantyre-street, West Chelsea, and a visit to him would repay any art-lover for the trouble. It is surely a mistake to allow such a man to struggle through the best years of his life in obscurity, and only to find out his merits when the finger of fashion may point the way; when his hand may have lost its cunning; and, so far as the artist is concerned, it may be "too late."

E. S. P.

ARCHITECTURAL ART CLASSES.

The arrangements for establishing drawing, colouring, and modelling classes for architectural students are making progress. A joint committee of the Royal Institute of British Architects, the Architectural Association, and the Architectural Museum, have held meetings, and the outlines of a scheme have been prepared and discussed. The classes will meet in the Architectural Museum, and have the advantage of the collection there. Such of our readers as may be disposed to join the classes, would do well by at once sending their names to the Museum, as willing to look to the terms when published.

THE LIFE-LINE FOR FIRES.

SIR,—I would beg to ask, through the medium of your journal, whether the life-line rocket apparatus, now in use for saving lives from shipwreck, might not be equally applicable to the rescue of lives from fire?

It appears to me that a portable apparatus of the kind, which would practically be able to convey a line to any height of story or roof that could possibly be required, might, in the absence of fire engines, or, as is more frequently the case, of water and fire-escapes or ladders, be the means of preserving many lives now lamentably lost?

ALFRED JOWERS.

RATTENING IN SHEFFIELD STILL.

THE villainous scoundrels who disgrace, not only Sheffield, but all England, are still at their nefarious work. Several houses have of late been attacked and the contents destroyed. In one instance, the assailants attacked the wrong house, and did not discover their mistake until they had broken up everything within their power. As soon as a man omits to make his weekly payments to the trade secretary he is rattened. A young man in the employment of Messrs. Sorby has had a nut stolen, to prevent him from working, because, having spent the whole of his ready money during the week of his honeymoon, he was not able to pay his "natty," and another man, working for the same firm, has been threatened with rattening because he engaged one of his five children to help him at his trade without having first obtained permission of the union. To be secretary to such a union ought itself to be punishable. The cat would be the best rooster out of these rats, could she only get at them to claw their backs well. Every honest English workman should raise his voice against them.

SIZE OF MORTAR JOINTS IN BRICKWORK.

Will you allow me to ask the following questions through your columns?

1. What is the best thickness for the mortar joints in brickwork?
2. What are the distinctive qualities of thick and thin joints respectively?

Mr. Street read a paper at the Institute a few weeks ago, of which a summary appears at page 959 of your last volume. With reference to Medieval brick architecture as it appeared in various districts, that gentleman is reported to have said:—

"The development of each was different. . . . But they, it seemed, all agreed that brickwork is to be strong it must be built with an enormous quantity of mortar; and so, instead of specifying, as enlightened nineteenth-century architects do, that 'no mortar joint is to be more than $\frac{1}{2}$ in. thick,' he thought, if we could find a Medieval specification, we should find it ran in this form, 'No mortar joint to be less than $\frac{1}{2}$ in. thick.'"

We might, perhaps, accept Mr. Street's dictum as to what is good brickwork without hesitation, if it only ran counter to the practice of those "enlightened nineteenth-century architects" who

are thus set down so summarily by one of their own number; but engineers are generally supposed to know something of good building at least, and Professor Rankine is the latest authority in the engineering world. What, then, are we to think of extracts such as this, which is from Rankine's "Civil Engineering," p. 393?

"The following principles are to be observed in building with bricks:— . . . To fill every joint thoroughly with mortar, taking care, at the same time, that the thickness of mortar shall not exceed about $\frac{1}{2}$ in.

In order to prevent the use of too great a thickness of mortar, it is usual in specifications to prescribe a certain depth which a certain number of courses of brickwork shall not exceed."

The question at issue is of considerable importance, and, if it involves the relative merit of Medieval and modern brickwork, is also of some interest. I therefore hope that some of your correspondents may throw further light on the matter.

W. W. R.

* * * The question was treated of in the *Builder* long ago, with some strong opinions in favour of large mortar-joints: it may be usefully re-opened.

COMPETITIONS.

New Infirmary, Eastry, Kent.—The Guardians of the Eastry Union in November last invited four or five architects to prepare designs for a new infirmary, capable of accommodating 100 patients, to be built on a portion of the present workhouse grounds. The designs of Mr. T. E. Knightley, of Cannon-street, City, were selected by the Guardians on the 12th inst. The drawings are now before the Poor Law Board for their approval.

Plymouth Guildhall.—At a meeting of the town council, on the 12th, a letter was read from Mr. C. F. Hayward, to whom the second premium was awarded, arguing, on the ground of admissions made by the referee, that his design should be carried out instead of that of Messrs. Norman & Hine. The council then proceeded to consider the general question, the proposal to erect a new guildhall. After a very long discussion, it was resolved:—"That the council do proceed to carry into execution the erection of a new guildhall, and that a committee be appointed, with the necessary powers to give effect to this resolution, subject to the further approval of the council." This remits the question to the committee as to the plans, the mode, and the time, subject to the approval of the council.

RE-OPENING OF HOLY TRINITY CHURCH, GUILDFORD.

THE church of the Holy Trinity, Guildford, has been re-opened for divine service, having in that time undergone much internal alteration, improvement, and embellishment. Since the opening of the church in 1763, nothing, except perhaps a little painting and varnishing, has been done to the building; and, of course, in so long a period the place had got dirty and out of order. The galleries, too, were inconvenient, and the pews unsightly and much too high. Measures were taken to obtain the necessary funds for carrying out the object sought. Designs were submitted by Mr. Woodyer, of Grafton, architect; these were approved, and the church was closed for the work of restoration to commence in the spring of 1869.

The old galleries on the north and south have been removed, and the whole of the windows have been altered, and glazed with slightly tinted glass arranged in geometrical pattern. The pews have been lowered 6 in., and varnished. The organ has been removed from the gallery and placed in the north aisle close to the choir. It has been reconstructed by Messrs. Berington & Son, of Soho. The chancel portion of the church has undergone a renovation. The arch is ornamented with an artistic bordering in ecclesiastical design, with blended colours, by Mr. Gray, of London; while the dome is painted deep blue, with stars of gold. The panels of the chancel recess were also decorated by the same gentleman. Each panel bears in its centre a double triangle, surmounted by a cross, gilded and shadowed, the edges of the panels being similarly coloured. The chancel and aisles are paved with glazed tiles, after the design of Mr. Woodyer, those in the aisles being arranged in geometrical pattern. The communion recess is enclosed with a light railing of blue and gold, with a crimson velvet rim. Two new windows have been added on each side of the great window in the chancel; and the choir stall has been

placed outside the communion recess near the organ. The reading-desk, pulpit, and clerk's desk have both been lowered. "Old Weston's" Chapel, which was nothing but a mortuary, has, with the consent of the owners, been floored and converted into a vestry. The two old chandeliers, which were formerly used for lighting the church, have been converted into gaseliers which afford an improved light. The western gallery has been reset, and contains 150 free sittings, thus making the building capable of containing 650 persons. The whole of the works have been executed by Mr. William Pimm, of Guildford, under the direction of Mr. Woodyer, architect.

CHURCH-BUILDING NEWS.

Causton (Notts.).—St. Andrew's Church Causton, has been restored and re-opened. The church is situated in the centre of the village. The edifice consists of nave, chancel, north and south aisles, and a small chancel aisle, of somewhat ancient appearance. The edifice is described as having been in a deplorable condition before the present restoration. It was filled with old pews; there was a gallery at the east end; the roofs were flat; and the whole sadly needed the hand of the restorer. The chancel has been entirely rebuilt at the cost of the Ecclesiastical Commissioners. The north wall has also been considerably altered and strengthened. The interior walls have been scraped and renovated, the belfry arch brought out to view; the old pews have been replaced by new and open deal seats—the old-fashioned pulpit and reading-desks replaced by a new lectern and pulpit. Inside the communion-rails encaustic tiles have been laid, and the altar is a new one. Accommodation is provided for above 300 persons. It is intended, we believe, to make the seats free and unappropriated, and to depend on the offertory for support. The architect of the work has been Mr. Christian, of London; and the builder Mr. Clipham, of Norwell. The cost of the restoration will be about 2,000.

Toller (Wolms).—In the hamlet of Toller Wolms has just been opened a new church, constructed at the sole expense of Mr. William Pope. He has endowed as well as erected it for the benefit of the labourers in his employ. St. John's stands on an elevated piece of ground, near the residence of Mr. Pope. It has nave and chancel, with a vestry on the north side, and a tower at the south-west corner. Its dimensions, excluding the tower, are 50 ft. by 20 ft. Local stone has been used in its construction, and there are Ham-hill stone dressings. Crosses of Ham stone ornament the slated roofs. The windows in the nave have foliated headings. The east window has three lights, and the west window has two, with foliated headings. The porch is lighted by means of a couple of small lancet windows with stained-glass borders. In the nave are open benches of stained deal. The chancel is paved with encaustic tiles. The altar, constructed of oak, and separated by oak rails, is the gift of the Corscombe parishioners. On the stained-glass east window is represented "The Crucifixion." Surmounting it is a foliated circle, within which is the figure of an angel, with a "crown of glory." Of angels bearing scrolls there are representations in two other circles. A representation of Christ on the cross appears in the centre, and there are figures on each side, and weeping angels above. The nave has an open stained deal roof, the plans for which were prepared by Mr. Warr, formerly of Corscombe. Mr. W. Holland, Warwick, supplied the east and nave windows; Messrs. Cox & Son, of London, the west window. There is but one bell in the tower; but Mr. Pope hopes to see the belfry furnished with a peal. Mr. E. Chedd, of Rampisham, did the masonry, and Mr. Saunders, of Beaminster, the carpentering; Mr. Chick, of Beaminster, constructing the pulpit. The entire work has gone on under the personal superintendence of Mr. Pope.

Silton (Dorset).—The parish church of St. Nicholas has been re-opened, after having undergone a restoration and repair. As it now stands, the church is without any enlargement, which is unnecessary. All the original architecture has been reproduced. The open oak roofs, with their carved bosses, have been exhumed from their plaster obscurity, the principals cleaned and divested of their whitewash coats, and the whole restored. The pews have been superseded by open benches of oak, and the floors repaved. The chancel is divided from the nave by an arch whose span opens to view the east window. There is a

step ascending to the chancel, and another at the altar-rails, whilst around the communion-table is a footpace, so that the ascent from the nave to the altar places it within view of all the congregation. The floor of the chancel has been laid with tiles, supplied by Mr. Godwin, of Lugwardine, who also supplied the plain red tiles with which the floors of the nave and aisle are paved. An improvement to this part of the church was the removal of the massive monument to Judge Wyndham, which formerly occupied the south end of the chancel. By the removal of this block of masonry some features of the architecture have been "unearthed," and the monument itself is seen to greater advantage in the recess which has been prepared for it in the north wall, immediately opposite the main entrance to the church. By the removal of this block an old window was found in the south wall, which has been restored and filled with stained glass. In the corner was also discovered an old sedilia and a piscina with credence-table, whilst a hagioscope, looking into the south aisle, has also been found, and the obstruction removed. The additional light thus obtained, as well as the finding of these old features of interest, have repaid the labour and expense of removing the monument. On the north side of the chancel is a chantry, which contains a fan-traceried roof, and this has been reproduced after the original style. This apartment, which is used as a vestry, is lighted from the chancel by a Perpendicular window with four compartments, filled with figures of St. Paul, Timothy, Barnabas, and Luke, in very old stained glass. In the corner of the chantry is a piscina and credence-table, somewhat similar (though not so large) to those in the chancel. The old stalls in the chancel have been removed, and their places supplied by benches of oak, pierced with Perpendicular tracery, and carved ends. The "parish pounds" have also been superseded by open seats of oak. The space under the western tower was formerly filled by the organ and chamber, over which there was a small gallery; but these have all been removed, and the large west window is now seen to advantage, while the school children have seats provided for them, and the ringers have ample room for their work. There is a Perpendicular font near the entrance, which is by the south porch, and this has been furnished up so as to present a uniform appearance with the rest of the building. The windows in the north wall are filled with plain cathedral glass, but all the others are specimens of window-staining. Several pieces of stained glass were found during the restoration, very much, it is said, of the colour of those recently supplied by Messrs. Clayton & Bell. The decoration of the chancel roof was carried out by Mr. Daniel Bell, by whom the carving and stonework has been restored. A quantity of old coins, including a Queen Anne's sixpence, have been found during the restoration, as well as a stone coffin, which was discovered about 1 ft. under the door of the church, and contained a skeleton, with the head turned aside, suggesting the idea that the body had been interred alive. Some tessellated pavement, in a perfect state of preservation, with the royal arms quartered on it, was also dug out, but the coffin alluded to has not been disturbed. The church is now warmed by hot-water apparatus, supplied by Mr. Richardson, of Wincanton; and every appliance for ventilation has been provided. Mr. Alfred Bell, of the firm of Clayton & Bell, contributed five windows, including that in the chancel, which contains three subjects—the Crucifixion, the Transfiguration, and the Ascension; Mrs. Martin and Mrs. Percy (the rector's mother) each gave a window on the north side of the chancel; Miss Grove placed a stained-glass window in the eastern end, the subject being the Last Judgment; and the rector one in the south wall of the chancel. The whole restoration has been carried out under the direction of Mr. C. Becke, of London and Oxford, architect. The contract for the building was taken by Messrs. Lambing & Dodington, of Mere, by whom the work has been executed. The organ formerly used in the church had become dilapidated and useless in its tone, and, to add to the importance of the work of restoration, a new instrument has been procured from the well-known firm of Sweetland, of Bath. The organ cost 160l.

Raughtonhead (Cumberland).—The new church of St. Jude's, Gatesgill, has been consecrated by the Bishop of Carlisle, as a chapel of ease to the parish church of Raughtonhead. The site was presented by Colonel Salkeld, of Holm Hill, who, together with Miss Salkeld, was one of the principal promoters of the new church, and in addition

to other gifts, subscribed liberally. The new church is situated upon the descent of the hill, before entering the village. The style of architecture adopted is Early English. The plan comprises nave, 45 ft. 6 in. by 24 ft. 8 in.; with chancel, 22 ft. by 14 ft. 6 in. The vestry and side chapel adjoin the church, and are roofed transversely. The side elevations are divided into bays by buttresses, with lancet coupled windows. On the south elevation is an entrance porch. The lower part of the west elevation is pierced with three lancet windows, with large circular window in the gable; and rising from the south-west angle is an open belfry, with slated roof, terminating with a gill cross. The east elevation has three lancet coupled windows, filled in with stained glass. All the external walls are built with the local stones, quarry-faced, relieved with tooled bands. All the gables have stone crosses or gill terminals. The interior walls are plastered. The roofs are high-pitched, open, and with framed principals, stained and varnished, and covered with slates of two colours, with enriched cresting. The seats are of pitch-pine, fitted with book and kneeling boards. The stalls in the chancel are moulded, also of pitch-pine. The chancel is laid with encaustic tiles, and the windows filled in with stained glass by Mr. Wailes, of Newcastle-upon-Tyne. The heating apparatus is supplied by Haden & Son, of Trowbridge. All the seats are free and unappropriated, affording accommodation for 150 persons. The site is surrounded with a stone wall, crested with wrought-iron railing. The stained-glass window in the chancel is a memorial window, placed there by Mr. Thomas Salkeld Bramwell, in remembrance of his parents. The subject is the Birth, Death, and Ascension of Christ, each incident occupying one of the large lancet panels. The large circular window at the west end of the church was presented by Miss Salkeld, of Holm Hill. The contractors for the building were Messrs. Bragg, Wilson, & Baty, of Gatesgill; for the carpenter and joiner work, Mr. T. Ward, of Raughtonhead; slating, Mr. Nanson, Carlisle; plumbing and glazing, Messrs. Thomson & Sons, Carlisle; plastering, Messrs. Johnston, Bros.; ironwork, Mr. Thomas Corbett, Carlisle. Mr. John Lowe, of Manchester, architect, supplied the design for the building. The church was built of stone from the quarries in the neighbourhood. The outlay, including boundary-wall, &c., has been 1,280l.

Droylsden.—After extensive alterations St. Mary's Church has recently been again opened for divine service. The south entrance has been closed, and the porch converted into a baptistry, and laid with encaustic tiles. Two new entrances have been made at the west end of the north and south aisles respectively. The seats under the gallery have been brought forward, thus doing away with the passage which led across the church from the south entrance. The old reading-desk has been removed, and the seats allotted to the female teachers and select class in the Sunday School extended. The capitals of the columns and other stonework which had been left uncarved, have been carved, and the whole of the church relighted by coronas, manufactured by Messrs. Hart, Son, Peard, & Co., of London. The chancel has been tiled with Minster encaustic tiles, and re-seated, and the whole building re-coloured and cleaned. The entire cost of the works will be about 800l. They were done under the superintendence of Mr. G. J. Redmayne, Manchester, architect.

Adisham.—The parish church has recently been restored and re-opened. The cost of the work done is about 2,000l. Funds are wanted for the completion of the decoration. The architect was Mr. Wm. White, of London; and the work was carried out by Messrs. Denne, of Walmers.

Blyth, Northumberland.—The prosperous little port of Blyth, celebrated for its steam coal, is about to erect a new Presbyterian Church. The structure will be built of brick, with terra-cotta dressings, and will have a tower and spire at the south-west angle. Mr. Thomas Oliver has been appointed the architect.

Crosshills.—The new church of St. Thomas, Sutton, Crosshills, has been consecrated by the Bishop of Ripon. Situated in the extensive parish of Kildwick, the township of Sutton, embracing a population of 2,200, has hitherto been without a place of worship in connexion with the Church of England, other than the school-room. The parish church of Kildwick was found to be situated at too remote a distance to be made available for the requirements of

the scattered district of which Sutton is the centre. The late Mr. T. B. Bairstow, of Sutton Mill, made a bequest of upwards of 3,000l., for the purpose of erecting the new church of St. Thomas, besides leaving a further sum of 1,000l. for the endowment of the living. The intention of her deceased husband has been carried out by Mrs. Bairstow, and hence the new building. Built in the Geometrical style of architecture, the new edifice comprises nave, north and south aisles, organ chamber, north chapel for vestry, and south chapel for school children. A tower, 60 ft. high and 14½ ft. square, is placed at the west end of the building. It is surmounted with embattled parapet, with carved and crocketed pinnacles, and provision is made to carry up a spire to the additional height of 60 ft. at some future time. The extreme length of the church is 81 ft.; the breadth, 42 ft.; and the height to the ridge, 36 ft. It is intended to accommodate 350 adults and 80 children. The roof is open-timbered. The pews are open, and made of deal stained and varnished. The chapels are separated from the chancel and aisles by open traceried pitch-pine screens, and the latter material is made use of in the construction of the choir stalls and altar rail. A stained-glass window has been introduced into the east end of the church. It has been furnished by Messrs. Clayton & Bell, and is intended as a memorial of the late Mr. Thomas Bairstow. The tower is intended to contain a peal of bells, one of which (the tenor) has already been cast and hung. The entrance porch is placed on the north side of the church, and the heating chamber is constructed under the vestry, the pipes being of the D pattern, and manufactured by the Messrs. Clapham, of Keighley. The windows are enriched with tracery, and the apexes of gables with carving. The pulpit and font, which are executed in Monkton Moor stone, are specimens of what can be done in this limestone (closely resembling Caen stone), and are richly worked and carved. The caps and arcades, and the carving throughout, have been executed by Messrs. Farmer & Brindley, of London. The whole of the work has been carried out from the designs of Mr. W. H. Crossland, of Leeds and London, as architect; and Messrs. John Chambers & Son, of Bishop Monkton, are the contractors. The cost of the church, with boundary walls and gates, &c., is about 4,000l.

Kensal New Town (London).—A new church, which will be known as the Church of St. Andrew, at Kensal New-town, Upper Westbourne Park, has been consecrated. The new building is situated in the centre of a densely-populated district, of comparatively recent formation, in the extreme west end of London. This district has formed part of the parish of All Saints, Notting Hill; but henceforward it may be looked upon as a distinct parish in itself. The style is a combination of the Early Gothic and Italian. The aisles are separated from the nave by twelve arches, supported by columns of Devonshire marble and carved stone capitals. The transept is covered by a groined arch, which is carried by mullioned windows and marble pillars of the Ionic order, and the ground is of tessellated pavement. The pulpit, reading-desks, and choir are of stained deal. The building has already cost 8,000l. of which 5,000l. have been subscribed by a benevolent lady who does not wish her name to be known, and 3,000l. from the Bishop of London's Fund. There are 840 sittings in the church, all of which will be free.

Droitwich.—The Church of St. Nicholas has been consecrated. It is built in the Decorated fourteenth-century style, and consists of a nave and south aisle, with provision for a north aisle in future. At the south-west angle there is a tower and entrance to the church. The edifice contains 250 sittings, all free. The seats, which are of deal and open, are stained and varnished. The roof is open, and composed of the same material, varnished. The pulpit is of stone, and is not yet finished as to its carving. The only carvings that are completed are the capitals of the chancel arch, the capitals of the other pillars being left for future carving. The chancel east window is of stained glass, and was presented by Mrs. Miller, of London, who also gave the sum of 500l. towards the erection of the church. "The Ascension" is the subject of the east window, and was presented by Mrs. Miller in memory of her late husband, and the four smaller windows, the subjects of which are—"The Nativity," "The Crucifixion," "The Resurrection," and "The Descent of the Holy Ghost," were also presented by Mrs. Miller in remembrance of her own and her husband's

arguments will be easily demolished by her opponents. Much may be said on both sides of the question; which goes to show that neither extreme can be right,—more especially the "strong-minded" extreme. That woman's mental nature differs from man's, there can be no rational doubt. It is more spiritual and less self-asserting,—more intuitive and less reasoning,—more ideal and less matter-of-fact,—more radiative or less concentrative than man's. It is, therefore, adapted, and hence intended, for a different sphere from man's. His is the mind and the nature best adapted for the external life, as it were; for facing the rough usage of outward nature, and the rough requisite to "make way in the world." Hers are the mind and the nature best adapted for internal life for domestic duties. She is the type of the ministering spirit of counsel and comfort to the man, and hence of the angel, even if she be a devil, since the devil was an angel. For woman to set herself up as a rival to man, therefore, must be radically wrong. But if "the times are out of joint" as regards woman's mission as man's counsellor and comforter,—if there be too little "marrying and giving in marriage," what is she to do? She is compelled by ungallant man to provide for herself, to walk out into the external life and strive as man himself does for a livelihood. The cause of the movement is a deep-seated one, therefore; and until that cause, or those causes, whatever they be, which hinder and obstruct the universal law of marriage among mankind, be removed, the higher civilisation, the more potent will the movement of the strong-minded women on their own behalf become.

Still there is a great deal of truth and force in "The Dean's" arguments, and we can only hope that their ultimate tendency may be to turn the attention of her sex upon their own shortcomings, as regards their modes of attracting the permanent regards of the man; for, doubtless, those shortcomings exist among women no less than among men; and especially in the early teachings and the general "bringing up" of girlhood. Is she properly taught to fulfil her manifest destiny? Does woman, who is also the man's early teacher, rightly fulfil even that duty as regards the end in view? The influence of early training, both on boys and girls, is all-powerful to any social end; and much might be done even in a single generation to restore that balance which is evidently lost. A despicable money worship on both sides has much to do with the present state of affairs between the sexes. So has the neglect of useful accomplishments on the part of the woman, and the desire to make her as frivolous and useless as possible to the man, as a comforter, or even as a counsellor.

Principles and Construction of Machinery: a Practical Treatise for Students, Engineers, and Practical Mechanics. By FRANCIS CAMPIN, C.E. London: Atchley & Co., Great Russell-street.

1A. Past president of the Civil and Mechanical Engineers' Society, as Mr. Campin is, cannot but be a fitting and competent writer on the principles and construction of machinery. Mr. Campin here treats of the laws of the transmission of power, and of the strength and proportions of the various elements of prime movers, mill work, and machinery generally. The work is the substance of a carefully revised digest of the author's oral instructions as a teacher in training pupils. He has aimed at setting forth fully the laws of construction in reference to the strength of parts, while stripping the subject of much cumbrous matter with which it has heretofore been loaded. He teaches not only why a given machine produces a certain effect, but also how practically to make it.

On Rebuilding Lanes in the City. By WILLIAM F. ROCK. London: Ebbingham Wilson.

THIS is an appeal against the threatened re-building of Bucklersbury, and the covering of the rest of the triangular plot now cleared next the Mansion House. The feeling is strong in favour of preserving this open space. At any rate, Charlotte-row must be greatly widened, and Bucklersbury must be greatly widened, which would make the plot very small, and we do hope the Metropolitan Board of Works, and the Corporation together, will see what can be done in order to keep the whole plot open. We shall not be amongst those who will abuse the Board of Works if, after all, they should utilise part of

it. The value of the whole is called 190,000*l.*, and the Board are forced to consider the ways and means. But we shall be amongst the heartiest applauders if they screw up courage to do the right thing. They will find hereafter that it is to such an act as this would be that people by and by will appeal when they are estimating the value or otherwise of the Board.

Miscellaneous.

The Public Health in 1869.—Under the title of "The Weather and the Public Health in 1869," an elaborate paper has been issued by Mr. Plant. From this paper we extract a few statistical details. The population of Manchester in 18 years—1851-69—with a high death-rate, increased at the rate of only 14 per cent. per annum; whereas the population of Liverpool, with a still higher mortality, advanced in the same period 2 per cent. per annum. The towns which have increased the most in population are Sheffield and Birmingham; the former, in the 18 years, at the rate of 34, and the latter 24 per cent. per annum. Sheffield, however, with 105 inhabitants per acre, has a prevailing high death-rate, and Birmingham, with 461 persons per acre, enjoys the lowest mortality of all the large towns. The towns which have increased the least in population are Bristol and Manchester; the former, with a uniform low death-rate, and 361 inhabitants to each acre of ground, and the latter, with a high mortality, and 827 persons per acre. Taking the five sea-ports in England, we find that during the last 18 years population has increased as follows:—London, 2 per cent. per annum; Liverpool, 2 per cent.; Hull, 24 per cent.; Newcastle-on-Tyne, 24 per cent.; and Bristol, 14 per cent. per annum. Liverpool is the unhealthiest, and London and Bristol the most salubrious of all these ports. Birmingham still ranks the highest for health:—

"If the authorities of this town would examine the sanitary condition of certain districts, the borough of Birmingham might be made even more healthy. There is a high death-rate, from zymotic and other causes, in St. George's, St. Mary's, and other districts. This excessive mortality goes on year after year, and the sanitary officers do not appear in the least concerned. The larger number of deaths are blended with the smaller of the more salubrious localities of Edgbaston, &c., and few persons are the wiser, because the general result appears satisfactory. It is a deception, and the sooner the real facts are revealed, and the health of Birmingham proper is published, the better for our sanitary guidance."

Progress of the New City and County Lunatic Asylum, Hereford.—The architect of this edifice reports "satisfactory progress. With the exception of the superintendent's house, the whole of the foundations are in, and the walls plinth high. The administration block is nearly covered in; the dining-hall and chapel ready for the roof. The men's workshop block is covered in, and great portions of men's No. 1 ward also. The browhouse building is roof high, and men's infirmary building nearly so." The desirability is suggested of heating by steam or hot water the single rooms of the males' and females' infirmaries, in addition to the open fire-places therein. The architect has directed the contractor to complete the more advanced buildings, the laundry and washhouse, and superintendent's house, as quickly as possible, so that a portion of the building may be in a fit state for reception of patients by August or September next. The visiting justices superintending the erection have recommended the purchase of 110 acres of adjoining land, for cultivation by patients, and for airing-grounds, &c.; and this has been agreed to at the sessions.

Cornish Granite Workers.—A correspondent of the *West Briton* writes:—"I regret to hear of many very important contracts for granite being given to the French and other contractors, which, with a little concession on the part of working men, might have been obtained for Cornwall. The consequence is that a large amount of capital is lying idle, and many men are out of employ, the masters' works being comparatively idle. The granite masons formerly had 4*s.* 6*d.* a day; they then insisted on having 5*s.*, with the additional privilege of having all their tools sharpened at the expense of their employers. But even this concession was not sufficient, and nothing less than 5*s.* 6*d.* a day would satisfy some of the men. The masters found this far beyond even what would give them a new shilling for an old one, and consequently decline to take orders which would involve them in a loss instead of a profit."

Lecture to Jewish Workmen on Houses and their Ornaments.—On the 9th instant a lecture was delivered by Mr. Ellis A. Davidson on this subject at the Jews' Infant School, Spitalfields. The audience were mostly working people and their families. The lecturer depicted the first habitation of man from the time of his banishment from Eden, which habitation, he said, was afforded by a tree, with a few skins of animals for cover. He next proceeded to show one or two uninvited dwellings, one of which was designated the "Human Nest." The foundation of this was a straight pole stuck in the ground, with a few skins of animals for a roof, at the top of which the children slept while the parents were out hunting. The lecturer exhibited a model cottage, the usefulness of which was explained by showing that the projecting points of the roof were not so much wanted for rain or bad weather as for protection from heat; so that the more it projected the more we got the shade. He went on to show the real principles of arch-building, and where the strength lay. Having given a rapid sketch of the history of building, the lecturer proceeded to describe a few ornaments, commencing with the Egyptians, as the most ancient. The lecture was instructively illustrated.

Maddening Drink.—Not long since we pointed attention to the sad and serious fact that of late years the infuriating effects of drink, and the dreadful crimes resulting from it, were greatly on the increase,—a fact which could only be attributed to the adulteration of the drink by poisonous agencies, producing effects stimulative of intoxication, but really of a different and far worse character. We observe that a Liverpool brewer, a Poor-law guardian, not only corroborates this, but states that in lately visiting the pauper lunatic asylums in Lancashire, and asking as to the causes of the increase of lunacy in such asylums, he was told that drink was the chief cause of the madness of paupers. Yes, and drink is the chief cause of pauperism itself. The guardian urged the appointment of inspectors of drinks, such as those of food. "There was a law," as he observed, "which, if put in force, punished people for using poisonous ingredients in the making of beer,—preventing them from using grains of *paradise*, *new vomica*, oil of *vitriol*, *ammonia*, and other things that were used in making beer, in addition to malt and hops." So said the brewer. Another guardian remarked on this, that after such an *exposé* of the secrets of the beer trade, anybody who drinks it must be mad already.

Christmas Lectures at the Royal Institution.—A series of six lectures adapted to a juvenile auditory has as usual been given at the Royal Institution. This time Professor Tyndall chose "Light" for his subject. "Faraday and Newton himself," says *Scientific Opinion*, in reporting the lectures, "would have been delighted had they witnessed the brilliancy of colours produced by a transparent film, such as was shown in one of the lectures. We are referring to the enormous soap-bubble (or rather a bubble made by means of glycerine and oleate of soda), on which the lecturer himself had experimented but the day previous for the first time. This bubble, when in contact with a beam of monochromatic light, produced effects not unlike the fiery flashes of an Aurora borealis at times; while at other moments the softest hues of spectral colours were thrown on the screen." His experiments with the invisible rays of heat alone, obtained by intercepting the luminous rays, were remarkable, though not new. During one of the lectures he produced a little stove, a kind of miniature kitchen-range, with a fire all properly laid, according to the established craft of our housemaids, but of course not lighted. He brought it near that dark, pitch-dark focus, and behold, it was lighted, as if by magic!

I.H.S.—A church in Hampshire, which has been restored, has very recently been re-opened. An altar-cloth was given by a lady well known for the specimens she has worked for numerous churches on such occasions. The letters "I. H. S." were, as is usual, very prominently worked on the sacred vestment. The initials of a parishioner, whose family restored the chancel, happen also to be I. H. S. On the day the church was re-opened, says the *Bristol Times*, a person from the neighbouring parish, at first sight of the altar-cloth, exclaimed to a friend,—"Oh! I know who gave that. It must be Mr. John Henry S—." It is very good of him to contribute in more ways than one."

The Little Girl who made San Francisco Populous and Famous.—Captain Sutter, an ex-officer of Charles X.'s Swiss Guards, who had been forced to emigrate in 1830, had settled in California and founded a little colony, which he called "New Helvetia." In the year 1847 he entered into a contract with a Mr. Marshall to have a saw-mill built for him on a branch of the Sacramento river. During the progress of the work, a little girl, the millwright's daughter, picked up a shining yellow lump under the mill-race, and showed it to her father as a pretty stone. Marshall brought it to Captain Sutter, who at once recognised the precious metal, made careful investigations, and soon found that the whole country watered by the Sacramento river and its numerous tributaries abounded in gold. San Francisco was then a wretched village, containing some 400 inhabitants; in a few years the population rose to 40,000; and it is now a magnificent city, the capital of the western world, the terminus of the longest line of railway ever planned or executed, and the rival of New York in the great contest of cities for the seat of the government of America. And all this has been brought about in twenty years by a few tons of gold!

A New (?) Application of Water Power.—"H. J. W." in the *Pall Mall Gazette*, notes the discovery of a new store of force for modern engineers:—"It certainly seems strange enough to speak of the power of falling water as a new force, but though water has been at work turning mills since, probably, the time of Moses, if not before, this seems to be the first time that it has been used in works of such magnitude as the Mont Cenis tunnel. If the aspirations of the French engineers are carried out, Switzerland, as being the most mountainous country in Europe, is likely to cut us out entirely. Her waterfalls will render our coalmines useless. However, we have Wales and the Highlands to fall back on, to say nothing of all the lake district: Stock Gill Force may come to merit its name in more senses than one. It may also be some consolation to us to consider that waterfalls are not usually in the most accessible parts of the world. The coalmines are *in esse*, and the waterfalls, as motive powers, *in posse*; so our manufacturers need not yet hurry themselves to migrate to Switzerland or the banks of Niagara."

"The Churches of Lindsafarne."—A volume under this title is announced to be published by subscription, containing plans and views of the seventy-six churches in the districts of Glendale, Coquetdale, Reedsdale, Bamburgh, Morpeth, North Durham, Holy Island, Berwick-on-Tweed, Tweedmouth, and Alnwick; the whole comprising, illustrating, and contrasting the fabrics in the archdeaconry of Lindsafarne; made from actual surveys, by F. R. Wilson, architect. It is said this survey will be found full of historical, archaeological, and parochial interest; and it is also novel, as most of the churches in it have not been illustrated or described before. The author has been collecting the materials for the last ten years, with a great expenditure of labour, time, and money, in order to make the work complete. Battered as most of the fabrics have been by the Scots and freebooters, they all possess features of great interest.

Fanic in a Theatre.—In the American Theatre, Walnut-street, above Eighth, Philadelphia, while crowded with people, a cry of fire was raised. The alarm was occasioned by the breaking off or derangement of one of the brackets on the east side of the theatre under the gallery, which caused the gas to pour out in a large volume, and this, communicating with one of the lights, soon took fire. The flame was about as large as a man's arm, and when observed by the dense mass of people, the excitement can be more readily imagined than described. At length a gentleman came forward, accompanied by a number of the *attachés* of the house, with buckets, fire-hose, &c., and after some twenty minutes had elapsed, succeeded in assuring the people that there was not the slightest danger, as the accident had been repaired. This had the desired effect, and the performance was proceeded with.

A New Light.—A new artificial light, specially applicable to photography, has been tried, it is said, with much success. It is produced by rendering oxylics, composed of magnesia and titanic acid, incandescent by the oxyhydrogen flame.

Accidents.—The roof and part of the walls of extensive dye-works, in Titchborne-row, Edgware-road, Paddington, have fallen in. The large number of workpeople employed on the premises had not begun their day's operations. It is supposed that there must have been some defect in the joists.—Three persons have met with their death at Penniford, in North Devon, by the falling of a chimney. A house near the chimney was in a dilapidated state, and in consequence of the chimney falling the premises were entirely demolished, the three inmates being buried in the ruins; others escaped. The chimney kerque, in the north of France, the public were leaving after the performance, when a part of the flooring gave way, and precipitated 150 persons to the ground beneath. Many received contusions more or less serious, but no lives were lost.

The Folkestone Bathing Establishment.—The result of the working of the Bathing Establishment at Folkestone has realised the anticipations of its promoters. The report of the directors for the first half-year of the existence of the establishment shows that "notwithstanding the drawbacks of a short unfavourable season, and the disadvantages necessarily flowing from many details in the arrangements being in an incomplete state at the opening, and which required much time to make perfect," the balance-sheet to November 30th shows a net profit enabling the directors to pay a dividend of 5 per cent. per annum on the paid-up capital, and carry forward a balance of nearly 200l. to the next half-year's account.

New Process of Photo-Lithography.—Mr. Francis, of the Athenæum Press, having secured the invention from Mr. Griggs, has introduced an entirely new method of producing copies of prints and pictures to the publishing world. The combination of photography with lithography was first attained by Sir Henry James, of the Topographical Department, but the process of Mr. Griggs claims to be a considerable advance on the original invention. Mr. Griggs takes a photograph of a print or picture in the ordinary way, but upon paper prepared in a manner only known to himself. The photograph thus taken is laid upon the stone and transferred, as in simple lithography, when it produces copies of the original picture with accuracy and clearness.

The Finsbury Estate.—"Corporator" in the *City Press*, says:—"The possession of the Finsbury estate by the corporation dates from the year 1553. The lease was renewed from time to time. In 1769 an Act was passed by Parliament, enabling the prebendary of Finsbury and his successors to grant a ninety-nine years' lease to the City, commencing from the year 1768, to be subsequently renewable every fourteen years. In 1769 Dr. Wilson, the then prebendary of St. Paul's, procured the passing of a private Act, apparently with the view of furthering the matter, but differing from the former one in having no renewal clause inserted. The result has been that the corporation has now no interest in this valuable property."

A Greek Church in Liverpool.—On Sunday, the ceremony of consecrating the new Greek Church of St. Nicholas, at Liverpool, was performed by the Archbishop of Syria and Tenos, assisted by several priests from London, Manchester, and Liverpool. The new church, which is situated on the Prince's Park road, is built of ornamental brick, and is surmounted by four domes. The interior is divided into three sections—a large vestibule, the body of the church, which is intended to accommodate 600 worshippers, and the sanctuary, which is separated from the body by an elaborate screen. We are compelled to defer a description of the building. The authorship of it is in dispute.

Ball for the Builders' Benevolent Institution.—We desire to draw attention to the circumstance that this annual festival in aid of a deserving charity will take place at Willis's Rooms, on Thursday next, the 27th. We have made this notification under similar circumstances many and many a time before. Whether or not it has effect; whether or not it leads any of our readers to aid the Institution; whether or not the committee think the not obliging, we do not know. Anyhow, we fulfil what we consider a right prompting, and must leave the result to chance. The Institution needs funds.

Explosion at Westminster Bridge.—On the Surrey side of Westminster Bridge—a loud explosion occurred the other evening in the gas-meter house, a small cell formed in the abutment of the bridge, on the Surrey side, access to which is obtained by the steps immediately in front of the Coronet public-house. The explosion forced out the doors of the meter-house. A number of the lights on the bridge were extinguished. The meter itself was uninjured. The accident was mainly caused by a defective cock, which had been temporarily plugged with a piece of wood. When the gas was turned on to light the bridge, the plug was inadvertently withdrawn, thus allowing the gas to escape and accumulate in the house. The explosion occurred when the lamp adjacent to the house was being lighted.

Iron Church and School, Cymman.—A galvanised corrugated iron building to be used on Sundays as a church, and on week-days as a school, has just been completed on the side of Hope Mountain. It is capable of seating about 200 persons, and is lighted by six windows on the sides, and a large window similarly at each end. The entrance is on the south side through a porch. This, in a mountainous district, with very bad roads, prevented the greater part of the children from attending school; therefore, we may presume the building will be a boon to the inhabitants. Mr. S. Sothorn, of Wrexham, was the designer and contractor.

Chemistry of Smoke.—Mr. W. R. Hutton, of Glasgow, proposes that coal, before being consumed in ordinary furnaces, stoves, or fireplaces, should be distilled in close vessels. The heat should be continued not long enough to produce the ordinary dense coke—which can only with difficulty be burned—but to form a soft coke, which can be consumed as readily as common coal, but without black smoke. According to Mr. Hutton's calculations, 1,000 tons of coal will yield as much gas and soft coke as would be sufficient to realise a profit of 71l., of which a large proportion would be derivable from the sale of the oil and the ammonia as a manure.

The Independent Society of Engineers, Manchester.—The members of the Independent Society of Engineers, which has recently been formed in Manchester, have inaugurated the formation of the society by a dinner, which took place at the Clarendon Hotel. The objects of the association are to afford assistance to those of its members who may happen to be out of employment, or who may be incapacitated from work by sickness. At present the society numbers forty members. The society has no connexion with any trade-union.

Stone from the Jura.—Our attention has been directed to some specimens of magnesian limestone, exhibited at the Institute of Architects, by M. Paul de Tinsau, proprietor of the quarries at St. Ylie, Jura, France. The stone is described as very hard, and capable of receiving a fine polish, which renders it suitable for the shafts of columns, staircase balusters, mantelpieces, and other decorative details, as well as for ordinary construction of a superior character. The cost of stone delivered in London would be about 3s. per cubic foot.

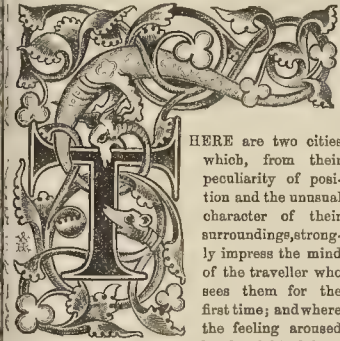
Castings.—We have an account of a new method of making castings. The mould is made of fine potter's clay, giving great smoothness of surface. The metal is then injected from below by means of a piston working in a cylinder, and as some pressure is applied, every part of the mould is reached by molten metal in a state of compression, so that the casting is as smooth as if worked by hand. Messrs. Smith, of Philadelphia, who have made castings in this way, claim to be able to produce screws at the same expense as that formerly incurred in merely manufacturing the wire.

The Church of All Saints, Dresden.—This church, which has been erected to the memory of the late Mr. W. H. Goschen, was consecrated on the 27th of November, by the Bishop of British Columbia, acting under a commission from the Bishop of London. Illustrations of the building will be found in our last volume. The site has been given by the town council of Dresden, in one of the best parts of the town. The whole of the windows, except those in the choir story, have been filled with painted glass by Hardman, of Birmingham, and Preddy, of London. The organ is by Walker, of London.

The Builder.

VOL. XXVIII.—No. 1408.

Grand Cairo.



HERE are two cities which, from their peculiarity of position and the unusual character of their surroundings, strongly impress the mind of the traveller who sees them for the first time; and where the feeling aroused by the sight of them

is not merely admiration of their extreme beauty, but the perception of a quality that they possess which is akin to the sublime. One of these is Venice, the sea-born, sea-girt Venus, as an old writer terms her, springing from the ocean bed, surmounted by the conch of St. Mark's, and graced by multitudes of cupolas and towers. The other is the queen city of the desert, Cairo, also rising in grandeur from a long level line, that of the sandy plain, and also crowned with innumerable domes and minarets. Both are surrounded, or nearly so, by a vast and apparently boundless expanse—Venice by that of the waters of the Adriatic, which if pursued to their utmost limits would lead to the shores of Africa and the Pillars of Hercules; Cairo by that of the sandy desert, which if followed out would lead past the kingdom of Theodoros, through the domain of Livingstone, to the territory of the Bojesmans and Boers. In both cases this expanse is trackless, except where, in the one case the wrecks of vessels, and in the other the white ribs of the foundered ships of the desert, point out the road; in both cases it is silent, for the velvety footfall of the camel makes no more noise than the car of the gondolier.

And both have the claim of age, for both were founded above a thousand years ago. Thus each has these elements of the sublime in its position—vastness, silence, repose, and hoar antiquity. But in this quality of sublimity, and even in that of beauty, the City of the Sea must yield the palm to the City of the Desert, for when looking at her domes athwart the lagoons, none does not see, as at Cairo, the summit of the eternal Pyramids looming in the distance, nor do the cupolas of St. Mark's, and the Salute, and the tower of the Campanile equal in loftiness or in elegance the domes of the Mosque of Sultan Hassan and other tombs of the Kalifs and the two hundred and fifty minarets attached to the mosques and sepulchres. We defy any traveller, however much he may have seen of Eastern cities, not to be impressed with the aspect of Cairo when he beholds it for the first time, whether he sees it from the railways of Alexandria or Suez, or whether he looks down upon it from the ramparts of the Citadel of Saladin.

It was our good fortune to behold it for the first time from the latter spot, for it was evening when we reached Cairo, and we sought rest and refreshment in a comfortable hotel in the Esbekiah, a large square in the outskirts of the city, planted with trees, and surrounded by the prin-

cipal hotels and other houses of the Franks. The next morning we drove to the citadel, through the only street practicable for carriages, preceded by a runner, who shouted warnings to the veiled women and turbaned men who thronged the bazaars. How we reached our destination without overturning man, woman, or child, in this crowded street, is to us a wonder to this day. Having ascended to the citadel, which is situated on the spur of a hill, we looked down upon the splendid panorama beneath us. Immediately under the walls was a vast piazza, bounded by low, flat-roofed houses, from amongst which rose at one side of the square a majestic mass of masonry, surmounted by a dome, and relieved by two lofty minarets of unequal height. The whole square was filled with rejoicing Orientals, in their many-coloured garments; every shade of every colour was to be found among them; and as they swayed to and fro, they resembled, more than anything else, a bed of tulips agitated by the breeze. It was the occasion of the fête of Sultan Hassan, and all Cairo was assembled in the vicinity of his mosque, the fortress-like building that adjoined the square, which was that of Roumelli. Beyond the piazza was an interminable series of small white squares—the flat roofs of houses—intersected by dark lines of shade, which marked the courses of the tortuous *souks* or alleys, for few of them deserve the name of streets. Here and there were roofs of a domical form, those of the *hammams*, schools, and other public buildings; and the whole was relieved by the elegant outlines of stilted domes and by the graceful minarets, which caught the sun's rays, and reflected them from every face of their honey-combed corbellings; and from their pierced and tracered balconies beyond this glittering mass, there appeared to be a vast lake,—for it was the period of the inundation,—in the midst of which the course of the Nile could be here and there traced by the palm-trees on its banks; while through the mist, caused by evaporation, were to be seen the dim outlines of the Pyramids. Such a view as this is seldom forgotten. Everything we saw was Oriental in character. At Constantinople, Italian palaces and hybrid Gothic churches break the spell, and recall us to the plots and intrigues of Frankistan; but here the Frank quarter is so distant that we saw no formal rows of modern houses, nor black-coated gentry riding on donkeys, to remind us of the grooves and trammels of European civilisation.

Whilst in the citadel we visited the mosque and tomb of Mehemet Ali. We were, however, disappointed with this specimen of modern Egyptian architecture. The plan is good, being that of a square with a semicircular apse on each side, and the materials of which it was constructed were of the richest, the columns being of marble, and taken from ancient buildings, and the walls, to a certain height, being lined with darkly-veined Oriental alabaster; but the details are rococo, the colouring is tawdry, and the general effect that of coldness and dreariness, which one perceives in the modern mosques of Stamboul. The rich carpets and pendent lamps alone relieved it. Had the founder been content to take for his model one of the numerous mosques that lay in the city under his eye, he would have left behind him a work that would have been the admiration of posterity; but it seems that it is not in England alone that full appreciation of truth and beauty has passed away.

The mosque of Sultan Hassan, to which we, ascending from the citadel, elbowed our way, through a crowd occupied in watching rows of felt-capped dervishes swaying from side to side in measured time; past the stalls of vendors of sweetmeats, and immense swings in which bearded Moslems, who in their amusements are but children, were taking great delight,—offers a fine contrast to that of Mehemet Ali.

We emerged from the crowded place into a narrow street, in which was situated the entrance to the mosque, and here we gazed up at its walls, which are 120 ft. high, built of alternate courses of dark and light coloured stone and marble, and finished by a rich corbelled cornice of great projection. This mode of building in parti-coloured courses, which is common to all the Cairene buildings, and indeed prevails generally throughout the East, gives scale to a building, and at the same time a satisfactory appearance of solidity. The doorway is situated in an arched recess, 100 ft. high, reminding one of the three western arches of Peterborough Cathedral. It is reached by a flight of twenty or thirty steps. On entering, we found ourselves in a small chamber, in which were stationed the guardians of the mosque, who directed us to take off our shoes, and enveloped the shoes of a lady who accompanied us in pocket-handkerchiefs, as she very naturally objected to walk shoeless on the cold marble pavement; we then passed through a low winding passage and entered the body of the mosque, which may be described as a cube of about 115 ft., with the top off; that is to say, it was open to the sky. In each face of the cube was a vast pointed arch, about 60 ft. in span, opening into a square or oblong recess: one of these recesses was larger than the rest, and had two doors in the inner wall, which led to another square hall, the tomb of the Sultan. In the centre of the court was a large domed fountain for ablution.

The effect of the whole was that of simple grandeur, arising from the vast dimensions of the arches. Passing a row of turbaned worshippers who were going through their prostrations, under the guidance of a *Mollah*, with as much regularity as soldiers follow their fagman, and who did not seem to regard the presence of a female in their holy place as a pollution, we followed our dragoman into the inner hall or tomb. This was a square of about 60 ft., lighted by windows at the sides, and covered by a lofty dome. The painting and gilding were faded, the ornaments crumbling to dust, and the whole had a dilapidated look, though it will be ages before the building itself can become an actual ruin, as the walls are generally 13 ft., and in some places 25 ft., thick. The windows which light the tomb are two-light, with circular apertures above them. They are set in trefoiled recesses. There is resemblance in these and in the windows of most of the mosques of Cairo to Gothic of the Plate Tracery period, which has become so much the fashion in England; and there is indeed much to be learnt from these fine specimens of Saracenic architecture by an architect whose mind has not been narrowed by exclusive study of one particular school. This mosque was built in the fourteenth century, and is of the later style, resembling the Byzantine. It was probably built by Sultan Hassan, during his lifetime, and was destined, like that of Mehemet Ali, for his tomb. In most cases the tomb of the founder adjoins the mosque, and has a dome. The mosque proper in Cairo has no dome, but a flat roof. Such is that of Toloom, which we subsequently visited. It consists of a large quadrangular court with arcades round it. On one side the arcade is five bays in depth, and separated from the court by a wall, thus forming a building similar to a basilica. This is the primitive type of mosque. When the impostor Mahomet built his first house of prayer at Medina, no doubt he took for his model the Caaba where his fathers worshipped, and after he had purified the latter spot and overthrown its idols, no doubt it became the mother of all mosques, especially as he taught that it was founded by Adam after the image of the house of prayer in the heavens, which he said was situated immediately above it. The plan was simple in the extreme;—a square enclosure, with

arcades all round, and a small building in the form of a cube in the centre. Subsequently when the *Successors* took possession of Damascus and Jerusalem, they found models for their mosques in the Church of Constantine and the Basilica of St. John. Accordingly we find that all the larger and earlier mosques in Cairo are upon the Basilican plan, and that it is only those that were erected after conquest of the whole of Asia Minor had familiarised the Moslems with the Byzantine churches, after they had seen the greater advantage of the cruciform plan, and the convenience and beauty of the dome, which they thenceforth adopted as the characteristic feature of their architecture, that were after the Byzantine fashion. But the inhabitants of Cairo never took kindly to the Byzantine plan. With the exception of the mosques of Sultan Hassan and El Ghoree, and a few others of the sixteenth century, which are on the cruciform plan, all the principal mosques, such as Toloom, El Azhir, and El Hakem, are built upon the primitive plan.

The Mosque of El Azhir is a Mahometan university; its spacious court, which is 250 ft. square, is divided into seventeen schools for the instruction of Moslems from Arabia, Morocco, Turkey, Nubia, and elsewhere. At one end of the court is the mosque, which has eight ranges of columns, numbering, with those of the quadrangle, 350, most of them with ancient capitals and bases. The gate has two trifoliated arches, exactly like thirteenth-century Gothic. We attempted to get into this mosque, but were repulsed by the fanatical gatekeepers.

But it is not in Cairo itself that Saracenic architecture is to be seen in its perfection: outside the gates and at the sides of the citadel are two extensive cemeteries, and in the midst of these are to be seen, a mile or two from the city, groups of domed tombs, with mosques adjoining them, and minarets of the most picturesque forms imaginable. These are commonly known by the names of the Tombs of the Kalifs and Mamelukes; and many of them bear the names of their founder, such as the Mosque of Kaït Bey, and that of Imam Chafel. Those on the north side of the citadel are the most numerous. They consist of eight or ten domes, supported by square basements canted off at the angles. These domes are all pointed, silted, and bulbous in form; that is to say, they are narrower at the springing than a little above it, and they are all, more or less, decorated externally with ribs, lozenges, or arabesque patterns cut in the surface of the stonework. The minarets are also of various forms, but most of them resemble those in the city, being some square below and octagonal above, with three or four corbelled galleries. On the upper stage there are small columns at the angles, and their summits have the termination like a pear with its stalk upwards. In the narrow streets of Cairo one has almost to break one's neck in order to get a sketch of the domes and minarets, but here they can be seen to the greatest advantage, and sketched without molestation.

Besides the mosques there are numerous buildings of interest in Cairo, such as the baths and bazars; but as there are no architectural peculiarities about them, the former consisting of a series of square chambers, lighted by bull's-eyes in the domes, and supplied with hot water and steam *ad libitum*, and the other being merely arched or covered passages,—we need not waste time in describing them. If the traveller should, after a few days, tire of Cairo and its old-world ways, and should wish to be refreshed by a glimpse at green foliage and an image of civilisation, let him make an excursion to the gardens of the Khédiveh, at Schoobra. A pleasant drive of three or four miles through a magnificent avenue of over-arching sycamores and acacias will bring him to the gates of the palace of Schoobra. This he will not care to visit; but in the garden he will find a collection of all the flowering and other shrubs of Egypt, and in the centre of all he will see a kiosk. If he be an optimist, who believes in the civilisation of the Mahometans, he will be gratified to see the interior fitted up like a Parisian boudoir, and handsomely bound editions of great writers upon the table. If, however, he be accustomed to Eastern ways, he will only perceive in this a sign of that Oriental politeness which aims at pleasing the eyes of visitors, and will not be a whit the more convinced that civilisation is compatible with a belief in the Koran.

There are many other interesting excursions

to be made in and around Cairo. Bonlak, the island of Rhoda, and other spots, may be visited without difficulty by any one who will trust himself to the guidance of a member of that institution of Egypt, the donkey-boys, and who will be content with the smooth paces of Ginger Pop, Yankee Doodle, or Lord Dandereary. He will not learn much from his guide, but will be amused by his stereotyped English phrases, and will be able to amuse himself by observing the manners and customs of the Arabs, which he could hardly do if seized upon and lionised by an enterprising dragoman.

But if he should venture on an excursion to the Pyramids on donkey-back, as we did on without the escort of that necessary evil, the dragoman, or he will be almost torn to pieces by the Pyramid Arabs, who never can be brought to believe that they have had *brocked* enough: beginning with politeness, they end with menace; and if they get a solitary traveller inside the King's Chamber, are not likely to let him get out without paying a king's ransom.

GLEANINGS IN GLASTONBURY.*

The wall arcades both within and without the Chapel of St. Joseph are designed with exquisite taste on a par with the beauty of their execution. Each shaftlet, no doubt a Parbeck monolith, was set upon a curved channel sunk in the wall behind. "The article," says Willis, "gives a lightness of effect, by providing a free space between the shaft and the wall, and at the same time enables the shaft to be set nearer to the wall." It is closeness and compactness, we would say, rather than lightness, that is aimed at and effected. The shafts carry round arch moldings, which do not interlace, but rather interfere, their plain faces being continuous on the same plane, and confluent also on the same, at the crowns of the arches, with the horizontal string-course under the windows. The arcade thus escapes any appearance of a mere surface application, and asserts a true organic articulation with the body of the building. The intrados of the arches carries the toothed zigzag, so well executed and accurately divided, that the members exactly fit both the effective pointed arch between shaft and shaft, that is brought out by the arrangement of interference, and the segmental division that re-appears above. The flatness of these arch moldings is in excellent harmony with the sobriety of projection that reigns in the pilastrial buttresses, the angle turrets, and the corbelled cornice.

The west front of the chapel, escaping all the confusion of buttresses, has a group of three round-headed windows, the central larger and taller, set symmetrically above the continuous series of arcade arches. There is an appearance, however, in the disintegrated ashlar below the central window, that the series of shafts, though not of the interfering arches, was originally partially divided by some architectural attachment,—a niche or shrine.

The heads of these triplet windows appear to be either parts of semicircles, or rather, perhaps, describable as flattened semicircles. They are enriched with forms of what may be called reeded zigzag, descending on shaftlets. The patterns of the sides differ from that in the centre, and it seemed to me that their places might have been with advantage transposed.

Already, on the exterior, we are struck—if we indulge the sentiment of art for a time, and leave aside veneration for antiquity,—with a disharmony which will obtrude itself again in the interior,—a conflict of form between the round and pointed arch. It were futile to fall back upon obsolete speculations as to the origin of the pointed arch, from the interlacing of round Norman arches, but it were no less futile to ignore how the development of semicircular arcuation evolved of necessity forms of pointed arches, and so introduced of its own motion a discord that, had all other influences held aloof, must necessarily have led—if ever the true sentiment of style were given to the world—to the ultimate predominance of the form that, other advantages apart, was susceptible of independence from its endless susceptibility of variation. The tallness and closeness of spacing of the shafts of the wall arcades cause the lines of their arches to intersect at a most marked acute angle, and this form is emphasized by the continued zig-

zag moulding of the meeting limbs on the same plane, while the semicircular outline of the extrados is left to be inferred among the confluent mouldings, or indicated at most by an incised line. This effect is still further exaggerated in the still taller proportions of the arcades that ornament the free turrets.

In the interior the intrusive form obtains all the additional force conferred by predominant magnitude.

To judge by the traces of the wall arches, the height of the interior scarcely exceeded from 30 ft. to 32 ft., and the vaulting ribs sprung from the abacus of a triplet shaft, ranging with window cills at about half this height. The chord of the diagonal rib of each severy, about 25 ft., seems, as nearly as possible, equal to the width of two severies. The dimensions of the interior being thus:—Length, 50 ft. to 53 ft.; breadth, 23 ft. to 24 ft.; height, 30 ft. to 32 ft. These limits, which do not pretend to exactness, as taken from a diminutive plan, are quite near enough for our present purpose.

We regard it as certain that the diagonal ribs, the widest arches in the building, were true semicircles. Crossing, as they do, towards the walls at an acute angle, the consequence is necessary that a wall arch enclosing the windows, to reach the same height, and starting from the same level, must be pointed, and such accordingly is the trace that remains inscribed upon the side walls; still more importantly the main transverse ribs which commence again from the same level, and have to reach the same height from a smaller chord as necessarily meet in a point; the vista down the chapel, therefore, from end to end, gave ever the section of a pointed arch, no less than the transverse aspects, and the outline of this arch remains again upon the western wall, enclosing in its large sweeps the triplet round-arched window. The diagonal ribs have only roll moldings; the transverse rib is much more important, and bears a bold combination of rod zigzag upon a semicircular core between pairs of smaller roll moldings on either side. The vista of pointed arcuation was thus defined with the greatest force.

The pointed arch has thus by mere spontaneous evolution, and as if apart from design, and to the fatal detriment, indeed, of the style which has led up to it, acquired irresistibly the upper hand; it has only to invade the windows, which are still at present exempted through inveterate tradition, for the victory to be complete. It might, however, have been long indeed before this last step was taken, but for the influence of bolder geniuses who dared to anticipate,—to precipitate evolution,—by revolution. These are the men who seem to make opportunities, but, in truth, obtain their advantage by being ever expectant and on the watch for them; who not only catch sight of a new principle at its very first emergence, but who are gifted with imagination co-operant with power of logical deduction, to recognise all that it implicitly contains and abolishes, and much, if not at once all, that it postulates and promises;—men who are gifted, moreover, with the courage to press a principle at once to its uttermost consistent application, break with whatever tradition, set aside whatever authority they may. Many influences concurred, no doubt, to the early developments of the Gothic style; it were vain to exclude the Eastern influence from ecclesiastical architecture at the very time when the philosophy of Averroes was reacting with such vigour upon ecclesiastical study. So much the greater was the merit of those who welcomed materials from any quarter, but modified all in subjection to one vital principle which it was their glory to have divined. It was in France that the Gothic system was first truly harmonised, and it is difficult not to be struck by the contrast of the progress of the style as between France and England, and as in a degree characteristic of the nations.

The spirit of progress is alive in both, but the spur in one case is somewhat overpled, and in the other, shall we admit it, the curb. Tenacity of precedent has here to be responsible for delays and incongruities that elsewhere are escaped in virtue of ruling avidity for novelty, albeit at expense of many a stumble. Of two competitors eager for advance, one will give up nothing without a compelling reason, and the other will retain nothing unless under compulsion. System is the first requirement of the one; whatever has to be sacrificed; it may be no less the ultimate aim of the other, but the risk of sacrifices meanwhile, is sorely appreciated.

* See p. 21, ante.

In St. Joseph's Chapel, we see the round arch architecture fairly taken by surprise by the self-generated pointed arcation, and the incongruous forms are left together with no attempt to relieve the incongruity. The architecture ought scarcely to be styled, as it usually is, advanced Transition,—it is rather a case of primary and frank Collision. When we pass to the remains of the abbey beyond, we still encounter incongruities scarcely less harsh; but this is no longer because the pointed arch is obtrusive in advance, but from the reluctance, the recalcitration of the Norman style in its necessary retreat. In the happily preserved chapel of the north transept fully developed Early English details are associated with the toothed zigzags of the Norman chapel in most elaborated combinations, very exactly worked, but not more out of harmony in outlines than in excess of massiveness relatively to the slender shafting; in the remains of the aisles, we see that if the pointed arch is adopted for the windows within, they are inclosed on the exterior (so the architect solves the problem) by a semicircular.

The architecture of the chapel of St. Joseph, so called,—in reality the *vetusta ecclesia*, the church dedicated to the Virgin,—marks its own date most characteristically at the very crisis that transferred the rule of England from the Normans to the Plantagenets. The foundation itself was, doubtless, very ancient—as early as King Ina, at least; its importance is proved by the fact that the Saxon abbot of Glastonbury was one of the seven hostages that the Conqueror took with him on his first return to Normandy. His grandson, Henry II., after keeping the abbey in his own hands for some six years, laid the foundation of the new church in 1184. The direction of the work was committed to his *camerarius*, Radolphus, son of King Stephen. "He completed the church of St. Mary," says Adam de Domersham, "in the place where from the beginning the *vetusta ecclesia* had stood, building it of squared stones of the most beautiful workmanship, omitting no possible ornament." This praise, both of ashlar and ornaments, is fully borne out by the remains; the Norman zigzag receives here almost its last developments in many variations and combinations of toothed and bent rod zigzag. The patterns on alternate windows differ; among them are the ingenious examples that are introduced in the beautiful north porch of Wells, but there in union with Early English floriation, and surmounted by the exquisitely perforated drip moulding.

When we regard the broad contrast between Norman and Early English, we may be disposed to think that never was a transition so sudden and complete—scarcely that which we know and some revile, as the Renaissance. When we pass and re-pass from the chapel at Glastonbury to the abbey, and to the cathedral of Wells, we may be sometimes disposed to think that never was transition more prepared and inevitable.

Whichever view we incline to we must recognise with admiration the architectural genius that carried through the change so rapidly, and with whatever occasional hesitations and inconsistencies, to a point of such high comparative completeness at last.

In this last Norman work under the first Plantagenet, we have lively promises of the refined and elegant style that was imminent; we have notice, too, of a difficulty that in England at least was scarcely effectively surmounted. This work is very closely of the same date as the round church of the Temple in London, and when we compare the Early English church which was attached there, we cannot but recognise a sympathy where we would willingly have missed it.

At Glastonbury the height of the vaulting shaft does not exceed, perhaps does not even equal, the vertical height of the vault, and the general effect could not but have been that of lowness and oppression, of heaviness and confinement; the spring of the ribs so low down as from level of window-sill necessarily brings the groins of the vault so much in front of the upper portion of the windows as to interfere with both the view of them from the end of the church, short as it is, and the diffusion of light.

We may also notice a carelessness of articulation of the side and transverse walls, that declares itself indeed often much more unpleasantly in the Early English structures of very high pretensions. In the angle of the interior there is only a single shaft which receives the diagonal rib, and there is no trace over the triplet-window where the outline of the vault is inscribed,—of

any transverse, which would here be a wall-rib,—to correspond with the broad and boldly-moulded transverse ribs of the bays. The result is a failure of emphasis at an important juncture and termination where its requirement does, indeed, receive an acknowledgment, but quite illusory, in a slight modification of the base.

When the crypt was inserted in the fifteenth century within the lines of the foundation, as is so satisfactorily proved by Professor Willis, the pavement was raised to the level of the bench-table that carries the bases of the wall-arcade and vaulting-shafts; and thus the original defect of lowness was still further recklessly enhanced.

The flat pilastral buttresses terminate with an oddly-moulded attached finial some distance below the external cornice. The point at which they terminate may have reference to their implied service to the vault within; but their summits range with no visibly expressive line,—no feature that betrays such organic dependence; and, in the absence of any hint of reason why they went so far or stopped when they did, the effect is inevitably inopportune and frigid.

Professor Willis says they end "with a corbel, which probably carried an image;" but this we seriously doubt.

The round recessed north door of the chapel has a roof-shield moulding above it, very depressed, and leaving the least possible vacancy between the crown of the extrados and the apex of the shield,—an intimation of the probable and commendable parsimony of vacant space between the lost roof of the chapel and the vault.

THE STRUCTURAL UTILITY OF IRON.

RECENT incidents cannot fail to awaken a certain degree of interest in architectural and engineering circles, apart from that which is associated with the fracture of the Holborn Viaduct columns. In accordance with the conclusions of those whose opinion in such matters is regarded as deserving every attention, it would appear that the perishable nature and properties of iron as employed in static engineering no longer forms the principal object to be considered in reference to its utility or value as a building material. The decay to which iron is exposed from atmospheric changes and by variations of temperature has long been within the knowledge of many, and more recently the transitional qualities which iron and steel have been observed to possess, have attracted more general recognition. The molecular aggregation and dissociation of iron have been demonstrated to such a point of clearness that the material may be said to be capable of being held in atmospheric tension more eminently, perhaps, than any other substance employed in building. In addition to this circumstance, the molecular capacity of iron is known to be such as to admit of essential changes of its properties and functions. The same bar of material would, in accordance with the varying conditions of its employment, exhibit all the features and elements of new and distinct substances. The freedom of action to which the constituent elements of iron and steel are known to be susceptible admits of the presentation of various orders or classes of fracture in the same sample, and the nature of such fractures may be said to determine the practical limits of the adaptation of iron as one among the materials of construction.

The sudden fracture of railway-carriage axles is sometimes attributed to a change effected in the material by vibration. After subjection to vibratory tests, a bar of fibrous iron has been observed to have completely changed, presenting a granular or crystalline fracture it may be; and it is equally possible that a crystalline or granular sample should, under certain conditions, acquire the properties and features of a fibrous specimen. The singular atrophy, or withering away, to which iron, under some circumstances, is liable, and of which a familiar instance may have been noted on the part of many at the base as well as in other parts of iron railings, may readily suggest itself. Although an incident probably in a measure now obviated, and comparatively of but little moment, such exhibitions, notwithstanding that they may be said to be capable of being effectually remedied, invite special observation on the part of those who may be led to widely adopt the employment of iron in construction.

It might be unavailing, if not altogether devoid of interest, to single out the more trivial and fortuitous examples of the speedy decay to which the material under consideration is occasionally seen to arrive, but the total and

intrinsic degeneration of such a substance by its mere proximity to others, whatever the process through which such a result is reached, is a subject possessed of unequivocal claims to investigation. In alluding thus prominently, it may be viewed by some, to what may be open to be regarded as the more unfavourable elements of this question, we would be understood as far from discountenancing the application of iron in a constructive direction. Many circumstances, however, we incline to think it would be agreed, contribute to indicate the necessity of some selection as to those conditions under which its employment would become more appropriate and effectual.

Upon the completion of many important erections in which iron is seen to have been largely employed it is by no means an infrequent occurrence to observe that opinions are in certain directions at once set in motion, to the detriment of the undertaking in many instances, it may be gratuitously, but in the general result uniting to diminish the assurances of the public with reference to the stability or safety of such structures.

It has upon some occasions unhappily proved too well founded that substantial grounds may have existed for some amongst the numerous deductions to which these speculations are likely to lead, while in other instances the conclusions which have been derived have been altogether disproved or shown to have been unfairly or unduly exaggerated.

It is a matter confessedly of such difficulty, even in engineering circles, to assume an unconditional responsibility with reference to some of the reputed properties of iron, that a tendency has declared itself on the part of those more intimately interested in that science in connexion with which its structural use is so closely associated to endeavour to discover continually improving and more favourable modes of its application.

It is this latter view of the subject probably which may be considered to possess more special claims to the notice of our readers, nor should it be omitted to be conceded that in entering into a more critical examination of what few would probably treat as altogether unimportant the modest pretensions which have been put forward on the part of the engineering profession are calculated to invite considerable forbearance, and may happily induce the supposition that the authority which age and experience can alone impart to the principles of any art or science may be expected to operate in its favour as it has done in many analogous instances.

Perhaps the most complete and authoritative inquiry which has yet been made with reference to the utility of iron for purposes of construction is that which was initiated some twenty years ago before the committee for inquiring into the application of iron to railways. Since the time at which those investigations were conducted, the theory of the structural utility of iron has sought to embrace such conditions, and the processes of the manufacture of that material have undergone such modifications, that in the future interests of architectural, no less than engineering, science, it would appear far from undesirable that some similar inquiry should now be established.

The important experiments upon the properties of iron and steel which we owe to Mr. Kirkaldy, and to which we had occasion to allude in a notice of Mr. Bindon Stoney's lately-issued work "On the Theory of Strains in Girders and similar Structures," would almost of themselves suggest the wisdom of further legislative inquiry; for while manufacturers and public alike may appeal, in a certain measure, to the results of such experiments as likely to exercise a salutary check over the constructive application of the materials in question, it is the result of a purely voluntary and promiscuous system.

It may be fairly questionable whether the subjection, say, of the whole series of links of a suspension bridge to a fixed and arbitrary strain, is calculated to enhance the stability of such structures when erected.

Mr. Stoney, in stating that the functions and properties of iron become changed after its subjection to various strains, has recorded what has long been known perhaps in a less determinate form. Whatever may chance to constitute those obscure qualities in iron and steel to which attention is attracted upon the occurrence of unexpected ruptures or disasters through the employment of those materials, it is obvious that they appear calculated to afford important

constructive facilities, and will always invite employment in some building capacity. It is of practical moment, therefore, to the architect to seek to bring under more critical examination the occasions of failure in either of those materials in their structural application. The fall of the Manchester Station roof, some two or three years ago, it may be remembered, was attributed to a flaw in some portion of the casting; while the more recent instance of the Caledonian Station has been laid to the account of a tie-bar giving way; and in the case of the Ludgate-hill Station, the accident was referred to the simple misplacement of a strut.

It is with no intention of imparting an undue importance to such incidents that we make reference to occurrences some two or three years old, but the integrity of an extensive undertaking, it may be in iron, has been so frequently traced to, and imperilled by, the giving way of some trivial support, or member of the general structure, that the circumstances may demand pointed observation in any further inquiries into the strength and adaptation of such materials. In reference to novel discoveries in static engineering and attempted improvements in the application of the materials with which that science is identified, it cannot but afford matter of congratulation to notice any instances where it may have been more clearly shown that undoubtedly successful results have been attained.

Although the extraneous successes of certain engineering experiments may be said to possess less interest in architectural circles than where it has been sought to import similar endeavours into the domain of architecture, it must necessarily be of interest to note those claims which are occasionally alleged upon special grounds, with reference to the allied arts of construction. Apart from the employment of iron, so obviously has the theory of engineering been necessarily founded upon certain of the principles of architecture, that a sense of usurpation reigns in engineering circles wherever the distinctive element is more notably absent; and this it is which, in the opinion of some, might be held to shed light upon the assertion of an eminent member of the profession, that it has been very unsatisfactory to attempt to describe in a few general words what a civil engineer really is.

As an illustration of the more unified elements upon which the art of construction in iron is yet based, reference might be made to the evidence which was given by Mr. Robert Stephenson before the Committee of Inquiry, upon the application of iron to railway structures. The report of this Commission is known to be still regarded as of high authority in engineering practice, and the circumstance may be noted with all the more pleasure, as instancing the undoubted progress which has been made since the time of the inquiry in the profession to which it relates.

Upon being asked as to his opinion with regard to suspension-bridges, and whether he considered them at all applicable to railways, Mr. Stephenson replied, "To a very small extent. I do not think, with the prospect of our weights increasing upon railways, that you can run a locomotive over any chain-bridge in existence."

We have already had occasion to advert to the opinions which have been derived by Mr. Edwin Clark as to the construction of suspension-bridges, wherein he expresses his belief that the erection of a suspension-bridge sufficiently rigid for the purposes of locomotive traffic would be tantamount to the construction of a tube. Mr. Peter Barlow, whose experience in the structural application of iron entitles his opinion to great weight, is at issue with Mr. Clark, and remarks that, "although unsupported by fact or experiment, Mr. Edwin Clark's theory has been received and acted upon, not only by a large portion of the public, whose impressions of suspension-bridges are derived from what had hitherto been constructed of insufficient strength and without being combined with a girder, but it had been received and acted upon by engineers of eminence in this country."

In the inquiry before the Commission to which we have alluded an important exception was taken by Mr. Stephenson in favour of a system of suspension bridge which at that time attracted considerable notice. The discovery invited such attention that Lord Western was induced to communicate at great length with Viscount Melbourne as to the superior applicability of the system to the repair or renewal of the Menai Bridge, deducing from actual experiments its merits in bridges of large span. This class of structure is known as Dredge's

Patent Taper Suspension Bridge. Lord Western observed that the inventor insisted on the possibility of reconstructing the ironwork of the Menai Bridge at a less sum than the superfluous iron would sell for, pledging himself to the power of the bridge if the irons were altogether altered, using Lord Western's words, and reconstructed on his principle, to be capable of supporting on transit 1,000 tons.

The main principles of the Dredge suspension-bridge would seem to be comprised in the employment of pyramidal suspension-chains, and the substitution of oblique for vertical rods for connecting the suspension-chains with the roadway. The invention of Mr. Dredge, with reference to the application of iron in the erection of bridges more particularly, was supposed to embody such important structural principles that, apart from the exception which was made in its favour before the Commission to which we have referred, it may now upon various grounds be found to possess further claims to practical consideration.

The Dredge principle is stated to have been founded upon the view that bridges are only brackets, and should be dependent upon their bases or abutments, and the strength of the material of which they are constructed, like the human arm, which depends on the shoulders, and not on the fingers' ends, or the limb of the oak, which is sustained by the larger part of the branch that grows from the tree, and not by the ends of the twigs at its farthest projection. Bridges have hitherto been made to rest on their centres, as beams in architecture, and hence the accumulation of leverage that exists on their centres, is the cause of their undulation and destruction. In a common bridge, whose depth is one-twentieth of its length, and the weight 1,000 tons, the central forces are computed at 5,000 tons, instead of which no description of force or weight, according to the Dredge principle, should exist on the centre of the arch of projections. The operation of the system is therefore in the direction of the annihilation of these static forces, which of themselves tend to destroy the structure, and to counteract which an excessive quantity of material must necessarily be employed, in accordance with more usual practices. One of the more important elements in connexion with the erection of all suspension structures of the nature in view has been the acquisition, at the least cost, of the maximum rigidity, and to accomplish this various expedients have been suggested and employed.

In the original suspension-bridge which existed at Hungerford Pier, in the line of the present Charing-cross Railway, the lateral motion, as well as the deflection, of that structure under passing and unequal loads was remarkable. In that case, as in the present Hammer-smith and Chelsea bridges, the roadway was attached to supporting-chains by vertical rods; but in the substitution of oblique bars in the Dredge system, considerable rigidity was supposed to have resulted. A more special treatment of this element of bridge construction may be noted in Koch's system of suspension, a class of structure perhaps deserving of fuller notice than it has yet received; but the more conspicuous instance is that to be observed in the Niagara Railway Bridge by means of timber trussing following up the direction of the chains. This feature has been reproduced in Lambeth Bridge, iron being there, however, substituted by Mr. Barlow for the timber, as employed in the Roehampton system. In most of the instances which we call to mind the metallic section of the supporting-chains has been uniform at any point along the span, nor do we remember any case of such singular deviation from this principle as that to be noted in the pyramidal chain-bridge. The attempted economy of material towards the centre of lattice girder bridges may faintly shadow out the principle involved, and we cannot resist the impression that an exaggerated view has been taken as to the possible saving of material as between the Dredge principle of suspension and others. Perhaps the most exquisite adaptation of iron to structural purposes—that is, in a useful sense—to which we may refer, is instanced in the case of the London, Chatham, & Dover Railway Bridge, erected at the crossing of the Thames at Blackfriars; but it seems unhappily possessed of fewer lasting elements than its present neighbouring structures.

The results of the experiments which were communicated by Lord Western to Lord Mel-

bourne, upon the distinctive features of the Dredge bridge would appear well calculated to attract the attention of the scientific; but, as we have before had occasion to notice, the extreme divergence of views entertained by the more eminent professors of engineering detracts from the value or importance, in a measure, of individual conclusions. Whether greater triumphs may be derived from the application of wires, cables, assisted by vertical and horizontal trussing by the system of pyramidal chains and oblique suspension-bars, or by the tubular system conjoined with chains, or in the form of tunnels, we would be indisposed at this moment to venture to predict; meanwhile attention is being attracted to more recent discoveries as to the structural application of iron and steel. Out of the mass of conflicting and antagonistic evidence with which the theory of engineering is obviously beset, it would afford matter of congratulation should some settled principles be evolved, and it is because we incline to the view that at length some tendency in this direction may be detected, that we would seek to bring under notice some few of the more striking features of that art.

INSTITUTION OF CIVIL ENGINEERS IN SCOTLAND.

THE address of the president, Professor Macquorn Rankine, has been published: we take from it two or three passages:—

Sand Concrete.—It has long been known how greatly the execution of breakwaters, and other harbour works and sea defences, is facilitated by the use of blocks of concrete instead of natural stones; because such blocks can be made of any size that may be required in order to resist the force of the waves. It has lately been shown by the mode of construction used in the breakwaters of Port Said, at the northern end of the Suez Canal, that such concrete may be made of hydraulic lime and sand alone, without gravel or stones.

Ventilation.—A branch of sanitary engineering not less important than water supply and cleansing, is ventilation; but its difficulties and imperfections are in some respects of an opposite character. In the branch which deals with liquids and solids, we find that the supply of pure water is comparatively easy, while the removal of refuse involves matters of dispute and perplexity. In the case of ventilation, on the other hand, appliances for the removal of foul air are well known and extensively used; while the supply of fresh air, though in some cases efficiently provided for, is in other cases neglected; and there are too many instances of the latter class. We too often see large and splendid public halls, in which outlets for foul air have been most carefully planned and executed at various points of the roof, while the supply of air has been left to the casual opening of a door, or to the currents which the pressure of the atmosphere may cause to enter through drains and soil-pipes, or down disused chimneys. There are many exceptions, however, to this remark to be found in buildings where the supply of fresh air has been amply and skillfully provided; and the number of these exceptions is fortunately increasing. Care should be taken not to under-estimate the supply of fresh air required by the inmates of a building: experience has proved that each individual requires at the very least 20 cubic feet per minute, and that if possible he should be supplied with 30 cubic feet.

Engineering Education.—The movement which is now so active for the extension and improvement of technical education, is one in which the members of the various branches of the engineering profession are deeply interested. The objects carried out by those who promote technical education may be classed under four heads: providing teachers, providing buildings, providing the materials of instruction, and providing scholars. A step was made by the Government about thirty years ago towards the providing of teachers of the scientific principles of engineering, by the founding of chairs of civil engineering and mechanics in some universities; amongst others, that of Glasgow. The efforts of the holders of those chairs met but with partial success, until their teaching was made to form the conclusion of a systematic course of instruction in the various sciences bearing on engineering. After that systematic course had been established, the students steadily increased in number, diligence, and ability. More recently much

has been done to increase the number of teachers; and I may mention, as especially worthy of honour, the establishment by the Government of the Royal School of Naval Architecture and Marine Engineering; the contributions of the inhabitants of Manchester towards the endowment of Owen's College; and the foundation, in the University of Edinburgh, by Sir David Baxter, with aid from the Government, of the most liberally endowed chair of Civil Engineering in the United Kingdom. As regards the provision of buildings, I know of no instance of munificence to be compared to that of the inhabitants of Glasgow and its neighbourhood. The amount of their subscriptions to the fund for the new University Building, taken together with the Government grant and with other resources, has enabled that building to be executed on a scale which will provide most ample and convenient accommodation for the engineering department, as well as for other branches of study, which have hitherto been conducted, in the old College, under great disadvantages as to space, light, and air.

The objects which give the most important aid to instruction in engineering science are those examples of materials and workmanship which are to be seen in actual structures and machines. Nevertheless, a good collection of specimens of engineering materials would be of great service in connection with the engineering department of a university; and so also would a collection of models, drawings, and instruments, though less important than specimens of materials.

It is only necessary to name to you Sir Joseph Whitworth, in order to remind you of the magnificent endowment which he has provided for students of mechanical science and practice combined.

It is evident that the value of scientific education to engineers is at the present day duly appreciated, and that the means of obtaining it are being rapidly extended, and indeed are in many cases promoted with enthusiasm. Just as in every similar case, in which a good object is earnestly pursued, there are errors against which it is necessary to guard. One is, to expect results from the scientific branch of education which it is not really capable of accomplishing. The purely practical parts of engineering, such as the use of tools and the superintendence of work, cannot be soundly and thoroughly learned except through experience in real business; and it is a mistake to endeavour to teach them during a university course. The true laboratory for students of engineering science is to be found in the workshops of such cities as Glasgow, and amongst the earthwork, masonry, carpentry, and ironwork of engineering structures in progress.

THE EARLY YEARS OF RAILWAYS.

MR. VIGNOLE'S ADDRESS.

We quoted in our last a portion of the address delivered by Mr. Chas. B. Vignoles, F.R.S., as President of the Institution of Civil Engineers. It contains so much that is valuable that we are tempted to make some additional extracts:—

Passing over intermediate years, let me come to my proper task and attempt to recall some of the memorable chain of occurrences, in the earlier days of the railway system, when the grandest improvement among the many ameliorations of the first quarter of this nineteenth century began its earliest struggles for general adoption. It is to the courage and enterprise of the mercantile and manufacturing communities of Liverpool and Manchester that we owe their introduction, and benefits such as we have enjoyed during the last forty years.

The trade to and from the port of Liverpool had long been outgrowing the existing means of inland carriage. The two great carrying companies, popularly known as the "Duke" and the "Old Quay," had provided it with water transporters during three-quarters of a century, as, for a shorter period, had the "Leeds and Liverpool Canal;" and the many waggons along the rough paved highway had supplied the road conveyance. But it may readily be imagined that, with the rapid increase of commerce subsequent to the close (in 1815) of our long series of wars, all of them were insufficient.

When the first steam-engine had only been erected in Manchester in the year 1790, not a power-locomotive had been introduced until twenty years later, and the population scarcely 40,000; when the port tonnage and population of Liverpool were small—when the first casual importa-

tion of eight bales of American cotton in the year 1784 was so strange that it was seized by the Customs officers, under the conviction that it could not have been the produce of the country which the invoice stated it to be; the trade of both towns was unimportant compared with that of 1824, by which time Manchester had 150,000 inhabitants, 200 steam-engines at work, and 30,000 power-looms employed; then dock-dues at Liverpool were paid by 10,000 vessels, the population was 135,000, and upwards of 400,000 tons of cotton were imported yearly; goods in transit between Liverpool and Manchester equalled fully 1,200 tons daily, besides upwards of a million tons of coal carried annually into those two towns. Thus the aspect of commercial affairs had totally changed, though the means of conveyance remained unaltered and unimproved: hence arose vast pressure and enormous sacrifices to ensure speed and certainty in the delivery of goods. This could only be done by land carriage, sometimes at almost ruinous cost. Some remedy was imperative, some competition indispensable, and the inquiry became necessarily limited to the form in which it should be devised and applied: it was not long before deciding that the remedy should be by means of a railway.

Railways, though rude, had existed in the coal counties on the Tyne and the Wear for 200 years previously, but since the beginning of the present century they had improved and multiplied rapidly, but were still only short isolated private undertakings, appropriated exclusively to the transit of coal. In 1822 the first public railway for goods, coal, and passengers was proposed between Stockton and Darlington: it was unsuccessful in Parliament from the opposition of the landowners and coal proprietors, but next year the Act was obtained. About this time William James, a London engineer, had suggested just such another railway to the mercantile men of Liverpool, to supply the great want of conveyance between Liverpool and Manchester, and James made the first actual survey. It was not adopted, but the idea was entertained and ripened. The water-carrying companies refused to reduce their tolls, the alternative of road conveyance was impracticable, from its limited resources and great expense; but independent of tolls, the endless delays on the canals, the pilferage of the merchandise in transit, and the terminal obstructions from want of space, left no hope of improvement; and in 1824 the first prospectus for the Liverpool and Manchester Railway was issued, the appointed committee prepared their plans under the advice and direction of George Stephenson, and lodged them for application to Parliament in the ensuing session.

The anticipated strenuous opposition to the scheme was not long in becoming realised. The three bodies of canal proprietors, each in itself no despicable opponent, forgetting their mutual animosities and former disagreements, banded against the new rival in formidable array, acting on common impulse, organised under most skillful direction, upholding with tenacity their vested interests, claimed as rights; and prepared at all hazards to resist and crush down so intolerable an innovation on established modes of communication, and on their chartered privileges and long-maintained monopolies.

Two noble peers, Lord Sefton and the great grandfather of the present Earl of Derby (whose estates the railway crossed, and have since so vastly improved those belonging to the latter nobleman), made common cause with the canals to prevent the passing of the railway bill. It was battled during three months through the House of Commons. Every possible objection was taken. Imperfect plans, erroneous levels, interference with parks a mile distant, danger, nuisance, and incompetence of locomotive engines, deficiency of estimate, impracticability, especially in crossing Chat Moss. One very eminent engineer affirmed that the probable expense of crossing that moss would exceed 200,000*l.*, though the real cost was actually within 30,000*l.*

I should inform those of my hearers, who have not watched the different changes which have taken place in the practice of passing private Bills through Parliament, that in those days committees on Bills, and even on standing orders, were open to every member of Parliament who chose to attend, were it solely for the purpose of voting upon the preamble or merely on a particular clause. The *whip* for the first division was tremendous. The preamble of the Bill was carried by a majority of one only in the open

committee to which seventy-three members had been pressed. It must then have been considered hopeless to persevere; next day the clause, empowering the company to make the railway, was lost by a vote of nineteen to thirteen; the clause to take land was also negatived; the promoters then withdrew the Bill, and thus ended the first act of the great railway drama, which, even at the present day, is still far from being played out, although 100,000 miles of railway are now laid on the face of the globe.

Nothing daunted, the high-spirited committee, the very *élite* of Liverpool, called their parliamentary supporters together on the third day after the loss of their Bill, and, encouraged by them, resolved to persevere. And, hear it, my fellow-countrymen of Ireland, the most cogent argument used by the leading political men of that day who attended the meeting—an argument repeated in the new prospectus of the railway—was, the benefit which the railway would produce, directly and indirectly, to the agricultural interests of Ireland,—a benefit I can testify from my personal knowledge ever since, has been most abundantly realised; and, considering that it was an argument brought forward five-and-forty years ago, there is good ground for maintaining that the best interests of Ireland were then, as now, quite as much cared for as those of Lancashire.

It happened that I had returned, some two years previously, from occupations on the continent and in North America, both civil and military, all connected with engineering, occupying repeated absences from this country. Having watched the few railways then made, or making, I was fortunate in being selected by Messrs. Rennie to take charge of the new surveys, which the Liverpool committee immediately ordered under the direction of those eminent engineers. But the opposition of canal owners and land proprietors had become redoubled; and it was in the course of carrying out this duty that I was brought into contact with the celebrated Mr. Bradshaw, the devoted trustee under the remarkable will of that Duke of Bridgewater who employed Brindley to make his canals, and had charged Mr. Bradshaw with the sole and absolute control of them, and of his large estates, for the benefit of his future heirs, which he exercised for nearly half a century.

I was brought up before Mr. Bradshaw, at Worsley Hall, on a pretended charge of night poaching and trespassing; for I was often obliged to make surveys and take levels by moonlight and torchlight, so strict was the watch kept by day, by order of many landowners to prevent engineers from completing the necessary plans and sections. Mr. Bradshaw had contrived to earn himself a terrible name for severity, but I found him a gentleman. My only reason for recurring to such a mere personal adventure is, that some not unfriendly discourse passed between us on that occasion, which I communicated to the Liverpool committee. This led, I have good reasons for believing, to communications which, before the end of 1825, ended in those arrangements by which the then Marquis of Stafford, for himself and those of his family who were ultimately to benefit in the profits of the Duke of Bridgewater's canal, took 1,000 shares in the Liverpool and Manchester Railway Company, with the privilege of nominating three of the directors, arrangements confirmed by the company's first Act of Parliament.

On the 25th of September, 1825 (I note the special date) the Stockton and Darlington Railway was opened for public traffic. The surveys for the new railway between Liverpool and Manchester, commenced in the July preceding, were completed and lodged in November: then public attention awakened to such projects, and early in 1826 the Bill was again introduced into Parliament, under less discouragement. The opposition, however, though not so compact was as keen as ever, and the passing of so important a measure required every effort, every precaution, on the part of the promoters. The leading counsel opposing was the late Baron Alderson, next to Sir Frederick Pollock, the most accomplished mathematician and man of science then at the Bar, prominent in his crucial examination of engineers by your esteemed past-president, George Bidder, then as well known for his marvellous power of mental calculation as he has since been as a scientific and practical engineer. Few of my audience will be disposed to infer, judging from his subsequent career, that my old opponent Bidder was the most formidable enemy of the railway in its first Parliamentary warfare.

In spite of him, however, the preamble passed the ordeal of committee this time with a majority of 43 to 18. The third reading was opposed in the Commons by the illustrious Lord Derby lately deceased, then the Honourable Edward Geoffrey Stanley, who made his almost maiden speech in that House against the Bill, with all the ardour of his character; but on a division, the numbers were 88 in favour, 41 against. The struggle was renewed in the Lords' Committee. One of the counsel for the railway was William Page Wood, then a junior barrister, now Baron Hatherley, Lord High Chancellor, and a very near neighbour of ours. On their last day of meeting in committee thirty-two peers were present, when the very old earl and his son-in-law, Lord Wilton, were the only dissentients. The third reading was carried without a division, though not without hostile speeches; the Royal Assent soon followed, and on the 29th of May, 1826, a general meeting of the subscribers was held in Liverpool, and the newly-appointed directors held their first sitting on the following day. Soon after George Stephenson returned to the post of engineer-in-chief, and the railway works commenced, and were vigorously pushed on for three years, until approaching near to completion, when it became necessary to settle the question of the motive power to be used on the railway.

It would occupy the time usually assigned to more than one address, were I to pursue the interesting record of the steps taken to solve this question; but I am not attempting an historical analysis—merely selecting a few reminiscences. I should have been very glad to have noted the proceedings known as the "Rainhill Experiments," having been myself present the whole time, in October, 1825, when the competitive trial of locomotive engines took place, ending in the grand prize being awarded by impartial judges to George Stephenson and Henry Booth jointly. It is from Mr. Booth's publication that I have been most unscrupulously abstracting. I will refer those who may be disposed to enter into details of such remote date to the pages of the Liverpool newspapers and the *London Mechanics' Magazine* of that period. Trustworthy, impartial accounts are to be found therein, and full justice done to my old friends, Braithwaite and Ericsson, whose engine, the "Novelty," was long remembered as the beautiful of a locomotive, and which, if it did not command success, deserved it.

A great gathering of engineers from all parts was, of course, in Liverpool; and as Englishmen are said not to get on well on important business without dinner demonstrations, the engineers gave on this occasion a grand banquet to the directors and officers of the railway, and to the competing locomotive engine builders. Of course speeches were made and healths drunk, and we toasted each other and everybody, except the waiters. Will you excuse me if I read from a newspaper report of our feast (in the *Liverpool Albion* of the 12th of October, 1825), two short predictions of mine about railways. I had had the honour assigned to me of returning thanks for the toast of "The President and Institution of Civil Engineers," and what I said is thus reported:—

"Mr. Vignoles, as a member of the Institution, returned thanks for Mr. Telford, to whom, as the constructor of many of our most important public works, the toast was due. His (Mr. Vignoles's) first step in life was as a military engineer; and as he was deputed to propose a military toast, perhaps he might preface it by some anticipation of what steam would do, in a military point of view. Supposing such a general as Napoleon were to effect a landing on our coast with a large and powerful army, and that he even were to be victorious upon us, knowing, armed as this country is, shortly to be with railways and locomotive engines, brief would be his triumph; for by return of post, as it were, parks of artillery and the whole military force of the country could be poured upon him, without even the fatigue of a march. Mr. Vignoles concluded with giving 'The Master-General of the Ordnance and Corps of Royal Engineers.'"

And a little later in the evening, having had to propose the health of the three judges of the locomotive competition, I stated, as reported:—

"Being engaged in having out a railway between Google and Barnsley, he (Mr. Vignoles) hoped to see that accomplished and made part of the union between the two sides of the kingdom, and that it might put it into the power of that part of the country to supply the metropolis with the article coal, at present furnished through sea transport by the great northern proprietors, whose monopoly, he trusted, would then soon be put down."

As regards my latter prophecy, my friends taking them either in alphabetical or geographical order, Barlow, Cubitt, Fowler, and Harrison, have now pretty well realised what I uttered about bringing coal into London by railway, though they only began some twenty-five or

thirty years after it was first thought about. Still it has been most effectually accomplished. In respect, however, of what railways would be able to do, in case of the momentary success of an enemy invading this country, I have to re-echo War Office, after the establishment of our Engineer and Railway Volunteer Staff Corps, was to point out the means by which, in the event of such a disastrous occurrence, the railways could practically protect us; and the answer we returned went to the effect of demonstrating that within forty-eight hours after the alarm had been sounded, the whole military force of the country could be poured down upon the enemy, on whatever coast the invading forces might land, without, excepting in a few limited cases, the fatigue of a single day's march. I would have asked our illustrious honorary member, Field-Marshal Sir John Burgoyne, whom I hope I may be permitted to call old friend (whose illness, I regret to say, has alone prevented him from doing us the honour of being present this evening), but in his absence I appeal to the Inspector-General of the Royal Engineers, Sir William Gordon, whom I am proud to see here, whether our replies were not complete and satisfactory, and whether what was thought at the time to be the mere boast of a dreaming enthusiast, is not now ready for realisation at any hour—though God forbid that that hour should come, even though it found us fully prepared, as forty years ago I ventured to anticipate we should be.

I am thus led to a subject which I had intended to mention previously, but here seems the most appropriate place. The civil engineers, as a body, were first so called by Belidor, to distinguish them from the military engineers. It may be readily understood, however, in how many cases the military professional operations would partake of the civil elements. On such occasions, when appealed to, as in several recent instances, we have always been most willing to give our military brethren any advice and assistance in our power, as has been repeatedly acknowledged.

But now a new era is coming upon us, which will bring us much more in connexion with the military service. First, by the organisation of our National Volunteers, in which we, as engineers and artisans, have largely partaken, giving to the movement our professional skill; and, secondly, in consequence of the general extension of railways, and the recent introduction of the new powerful arms and implements, none of which have been as yet subjected to any regular fully-devised system, even in the most recent wars but which will necessitate increased influence of engineering in military operations, the full consideration of which we, as civil engineers, including the most eminent of our body, are using our best efforts to develop; and we have the satisfaction of finding these efforts appreciated by military and naval officers of the highest distinction and experience.

I need scarcely say that a year or two before, and, of course, immediately after the opening of the Liverpool and Manchester railway,—the attention of the public generally had been drawn to the new system of locomotion; a number of projects were brought forward, and many more were in contemplation, especially a railway from London to Birmingham, and another from Birmingham to Liverpool; for amalgamation had not then become the order of the day. Among others was a plan for connecting London and Paris by railroad, via Brighton (or, rather, Shoreham) and Dieppe, the long sea transit not being then deemed so objectionable, considering the distance between the two capitals by this route was the shortest by sixty miles.

A powerful combination of capitalists was formed, and soon after the change of monarchy

which placed Louis Philippe on the throne of France, I was sent over to negotiate for a concession in the French dominions. I had the honour of several interviews with his Majesty the celebrated statesman, Thiers, then Minister of Public Works, was sent to England, and so on after M. Le Grand, his Under Secretary of State, came over. I had the honour of escorting them one after the other through the manufacturing districts and along the railways, some of which I was constructing, and I thought had convinced them both of the advantage which the railway system would be to France.

After some considerable time occupied in inspecting everything which I thought most likely to interest these two chiefs of the Public Works of France, and conveying them over road and railway at a pace at which I am sure neither of them had ever moved before, M. Thiers took leave of me in a speech full of compliments and polite phrases, which I will attempt to paraphrase in plain English:—"Mr. Vignoles," said the accomplished statesman, but bad discriminator, "I am infinitely obliged to you, and I think you very clever fellow, but, do you know, I did not believe a word of what you told me before came, and now I cannot see the great advantage you were constantly dwelling upon. You have good canals—but very small, and ours in France are much superior. As for your roads, they are very good, but I have not met a merchant's wagon on them in the whole of my journey."

I do not think railways are suited to France!—And as to your wanted posting, we go quite as quick in France!" Perhaps this last remark was not to be wondered at, for M. Thiers had insisted on bringing over to England his own heavy lumbering vehicle, quite à la Louis XIV., with immense lamps, like the old Paris reverberators, at the four corners on the top of the coach, which carried heavy Imperials, and eight or nine persons in and out, requiring six horses most of the way.

M. Thiers returned to Louis Philippe, and reported against the introduction of railways. He made violent speeches in his place in Parliament as Minister of Public Works, adverse to them, and the benefit of railways to France was postponed for eight or ten years, of which M. Thiers has been repeatedly and sharply reminded by his political opponents, when lamenting his shortsightedness. But his deputy, M. Le Grand, was somewhat more reasonable. He left a staff of young engineers to study our system of road-making, and it was copied closely in all the new roads subsequently made, and the Maximilian principle of repairing was adopted; and, in fact, from that period the roads throughout France have been changed, greatly for the better. I cannot but acknowledge that the way in which roads in that country are now kept up is superior to our own—especially as regards our mode of forcing good horses and light carriages to grind down broken stone. In France they keep many of the roads clear from mud in winter, and from dust in summer; and where road materials are scarce and dear, they find a great economy in doing so.

More politicians called upon to consider and judge of engineering naturally fall into errors which, if excused, cannot be easily forgotten; but what can we think, or rather what ought the engineers of France to think, of a system which placed at their head a statesman, who, virtually, robbed them of the glorious opportunity of doing for themselves and their country what, after years of injurious delay, fell into the hands of English engineers, and capitalists, they becoming the first practical introducers, on a large scale, of railways into France? A system, which, in my judgment, notwithstanding many advantages, hangs like a dead weight on the talent, genius, and invention of that country.

STATISTICS.

1868-69.	United Kingdom.	France.	Prussia.	Spain.	United States of North America.
Railways (English miles).....	14,247	10,3-2	5,403	3,331	42,572
Metalled Roads (ditto).....	160,000	100,000	65,818	10,889	...
Navigable Rivers (ditto).....	3,600	6,015	...	...	...
Canals (ditto).....	96,104	5,154	13,891	6,072	...
Telegraph Lines (ditto).....	22,165	23,450	45,768	15,263	99,069
Wires (ditto).....	17,741	1,701	3,942	184	...
Post Offices (No.).....	2,432	5,060	...	...	25,200
Letters (No. Yearly).....	505,118,000	537,069,388	...	...	631,011,600
Newspapers and (ditto).....	105,845,000	351,078,008	270,000,000	...	...
Book Packets.....	122,519	210,480	139,675	198,001	3,501,840
Area (English square miles).....	31,821,431	38,142,064	23,970,941	15,473,491	38,442,905
Population (No.).....	...	...	...	...	...

WHITEHALL AND VICINAGE.

This noble expanse, now extending from the National Gallery on the north, to Parliament-street on the south, is the most spacious, and, on its central position, the most important thoroughfare, or rather piazza, of the metropolis; and when extended as proposed, of equable width, as far as the Abbey, will open a view of ancient and modern public buildings of great extent, half a mile in length from Trafalgar-square. On the west side, after a range of twelve or, important buildings continue the line to the corner of Great George-street, where the new church ground reveals the views of the Houses of Parliament, and Henry VII.'s Chapel, the Abbey, and St. Margaret's Church. First, is the Admiralty, with a frontage of about 300 ft. The façade of this building is not very distinguished in architectural effort, save its open porch colonnade, inclosing a court-yard, and a porch with lofty columns to its retired front of red brick; these ornamental features but ill accord with the rest of the fabric, which is something akin to Chelsea Hospital, or Hampton Court, a little modernised. The depth towards the park much exceeds the frontage, as there are grounds extending in the rear at least 100 ft. A red-tiled stable and an antiquated house, built on what, possibly, is called the garden, front the parade-ground, and are occupied by subordinates of the Admiralty, extending as far as the houses in New-street, Spring-gardens. The main body of the structure is, no doubt, spacious, but this department has much swollen since its first erection, and the lords have been compelled to acquire large detached establishments, and most expensive locations, too, in Pall-mall, Somerset House, Spring-gardens, and elsewhere.

Seeing that all establishments connected with so important a branch of the public service ought to be in propinquity with it, and that so valuable a site lies open at command, it appears strange that instead of renting offices at enormous rates suitable buildings have not been erected on their own ground. A building subsidiary to the Admiralty, if placed there, might correspond with the range of Foreign Office on the opposite side of the parade-ground; a back window of the existing building, although screened from a park view, might have sufficient reserves of light and air for ordinary officials; whilst the new structure would afford a better woodland view, and would also stand out to the parade,—thus affording scope for all the ramifications of the Admiralty. Our readers will remember plans for the union of offices on this site which have appeared in these pages.

Next in sequence on the Whitehall east street line comes the Army Pay-office, a stack of the old, quaint, packed description; it is about 100 ft. frontage, without an obvious portal, but having two entrances, one at the end next the Horse Guards, practised in the front wall and under a window line; the other through an angle or arch on the Admiralty frontage! The whole structure must be at least 250 years old.

The Horse Guards follows next in street line. This building was commenced in 1751, and was designed by Kent; its aspect from the park is certainly better than the complicated variation, or mixture, as some may call it, displayed on the frontage. It occupies a line of over 300 ft. along the pavement, and as this, too, is inadequate to a service in our times, perhaps the conversion of the Army Pay-office into a subsidiary department for the Horse Guards might be the best mode of redressing a necessity, and at the same time of adding a redeeming feature to the aspect now beheld from the banquetting-hall opposite. The fine mansion of Lady Dover follows; the front hall, portico, and screen wall, filling up the distance of 140 ft. between the Horse Guards, and the new Privy Council Office, and extending forward to the park.

In close juxtaposition with Dover House, the Council Office completes the line, in a range of 315 ft. to Downing-street. As the interior of this Classic pile is vastly superior to offices of inferior foundation, so in architectural effect it far surpasses them, as also in solidity, internal adaptation, and finish.

The remainder of the street line from Downing-street to Great George-street will be occupied by the levithian range of new Government and Foreign Offices, which are, as to the park frontage, now completed, nearly the whole way to Storey's Gate,—viz., to Charles-street. The façade to Parliament-street, which is to be widened to

the Council Office line, will add fresh dignity to the continuous piazza.

On the opposing side of Whitehall there is but one public building of any pretension, but that one, the Banqueting House, gives importance to the whole range; and the Duke of Beaufort's mansion and open court, together with Richmond-terrace, lend to it an unusual dignity.

It may be added, that Hubert de Burgh built the Palace of Whitehall, A.D. 1242, since which it continued to be the most valued site in London. Afterwards, in 1248, it became the urban residence of the Archbishop of York, until in the reign of Henry VIII., that monarch, A.D. 1530, erected a magnificent gallery, decorated by Hans Holbein, for the purpose of viewing tournaments performed in the tilt-yard, which occupied the present site of the Horse Guards and the parade-ground, the whole extent of St. James's Park being then open to view.

In the reign of James I., Inigo Jones was commissioned to design, A.D. 1606, a plan for a new palace, "in place of the old rotten sleight building Banqueting House." The length was to have been 1,152 ft., and the width 874 ft. The plans were duly matured and drawn, but of the whole design which, if carried out, must have continued to be a lasting monument to the fame of the architect, the Banqueting Hall alone was erected.

There is a great blot on this vicinage,—the state of filth and waste of Scotland-yard, and the whole range between Whitehall-place, Hungerford station, and the Embankment. It has lain for many years in desolation, and must continue so until some decision is come to as to the intended bridge across the Thames, whether the piles and coffer-dams for three piers, which have impeded navigation for so many years, shall be removed, or the works carried out.

THE ARCHITECTURAL PUBLICATION SOCIETY'S DICTIONARY OF ARCHITECTURE.

We are glad to believe that the completion of the Dictionary is now fairly assured.

A special general meeting of the subscribers was held at the House, in Conduit-street, on the 19th of January; Mr. T. H. Wyatt, in the chair.

Mr. Arthur Cates, the hon. secretary, read a report from the committee, which congratulated the members on the complete discharge of all debts and liabilities, and the possession of a cash balance of upwards of 150*l.*, available for the prosecution of the Dictionary. The result of the exertions made to obtain new subscribers, so as to secure the completion of the Dictionary, was reported as having been attended with remarkable success, only sixty-seven names being now required to fill up the list; and as new adhesions were still coming in, the committee recommended the subscribers to authorise the immediate undertaking of the work of completion, relying on the continued exertions of the members to secure the additional subscribers still required.

The Chairman said he need trouble the meeting with but few observations on this matter. They all felt the great importance of completing this work which, as far as it had yet gone, had done great honour to the profession, though he felt in common with them all, that the great share of labour and responsibility had fallen upon two or three gentlemen. The work having gone to the length it had, it would be a great pity it should now lapse for want of a little individual energy on the part of the general body of the subscribers. Considering that in round numbers 100 new subscribers had been obtained since the annual meeting last May, it would be hard indeed if, in the course of the next twelve months, they did not obtain the additional sixty-seven required to complete the list. He would at once put down his name for an additional copy.

After some conversation, the following resolutions were then unanimously adopted:—

1st. That the continuation of the Dictionary of Architecture be at once proceeded with in such a manner as to secure its completion at the earliest possible period.

2nd. That the hon. secretary of the Dictionary be requested to superintend, as before, the production of the text.

3rd. That the work as produced be issued,—

A. To all subscribers now on the list, whose subscriptions to December 31st, 1869, shall be fully paid up on March 1st, 1870. All in arrears at that date to be considered as having withdrawn, and will thus lose the advantage of obtaining the completion of the Dictionary of Architecture without further cost.

B. To all subscribers who may have paid up the fifteen guineas in full, for which they will immediately receive all of the Dictionary thus far published.

C. To all new subscribers who, under special arrangement, are paying up gradually the subscriptions for past years, so soon as the payments made by them shall amount to fifteen guineas.

D. To all new subscribers who shall have elected to pay the subscription by instalment, as soon as their payments shall amount to fifteen guineas, they in the meantime receiving parts of the publication already issued, equivalent in value to the amount paid.

4th. That on each part of the publication be marked a price, calculated at rates, based on the cost, at which the preceding parts have been produced, at which price the parts may, at the discretion of the hon. secretary, be issued to persons wishing to complete sets, and to whom the foregoing paragraphs do not apply.

5th. That this meeting pledges itself and the general body of the members, to use every exertion to obtain the subscribers still required, and to aid and support the committee and officers in carrying on the undertaking to a successful issue."

The Chairman said extraordinary energy had been displayed by three or four gentlemen since the annual meeting; as an instance of that he mentioned that Mr. Corson, of Leeds, had recently gained not less than eight new subscribers; and Mr. William Barn had used his influence greatly to the advantage of the society. Accessions to the list had also been made by the exertions of Mr. Abbott, of Sheffield, and Mr. Burnet, of Glasgow, Mr. Horace Jones, Mr. C. F. Hayward, Mr. D. C. Nichols, and many others. A little more energy in the early part of the present year, he was quite certain, would result in the completion of the subscription list to the point fixed upon; and he had no doubt the committee would have the pleasure of announcing before the next annual meeting that the list was complete. He was happy to say that several of the large builders and contractors had recently become subscribers, and in some cases a copy was subscribed for by the individual members of firms.

Several members having expressed the strongest hopes with regard to the speedy completion of the subscription list and the immediate continuation of the publication,

Cordial votes of thanks to the hon. secretary of the society (Mr. Cates), and the hon. secretary of the Dictionary (Mr. Wyatt Papworth), for their past labours and those which they had promised for the future, were passed unanimously.

Mr. Sydney Smirke said he could not allow the opportunity to pass without bearing his personal testimony to the great services rendered by the hon. secretaries. He had seen so much of them in this matter that he could truly say they had been the pillars of the concern, and their labours, intelligence, and constant and indefatigable exertions were beyond all praise, and he thought it was due from all present to thank those gentlemen in the strongest way they could.

A discussion ensued as to the means of expediting the production of the work and the mode of properly recognising the services of the hon. secretaries, and a vote of thanks to the chairman closed the proceedings. Friendly exertions are still required.

THE NEW EAST WINDOW IN CHRIST CHURCH, NEWGATE-STREET.

THERE is no subject upon which it is more difficult to pass a final judgment than upon a stained-glass window. No sure canons of criticism applicable to all styles have yet been fully accepted, by any appeals to which the capricious applause, or equally capricious abuse, of ill-informed taste can be silenced. How far is it allowable, or even expedient, to abandon a conventional for a naturalistic treatment? How far may perfect translucidity be sacrificed for the sake of pictorial effect? At what point does the picture executed in glass degenerate into a mere transparency? What modifications of treatment are rendered necessary when stained glass, whose birth-place was the Gothic cathedral, is transferred to a Renaissance or modern Grecian church? Such are a few of the reflections consequent upon an inspection of the new window placed in the eastern wall of Christ Church. Before, however, saying a word about the window itself, let us applaud the spirit which has led to its erection. We are delighted to hail one more instance of the intelligent interest which the guardians of our City churches now take, not merely in their preservation, but also in their adornment. Churchwardens and vestries vie with, often even urge on, the clergy in the path of improvement. Whatever may be the merits of this church window, let us give credit to the committee under whose auspices the work has been brought to a happy conclusion, to the liberality of the treasurer of St. Bartholomew's and Christ's Hospitals, and

to many of the chief parishioners. Nor must Mr. Hardwick go without a special word of praise for time and thought given to the cartoon.

The subject is appropriate in the church of Christ's Hospital. Our Lord Blessing the little Children presented to him. The chief figure is seen issuing from beneath a richly ornamented gateway, on the sides of which appear in niches six of the cardinal virtues. On the one side, Faith, Hope, Charity; on the other, Justice, Fortitude, Chastity. In the mouldings of the arch are medallions containing the heads of the four Evangelists. The uncoloured glass (we cannot call it white) of which much of the architectural part of the design is executed is of value in partly redeeming the whole from its obvious fault—a certain sombreness of hue which prevails throughout. The central group is well composed, and the legitimacy of the pictorial style on glass being admitted, its treatment is deserving of great praise. The figure of our Lord is majestic; the two apostles in attendance on our Lord, the women, and the children, prove that the artist has studied carefully, and profited by his study of, the old masters.

Our criticism would be suspicious if it contained no element of blame; and we do not, therefore, scruple to repeat our regret at the low key, so to say, in which the colouring of this central group is struck. We regret it the more because the window, except to a person standing immediately under it, gets none but reflected light. This aggravates the evil.

In saying so much, we would be understood rather as giving advice which may be profitably followed hereafter, than seeking to detract from the praise due to Messrs. Heaton, Butler, & Baynes for their principal share in the production of this window.

THE DRAINAGE AND WATER SUPPLY OF BUENOS AYRES.

A LAW empowering the Government to carry out a project of Mr. John Coghlan, M. Inst. C.E., F.R.G.S., for the drainage and other improvements of the city of Buenos Ayres, was recently before the legislature of the country, and there was every reason to believe would be passed. The scheme for water supply is nearly completed, although Mr. Coghlan has additional works to carry out. As for the drainage, Mr. Coghlan has gone upon the model of our great city drainage systems; and, indeed, he consulted Mr. Bazalgette and Mr. Bateman on the subject, as well as our own pages, of which he has made good use in his report to the local government.

He proposes a system of irrigation in connexion with the drainage, and points out the land proposed to be used for the utilisation and deodorisation of the sewage before it is allowed to pass into the river. He suggests the introduction of brickmaking and other approved machinery and materials, the erection of lime-kilns, &c., for the execution of the drainage works. The total cost of the drainage works Mr. Coghlan estimates at 698,746l. The total cost of the water supply, including the money still required to complete the works, to supply 3,000,000 gallons daily, is 164,000l., of which 55,000l. constitute the cost of the works already done. Street improvements, 178,571l., bring up the total cost to 941,317l.

THE EASTER ISLAND STATUES.

EASTER ISLAND, to which we have recently drawn attention,* was the subject of a paper at the Geographical Society on Monday night, read by Mr. J. L. Palmer, B.N., of her Majesty's ship *Topaz*. Mr. Palmer described the topography of this remote island in the South Pacific. As our readers know, it is in a part of the ocean far away from other islands, at a distance of 2,000 miles from the coast of South America, and 1,000 miles from the nearest Polynesian islands to the west. The island is entirely a volcanic formation, and presents numerous extinct craters, one of which yields gray lava, and another the red tufa, from which are carved the crowns or hats that formerly rested on the heads of the figures. The present inhabitants are only 900 in number. They belong to the Polynesian race, and have a tradition of their immigration from Oparā at no very distant period. The interest attaching to the island was an ethnological one, and con-

* See p. 10 for illustrations; et cetera.

cerned the race who sculptured the vast quantity of stone images now existing *in situ* on stone platforms in various parts of the island, or inside large stone chambers or houses. The platforms, chambers, sculptures, and mural paintings were described by the author, but he did not propound any theory as to their origin. He stated that the inhabitants knew nothing of the matter; that they were undoubtedly of great antiquity; and that it was probable they were executed by a race who had long since passed away.

In the discussion which followed, Mr. Markham mentioned the fact of similar images having been found by the early Spanish invaders in the cities on the banks of Lake Titicaca, in South Peru, and belonging to the Aymara nation. There existed, however, this difference—that the Aymara images were profusely sculptured. Recently a stone platform had been found in one of the Pacific Islands, 1,000 miles to the west of Easter Island, at the bottom of a deep deposit of guano, and he threw out the suggestion that these were all relics of a very ancient people who slowly migrated across the Pacific from west to east. Mr. Franks gave in detail his reasons for concluding that the ancient remains in Easter Island truly belonged to an earlier population of the same Polynesian race who now inhabit the island. Sir George Grey also expressed the same opinion, and spoke of the habit of carving images as being a peculiarity of Polynesians, including the Maories, and that in a place where wood (the usual material) was very scarce, as it is in Easter Island, it was natural that stone should be substituted.

PRINTED OR WRITTEN.

Two students write,—Will you kindly inform us whether or not it is correct, in affixing the names by hand to plans in block letters, to speak of them as being printed?

* It is incorrect, though the expression is common enough. If our young correspondents will recollect that the root of "to print," is *premo*—I press, they will see the reason why. To print is to form characters by impression.

ART-UNION OF LONDON.

In the year 1868, the council of this society offered a premium for a series of partially shaded drawings, illustrating some work of a British author or events in British history.

Thirty-five sets of designs, of various degrees of merit, being sent in, the premium was awarded to a set of twenty, illustrating Canon Kingsley's story of "Hereward, the Wake," and these were found to be the work of Mr. H. C. Selous, an artist well known for his outlines illustrating "Pilgrim's Progress," his historical picture of "The Surrender of Calais," and for works from time to time exhibited on the walls of the Royal Academy.

The designs set forth many of the chivalrous deeds and hairbreadth escapes of the hero. He, "the last of the English," as the author calls him, betook himself to the fen country on our eastern coasts, when the field of Hastings had given England to William of Normandy, and there, with a band of devoted followers—a kind of prototype of Robin Hood and his merry men—he for a long time set at defiance all the attempts of the king to capture or kill him. At length, after various turns of fortune, partly in desperation, and partly induced by kind messages from William, Hereward determined to go down to Winchester, and become "the king's man." He was received with much kindness and consideration, and lived for some time in great honour at court; but, ultimately, through the envy or jealousy of some of the Norman knights, a plot was formed for his destruction, and he was ruthlessly killed.

All these matters the facile pencil of Mr. Selous has depicted with much spirit and a great deal of fine drawing, though, as usual in such cases, there is not always the same amount of power displayed.

The work has been very faithfully rendered by the burin of Mr. C. G. Lewis, and the twenty plates, bound in a volume, will form the society's presentation work for the current year.

Whoever has read the story will certainly be anxious to secure these plates; and whoever sees the plates will want to read the work; while whoever pays his guinea for a ticket for this year's distribution, will certainly have more than

his money's worth, independently of the chance of a picture or other prize. The advertisements announce that the volume will be out on the 1st proximo.

SCHOOL OF ARCHITECTURE.

WHILE the education of the architecture student is under consideration at the present time, it will, perhaps, be a matter of pleasant interest to some of the elder members of the profession to have recalled to them their past efforts in search of academical tuition; and to the students of the present day, the following recital of an attempt to gain that tuition, though unsuccessful at the time, may tend to give encouragement during their own efforts in the same course. It is very satisfactory to see that nearly all those whose names occur in the accompanying list raised themselves to eminence in the profession in London, or in the provincial towns where they subsequently established themselves. Only about ten of the then students are still alive. The originals of the four papers, formerly in the possession of the late Mr. C. H. Smith, are now preserved in the collection of the Royal Institute of British Architects.

WYATT PAPWORTH.

(No. 1.)

"No. 8, Bloomsbury-square,

February 25th, 1817.

Architectural Students' Society.

Resolved:—

1. That this Society have to regret that no public school has been formed in this kingdom for the promotion of architectural students' studies,—a measure highly necessary for the advancement of the art.

2. That the Royal Academy, being the establishment appointed for the promotion of the sister arts, painting, sculpture, and architecture, the Architectural Students' Society regard this institution as the parent of their art, and the most proper place for such a school.

3. That it appears to this Society, as the most probable method of attaining the desirable object, that it would be expedient that the architectural students of the Royal Academy in general should petition the president and members thereof, requesting them to form a school of architecture.

4. That the secretary is desired in the name of the Architectural Students' Society to write to the architectural students of the Royal Academy, enclosing these resolutions, and requesting their attendance (at a general meeting of the architectural students) in order to give their opinion and support to the same.

5. That as correct a list as possible of the architectural students of the Royal Academy be immediately procured, printed, and enclosed in the circular.

6. That the costs of printing, those attending the use of the room, and all other expenses incident to this business, be defrayed out of the funds of this Society.

LIST OF THE ARCHITECTURAL STUDENTS OF THE ROYAL ACADEMY.

Acton, —, Wilson-street, Finsbury-square.
Adams, Joseph, Portsmouth.
Ainger, Alfred, 22, Everett-street, Russell-square.
Altchison, G., at Mr. Seward's, 39, Craven-street, Strand.
Alderson, James, Chelsea.
Alexander, Daniel, Greenwich.
* Alexander, D., jun., 3, Pier Head, London Dock.
Allason, Thomas, Westbourne Green Outage.
Angel, Samuel.
Archer, Archibald.
* Bailey, George, 272, High Holborn.
Bailey, James, Paradise-row, Lambeth.
Bassvi, George, Rome.
Baxter, J.
Bedford, F., 8, Southampton-street, Bloomsbury-square.
Busby, Charles.
Brooks, William, 32, Doughty-street.
Clayton, Alfred B., Gray's-inn-square.
Cooper, John, 8, Phillips's Buildings, Somers Town.
* Donaldson, T. L., Bloomsbury-square.
Donli, William, at R. Snirkle's, jun. Esq., Albany.
Edwards, Francis, 8, Salisbury-street, Strand.
Rimes, James, Camden-row, Somers Town.
Foster, H. S.
Forbes, John, 15, Robert-street, Bedford-square.
Gardiner, J. B., Wormwood-street.
Gandy, J.
Garling, H., Little James-street.
* Goldcutt, John, Rome.
Habington, —, at Mr. Atkinson's, 50, Bentinck-street, Manchester-square.
Hardwick, P., jun., Berners-street, Oxford-street.
Hakewill, —, 6, Lower Brook-street, Grosvenor-square.
Haycock, Edward.
Inwood, —, 3, Southampton-place, New-road.
Jones, John, Ireland.
Kinard, W., jun., Rome.
Lane, William.
Leachman, John, 18, Rupert-street.
Lee, Thomas, Barnstable, Devonshire.
* Lee, T., jun., 43, Devonshire-street, Queen's-square.

Legg, George, 254, Oxford-street.
 Lochner, William, 30, Coleman-street.
 Nicholson, Charles, Burton-street.
 Martin, Albino, Gray's-in-square.
 Matson, C., at Mr. Hayes's, 12, Bedford-street, Bedford-square.
 Mead, J. Clement, 34, Charlotte-street, Fitzroy-square.
 Meikleham, R. S.
 Merideth, M.
 Mulphand, George, 44, Green-street, Grosvenor-square.
 Nicholson, M. A., Titchfield-street.
 Osborn, Robert.
 Pain, G. R., 1, Diana-place, New-road, Fitzroy-square.
 Paterson, Samuel, 4, Holborn-court, Gray's-in.
 Phillips, G., Wandsworth-road, near Vauxhall Turnpike.
 Porter, —, at Mr. Chawner's, 82, Guildford-street, Brunswick-square.
 Porden, W., Jun.
 Purser, William, 4, Bennet-street, Blackfriars-road.
 Pritchebt, Joseph.
 Smith, C. H., 6, Portland-street, New-road.
 Smith, Charles, 4, Upper Seymour-street.
 Taylor, T., Jun., Wier-street, Richmond.
 Thomas, M. R., 74, Margaret-street, Cavendish-square.
 Turner, John, Shrewsbury.
 Tyrer, Charles, Guildhall-yard.
 Upward, J. William.
 Vulliamy, Lewis.
 Wallace, Robert, 29, Leigh-street, Burton-crescent.
 Willmetts, C. J.
 Winkley, John, 35, Upper Norton-street, Fitzroy-square.
 Wyatt, Henry.

N.B.—Those who have an asterisk (*) affixed to their names are members of the Architectural Students' Society.

(No. 2.)

"No. 8, Bloomsbury-square, February 23th, 1870.
 Sir,—In consequence of the enclosed resolutions, passed at the last meeting of the Architectural Students' Society on the 26th instant, I have to request that you will be pleased to favour the members with your attendance on Friday evening next, the 7th of March, at the Public Room, No. 6, Pall-mall (the doors from the British Gallery towards St. James's-street), in order to give your opinion and support to the same.

Free admission will be given on producing this letter, or your student's ticket, at the door. The doors will be open at half-past seven, business will commence at eight o'clock precisely, and at half-past eight the doors will be closed. I have the honour to be, Sir,

Your most obedient servant,

T. LEE, Secretary.

Note.—In consequence of the impossibility of procuring a correct list of all the Architectural Students of the Royal Academy, it is requested that those who may be written to will have the goodness to communicate the accompanying resolutions to such of their friends as are Architectural Students, and whose names or residences are omitted in this list, and request their attendance at the meeting; they will be admitted on producing their ticket.

(No. 3.)

"To the President and Council of the Royal Academy.

We, the architectural students whose names are hereto affixed in behalf of ourselves and the other students of the Royal Academy, respectfully beg leave to solicit the attention of the president and council to this our petition, and humbly request that they will be pleased to take its prayer into their serious consideration.

Since the first establishment of the Royal Academy, instituted under the auspices of our most gracious Sovereign, for the promotion of painting, sculpture, and architecture, various schools have been formed for the improvement of the students in the several branches of the two former arts, from which they have received great and manifold advantages. We beg leave most gratefully to acknowledge the benefits which we also have derived from this institution, but we hope and trust the president and council will be pleased to extend to us in our art, advantages equal to those which the students of painting and sculpture in theirs at present enjoy; and, conceiving that it would not only tend to the advancement of the art, but would add to the reputation of the Royal Academy, we venture to petition the president and council that they would be pleased to form for their students a school of architecture, and allow them a further extension of the use of the library.

We presume not to offer any suggestions on the merits of such a school, but leave it to the liberality and discernment of the president and council to render the object desired worthy the institution, and suitable to the dignity and importance of the art.

We trust that the president and council will be pleased to regard this expression of our wishes as joined with sentiments of the utmost deference and respect.

Signed by —

(No. 4.)

"8, Bloomsbury-square, December 1, 1870.
 Sir,—The members appointed by the Committee of Architectural Students to wait on Mr. Howard with a petition to the Royal Academy, have received the following answer of the President and Council, which I am directed by the Committee to communicate to you.

I am, Sir,

Your obedient servant,

O. H. SKIRN, Secretary.

'Royal Academy, July 19, 1870.

Gentlemen,—The petition of the Architectural Students in the Royal Academy has been laid before the President

and Council; and I am desired to acquaint you that the President and Council, viewing it as a proof of the arduous which the Architectural Students feel in the pursuit of their art, have received it in good part, and will give it such attention as the general circumstances of the establishment will allow.

I am, gentlemen,

Your obedient humble servant,
 (Signed) HENRY HOWARD, R.A., Secretary.
 To Mr. George Bailey,
 Mr. Thomas Lee."

ARCHITECTURAL EDUCATION AND THE DIPLOMA QUESTION.

NORTHERN ARCHITECTURAL ASSOCIATION.

THE president for the year of this association, Mr. T. Oliver, delivered his opening address at the last meeting. We print the concluding portion of it which relates to the subjects at the head of this notice:—

I am well aware of the difficulties, and even the disadvantages, that attend the establishment of an architectural diploma; but these, as in the case of both the legal and the medical professions, may readily be overcome, or even turned, as in the instances referred to, to the well-being of the profession.

This is not a new subject to me, and, therefore, I am prepared with the outline of a scheme for the occasion; and I base this scheme on the mode of procedure that was adopted in the enrolment of the legal and medical professions by the then governments of the country, and which occurred in this wise. About fifty years ago, the legal profession was in a somewhat similar position to our own, with this exception, that while any one could practise, it was necessary to be admitted on what was termed the "roll,"—a merely local matter, and quite a matter of form,—a sort of manuscript directory, indeed. On the application of the examination test, however, a serious question arose; and that was, What is to be done with the present practitioners? That question was soon settled on this principle,—all members of the profession whose names were upon the roll were admitted as attorneys, while all those seeking for admission had to undergo the examination.

In the case of the medical profession the same principle was applied as had been found to operate so successfully, only a few years previously, in regard to the legal profession.

In the year 1815 all persons in practice at that time became legalised practitioners, and could receive a diploma by merely applying for it; all subsequent practitioners to that time, however, were required to pass an examination at the Apothecaries' Hall, and latterly elsewhere at our medical colleges, universities, &c.

Now, my scheme for an architectural diploma is this:—Let the Royal Institute of British Architects obtain an enlargement of its charter, giving it power to bestow a diploma on all architects who are in actual practice,—as architects only,—not to architects and builders, not to architects and engineers, but to architects who practise architecture only,—say in the year 1870,—while all future applicants would be required to undergo an examination, graduated year by year,—say for three years, not longer,—the test-standard being advanced each year, until a thoroughly scientific curriculum was obtained. The details of this scheme could be filled up, as the details of those were which I have already mentioned, and which have been altered, enlarged, and improved from time to time as necessity and occasion appeared to require.

The only sound argument that I have heard urged against such a course is that it might prevent those who are qualified by undoubted genius for the profession, but who, owing to neglect in their education, were incapable of passing the ordeal of such an examination as would be required of them. And such a case is instanced of Kemp, the architect of that beautiful and remarkable monument of Scott, which is to Edinburgh what the Arc de Triomphe is to Paris. Such instances, however, are so rare that we are not called upon to legislate for them; and, besides, I question if the man who could produce such an immortal design could not easily work himself up through an examination; for genius is power of mind, and he who can devise great ideas himself can readily appreciate and learn the ideas of others. But admitting that he were not qualified, as in the case in point, he would have to secure the help of others in the event of any great success, as was actually done in this instance; for, if I mistake not, Professor Cockerell and other London architects were called in as consulting architects, and who not only greatly modified the construction of this

structure, but also improved it in some æsthetic respects. But just as bone-setters, hydropaths, quasi doctors, and others of the present day,—many of them doubtless men of decided talent,—evade the law in the public benefit, so could our genius do, and, under such circumstances, we should all be glad to see it done.

The advantages that would follow a diploma far outweigh the disadvantages, whether real or imaginary. A scientific and technical education would be the result; confidence would be increased, both in the practitioner and in the public; the public would have a control over "sharp" practitioners and empirics; the expulsion of the incapable and the unworthy would naturally follow; and last, though not least, the works of the architect, being designed and directed by educated thinking beings, would become works of art to "all ages and generations of men."

If we put our shoulders to the wheel, we may carry the diploma as rapidly as the events of the day are being carried on around us, whether we look at the Church or the State, or to our social reforms. This, probably, like many events of the present day, will be accomplished by a coup d'état.

The acquirement of a diploma necessarily implies a compulsory examination; an examination implies a certain amount of information; and a system of architectural education which will readily supply this information has yet to be established. And this can only be secured by the combined action of this Association with other similar bodies throughout the kingdom. Indeed, this is one of the great movements of the day; and for some years now this society, along with others, has been giving its attention to it.

Education is unquestionably a personal matter. Every separate individual must acquire it for himself. There is no royal road to learning.

But the education I refer to must not only be general, but it must be technical. And here do not let us confound ourselves with terms. We are too apt to have floating ideas of the meaning of terms, and it is only when a forcible thinker or an eloquent speaker puts these ideas in plain language and logical form that we fully realise them; like many indistinct things, which, as by the light of a sunbeam, force themselves upon us when placed in plain and naked outline, and we wonder that we had never seen, though we had often felt them before.

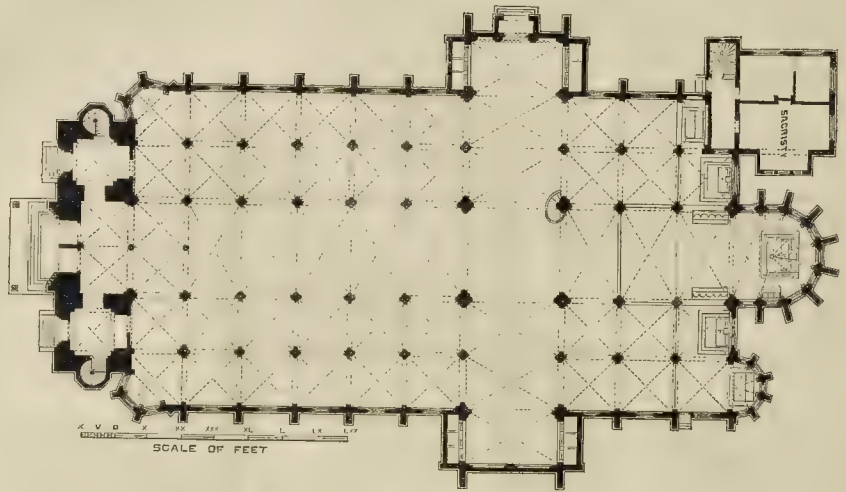
Now what do we mean by a technical education? The term "technical," Webster says, is that which is not in common or popular use. What, then, do we require that is not in common or popular use? What should an accomplished architect know?

Before referring to those subjects required to be known by an architect, and not in common or popular use, I must refer you to those that are. Writing is one, but how rarely it is good; spelling is another, and how seldom this is correctly given; and arithmetic is another. The English language, with a knowledge of Latin and Greek, and perhaps French and German, are the educational accomplishments now in common or popular use.

After the architectural student has acquired a good knowledge of English, he ought to apply himself to the study of language to this extent. Take the dead languages. He ought to have such a knowledge of Greek and Latin as would enable him to divine the meaning on architectural or archaeological subjects, by the structure, origin, or derivation of the term. So much of our own language, and so many of the technical terms now in use, are derived from these sources, that it behoves the student to become tolerably conversant with them. Take the living languages. French and German are now the most in vogue, and for this, as well as for the additional reason that very valuable works in these languages have recently been published, he ought to become sufficiently acquainted with them to enable him, at the least, to read with fluency; and as travelling has so much to do in forming the taste and judgment, he ought to be able to make known his wants and wishes through these media.

Now for the technical. Premising that the architectural student necessarily becomes an accomplished geometrical draughtsman, and acquires an intelligent knowledge of the etiquette and routine of professional practice in the office of his principal, his special educational curriculum must embrace,—

First.—Drawing, in its more advanced forms, such as freehand, for the filling in of foliage



ST. BARBARA'S CHURCH, BRED A.

Plan.

and ornamentation; model or figure, for the arrangement and grouping of statuary and sculpture; perspective, for easy illustration of his daily duties; and "hand-sketch" drawing, for the sketching of buildings, mouldings, what are called "bits," and for help in rapid designing. Indeed, he ought not to rest satisfied until he can sketch a building so accurately that the respective proportions shall be relatively the same as if laid down geometrically to a scale.

Second.—History: the history of architecture; of all architecture; of art generally, embracing the schools of painting, sculpture, and perhaps music, with the history of his own country in particular.

Third.—Mathematics, embracing a knowledge of algebra, geometry, mensuration, and general arithmetic. Practically, an expertness in calculating areas and cubes, squaring dimensions by duodecimals, and a capacity of applying algebraic or arithmetical formulæ, are about as much as the architect will care for carrying about with him, unless his forte lies in this direction. The mathematical and the artistic are so inimical, the one being the practical application of a rule, the other the inspiration of free, original thought, that I should not lay much stress on great proficiency here. An artist friend of mine never could add up pounds, shillings, and pence, but he had a remarkable eye for gorgeous colour. I do not by any means wish to undervalue this study. It is an essential portion of study, and like logic, if it teaches you nothing, it disciplines the mind.

Fourth.—Design. The architect must be able to express his thoughts in drawing, just as the author expresses his thoughts in writing. They are but different modes of communicating to others what we ourselves feel. No one can design until he understands certain æsthetic laws; these laws, I confess, I am at a loss to express, they are so subtle. But they are seen in all works of art, are felt to be in nature, and are spontaneous and intuitive in the breast of the artist. This power, together with a knowledge based upon observation and experience, as well as that of book-learning and memory, will enable a man to design. A knowledge of the details of each style is, of course, essential to success; and the feeling above referred to is greatly enhanced by the study of executed works, in this and other countries, by travelling, and by discussion and reading.

Fifth.—Construction. A sound knowledge of construction is of the utmost value to the architect. Here, his mathematical attainments are called into operation; but as mathematical formulæ and constructional data are based upon experiments or observations amounting almost to facts, an experimental comprehension is of far more value, in the multifarious instances of ordinary practice, than a mere collection of formulæ, valuable as these unquestionably are. Now, to my mind, construction is best taught by lectures, and it is best taught by illustrations of failure. No man can correctly tell by abstract calculation what the thickness of a tower foundation wall should be, with given height and span, unless he is previously acquainted with the ordinary rules as applied in practical operations.

Sixth.—I must now group the remainder of the technical subjects required to be known by an architect, not in common or popular use, with just a word or two upon them. He must be acquainted with chemistry as applied to ventilation, sanitary matters, and certain classes of building materials; with geology, as applied to stone, clay, foundations, and also to certain classes of building materials; with acoustics, as applied to the relative sizes of lecturing and concert halls, churches, chapels, and other public structures; with mechanics, hydraulics, surveying, and levelling; with the principles on which valuations are founded; a knowledge of building materials in their application to specifications; and lastly, he ought to be able to take out the quantities of one of his own designs, for the sake of the essential good that the practice in doing so would do him for his lifetime.

Such are the technical studies to which an architect must devote himself under ordinary circumstances. But if he should have a forte for any particular branch of study, to this forte let him by all means direct his attention.

ST. BARBARA'S CHURCH, BRED A, HOLLAND.

The new church of St. Barbara, in Breda, the opening of which we noticed in the *Builder*, vol. xxvii., p. 691, is one of the most remarkable examples of the revival of ecclesiastical architecture in Holland. The style chosen by the architect, Mr. Cnypers, is First Pointed, of that plain and rather severe kind so common in Belgium and parts of Holland. The plan of the church con-

sists of a western porch; two western towers, flanking the nave; a nave of six bays, with four aisles; transepts, each three bays deep; a choir of three bays, also with double aisles; and a sanctuary of two narrow bays, terminating in a five-sided apse. The east bay of each of the four choir aisles forms a chapel, and has its separate altar. The high altar stands upon the "chord" of the great apse. The choir is fitted up with stalls and a rood-screen. There will eventually be three spires, two at the west end and one over the crossing of the nave and transepts; at present, however, the western towers are only carried up to a level with the apex of the roof of the nave.

The interior of the church is very striking, the whole building being vaulted, and the number of columns and arches seen at once give picturesque perspective effects.

A very remarkable feature in the interior of this church is the large triforium, equal in height to the arcade of the nave. This triforium is used as a gallery, and extends over the two inner aisles of the nave and chancel. Above this triforium is a clearstory, lighted with rose windows. It seems to us that this clearstory is scarcely important enough for such a large church; however, we must, in justice to the architect, allow that he could point to many ancient examples of churches in the north of Germany, where the clearstory is treated in the same way.

The whole church is built of brick, with the exception of the window-tracery, the columns, strings, &c., which are carved out of a stone called *Savonnière*. The steps and lintels of the doorways are of Belgian granite. The vaulting is filled in with brick called *Ysfelsteen*; the ribs are of stone. The cost of the shell of the building, exclusive of foundations, towers, and all carving or decorative work, was rather less than 15,000*l.* in English money. Of course, it must be remembered that materials and time are cheaper in Holland than in England. All the carving, the capitals, sculpture, &c., were executed in the workshops attached to the architect's offices at Roermond, and carried out from his own designs and under his direction. The same may be said of the stained glass and all other decorative portions of the building which could be executed separately.*

* In mentioning the opening of this church in our last volume we were led to call it St. Catherine's instead of St. Barbara's.



ST. BARBARA'S CHURCH, BREDA, HOLLAND.—MR. CUYPERS, ARCHITECT.

VALUE OF GROUND RENTS IN LONDON.

ON Tuesday last Messrs. Foster sold, at the Mart, freehold ground rents (for terms of eighty years), with reversion to rack rents, created by the Metropolitan Board of Works in New Southwark-street. They amounted to 2,505*l.*, and produced in twenty-seven lots 68,080*l.*, at prices varying from 26 to 33 years' purchase, or an average of nearly 27½ years. We give the details of some of the lots.

	Ground-rent.	
1 House, shop, and appurtenances, a few doors from Bear-lane, in the occupation of Mr. Baker	£30 0 ...	£780
2 Mercantile premises, on the south side of the street, near Gravel-lane	105 0 ...	2,760
3 Ditto, adjoining eastward the preceding	68 10 ...	1,730
4 Mercantile premises, in the occupation of Messrs. Watto & Co.	162 0 ...	4,540
5 Mercantile premises, adjoining the preceding, in the occupation of Messrs. Daniel Judson & Son	65 0 ...	1,980
6 Mercantile premises, on the north side of the street, the corner of Essex-street	50 0 ...	1,380
7 Mercantile premises, adjoining the preceding, in the occupation of Messrs. Peter Lawson & Sons	108 0 ...	3,520
8 Mercantile premises, on the south side of the street, the corner of Southwark-square, in the occupation of Messrs. Joseph Hunt & Sons	90 0 ...	2,480
9 Mercantile premises, adjoining the preceding, part in the occupation of Messrs. Isaac Beer & Co.	75 0 ...	2,080
10 Ditto, on the eastern corner of Worcester-street	52 0 ...	1,450
11 Mercantile premises, on the north side of the street, in the occupation of Mr. W. V. Wright	110 0 ...	3,070
12 Ditto, in the occupation of Messrs. Dalton & Morgan	140 0 ...	3,690
13 Mercantile premises, on the north side of the street, adjoining eastward the entrance to the testing-office of the Metropolitan Board of Works	75 0 ...	2,030
14 Mercantile premises, adjoining eastward the preceding, in the occupation of Messrs. Price, Dunn, & Co.	85 0 ...	2,400
15 Mercantile premises, Nos. 14 and 15, on the south side of the street, in the occupation of Messrs. Fatten-den, Smith, and others, hop factors	185 0 ...	4,290
16 Premises of the Alliance Bank, the corner of Southwark-street	670 0 ...	12,850

NOTES OF MISCHIEF.

OLD readers of the *Builder* will not find anything very new in the leading idea of Professor Tyndall's important lecture on "Dust and Diseases," at the Royal Institution, which has justly received much praise and attention. Take one passage written years ago:—

"How can the atmosphere—invisible, tasteless—convey these impurities? It has been asked. In the ordinary light which exists between the brightest sunshine and darkness, the atmosphere seems, so far as appearance goes, pure and harmless. When the sun shines, however, through narrow channels, into this seeming void, the notes in the sunbeam show that the atmosphere is anything but transparent: countless myriads of minute atoms of matter are constantly floating in the atmosphere, some entering the lungs of young and old. Here, then, is palpable evidence of the necessity for care. The semi-opaque nature of the air we breathe is evident; and far smaller particles, which the eye cannot see, are constantly rising from the surface and floating around—germs of disease, emissaries of death.

In ill-saved streets and back yards in a similar condition, on which waste water is allowed to remain and saturate the soil, when the drainage from cesspools also further pollutes the earth, exhalations fill the air, and poison the system of those who are unfortunately obliged to inhale this important necessary of life so adulterated. Those who, in the cleanest and best-ventilated houses in the metropolis, have noticed the thick layer of dust that in one day covers tables, books, and the surface of every other object, can form an idea of the large quantity of these floating atoms which enters the mouth, both during day and night, at every respiration.

If the dust on the walls and floor of a room in which tobacco has been smoked be swept up, and then carefully packed away, on examination, after some time, it will be found that the tobacco-fumes are still detectable. Window hangings, carpets, and other fabrics will absorb the gases thrown off by tobacco, sulphur, and similar matter. In the same way the bad gases arising from overcrowded sleeping-rooms, or from drains, pervade and lodge themselves to a considerable extent on all surrounding objects, and poison those notes made evident to us by the sunbeam; and which, even when the bright sunlight does not make visible, are still surely performing the never-ceasing work. Although in ships at sea, on mountain-tops, on moors and marshes, the notes, showing the never-ceasing operations of nature, glisten in the sunshine, there is a difference between the pureness of such dust and that which arises in the houses of polluted courts, in the neighbourhood of crowded graveyards, in ill-ventilated assembly-rooms, overcrowded barracks, and other places. The particles of dust loaded with fever and contagion are readily borne upon the breeze from ill-constructed and hidden places to those adjoining, and, of course, to a certain extent adulterate the better atmosphere. As an instance of the extent to which dust can be borne, it may be mentioned that when the wind has been blowing gently in the right direction, we have often distinctly identified, in Holborn and in parts of the City, the pleasant smell of the new hay from the meadows on the north of London. In like manner dangerous nuisances are floated on the air; and this circumstance, together with the sight of the

notes in the sunbeam, ought to be a lesson to us that large masses of the poor cannot be neglected with impunity, and should teach us that it is necessary to preserve the atmosphere from pollution."

GOSSIP FROM ROME.

A FRIEND writes from Rome:—"Two days ago I went out to S. Paolo 'fuori le mura,' to see it in the midst of a lake about half a mile round the church. Of course it was not possible to get to the church, as the water was nearly 3 ft. deep. I do not yet know if the water got inside on to the beautiful pavement. My good patron, Cardinal Weld, made a successful effort to raise the floor 3 ft., so I shall be curious to know the result. Inundations are now damaging all Italy; Pisa and Florence are great sufferers.

The great Exhibition is preparing in the vast corridor of the cloisters of the Baths of Diocletian, Sta. Maria degli Angeli, where the cypresses stand. It is finely getting up;—an immense circular saloon, with compartments to the centre, where a 'piazetta' is formed round the trees. This saloon must be of immense diameter, and is skylighted all round. As the Exhibition is to be ecclesiastical in all its objects, I cannot conceive how its vastness will be filled. The mile of corridor is for sculpture: works from the 'cinque cento' to our time are to form the show. Vespignano is the architect; but the constant rain has almost suspended the work. Certainly everything this Pope does is splendid. The stained glass windows in S. Paolo are now complete, and are magnificent works of art, giving dignity to the building.

ST. LUKE'S WORKHOUSE.

THE Guardians of the Holborn Union have received the sanction of the Poor Law Board to their proposal for adapting the St. Luke's Workhouse to the purposes of a hospital and infirmary for the sick poor of the Union, and to the alteration of the workhouse in Gray's-inn-lane for the reception of able-bodied paupers. It is intended at once to erect a large block of building to contain 450 aged and infirm women at St. Luke's Workhouse, according to the plans prepared by the architect to the Union, Mr. Saxon Snell, and which plans have received the unqualified approval of the Poor Law Board.

The proposed buildings at St. Luke's are estimated by the architect to cost 14,000*l.*, inclusive of architect's commission, fittings and fixtures, and all other charges of every description. This estimate is at the rate of 27*l.* per bed for the hospital portion of the building, and an additional 2,000*l.*, if a basement story be added, as designed.

SIZE OF MORTAR JOINTS IN BRICKWORK.

SIR,—This subject may be considered in a variety of ways. First, if we consider that the strength and capability of sustaining weight will be increased by having thicker mortar joints than those commonly made, then it would appear probable that a building erected with mortar walls and without any bricks, would be of still greater strength; but we know that the mortar usually used would stand no such test. It therefore seems probable that thin joints would be preferable. But it may now occur to us,—then, why have joints of any thickness; or why should they be of a certain thickness, and neither less nor more? This will lead us to consider the properties of mortar and the duties it actually performs in brickwork, and to endeavour to discover how we can cause it to most effectually perform those duties.

Respecting its properties, it would be unsafe to consider that mortar is generally capable of bearing the compressive power that brick will bear, therefore the less of it we can manage with the better; but as thin, flatish pebbles will pass through a fine sieve, and may chance to lodge on edge when in a mortar joint, such would in too thin a joint cause the brick above it to ride, and the extra thinness of such joint would consequently be an element of instability instead of strength.

The duties mortar has to perform may be considered principally as two, viz., first, to be the means by which each successive course of bricks

may be solidly bedded; secondly, to be the agent which shall enable each brick to bond with those beneath it.

We have already seen that it would generally be inadvisable to have thick joints, on account of any imaginary compressible superiority of the mortar over brick; we shall now see that joints as thin as they can with safety be made will also generally be desirable, when considered in their action, as the means by which "bond" is effected, for bond is the tying, as it were, of bricks by one or more bricks laid across and uniting them, and which is effected by means of the mortar placed between them, which, filling the inequalities of the bricks so placed, will, with a sufficient weight on the upper course, be the means of preventing the bricks in the under course from being dragged apart.

Then to consider whether thick or thin joints will more effectually achieve the bonding, let us consider the action of two stretchers bonding (in English bond) three "headers." If the joint in such case be made thin,—say ½ in. thick,—then as the stretchers would bear 2½ in. on each of the two outer "headers," and the bonding connexion between them would be the mortar under each end of the "stretchers," and in each case being in sectional area (taken parallel to the face of the wall) equal 2½ in. by ½ in.; then such would in the tearing asunder of the two outer "headers" be subjected to a compressive strain acting in a direction (nearly or quite) identical with a diagonal to the said area. Now, if we were to increase the thickness of our joint, then the length of the diagonal would also increase, and would consequently be unlikely to resist so great a strain as the shorter one, for the same reason that a long column will generally bear less pressure than a short one of equal diameter; also the angle of inclination of the shorter diagonal, being less than that of the longer, would give it an advantage over the latter.

But let us yet consider it in another way: if a ½-in. joint be stronger than a ¼-in. ditto, then why not a 1-in. also stronger than a ½-in., and a 2-in. than a 1-in., a 4-in. than a 2-in., an 8-in. than a 4-in., and so on? Let us consider an 8-in. joint, then our old sectional area of 2½ in. by ½ in. will become 8 in. by 2½ in., the 8 in. being its height, and consequently the mortar connecting the ends of the "stretchers" with the "headers" will be easily cracked; and the "bond," in this case, show itself to be no bond in reality, as the strain would here be a tensile one, and which mortar would be unlikely to bear.

And again, if thick mortar joints be the element of strength, why should voussoirs, or arch-bricks, be cut or rubbed for the sake of strength? or, better still, why not have, as before, joints, say 8 in. in thickness, or to gain the utmost strength arches of mortar altogether, no bricks being used? HENRY AMBROSE.

THE clause enforcing thin mortar joints seems to me a relic of those classical days when every brick was required to be gauged to the same size, and all the joints tick-pointed; and that when the architectural mind became emancipated, the battle of the styles was so hotly contested, that small matters of detail were overlooked, and in the routine of the office the clause has remained unchanged and unaltered. With regard to the thickness of the joint, I am of opinion (without going into the chemical properties of mortar), that the thick joint is preferable if the mortar is good: the bricks generally used being of an absorbent nature, suck in a certain amount of moisture from the mortar, which moisture is necessary for its proper crystallisation: the thinner the joint the less resistance it can offer to the suction of the brick, and the less quantity of moisture it can afford to lose. The thick joint retains its moisture until the crystallisation takes place: it makes a greater allowance for the inequalities of the brick, and makes a much better bed in every respect. Another tradition of *olden times*, is the practice of rubbed and gauged arches: the arch, instead of appearing as strong as, and part of, the surrounding work, has quite a cheesy effect, owing to the outer face and protecting coat being rubbed off. If our Gothic architects would try the effect of arches merely axed and set in cement, the character of many buildings would be much improved. C. N. McI. N.

I VENTURE to say that where the joints of a piece of brickwork are of an equal thickness of ½ in. throughout, the settling of the work is

* "Town Swamps and Social Bridges." By George Godwin. 1858. In *Builder*, ante.

equal, and the joints being small, they do not bulge enough to do any harm. Whereas in a piece of brickwork where there are large joints, as may be ascertained and the joints, in consequence of the quantity of mortar, it causes the joints to yield to the weight above, which makes the joints bulge outwards: so that whenever it rains, the joints catch every drop that may trickle down the wall, which, in my opinion, causes a great deal of dampness in the walls.

A BRICKLAYER.

THE FATAL PANIC AT LIVERPOOL.

A TERRIBLE catastrophe has occurred in the Roman Catholic Chapel of St. Joseph, Grosvenor-street, Scotland-road, Liverpool, resulting in the death of sixteen persons, and injury to others. While a drunken man was causing confusion in the crowded chapel by vociferations about not stopping there any longer, some person unknown, whether by way of practical joke or otherwise, bawled out "fire," and a complete panic seized the congregation. A rush was made to doors and windows. It appears that there were large doors opening outwards, with printed directions to push them open prominently posted on them; but to these the panic utterly blinded the people; and one crowd from the chapel met another from a school in the same premises, where another congregation had been alarmed by the same idiotical cry of fire, the result being that many were thrown down, trampled on, and suffocated.

HERNE CHURCH, KENT.

ON Tuesday, the 18th, the chancel of the parish church of St. Martin, at Herne, was reopened after a rearrangement of the seats and fittings. Previously to the alterations, the chancel steps were very steep and awkward, and the floor had been brought to within 7½ in. and 8½ in. of the seats of the sedilia, although these had been raised about 4 in.; and though there were six of the old stalls remaining, these had been placed in such a position as to render them useless for their proper purpose of seats for those conducting the services. The floor levels have now been remodelled, rendering the steps of an easier grade, and bringing them into harmony with the sedilia, which have also been restored to their original height; the pavement being laid with Minton's red, black, and buff tiles to pattern, in place of the old coarse red and black tiles in alternate squares. The old altar-table has been replaced by a new one of oak, with panels and tracery, and covered with an altar-cloth with embroidered super-frontal. Eight new stalls of oak have been carved similar to the ancient ones, and, with them, placed according to the original arrangement, viz., with three returning on each side at the west end of the chancel; and the old bench ends, with carved poppy-heads, have been reframed with new seats and backs. A new oak screen, with panels filled with tracery, has been placed at the entrance to the chancel. A fine organ (by Lewis) has also been provided. The alterations were carried out under the direction of Mr. Walter F. Dawson, of London, architect; and the wood carving was done by Mr. Adams, of Herne Bay.

KIND WORDS FROM THE LAND'S END.

WE find the following hearty expressions in the *Cornish Telegraph*. As a spontaneous outbreak of kindly feeling, we are tempted to quote it:—

"A firm grasp and vigorous shake of the hand, if they be cordial, are good at all times; but at no season can they be more fit than now, when mind and body, after a too brief season of rest, must be girded up for one more stage of life's journey. Distance, in these days, is no barrier to a prompt and hearty expression of good wishes; for electricity can speed a whisper with the suddenness of lightning, and the pen's utterances are conveyed hundreds of miles in a few hours. Moved thereby by its first article for the year 1870, we send our hearty good wishes to our contemporary, the *Builder*, from whom, for nearly twenty years, we have derived, week after week, something valuable in the way of art instruction or practical hint. For twenty-seven years our friend has laboured in the interest of those who go and those who construct the edifices of the present day. Seeking to elevate and enlarge the views of the one class, and to advance the social and material position of the other, with intelligence so broad that the world is ransacked for all that may in handicraft has its interests studied; and with eye so microscopic that no event within its sphere transpires, even in the remote corner of England, but the *Builder* sees it, no wonder that our friend is both prosperous and respected. For twenty-five years the present editor has been at work, and he says with perfect truth that it is a true estimate of the labours of his coadjutors and himself he requires, the volumes they have produced, and not a single

number, should be glanced at. In this we fully concur. To take but one branch of the subject, the arguments and facts in favour of sanitary progress; the accumulated proofs that disease is dear and health invaluable; that the raising of human happiness and the prolongation of human life; and the plain rules laid down to attain greater comfort and more length of days;—and, even here, we find our contemporary's columns a mine of gold, and a store of pearls. There is, further, in this article, a passage or two particularly grateful to those who have Cornish industries at heart, not because the topic is our own, but by reason of its hopefulness and confidence in the future. We will quote it.

And, in the hope that the *Builder* may continue to play a useful part in the future, we wish it good speed in the year 1870."

THE INDIAN GOVERNMENT AND THE CIVIL ENGINEERS.

In the reply received by the Institution of Civil Engineers, Col. Strachey says for the Government of India,—"It has been a subject of much regret to the Government."

General in Council, that serious misunderstanding of the intention of this notification should have arisen among civil engineers, both in this country and in England. His Excellency in Council, when informed that misconceptions had occurred, lost no time in issuing a circular order to explain the object and origin of the notification, and to assure the civil engineers in the service of the Government in India, that nothing had been further from the intention of the Government-General in Council than to impute unworthy practices to the profession. A copy of this circular is annexed.

His Excellency in Council most fully accepts the declaration made by the Council of the Institution of Civil Engineers of the principles which are recognised by the profession in relation to the payments they receive for their services, and he desires to add that there has never been any doubt on the part of the Government of India on this subject, and that the notification specifically and exclusively referred to the receipt of a commission which was a legitimate source of emolument, as being a recognised practice."

The Government made a very blameable mistake, to which we early drew public attention, and have got out of it in the best way they could.

MIDLAND COUNTIES MIDDLE CLASS IDIOT ASYLUM.

Srs,—Kindly allow me space to say, in reference to this competition, that Mr. A. Waterhouse is now engaged in examining the designs, having been nominated consulting architect, by a large majority of the competitors.

The plans will be exhibited in the Athenæum Hall, Birmingham, on Monday, January 31st, and the five following days. Cards to view may be had from me.

W. G. BLATCH, Secretary.

A NOTE FROM TORONTO.

Srs,—I have been a constant reader of the *Builder* for many years, the numbers of which have so accumulated as to form almost a library of themselves. I am an old worn-out architect, and have retired to a snug retreat on the north shore of Lake Ontario, and look as regularly for my *Builder* every week as my Sunday's dinner.

The number for November 18th, 1869, was particularly gratifying to me, as it referred to Leeds Castle, which in 1832 I left London on a tour through Kent in search of employment, having a letter of introduction to a well-known baronet of the name of Leeds, residing at Leeds Castle. He kindly recommended me to the gentleman in charge of the works at Leeds Castle, who employed me as a timekeeper. I remained there but a few months, as I was a good deal annoyed by being always spoken of as the little Cockney.

I emigrated to Canada ten years afterwards, and was fortunate enough to gain the good opinion of the then Governor, Sir John Colborne, and most of the leading men in York (now Toronto). In 1833 I erected a villa for the Hon. C. Widdow, M.P., whose wife was related to the Martins of Leeds Castle. They were the only persons that I ever met who knew anything of that castle.

I was present with the four men when, on removing the last piece of the oak floor of the Queen's Wardrobe (described in the *Builder*), the chestnut oak girders, which crossed in the centre of the room, were so rotten that they broke with the weight of the men who were at work upon them. No bones were broken, but the men received frightful wounds on their legs by falling upon the points of the splintered oak flooring which stood upon end in the room below. I escaped by jumping into the recess of a window. I was also present at the erection of a temporary bridge across the moat for the conveyance of the debris of that part of the castle which was pulled down. I was also present when the moat was traced, and a large stick caught, 4 ft. 11 in. long, weighing 23 lb. I caught it with a hand-saw in a day or two before, and when I have requested my stationer to procure for me Mr. Martin's "History of the Castle."

As to Mr. Bell of St. Mary's, Cambridge, page 869, of the 4th of December number, I have to say that in the year 1798 the Cambridge youths sang a psalm in the choir for five hours and five minutes. It consisted of 6,830 changes.

This reminds me of a tomb in Leeds churchyard, erected to the memory of ten celebrated bell-ringers who rang for, I think, 35 hours without stopping. The whole account was quite legible on the tombstone. I read it forty-seven years ago; so fresh is it in my memory that I know the man who called the Bobs was over seventy years of age.

If one of your correspondents will gratify a gossamer by publishing a true account of the Leeds bell-ringers who have slept in Leeds churchyard for, I think, seventy years, most of your readers will be pleased, and none more than

JOHN G. HOWARD.

P.S. I send you two views of the Toronto Lunatic Asylum, erected by me for the Government twenty years ago.

TENDERS: KITE'S-NEST FARM ESTATE, HASTINGS.

Srs,—In August last an advertisement appeared in your paper for tenders for the construction of roads, fences, &c., on the above estate, and for which at least five or six competent and responsible contractors from London submitted reasonable estimates, also others in the neighbourhood and from other parts. Tenders having been duly sent at the appointed time, parties were then informed that a successful person would be written to, and others would see the result in the *Builder*. But such has not been the case, and for nearly five months no result could be known; but, after the lapse of that time, a person had been accepted, he not having submitted any estimate among the rest at the time invited for. However, such being the case—setting aside the length of time parties have been kept in suspense in knowing the result;—the expense, which was not a nominal one, to obtain all particulars, visit the place, make estimates, &c.,—I ask, is not this not only great injustice, but scandalous treatment, to put persons to the trouble and expense to respond to an advertisement for a mere nominal competition? Your giving this publicity will greatly oblige a few of the UNSUCCESSFUL.

THE HOLBORN VIADUCT.

WE have received a long letter from Mr. Richard Bell, to whom the chief premium was awarded by the Corporation for his design, in reply to Mr. Haywood's letter in our impression of the 27th of November last. The length of time that has elapsed justifies us in declining to print it.

FOREIGN LOANS—A MISTAKE.

YOU have done good service in warning the British public against that delusive investment in the sinking funds of *Foreign Loans*. There is an incredible amount in millions that has been lost in Spanish, Mexican, North American, and other State stocks. In one repudiating State, Indiana, the writer lost 1,600*l*. But nothing will warn the fools ever ready to "rush in."

A loan is now in the market for 12,000,000*l*, ostensibly for railways; but how know we but that this may furnish a hostile power with means of attack? At all events, these loans, on the first approach of difficulties, become well-nigh unobtainable; and there must ever be the greatest amount of risk attending them.

Proper national works, undertaken on a sure basis and with care, should be fostered by our paternal Government, ever engaged in party squabbles.

The landowners will very soon be found coming forward offering land to railway companies if they will simply treble the value of that adjoining by running a line of railway through it.

PAULATIM.

BARRACK ARRANGEMENTS.

A PAPER has been read by Dr. Stallard, to the Social Science Association (Mr. E. Rawlinson, C.B., C.B., in the chair), "On the Construction of Barracks in reference to the Physical and Moral Improvement of the Soldier." Dr. Stallard said that he had to lay before them some objections which he had offered to the Government against the principle upon which the most complete barracks are constructed, and to submit suggestions to insure comfort to the soldier, inducing a better class of enlist at least not so at present. As a rule, commanding officers preferred the establishment of large barracks-rooms, to contain at least twenty-five men; while the soldiers themselves, tired of constant association with a number of their comrades, and, in fact, continual life in public, would like to be more private. Dr. Stallard drew attention to evil effects from the constant association of twenty-five or more men, in the absence of all privacy, and the difficulty of maintaining any high standard of discipline or moral tone among so many. As a rule, he believed it to be the case that one bad man was more likely to bring the whole down to his own degradation than a good man was to raise them to his, and he attributed to the constant and enforced association of the soldiers a great deal of their partiality for the canteen and the public-house. As a remedy for this state of things Dr. Stallard suggested that barracks should be constructed on the same plan as convict prisons, and so provide for each man a separate cell or apartment for his own use at night. Thus, let us here remark, the treatment of our soldiers, like that of our poor, would be more humane and proper if it were brought up to the standard of our treatment of sound convicts. Dr. Stallard found, moreover, that the cost of barracks, as at present constructed, was not less than 60*l*. per man; whereas the cells of prisoners on the corridor plan cost only 18*l*. per man. He was convinced that the men as-

sociated with each other during the day would prefer to be private at night. The separate system would improve, their health and morals, and would enable the officers to exercise a more strict supervision over individuals than could be practised under the present general system. In a discussion which took place on the subject of the paper, it was mentioned that partitions had been introduced with good effect in the sleeping apartments of public schools. The partitions need not necessarily be carried up to the ceiling; and it was generally agreed that, whether the corridor system was adopted or not, improvement in barrack accommodation is greatly necessary.

LADDERS FOR FIRES.

Sir,—With reference to the disastrous and fatal result of the fire at Richmond, one of the London papers states that "Mr. Lever, the manager, and Simpson, the clerk, were both at the windows, calling loudly for ladders;" and further adds, that, "Mingey, the cellarman, knowing there was a fifty-six-round ladder in the yard of the new hotel, got the two policemen present to go with him to fetch it, but their united efforts were insufficient to remove it."

Now, it appears to me the days of such antiquated and inconvenient ladders at present in use are gone by, and that ladders light and portable, composed of tubular iron, galvanised, might be economically constructed in short lengths, and fitted together, or taken to pieces in a few seconds, by two persons, at most; such ladders, in addition to general use, to be supplied to all hotels, in a similar manner, as ladders are to the magnificent hotels in New York, viz., fixed from some of the top-floor windows in rear of the building, and reaching within 12 ft. from the ground. There may be some such ladder combining the qualities I have described, at present made in this country.

A SAFETY LADDER.

SEWAGE AND STRATEGY.

YOUR correspondent, "M. F. T.," has taken a wrong view of the subject referred to under the above heading, viz., that the "Enemy" in advancing up the Thames upon London, could bump up our sewage outlet at Barking Creek, and thus poison London.

No city in the world has such a grandly organised scheme for the concentration of filth, and in the "weakness" suggested by your correspondent is our very safety.

The sewage of London, North and South, suddenly discharged upon an advancing fleet would inevitably produce a panic and a retreat, or death by poison.

We have to thank your correspondent's fears for the discovery of a new defence for the metropolis.

L. A.

HOLY TRINITY CHURCH, BARNSTAPLE.

The new church of Holy Trinity, at Barnstaple, in Devon, has been opened by Dr. Temple, bishop of Exeter. The church was originally built in 1846, but owing to its defective construction, fell so quickly to decay that the whole of it, save only the tower, has been entirely rebuilt. The tower is a Perpendicular one, standing 130 ft. high. It was somewhat higher, but has been lowered some feet, and advantage has been taken of the scaffolding erected for that purpose to carve the blocks left for ornamental purposes at the time of its construction. The new church, which is cruciform, follows nearly the plan of the old walls; with an extension westward of a few feet, and eastward by the addition of an apse. The nave, instead of being as before, in one single span, with walls comparatively low, is now divided into three parts. The central part has lofty walls, forming a clear-story, into which the old nave windows are incorporated, with new hooded curtain-ribs on the inside. There are now narrow side aisles, with small two-light windows, separated from the nave by an arcade on either side, of Hatherleigh and Ham-hill stone, with moulded capitals. The chancel aisles are covered with double roof transversely, and there is a narrow aisle to these, connecting them with the nave aisles by transverse arches. The old roof timbers are reconstructed, and the carved angels are used again for the corbels, but the spiral roof of the chancel is carried on small vaulting-shafts with carved capitals. The old pews are reconstructed into open benches, and the chancel is fitted with stalls. The chancel is laid with Minton's tiles.

A memorial window in stained glass in the south aisle is from a design of the architect; another is in course of erection for the east window, by Messrs. Powell. In the west window some coloured glass is introduced. The stonework of this window is made of the old work, but reduced from seven lights to five. The contractors were Messrs. Hartnoll, Pulsford, & Cox. The carving of the tower was executed by Mr. Harry Hems, of Exeter. The architect was Mr. W. White, London.

LONDON CORN EXCHANGE COMPETITION.

As one of the architects invited to prepare a design for rebuilding the Corn Exchange in Mark-lane, Mr. John Whichcord found it necessary to address a letter to the committee on certain objectionable points in the conditions, especially as to the circumstance that while the selected architect's design would be rejected if it could not be carried out for an amount within 10 per cent. of the sum named (20,000*l.*), the light and air rights of adjoining tenants might lead to a large expenditure, if not prevent the building being carried out altogether. The committee removed one of the objections taken, but refused to make any arrangements as to the latter; and Mr. Whichcord therefore declined to compete.

Other competitors will do well to keep this question of compensations in mind.

NEW POLICE STATION, IPSWICH.

At the Quarter Sessions held at Ipswich last week it was resolved that the designs prepared by Mr. W. Oldham Chambers, architect, Lowestoft, for the new police-station in Ipswich, should be accepted by the county, and the same were ordered to be sent by the Clerk of the Peace to the Secretary of State forthwith.

The arrangement on the ground floor gives accommodation for the Petty Sessions, with magistrates' retiring-rooms, attorney and witnesses' rooms, lavatory, and so on. At the rear of the above, provision is made for six cells, contiguous to which is the constables' sitting-room, coat-room, bedding store, and the usual offices. The superintendent's department contains parlour, living-room, kitchen, and five bedrooms, with infirmary for sick prisoners if required. The constables are provided with five bedrooms, reached by a separate staircase from that used by the superintendent. It is intended to commence the works immediately the plans are approved by the Secretary of State.

CHURCH BELLS AND CHANGE RINGING.

A LECTURE on this subject was lately delivered at the Bury Athenaeum, by the Rev. J. J. Raven, B.D., head-master of Yarmouth Grammar School. The chair was taken by the new president, Lord John Hervey. The rev. gentleman, having introduced the subject, said there was no metal which would not give a musical sound in some shape or other, yet bells from the earliest times seemed to have been made of pretty nearly the same material—common bronze. At first, however, they were not cast, but hammered into shape, and of course nothing like music could possibly be got out of them. He was not certain when the casting of bells was first introduced into this country, but certainly before the Conquest. The present mode of casting was much the same as that made use of centuries ago. About the year 1000 there must have been a great many bells in England. There were no bells in this district, however, of very great antiquity. The oldest, perhaps, was one at Wordwell, a queer, long-shaped bell, with no date upon it, so that they could not judge correctly of its age. Some of the inscriptions on bells were very amusing; there was one on a bell, in Ickworth Church, made by a man named Pleasant, at Sudbury, which was rather a puff:—

"Henry Pleasant has at last
Made as good as can be cast."

Another was:—

"Henry Pleasant did me run
In the year seventeen hundred and one."

Some of the inscriptions were historically valuable, as, for instance, this:—"I was cast in the year of plague, war, and fire, 1666." In later bells the churchwardens' names were put in as well as the founders, but in the present time, he was glad to say, they got wholesome inscriptions, not superstitious invocations, such as "Praise the Lord," "Give thanks to God," &c.

CHURCH-BUILDING NEWS.

Aikton (near Wighton).—The old parish church at Aikton, which has recently undergone a renovation, has been re-opened for divine service. The old church is a very ancient structure, and appears to have been built upon the site of an edifice of still greater antiquity; but of the anterior church there is no historical record. The remains which still exist exhibit rather a good example of the Norman style. The present church, which is composed of a nave, aisle, and chancel, appears to have been built in the thirteenth century. Before the recent improvements the church had fallen into a deplorable state of decay. It was, in fact, a complete wreck, and was damp and unwholesome. The old oak beams of the nave had been covered, probably some century ago, by a flat-plastered ceiling only 13 ft. from the floor. The floor was flagged, and very damp; the pews were of a very unsightly description, and much dilapidated, while the pulpit, a structure of a rather uncomely appearance, was stationed in the middle of the nave. Modern windows, of by no means ornamental construction, in the nave and aisle walls increased the unprepossessing appearance of the place; while the whole of the interior, including the pillars between the nave and aisle, which were of good dressed stone, were whitewashed. All this, however, has now been changed. The church has been repewed with open benches placed on a wood floor. The passage has been flagged and the chancel floor has been relaid with ornamental encaustic tiles. The north and south walls have been rebuilt, and the old windows have been replaced by grouped lancet windows, in the style in which the church was originally built. An entirely new roof has been put upon the aisles; and in the nave and chancel the plaster ceiling has given place to heavy oak timbers, at an altitude double that of the previous ceiling. When the old roof was removed, a somewhat singular phenomenon was brought to light, exhibiting rather a curiosity in church architecture. All the tiles were fastened together with portions of the shank bones of sheep. The work of restoration has been carried out under the direction of Mr. Birkett, of Carlisle, architect. Mr. Pearson, of Wighton, had the joinering; Messrs. Roper & Beatty, of Dalston, the masonry; Mr. Wilson Bell, of Wighton, the painting and plumbing; and Mr. Joseph Bell, of Wighton, the slating.

Albury.—A full choral morning and evening service has been held at Albury Church, in celebration of the opening of the new organ and chancel. The new chancel has been erected at the cost of the Duke of Northumberland, and improvements in the nave, if not its reconstruction, it is expected will take place next year. The present improvement—that of the erection of a new organ, in a new chancel, with artistically designed roof—is a step towards introducing church architecture in a purer form into Albury. The new chancel is from the designs of Mr. A. W. Blomfield. The windows are filled after designs by Lady Rokewood Gage. The three at the east are memorials of her ladyship's father, Mr. Henry Drummond. An oak screen separates the chancel from the nave. This, and the oak stalls, were made by the contractor for the whole work, Mr. Inkpen, of Abinger.

Bedhampton.—The Church of St. Thomas has been re-opened, after undergoing extensive alterations. The work was commenced about a year ago, when Mr. E. A. Gruning, of London, architect, after making a survey, reported that to carry out the repairs and alterations most necessary a sum of 650*l.* would be required for the repair of that portion of the church the expense of which would fall upon the parish. In June the contractors, Messrs. W. Moore, H. Carrell, and M. Osborn, of Havant, commenced the work of restoration. The walls were cleaned of stucco and pointed; a new bell-turret, a porch, and a new vestry were erected; the pulpit was removed, and its place supplied by a carved one of modern style; a reading-desk was provided; gas laid on in the place of the dips formerly used; and many alterations, improvements, and additions were made. The principal feature in the church now is a stained-glass window, presented by Messrs. F. J. Lightfoot and Richard Hewitt, of London, and executed by the firm of Lavers, Barraud, & Westlake, of London, the subjects represented being the Crucifixion and the Last Supper.

Maldstone.—The Free Church of St. James, Maldstone, a mission church in the parish of St. Paul, has been opened by license from the Arch-

bishop. The building is of brick, capable of holding 200 persons, all the seats being free. The walls internally are built of white brick, red and blue Staffordshire bricks being introduced in the arches and elsewhere. At the east end is a group of four lancet windows, the arches of which are supported by red shafts, having Bath stone bases and caps, the latter left in block for carving; the whole window being enclosed by an arch in red brick. The west end has a large circular window in the gable; and below it right and left are coupled lancet windows: between them is the entrance. The western gable end is surmounted by a bell-cot in Bath stone, in which is hung a bell cast by Messrs. Warner & Sons, of London. The church is warmed on a patent principle by a Gill stove sunk under the floor. The lighting is by gas, for which gasaliers have been designed in accordance with the style of the building, by the architect, Mr. Hubert Benstead, and they have been executed by Mr. Golding, of this town. The builder is Mr. Henry Bridge.

Asterley.—A new mission school church at Asterley, a small outlying hamlet of the parish of Pontesbury, has been opened. The church is a simple and unpretending structure of brick, built in the Early English style, and having an apsidal chancel. Its extreme length is about 60 ft., and its width 18 ft. The nave is divided into five bays marked externally by deep buttresses, and having coupled single-light windows in each, whilst the chancel has loftier single-light windows breaking up into the roof by gables. At the western end a bell-cot, terminated by a wrought-iron cross, distinctly marks the character of the building; and the porch, of timber construction, occupies the westernmost bay of the south side of the nave. Internally the walls are left unplastered, and the warm appearance of the brickwork forms a variation to the usual whitewash. The roof is an open one. The chancel is formed by a raised step, on which is placed a perforated low screen of woodwork, behind which are seats for the choir, of a more ornamental character than those of the nave. Beyond the choir rises the sacristarium, elevated three steps above the nave floor. The sacristarium and choir are laid with Shropshire tiles, from Messrs. Maw's works at Benthall, and the central window of the apse is filled with a stained-glass window, having for its subject the Crucifixion of our Lord. The church is nominally constructed to accommodate only 125 persons, but 180 found sitting or standing room in it at the opening. The edifice has been built by Mr. E. Yates, of Shifnal, from the designs of Messrs. Paul & Robinson, of Manchester. The fittings, some of which are available for school purposes, were made by Messrs. Sidebotham & Co., of Manchester. The altar furniture was made from the architect's design by Messrs. Jones & Miller, of Birmingham; and Messrs. Edmundson, of Manchester, supplied the stained glass, also from the architect's drawings. The font is the work of Mr. Yates, the contractor. The site on which the church stands was given by Mr. Henry Gardner, of Westley.

Bastry.—Harworth Church has been reopened for divine service after restoration. Mr. C. J. Neale, of High Oakham, near Mansfield, was engaged as the architect. Plans having been prepared and approved of, the contract for the work was undertaken by Messrs. Robert Wood & Son, of Doncaster. The work includes the re-erection of the whole of the body of the church and the chancel, with the addition of two new transepts, each 17 ft. by 15 ft., a vestry, and an organ-chamber. The chancel arch and the arch at the entrance from the porch, from their being Norman in style, have been retained. The church has been built with wallstone obtained from the neighbourhood, and is dressed with ashlar stone, supplied from Ancaster. The tower is the same as before. The style of the previous building has been retained,—that of the Early Decorated. The floor of the chancel, and within the communion-rails, has been laid with encaustic tiles, supplied by Messrs. Maw & Co., of Broseley, Shropshire. As regards the interior arrangements, very little difference from the former church is perceptible, the old stalls, reading-desk, and pulpit having been nearly refixed. The church will henceforth be heated with warm water. The cost of the restoration has been about 1,450*l.*, most of which is already contributed.

Bristol.—For the proposed alterations in the Mayor's Chapel, plans have been prepared by Mr. Butterfield, architect, according to which it is intended to place the organ in the recess in

the tower; by which means the general effect of the building will be more spacious. It is also proposed to make some alterations in the fittings, so as to move the "Red Maids," who now into the building. The local *Times* hears it is contemplated to have large it is re-erected. The cost of the whole, it is estimated, will not much exceed 500*l.* The matter will again be brought before the council before the plans are confirmed.

PROVINCIAL NEWS.

Baldock.—For a proposed town-hall for Baldock donations amounting to upwards of 800*l.* have been promised. It has, however, been resolved that a site shall not be purchased until 1,000*l.* have been subscribed.

Rickmansworth.—The completion of the new town-hall has been celebrated by a public dinner. The new building has been erected by a limited liability company (with shares of 5*l.* each) on the site of the old market-house, which had stood for many years in a most dilapidated and unsightly condition. The present structure is built in the Domestic Gothic style of architecture. The assembly-room is 56 ft. long, 27 ft. wide, and about 22 ft. high. It is well lighted, having five windows on each side. The roof is light, being a hammer-beam roof with an intertie of wrought iron. There are stone corbels supporting the roof, which will be carved when the funds permit. The artificial illumination is furnished by two sun-lights. The hall will accommodate 400 persons, or about 350 after deducting the space necessary for a platform and gangway. There is an ante-room at its southern end, and at its northern end a magistrates' room, nearly 30 ft. long, and about 15 ft. wide. In addition to these rooms, there are two other ante-rooms and a "cottage" for the hall-keeper to live in. The front of the building is of red brick and Bath stone, and over the entrance doorway is a gable-turret, in which it is intended to place a clock. The cost of the erection has been about 1,200*l.* Mr. Arthur Allom, of Westminster, was the architect. The contract was divided between Mr. T. Holland and Mr. H. H. Hudson, builders, Rickmansworth. Mr. A. Allom was the architect of Lord's Grand Stand.

Hartshill.—The new buildings of the North Staffordshire Infirmary at Hartshill have been opened by the Duchess of Sutherland. The high sheriff opened the proceedings by presenting an appropriate address, to which her Grace responded in an able speech, in the course of which she said:—"I trust that I may be allowed earnestly to commend the claims of this house of mercy to the heart of every woman in this neighbourhood, who may have the honour of ministering, by her personal presence or otherwise, to its suffering occupants. I must also venture to express the hope that no feelings of sectarianism, arising from divisions among those who differ in forms only, may be allowed to weaken the unanimity required for the support of this charity. I will with the greatest pleasure convey to their Royal Highnesses the Prince and Princess of Wales the intelligence of the completion, under God's blessing, of the building, the foundation-stone of which was laid by his Royal Highness, and graced by the presence of the Princess, and the object of which is one that has always her tenderest sympathies."

Frank.—The Thompson Memorial Reading-room has been opened. It includes a residence for the schoolmaster and schoolmistress of Frant school. The building is erected as a memorial of respect and gratitude to the late Rev. Sir Henry Thompson, bart., the funds for which were raised by subscription amongst the parishioners of Frant. The building is situated at the back of the school, and is fronted with white bricks and red tile, and is of that peculiar style of architecture which is usually seen on land belonging to the Earl of Abercromby. The cost of the building is between 500*l.* and 600*l.*

Watford.—It is proposed to erect here an Agricultural Hall, by means of a subscribed capital of 3,000*l.*, in 5*l.* shares, and the sum of 2,000*l.* is already subscribed. The active agent in this movement is Mr. Alfred Sedgwick, the hon. secretary to the West Herts Agricultural Society.

Levens.—The Visiting Committee of Justices propose that accommodation should be provided in the County Lunatic Asylum for fifty additional female patients, at an estimated cost of

3,600*l.* The plans and estimates have been prepared and laid before the Home Secretary.

York.—After the conclusion of business in the Corn Exchange on Saturday last, Mr. F. Carr said there was now a prospect of having a covered market erected in this city, as the corporation would apply for an Act in the next session of Parliament. There had been a great fight as to where the market should be placed. The site had been determined upon, but he heard with very great regret that there was a sort of opposition to having a covered market on that site at all. He, however, trusted that there were no persons, either in or out of York, who were really bent upon opposing this desirable scheme, considering that a covered market had been wanted for so many years.

East Retford.—The new Temperance-hall, in Chapel-gate, for the Band of Hope and Temperance Society, has been opened. The building was formerly used by the Exchange-street Temperance Society, but was bought by the Chapel-gate Society for 300*l.* Messrs. Bellamy & Hardy, of Lincoln, were employed in the preparation of the plans for the alterations proposed to be made in the building, and under the direction of these architects the works have been carried out by the contractors, Mr. Liller, carpenter; Messrs. Bailey, gasfitters, &c.; and Mr. Pollard, decorator and painter. The main hall is capable of accommodating about 500 persons. The room is lighted by a number of statuettes placed round the wall, and each bearing two lights. There are a workmen's reading-room, committee and waiting rooms, one of which, behind the stage, can be turned into an orchestra at small trouble.

FROM SCOTLAND.

Bucklyvie.—The new water-works, which have just been completed, at Buckleyvie, have been inaugurated. The village, till the present time, has been supplied with water from a brook which runs along by its side; but about two years ago a water company was formed. A spring on Upper Caithley Farm, from which the water is principally obtained, was measured, and it was calculated that the supply from it, amounting to 2,000 gallons in twenty-four hours, would be adequate for the demands of the population, which numbers about 350. The ground was surveyed by Mr. Alexander Malcolm, jun., Ballinor, and estimates having been procured, it was seen that the supply might be obtained at a cost of about 150*l.* The capital was soon subscribed, in 1*l.* shares, by upwards of twenty shareholders; and the contract was undertaken by Mr. Archibald Merriells, plumber, &c., Stirling. The contract embraced the laying down of 1,234 yards of 24-in. cast-iron pipe, and 134 yards of 15-in. pipe, the erection of wells, construction of cistern, &c. The water is collected from the spring which rises near Caithley Burn, and runs about 50 yards into the cistern; it is then conveyed through cuttings, in some places 8 ft. deep, down to the Culbowie-road, and into the village. The fall is considerable, and the pressure is good. It is thought that a water-rate of 1*s.* will amply repay the capital expended. Many of the residents have taken the water into their houses.

Books Received.

The Legend of Christian Art, illustrated in the Statues of Salisbury Cathedral. By the Rev. H. T. ARNFIELD, M.A. Salisbury: Brown & Co. London: Simpkin, Marshall, & Co.

The statues in the external niches of Salisbury Cathedral have been restored, whether well or ill it is unnecessary for our present purpose to say; and Mr. Arnfield, who is a minor canon of Salisbury, observing how few amongst the multitude of spectators who gaze upon them were able to identify any but the most familiar of the figures, has written this little book for their elucidation. Inasmuch, however, as these figures represent some of the most famous saints of Western Christendom, the volume has a wider use, and may be regarded as a useful handbook for architects and others engaged in ecclesiastical art, as well as for visitors to galleries and cathedrals at home and abroad. Many of the latter certainly lose much of the interest hidden in what they look at through want of such information as is here set forth. Husenbeth's "Emblems of Saints," which, though useful as a pocket companion enabling tourists to identify saints, does not give the reasons why particular emblems have been assigned to them, shows how

large a number of personages whose effigies occur are not mentioned by Mr. Armfield. Still this book is useful as far as it goes, and those who want further information on the subject may consult *Père Cahier's* book, *Les Caractéristiques des Saints dans l'art populaire, énumérées et expliquées*, The "Legenda Aurea" (Golden Legend) and Mrs. Jameson's "Sacred and Legendary Art" have, of course, supplied Mr. Armfield with much of his information. The legend of St. Osmund, the originator of the "Use of Sarum," is taken from a Latin MS. in the British Museum, which the author believes has never before been printed. Of course, we do not ask our readers to believe all these tales. Mr. Armfield says on this point,—

"Our own attitude towards these legends, whether as writers or as readers, I could wish not to be mistaken. It is, of course, no part of my present business to establish or defend them. But one thing about them will be admitted by all. Although from the change in the modes of European thought and feeling, which the critical spirit of modern times has introduced, we may smile at the extravagance, the disregard of all the laws of incident everywhere discernible in these Medieval legends, yet it is impossible for any thinking man not to read in them the history of processes in the inner life which are being continually reproduced within the compass of our own individual experience; impossible not to recognise in their details the features of exalted ideals of character, a unity of lofty purpose and an heroic devotion to duty, which will to the last command the admiration and the sympathy of mankind."

Construction of Hospitals. By DOUGLAS GALTON, F.R.S. London: Macmillan & Co. 1869.

OUR readers will remember that Captain Douglas Galton read an address on the general principles (which should be observed in the construction of hospitals before the British Medical Association in Leeds. This he has now wisely published, with illustrations and a report of the discussion that followed the reading. A full account is given, in an appendix, of the ventilating fire-places, founded in General Moria's experiments. We take exception to Captain Galton's observation in the preface, suggesting that improved hospital construction is to be dated from the Report of the Royal Commission on the Sanitary State of the Army of 1857. But we may have another opportunity to look to the address generally.

VARIORUM.

"ANDERSON'S Essays from the *Spectator*," as that now issued by Tegg, make a volume of enduring value and interest. Addison, as an essayist, has long influenced society, and will continue to do so; and it was a good thought to bring his work together in a compact form, cleared from inferior matter. It is unnecessary in this place to inquire if the editor has not clouded some few essays by other contributors to the *Spectator*. The object of the volume is not to settle what Addison did and what he did not write: here, at any rate, we have the great bulk of what he contributed to that famous serial.

The *January Quarterly* is good and varied. An article on the Land Question in France will attract attention, especially at this moment. The magistrate gets but scant justice at the hands of a reviewer of "The Holy Grail." Mrs. Stowe's "Windication" is rightly knocked about.

Hints on Sanitary Reform; with a Plan for the Disposal of the Sewage and Debris of Glasgow. By James Gray, M.D., and Robert Baldie, Architect. Glasgow: Cairns & Co. The authors of this pamphlet propose to convert the sewage and debris of Glasgow into artificial guano, and

purify the Clyde by a scheme of drainage and conveyance through intercepting sewers down the river banks on both sides as far as Newsham sand, where the tank pond and other works would be used in converting the sewage into artificial manure, the filtered water being allowed to pass down into the river. As many as twenty different schemes for disposing of the Glasgow sewage have been projected within the last ten years.

"Prison Discipline, with some Suggestions for its improvement." This is a letter addressed to Henry Pownall, chairman of the Middlesex Magistrates, by Mr. A. Angus Croll, J.P., late Sheriff of the city of London, &c. The author takes our side of the question; urging the useful employment of prisoners. He says,— "I feel a strong aversion to the coarseness of our present system. The plan which I propose would, I think, give it a very great saving of expense. Why should we employ and unskilled labour within the walls of our prisons be almost entirely unproductive? Might not be employed so as to produce some return? I cannot think that something might be effected. I feel that something ought to be attempted, in this direction."

He proposes to extend and develop the principle of employing prisoners in their own trades,

—a principle, as he observes, already to some extent in operation. He would only keep them above starvation point, leaving all beyond that to their own exertions and wages:—

"All I contend for is that a true system of prison-discipline should include the following points:—

1. That in the classification of prisoners they should be grouped according to their trades and professions, each man following his own proper calling, and receiving better or worse accommodation in proportion to his earnings.

2. That if a prisoner will not work, neither shall he eat, except the poorest fare and in the scantiest quantities.

3. That all beyond this shall be dependent on the man's own exertions.

4. That a contribution be levied upon the proceeds of the convict's industry in payment for the rations provided by the prison authorities.

5. That an adequate motive to work be provided, and that the motive be of the same kind as that which actuates those who are at liberty."

—"A Chart of Industrial Life, with some Instructions for its Use. London: Simpkin & Marshall." The word "chart" is here used as a figure of speech relating to the avoidance of obstacles and dangers in industrial life:—

"To sum up," says the author, "intelligence and goodness of disposition are indispensable qualifications to enable mankind to enjoy well-being in its highest form. Without real education extended to all children, these qualifications will not prevail among adults. And since children cannot provide education for themselves, all adults who are not indifferent to the happiness and improvement of society must lend their aid to have it provided for them. If this be true, the neglect and misdirection of education in times past fully account for the number of destitute and miserable to be found in every country. And if similar neglect and misdirection are persisted in, the number of destitute and miserable among us will remain undiminished.

Parents in some countries expose or kill their children. In others, they passively permit them to grow up ignorant, vicious, and miserable. The latter condemn the former for their cruelty, their barbarity. The reform of the former is a frightfully crushing. Let it be our endeavour, while we keep free from the guilt of destroying our children, not to deserve their reproaches for suffering them to live."

Miscellaneous.

Completion of the Liverpool New Exchange Buildings.—The reconstruction of the Exchange Buildings, of which a view and description have already appeared in the *Builder*, has now been completed. The present quadrangle, like its predecessor, is surrounded on three sides by an arcade, but, unlike the old one, the new arcade stands before the building, except at each end, where it is terminated by a pavilion, and in the centre of the north wing, where it passes under the principal tower. The architectural effect of the new building is very different from that of the old: the latter partook of the Palladian character of the town-hall. Outside the quadrangle, in the streets which bound the property of the company, the exterior of their buildings has greatly improved the aspect of this part of the town. In Exchange-street East the alignment of the property has been altered, so as to bring that front into range with the Liverpool and London Chambers, and the turret at the corner of Tithebarn-street forms an agreeable termination to the view from Dale-street. At the foot of this turret, as in Tithebarn-street, Chapel-street, and Exchange passage, east and west, various other improvements have been effected, whereby the convenience of the public and the appearance of the buildings have been promoted. The architect of the new edifice was Mr. T. H. Wyatt.

Great Strike of Workmen in France.

A general strike took place recently among the workmen at the iron-works of M. Schneider, the president of the Corps Législatif. About 10,000 persons at Creuzot left off work. The origin of the strike had to do with an offer spontaneously made to the workmen by the manager to leave to the men the direction of their own savings-bank: it had nothing to do with wages. The strike commenced first in the building workshops, whence the leaders proceeded to the forges, furnaces, and mines, where they successively induced the men to join the strike. The strike, however, seems to have ceased as suddenly as it occurred.

Death of Mr. Broome, of the Temple.

We regret to hear of the death of the celebrated gardener of the Temple, Mr. Broome, whose caryatums and pompons are so well known to the citizens. The readers of the *Builder* were among the first to have their attention drawn to Mr. Broome's merits. He published a book on his favourite flowers which he did much to render popular; and the Londoners were greatly indebted to him for the horticultural improvement of their squares and open spaces.

The Approaching Census.

Dr. Begg urges, as we did previously to the last census, that information by its means should be obtained respecting the state of the houses of the people. This was done in regard to Scotland at the last census after some difficulty, and it would be most valuable with reference to many social questions if similar information could now be secured for the United Kingdom. The points ascertained in regard to Scotland were the number of rooms in each house, the number of persons in each family, and whether the houses had or had not windows. The following was the curious and instructive result for all Scotland:—Houses without windows, 7,964; houses of one room, 226,723; houses of two rooms, 246,601; houses of three rooms, 75,933; houses of four rooms, 37,186; houses of five rooms, 19,910; houses of six rooms, 15,278; houses of seven or more rooms, 37,191; total houses in Scotland, 666,786. The full details were given at the time also in a tabulated form in regard to Edinburgh and Glasgow, and are not only very instructive, but have given a great impulse to social and sanitary improvement in these cities. If similar details were now given for every city and town in the empire, and if they were continued every ten years, we should not only lay a solid basis for social science in regard to disease, pauperism, and other evils, but we should be able to compare one town with another, and from time to time the kingdom with itself.

Metropolitan Fire Brigade Statistics.

The report to the Metropolitan Board of Works of the chief officer of the Metropolitan Fire Brigade has been printed. From this report it appears that 1,784 calls were received during the past year; that 120 were false alarms, 92 chimney alarms, and 1,572 calls for fires, of which 199 resulted in serious damage, and 1,373 in slight damage. The fires of 1869 show a decrease of 96 compared with those of 1868; but compared with the average of the last ten years there is an increase of 230. These lists do not include trifling fires or chimney-on fire. The energy and activity of the firemen are shown by the fact that amongst the brigade of 378 firemen there were 102 accidents from contusions, wounds, sprains, burns, &c. Amongst causes of fires prominent places are held by the candle, the lucifer, tobacco, the fire-spark, the airing of linen, defective fan, and blocked up flues, gas-escapes, and swinging brackets, paraffine stoves, &c. Out of 1,572 causes specified, the candle is set down at 202, the fire-spark at 133. The next is 45 from smoking tobacco, and gas-escapes and flue fires follow next in order.

St. James's Church, Aldgate.

At a meeting of the City Commission of Sewers on Tuesday last, with reference to this church, of which the members of the Court of Common Council are the patrons, information was given that the edifice was in such a dangerous condition that no services could be performed in it, and that no funds were in hand to restore the fabric. Mr. John Young, the district surveyor, had reported that the arched ceiling over the entrance to the church had sunk, and was in a dangerous state, that the external walls were fractured, and were also dangerous; that the pillars were broken and decayed; and that the belfry windows likewise required repair. The expense of shoring up the church was reported at 251, or 301. The necessary steps were thereupon ordered to be taken. A letter on the subject has been written by Mr. Daw to the town clerk, with a request that it might be brought before the notice of the Common Council. With them rests the question whether the structure shall be restored or not, or whether the amalgamation of the benefice with the adjacent one of St. Catherine, Cree shall be effected.

Free and Cheap Steel for Rails, &c.

It is expected that the approaching expiration of Mr. Bessemer's patent for converting pig-iron into malleable iron, and that again into steel, without any additional consumption of fuel, will tend in a considerable degree to the future safety of railway passengers. The patent will come to an end in February, and as a result, it is expected that steel rails, which have hitherto been almost too expensive to be used, will fall to a price a very little above that of the best iron. The projectors of new street tramways now will, no doubt, avail themselves of this material. Mr. Bessemer first communicated an account of his process to the meeting of the British Association at Cheltenham in 1856.

New Cemetery for Bingley.—In accordance with a notification given to the newly-formed burial board for the parishes of Bingley and Holy Trinity, Mr. P. H. Holland, of the Burial Acts Office, Whitehall, has visited Bingley for the purpose of inspecting the site of the proposed cemetery. Mr. Taylor (of Taylor & Garthwaite, architects and surveyors, Bradford, who are instructed to prepare plans for the laying out of the cemetery), and several other gentlemen, members of the Board, and ratepayers, attended. The site of the cemetery is at the north-west end of the town, and consists of ten acres of rising and undulating ground, which have been purchased for 3,500*l*. After Mr. Holland had gone over the ground, a meeting was held in the Mechanics' Institute, but no formal objection was submitted; and the vicar, although he disapproved of the entrance to the cemetery being formed so near his residence, stated that he should not oppose the public convenience. A resolution requesting Mr. Holland to recommend the Home Secretary to approve of the site was then unanimously adopted.

Archæological Discovery.—An interesting discovery has just taken place at Teolothorpe, near Stamford. Whilst excavating in the grounds of Mr. Charles Ormston Eaton, the workmen came upon the foundations and other remains of an ecclesiastical building of the fourteenth century. In Blore's *Rutland*, we find it recorded that "Before the year 1300, Sir John de Oketon and Alice his wife, presented a clerk to the church of Little Casterton; but whether they were owners of the manor of Teolothorpe I have not been able to discover; it is probable, however, that John de Oketon is the same person with John de Teolothorpe, who in the year 1301 founded in Teolothorpe an hospital for seven poor men, and a chantry for the benefit of his soul." The writer adds, "all the inquiries I have made relative to the chantry of Teolothorpe have not procured for me the least information as to the site of the chapel or other places of worship, of that religious foundation."

Rotherham Hospital and Dispensary.—The foundation-stone of the proposed hospital and dispensary at Rotherham has been laid with Masonic honours by the Right Hon. Earl de Grey and Ripon, K.G., Lord President of the Council, Deputy Grand Master of England, and Provincial Grand Master of the West Riding. In the selection of a suitable design for the new building, the successful competitors were Messrs. Mallinson & Bakewell, of Leeds. The contract was let to Messrs. Askew Brothers, Parkgate, for 4,680*l*. The Tudor style of architecture has been adopted. The total length of the building will be 260 ft., and the breadth from front to back 180 ft., each department occupying a separate block, and being entirely isolated. The principle of isolation will, in fact, be extensively adopted throughout the building, while each ordinary patient will be allowed 2,000 cubic feet of space, and those of the special wards, 2,500. The total sum subscribed and promised is upwards of 6,000*l*, which will about meet the probable cost of site and buildings; but about 2,000*l*. more will be required.

Premiums for Odours.—As an encouragement to colonial flower-farmers, various premiums have been placed at the disposal of the council of the Society of Arts, for the term of seven years, by Dr. Septimus Piesse, F.R.S., including 5*l*. for one pound of Otto of Bergamot, of the value of 16*s*. or more in the London market, being the produce of plants (*Oturus bergamita*) grown in Australia, New Zealand, Natal, any of the British West India Islands, or any other British colony or dependency; 5*l*. for one ounce of Otto of Roses, of the value of 20*s*.; and 10*l*. for a canister of flavoured butter or fat, scented with any kind or sort of flower,—all the product of the same colonies.

Poor-rate Valuation Lists.—A Poor Law Board return for 603 of the unions in England and Wales shows that in April the valuation lists had been completed in all but ten of them. The amount as settled by the assessment committee, in the valuation lists last approved, of the gross estimated rental, was 95,974,617*l*. The amount of rateable value on which the contribution to the common fund was calculated at Lady-day, 1868, was 79,790,257*l*, being about four-fifths of the rateable value of the whole of England and Wales. The expenses incurred by the committees in the year 1867-68 amounted to 35,176*l*, and in 1868-69, 32,707*l*.

Earthquake-proof Churches.—A Philadelphia letter in the *Times* says:—"The people of California, since the earthquakes of 1868, have a great dread of recurring shocks. We have intelligence from San Francisco that the Roman Catholics are building there 'an earthquake-proof church.' The side walls above the basement are only 30 ft. high. At this height a row of rises, which, with the main roof, is supported independently of the walls by two rows of pillars inside of them. Both roofs are firmly bound to the pillars, and the pillars are fastened together by iron cross-beams, secured with heavy iron bolts, forming a network of great strength. The theory of the plan of construction is, that should the pillars be shaken down, the roof would be launched off outside the walls, instead of falling inside, thus giving a chance of escape from the ruins. In thus falling, the roof would be carried aside a distance of 80 ft., the length of the pillars.

The Decoration of Radford Church.—The decorative work has been proceeding under the hand of Mr. Meek, of Kingsholm, Gloucester, directed by Mr. Gambier Parry, and at the cost of Mrs. and Miss Price, who gave the organ. This decorative work is now finished. The base of the walls is chocolate, with cream colour above. The mouldings of the chancel arch, with its dog-tooth ornament, are picked out in various colours; the organ-front showing beyond the arch. There is diaper work at the east end, with the sacred monogram in gold; and the chancel shows a blue firmament, powdered with gold stars. More colour has been added, and texts have been painted around the walls and over the chancel arch and communion-table.

Memorial Tomb in Abbot's Leigh Churchyard.—In this churchyard there has just been erected a tomb in memory of the late Lady Miles, wife of Sir W. Miles, bart., of Leigh Court, and of one of their children. The design was furnished by Mr. Pope, architect; and Mr. Pavey, marble mason, Clifton, has executed the work. The tomb, as described in the *Bristol Times*, consists of a red Mansfield base, with chamfered gray plinth, surmounted with a red granite mitre ledger, with an elaborately-carved marble cross lying in relief on the ridge. At the head and foot of the tomb stand two ornamental crosses, different in character, on a red granite plinth. The whole is surrounded by a stone edging, enclosing an area of about 10 ft. by 8 ft., with a low ornamental railing.

Proposed New Corn Exchange for Doncaster.—It has long been contemplated by the town council of Doncaster to erect a new Corn Exchange adjoining the present Market Hall, and in close proximity to the Cattle and Wool Markets. The question was again mooted at a council in committee. Mr. Watkine's plans were again brought under consideration; and after considerable discussion, it was agreed that Mr. Watkins, of Lincoln, architect, be instructed to prepare estimates, in accordance with his amended plan, of the cost of the proposed new Corn Exchange and south-east wing, and submit them to the council without delay.

Presentation of a Testimonial to the Ex-Borough Surveyor of Penzance.—We observe, from the *Cornish Telegraph*, that a public recognition has been made in the town-hall of the services of Mr. John Matthews, who has lately, from ill-health, resigned the borough surveyorship of Penzance, which he had held during the space of a quarter of a century. A purse of 500 sovereigns, a massive silver salver, and a parchment bearing the best good wishes of a host of friends, were offered to him on his retirement from the more active and laborious duties of his office. The salver bears this inscription:—

"Presented to Mr. John Matthews, with a purse of 500 sovereigns, by the corporation and inhabitants of Penzance and the neighbourhood, on his retirement from the office of borough surveyor and engineer. This testimonial marks the high sense of public respect and esteem for his integrity and ability, during a period of twenty-six years, 14 January, 1870."

Destruction of a Statue about to be Cast in Bronze.—The sculptor Marcello—a pseudonym for the Duchess Colonna, the author of two busts of Marie Antoinette, and other works,—has just had a sad mishap. She had sent to Paris, from Rome, a statue to be cast in bronze by one of the best French artists. This work has arrived broken to pieces. The duchess has thus lost a year's labour.

The Treatment of Sewage with Carbon. Mr. R. Hinde, of Lancaster, writes us, pointing attention to the fact, corroborated by a reprint from the *Lancaster Guardian*, as to proceeding in 1849, that at that time he had not only proposed the treatment of sewage with carbon, but had successfully practised the process at Lancaster. Neither does Mr. Hinde claim the origination of the process, but names Mr. Jasper Rogers, and Mr. Clarke, a London manure manufacturer, as having claimed it at that time. These names, and especially that of Mr. Jasper Rogers, many of our readers will remember in this connexion. Mr. Hinde, therefore, does not understand why a process such as that described by Mr. Johnson as having been tried at Newcastle should have been patented.

Opening of Public Baths for Stroud.—The public baths just provided for Stroud by a company headed by Mr. Dickinson, M.P., are now practically open. The Turkish bath is heated on a patent principle, providing a constant supply of fresh air from without, which in passing through the warming apparatus, can be heated to any temperature up to 200 degrees. Under this principle of heating the oppression usually experienced by persons in most Turkish baths is said to be avoided. The swimming-bath is fitted with a shower in its centre, which keeps the water in continual motion. The cost of the baths is about 1,500*l*; the subscriptions from shares and donations amount to 750*l*; and there is therefore a deficiency of 750*l*.

Strike in the Building Trade in Edinburgh.—Messrs. Beattie & Sons, while building under contract the new city porchouse at Craiglockhart, were met with a demand on the part of the men for an increase of a farthing per hour in their rate of pay. The masons were then receiving 6*d*. per hour, and 6*d*. was demanded. As the Messrs. Beattie were, in terms of their contract, compelled to have the porchouse erected within a specified time, they acceded to the demand of their men. The porchouse is now finished, and a few weeks ago Messrs. Beattie intimated that they would again reduce the rate of pay to 6*d*. per hour. The men objected, and about 130 have struck work.

Society for the Encouragement of the Fine Arts.—The first *conversations* for the season was held on Thursday evening, 27th inst., in the Gallery of the Female School of Art, Queen-square, Bloomsbury. On the 10th of February Mr. Hyde Clarke will lecture on the Culture of the Fine Arts in its influence on industrial pursuits.

Wanton Mischief.—A few nights since a gang of roughs smashed the stained-glass window and otherwise damaged the edifice of Heath Church, near Leighton Buzzard. Beds: previously to this they unhinged every gate between the two places, pulled up turnips, unearthed potatoes, and threw stones into the bedroom windows of peaceful inhabitants.

Paper Houses.—The American invention for paper building material has been recently tested in Chicago, with the result, we are informed, of establishing its utility. It is said that a house, 22 ft. long, 16 ft. wide, and 14 ft. high, can be covered on the outside for less than 9 dollars; and a house 16 ft. by 22 ft., and 20 ft. high, for 20 dollars.

Columbia Market.—The twenty-four iron pillars have been erected in the centre square, and the cross-beams are already placed, and by the close of this month "the covering-in" will be completed. There will be a stand or rostrum at each of the centre pillars, for "fish auctions." The paving of the covered square will be asphalted over, and the market lighted.

Her Majesty's Board of Works.—Mr. Ferguson having resigned the office of Secretary of Works, under the Board of Works, it has been resolved to make new arrangements respecting the works and buildings in connexion with the public service. Capt. Galton, C.B., F.R.S., has been appointed to the office of Director of Works.

Art Workmanship Competition at the Society of Arts.—In response to the offer of prizes issued by the Council in 1869, 143 specimens have been received for competition in the various subjects for which the prizes have been offered. These articles will shortly be arranged for exhibition in the Society's great room.

The Royal Irish Academy, at their last meeting, according to *Nature*, approved of some alterations in the bye-laws proposed by the Council. By these alterations the Council for a future will be divided into two committees, one of science, consisting of eleven members, and one of Polite Literature and Antiquities, consisting of ten members. The Committee of Publication is to consist of four members from each of the Committees of Council.

The "Danger of Introducing" Painted Windows.—The prize for the best essay "On the Use and Abuse of Music in Public Worship, and the Danger of Introducing Painted Windows in Churches," has been awarded to the Rev. J. H. Dutton, secretary to the Lord's Day Observance Society.

The Utilization of Sewage.—This question has been again discussed at the Surveyors' Institute. A general opinion was expressed that the application of town sewage to land would ultimately be found the most advantageous way of meeting a difficulty which has so long existed.

The Subway, Westminster Bridge.—We say as well add to the information given in our paper under the heading "Works at the Houses of Parliament," that to render the subway damp-proof in every respect, it was encased in a thin coat of asphaltic.

The Greek Church, Liverpool.—Mr. Rogers has sent us copy of correspondence on the subject of the authorship of the design of a building. It shall have attention when we have particulars of the church.

The Queen's Library.—It is understood that Mr. R. Holmes, of the British Museum, will retain the appointment of librarian to the Queen, created by the death of Mr. Woodward. We leave the candidates were numerous.

St. Mary's, Mistle.—The work in marble and alabaster, and the carving in this church, were executed by Messrs. Chinnock & Co., of Norwich. The pulpit and font are well spoken of.

TENDERS.

For alterations and additions to the Baptist Chapel, Water-street, Taunton. Mr. J. H. Smith, architect :—
Applin £250 0 0
Disham & Manning 738 0 0
Giles 698 0 0

For alterations at the Duke's Head Hotel, Margate, for J. J. Sharpe. Mr. W. Lane Sear, architect :—
Bushell & Son £1,363 0 0

For building a photographic studio at Margate, for Mr. Goodman. Mr. W. Lane Sear, architect :—
Wharton £749 0 0
Bushell & Son 658 0 0
Bayer 698 0 0

For partly rebuilding the Britannia Inn at Margate, for Messrs. Cobb & Co. Mr. W. Lane Sear, architect :—
Shrubsole £998 0 0
Brown & Co. Light 949 0 0
Simmons 686 0 0
Bushell & Son (accepted) 460 0 0
Hayward 477 0 0

For erection of baths and assembly rooms, at Southsea, for the Southsea Baths and Rooms Company (limited). Messrs. Davis & Emanuel, architects :—

For Builder's Work.

Doverwood & Co.	£12,494 0 0
Bramble, Brothers	10,260 0 0
Yook	9,020 0 0
Nightingale	8,576 0 0
Stevens	9,548 0 0
Larcombe	9,238 0 0
Hurdidge	9,136 0 0
Quick	9,133 0 0
Ward	9,079 0 0
Abelson	8,850 0 0
W. R. & Co. Light	8,651 0 0
Sadders	8,469 0 0
Barnes	8,370 0 0
Neave & Fry	8,333 0 0
Nance	8,250 0 0
Smith	7,305 0 0

For Engineer's Work.

Rigg	£2,576 12 7
Phipson	2,060 12 0
Bacon & Co.	1,978 0 0
Trust	1,945 0 0
Jennings	1,725 0 0
Topham & Co.	1,649 8 8
Jones, Cotton, Stokes, & Co.	1,607 0 0
Gimion & Co.	1,423 0 0
Grant	1,028 0 0

For the erection of stabling in rear of the Adam and Eve Tavern, No. 1, Hampstead-road, Messrs. Richardson & Waghorn, architects :—
Sorvener & White (accepted) £2,059 0 0

For the erection of stabling in rear of Nos. 19 & 21, Wimpole-street, Messrs. Richardson & Waghorn, architects :—
Merritt & Ashby (accepted) £1,080 0 0

For alterations and repairs to No. 48, Portland-place. Mr. W. A. Baker, architect. Quantities by Messrs. Richardson & Waghorn :—

Howard, Brothers	£3,900 0 0
Clark & Manneoch	3,479 0 0
Kayes & Head	3,335 0 0
Simpson & Son	3,380 0 0
Phillips & Son	3,267 0 0
Edwards & Son	3,249 0 0

For alterations and repairs to No. 25, Harley-street. Mr. W. A. Baker, architect. Quantities prepared by Messrs. Richardson & Waghorn :—

Cowland	£1,416 0 0
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Steady repairs, &c., to premises at Limehouse. Mr. S. G. Foulkes, architect :—

Woodward	£290 0 0
Brown (accepted)	280 0 0

For additions to Elm Lodge, Surbiton, for Mr. C. Ostram. Messrs. T. H. Rushforth & C. L. Luck, architects. Quantities supplied by Mr. Northcroft :—

Johnson & Gilby	£1,815 3 3
Dove, Brothers	1,655 0 0
Hawood	1,654 0 0
Simpson	1,600 0 0
Gannon & Son	1,568 0 0
Higgs	1,540 0 0
Manley & Rogers	1,477 0 0
Foster	1,468 0 0

For alterations and additions to No. 1, Copthall-court, Throgmorton-street, City, for Mr. H. Solomon. Mr. B. Taberner, architect :—

Larke	£728 0 0
Whittingham	674 0 0
Crabb & Vaughan	663 0 0
Sergeant	680 0 0
Prince	680 0 0

For new cemetery at Bristol. Mr. H. Masters, architect :—

Buildings, Roads, and Boundaries.	
Davis & Son	£5,305 0 0
Diment	5,345 0 0
Storkey	5,800 0 0
Rastabrook & Son	5,629 0 0
Wilkins & Son	5,555 0 0
Baker	5,550 0 0
Kington	5,492 0 0
Bever & Son	4,998 0 0
Brown	4,799 0 0
Stevens	4,688 0 0
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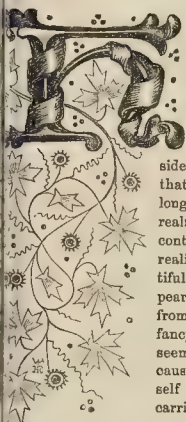
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The Builder.

VOL. XXVIII.—No. 1409.

Truth to Nature in Art.

OW can we consistently interpret,—what is meant by,—the ascription to the beautiful in art of uniform and conspicuous truthfulness to nature, considering our experience that the beautiful belongs so definitely to the realm of imagination as contrasted with that of reality, that when beautiful things do not appear to descend at once from the region of pure fancy and invention, it seems ever only because imagination herself has descended, and carries upwards what-
 ever of reality she grasps into her own supersensual realm.

The beauty of the real seems thus to depend as a glory conferred from the imaginary; and yet, on the other hand, the imagined, however wild and free its apparent range, is ever recalled to a certain, nay, to a strict, admission of the rights of reality, and at last has to find its degree of excess taken as an absolute measure of its truthfulness to nature.

There is very much indeed dependent on the slight adjustment of these relative claims and interests; their creative concert is otherwise liable to be misconceived,—misrepresented under miserable earnestness and colourable consciousness, or transformed through false deductions into destructive conflict.

It is in this manner that the exercise of imagination is most unfairly and injuriously laid down to processes that, as dogmatically enjoined, were more fully addressed to pure scientific intellect or to the blindest handicrafts. Many, the student is sometimes told with authority, is to be achieved by earnest work, by minute application; a work of beauty has to be thoroughly "thought out;" the result it is termed and promised, if these conditions are fulfilled, will be in direct, in calculable, proportion to the labour and mind employed, and being ever assumed to be at the command and subject to will.

So far as this language is held with a view to correct an over-tendency to idleness by an over-claim in the direction of industry, we may leave to correction to Aristotle's counter vindication of veracity in education in the last paragraph of the *Ethics*. Otherwise, the doctrine that insists on the duty and profit of minute conscientious copy as the primary and the ultimate, has to correct itself as gracefully as it may when confronted by its own results, and to qualify its concepts very materially thereafter. Selection, as a pupil is now told, is to be made; the best of nature is best worth copying, and regard being paid to the brevity of life, time cannot be spared for other than the best.

But again, the best effects of nature will not copy to be copied; it is often much if they will even tarry to be very minutely scrutinised: a sunset of light in a landscape, of expression in a pose, of grace in a movement, has to be caught in mid flight,—caught and retained. And so

the most scrupulous student must refer to his memory for much of the reflected image of nature that he is to copy, and the more vivid the image he recovers, the less certain will be often be how much of it is due to pure memory and how much to interference of another power,—jealous of her rights as against both memory and senses,—the power of imagination,—imagination that repudiates set copies and models, and is even chary of admitting allegiance to specific experience and observation.

These difficulties are combated with ingenuity and pertinacity no doubt in some of the arts, by posing models, building up back-grounds, regulating north lights, adjusting casts of drapery, and so forth; but whatever success may be obtained in so fixing the fleeting, it will be relatively unimportant. The best and most expressive emanations of nature defy such fetters, and the artist who puts his exclusive or chief trust in such resources, is simply restricting himself, contentedly or unawares, within limits of the moderate in beauty and the subordinate in art.

But in any case, when once the student, awakened to his privilege, or bowing to necessity, applies himself to make a selection from nature,—to pick and choose, adopt and reject,—he cannot be withheld from asserting a further extension of independence. He fairly claims to be no less true to nature,—true, indeed, in a nobler sense, if he embodies not merely what nature has done, but anything whatsoever for which her powers are competent. He is bold to combine effects which, severally, are true to nature, and of which the combination is counter to no natural law, though it may never have occurred within his observation. He places a tree in a landscape where no tree grows, but where there is no inconsistency in supposing that it might have grown. He removes a mountain in the faith that the reversal of its aspect involves no contradiction. A conversation is ascribed to two historic personages which it is certain they never did hold—though they might have held it had they chosen, and been so disposed. A series of incidents are related as occurring in close succession, and so aptly, and to such a peculiar and assorted set of people, that it would be vain to dream of justifying precedents; and yet no law of nature need be positively transgressed through the whole story. Othello, Iago, Desdemona, Emilia, Cassio, are all severally possible, but what shall we say of the chance that brought together precisely the kind of people under the precise circumstances that were requisite to draw forth such a complete exhibition of the passion of jealousy?

Even so it becomes manifest that while we are professedly restricting ourselves to what nature might do or might have done, we are taking very arbitrary liberties with her proceedings. Be our picture historical or idyllic, it will most certainly comprise objects and collocations that are at variance with matter of fact. We are true to nature,—at best with a reservation,—not literally and historically true, but true in the sense of consistency with natural laws as independent of history;—true it may, perhaps, be within the limits of probability: we may represent what is likely to have been; or what, at least, is not grossly unlikely; or, by a still larger extension of our freedom, what, however unlikely, is still within the wide range of possibility.

So it becomes clear that art in any form, and art of any value—and with this only we are concerned,—cannot be restricted to matter-of-fact nature, and, indeed, is scarcely attainable unless under certain indulgences and conventions. We have to agree,—from childhood upwards we have been accustomed to agree,—not to stickle for the matter of fact in points where actuality has no bearing of importance on the general conception that interests us. The scope of the convention required and demanded has endless variations;

it may be considered as standing at the commencement of the work. It is in the artist's mind, at least, like the signature of a musical key, and fiction is only justly denounced when grossly out of keeping in parts with the scale of probability postulated throughout, or when failure of interesting result excites indignation at abuse of an indulgence conceded in vain.

Mere degrees of divergence from the facts of nature in particular points decides nothing,—can decide nothing, when we have once agreed that art is competent to clear at a bound even the ring-fence of the possible. The laws of time and space are set aside by the best artists without hesitation. The same picture shows Abram at the foot of the hill, ascending it, and at the top; shows the Transfiguration on the summit of the mountain, and no less visibly the difficulties around the demoniac boy at the base. Racine crowds into half a day the interests and feelings of half a lifetime. Shakespeare follows a lifetime from scene to scene, from one continent to another and back again, or calls upon us to acquiesce in a lapse of days, even while a scene has remained unchanged, and the stage has never been unoccupied.

As, then, it seems in truth to be only in virtue of certain primary conventions that art becomes possible,—to an extension of these, also, does it owe its emancipation,—and by them escaping from trammels, finds the noblest sphere of its activity opened, though, doubtless, at the same time, temptations to lapse and liabilities to abuse.

Just as in a pure historical composition it is permissible to omit a multitude of details in themselves important, provided they can be correctly and satisfactorily summarised; so also in art, any natural restrictions whatever may be overlapped, provided a chief and worthy effect is worthily set forth. But the worthiness of the result must bear some proportion to the liberty taken; and it is in this result that the imperative, the indispensable truth to nature has to be looked for and realised.

And art has, therefore, a faculty and function of generalisation analogous in its way to that of science, the very ground on which Aristotle declared poetry to be more philosophical than history.

The more highly idealised the work of art, the more of the truth of nature does it concentrate, albeit the more decisive may be its breach with the limitation of ordinary nature.

Art, even in the simplest case of selection, tampers with nature for the sake of effect—tampers, that is, with the laws of probability—and does so to an extent that involves the absolutely impossible; not, however, the impossible under the conceded postulates, in virtue of which new laws of Nature are imposed and enacted.

What manner of changes are admissible, and for what end?

Enhanced force is arrogated for certain laws of Nature by deliberate reduction, if not suppression, of others.

Achilles shouts loud enough to alarm an entire army; Ulysses swims nine days and nine nights without pause or refreshment; the muscles of the Farnese Hercules receive superhuman development; the usurping Duke, in "As you like it," meets with a religious man, and straightway and suddenly retires to a cell a convertite.

Certain qualities and sets of qualities which by their coherence relatively to an end are characteristic, are enhanced—enhanced by reduction or obliteration of conflicting powers. Nature, we say, is thus elevated—is idealised. We read that Brutus, out of patriotism, ordered his own son to execution. If the fact is true, it is of heroic type; if an invention, it is ideal.

Art, whatever licence it enjoys, can still but be the minister and interpreter of nature. Nature supplies at last the entire fund of its

materials. Hence, if it transgresses and alters nature in one direction, it can only be to give greater brilliancy to her operations in others.

Hence art is bound to give the effect of naturalness to the very representation that involves such a breach with her important laws. It is bound to produce such acquiescence of result as shall conciliate our approval of the liberty, blind us to all suspicion of untruthfulness, impress us for the time with most satisfied sense of consistency, of naturalness under the assumed conditions.

Art has the function to make manifestations of Nature's laws, that under existing circumstances are impossible, appear under convention of assumed circumstances, perfectly natural, consistent, and, in fact, highly illustrative of the operation of those laws as they really exist, by exposition of their tendencies under freer relations, released from limiting coercion, favoured by every imaginable advantage.

Gulliver's travels are as full of truth to nature as Robinson Crusoe's, — a mythological fiction of Rubens as one of his Flemish landscapes, — "Midsummer Night's Dream" as "Merry Wives of Windsor."

To idealise, then, though by mere process of omission of the insignificant or the detrimental, is in effect to exaggerate, — using the word, and we must conceive this to be possible, in an inoffensive sense. Still more distinctly is this the case, of course, when magnitudes and intensities of qualities, — of gross material bulk and force, colours, &c., — or of sensitive mind, its energies and passions, — are modified, whether by reduction or increment.

For exaggeration, — the word being thus used with difficulty in a better sense, — we may substitute enhancement or emphasis, emphasis which adds force adroitly to one portion of an enunciation of which all may be alike indispensable, though due to be variously subordinated.

We come to much the same result if we approach the subject from another side.

What advantages do we gain? what, rather, do we not gain by these concessions in respect of literal nature for the sake of art?

Permanence is a chief; the artistic conventions enable us to fix for continued enjoyment the beautiful effects that in nature must needs be fleeting — transitory.

This is in itself exaggeration, extension of a quality beyond the fact of nature; it involves the first of all conventions, and is ever accepted as a matter of course.

By convention as indispensable we are enabled to achieve purity of effect, of which a condition is the unhesitating suppression of details that would distract attention from, interfere with, or counteract the beauty of the manifestations we are interested in; occasion, again, for abundant license and liberal condonations, exclusion of the incongruous, — the indifferent.

Distinctness, characteristic definition, again, so far as this is not involved in the conditions of purity, is attained by the development and elaboration of members and details to a degree and in a manner corresponding with their relation to expressiveness. Ornament has its root-hold here, and blooms and burgeons in the free atmosphere of fancy and imagination with fullest foliage and flowers exhaustless in variety.

Such are the conditions of the ideal, its relations to Nature, — source of all truth, — its own title to acceptance and admiration.

But it must not be disguised, that of the Nature which art lavishly concentrates in the most idealised work of art, there will ever — will often, at least — be much that, while manifestly expressing the uttermost truthfulness, it will not be easy to trace home to Nature. We might almost as reasonably sometimes hope to find the colour of the rose either in the ground it roots upon, or the gases it absorbs from the air around it.

The functions of imagination are very wonderful indeed. It is not merely that the mind appears to absorb the elements it works on from the world without by observation and experience, — to resolve, recast, reunite them into new forms, while they still, more or less, bear traces of their origin. Imagination does something more than help the artist, as a nurse might help a child to put together the scenes and figures of a toy theatre in new combinations. The seeds of beauty and expression seem to germinate within the mind spontaneously, — to be the almost independent outgrowth of our faculties that are part of nature as much as the external world — as, in fact, their immediate organs are

part of the external world — that are pre-arranged to harmonise with that world, even as the ear with vibrations of the same atmosphere we breathe, — that comprise susceptibilities of passions which seem sometimes not merely dormant and ready to be awakened by arrival of appropriate stimulus, but restless already, and imagining in dreams the food that is to satisfy them.

The phenomena of the exceptionally precocious exemplify the existence and nature of this power of imagination with more certainty than it can be traced in the more developed, where its operation must necessarily be occult and overlaid, if not weakened. Child actors have been known to represent with wonderful truthfulness a variety of passions that they never can have felt, — the ambitious, the enamoured, the jealous, the remorseful. Imitation and instruction are out of the question; the function of all but independent imagination in these otherwise unimportant vagaries of nature is as palpable as when Shakespeare himself divines the working of the madness of Lear or Ophelia, or the miserably-bereaved maternity of Lady Constance.

The culture, then, under which imagination most favourably brings forth its fruits seems to lean jointly, if not equally, on the spontaneous suggestions of Nature, and that sedulous study that peculiarly pertains to art. The logical and directive faculty of the mind must by no means be dormant, even when contemplation seems drinking in impressions freely ministered by Nature. The unbidden suggestions of the mind that come like strangers must have a stranger's welcome, scrutinised in some cases critically, — in others accepted as bearing on their faces the guarantees of sincerity, dignity and worth.

Thus art stretches itself beyond its first ambition to fix the fleeting beauty that it catches momentarily in nature, and seeks to purify it by elimination of intrusive elements, and to correct it by duly adjusting the balance of obtrusiveness between part and part, by enhancing or subordinating glory and glory, and so completing an ordered and harmonious whole over which the contemplating mind may range undisturbed by the incongruous, and within whose limits it may linger unoppressed by sense of checking limitation.

To take an illustration from the art of architecture, — so we are brought round to our leading interest and thought, — at its commencement it subverts one of our commonest needs, protection from weather; the mere shelter of sufficient permanence receives from art still greater strength and solidity; it is cleared progressively of inconveniences, obstructions, and superfluous material, and at last receives an elaboration of its parts into distinct members subserving and expressive of functions of enclosure, of support, or covering, base or impost, column or groin rib, and the lighter surface decoration that implies consideration for contact. So at last it submits itself to a general law of dominant order that answers to and declares an organised purpose and order within. When enrichment and ornament supervene, they come to tend appropriate, but still free and graceful, service, to veil whatever coarseness will cling to mere construction, to supply vent for the pleasurable feelings that spring up in the leisure that ensues when need alike and intelligence are satisfied. The roots of ethics and of art are very closely intertwined, lie very close together in our deepest and noblest nature, and the principle is common to both —

"Oh, reason not the need! our basest beggars
Are in the poorest thing superfluous;
Allow not Nature more than Nature needs:
Man's life is cheap as beast's."

THE MATERIALS FOR ECONOMIC DWELLING-HOUSES.

In any well-ordered attempt to lay the foundations of a general system of economic dwellings, in which cheapness shall be combined with the conditions requisite to health and comfort, one of the first considerations is that of the best materials for the main portions of the structure. Shelter is the first advantage sought for in a house. For shelter to be perfect, it must be such as to render the inmates to a great degree independent of the rapid and violent changes to which our climate is exposed. Roof, walls, and floor should be not only so constructed as to resist the fury of the winds, the down-pour, or drift of rain or sleet, the exudation of perco-

lating water, but further to keep out the extreme cold of winter, and the excessive heat of summer. Very different, although not inconsistent, properties are therefore requisite in the materials in question. That they should be non-absorbent is of the first importance. But there are natural substances highly valuable for their non-absorbent qualities, such as slate, which afford little protection against great variations of temperature. Other materials, which have long been regarded with favour as good non-conductors of heat, are objectionable from their absorbent qualities. And in this respect it must be borne in mind that there are two sorts of absorption, the first of which, indeed, is hostile to comfort, as well as to health; while the second, less obnoxious to the senses, is far more pernicious, and even fatal, to the inhabitant. We refer to the absorption and re-emission of damp, and the absorption and re-emission of miasma, or the effluvia and seeds of disease.

The power of materials to resist the percolation of damp requires to be tested by experiment. The large Government smithery in Pembroke Dockyard was built of very excellent rubble work, consisting of limestone from the local bed, as hard as granite, and Atherhaw (hydraulic) mortar. The walls were 3 ft. thick. But when the rain-bearing west wind, so prevalent in that part of Wales, set in with fury, water ran down on the inside of these walls, as if they had been actually porous. It was probably the case that the limestone parted with the water which it held, by a sort of endosmosis, towards the dryer air within, supplying its place from the copious store of wet without. However this might be, the effect, when the building was new, was as if the rain had actually beaten through the wall.

Those who visit the common crowded dwellings of the wage class in our towns, even when they are unoccupied, are aware that the walls have a peculiar depressing, musty, or fetid smell. On visits after severe epidemic attacks, in some of these dwellings a peculiarly offensive smell has been perceived, and on inquiry what that could possibly be from, the answer has been that it was the "dead man's smell," the dead body had been too long kept near the wall in a state of decomposition, before it could be removed for interment, and the fætor adhered to the wall. Fever is propagated with unerring certainty by uncleaned, absorbent walls. The French writers on sanitary subjects lay unusual stress on the absorption of damp and on *mephitis*. All emanations of the body, even when acute disease is absent, attach themselves to walls, as well as to clothes, and more particularly to walls of porous stone. M. Devey, in his work on "Hygiene de Famille," states that ventilation has comparatively little effect on the *mephitis* of walls. Disinfecting vapours may purify the atmosphere; but they fail to remove the infection imbibed by the walls. No satisfactory analysis has hitherto been made of this mephitis affection of a dwelling-house; but M. Devey declares that "it is certain that there exists, according to the energetic and picturesque expression of Moses, the plague of leprosy in a house." The minute detail traced with such unerring precision 3,400 years ago, might be placed even here with advantage in the hands of our sanitary inspectors. "If the plague be in the walls of a house with hollow strakes, greenish or reddish, which in sight are lower than the wall," the house was to be closed for seven days. If, at the expiration of that time the distemper had spread, the carious stones were to be removed, the house was to be "scraped within round about," and so to be plastered with fresh mortar. If the menacing symptom again appeared, the house was to be demolished, and the materials removed from the City "to an unclean place." If the cleansing stopped the distemper, the house was to be fumigated with burnt cedar before it was again inhabited.

Diseases of all, or, at all events, of very various kinds, are apt to cast seed, and to take root, in absorbent walls. When the cleansing of hospital walls, in this country, has been too long delayed, there are several instances known, in which every workman who was engaged in the operation was taken ill. Doctor Sainte Marie states, that he attended a patient who died of gangrene. Two years afterwards he attended another patient in the same place, and perceived the peculiar odour of gangrene, which is unmistakable. At Lyons puerperal fever broke out in a hospital. Fifteen or sixteen women fell victims within a few days. The ward was emptied, and the plaster was removed. The fetid odour that escaped during the process was

more than that of the dissecting-room. When a ward was restored to a proper state, the epidemic disappeared. Fever, cancer, gangrene, &c. Infertile maladies, are propagated by infected walls. In large towns, especially in ancient quarters, mephitism has become endemic, and its presence may be recognised by any one. Walls of lath and plaster, especially when papered, are eminently liable to this dangerous mode of infection. In the model dwellings of Miss Burdett Coutts, Mr. Peabody, and some others, the walls have been left without either paper or plaster, in order to be lime-washed twice a year. These bare brick walls, presenting certainly an unpicturesque surface as any on which the eye can rest, are greatly disliked by the inhabitants. The English working classes especially abhor that invasion of their freedom, which not only finishes their dwelling-rooms in a manner appropriate to a coach-house or stable of a humble character, but further insists on poking into their privacy every three or four months, the unskipped visitor being followed by a man with a brush and a pot of whitewash. The aboriginal Celtic pigmy, if it verified the proud boast of the orator, "the King of England cannot enter it," would be preferred by nine working men out of ten, to a healthy but,—to their views,—humiliating, squalid, kept obtrusively clean and white. It is of little use for us to attempt, on the one hand, to initiate and to cultivate æsthetic perceptions among the rising generation of our industrial classes, while on the other hand we strive to house them in bare barracks, and insist on the unsightly. We must ascertain what is demanded for health, and we must then turn our attention to combine, with the fulfilment of that first requisite, something that will be consistent with good taste, and even with simple elegance. The first requisite will be attained by a surface that is non-absorbent and washable. There can be no good reason why such a surface should be offensive to the eye.

For the purpose of rendering walls bad conductors of heat, and thus of enhancing the comfort, protecting the health, and diminishing (in winter) the quantity of fuel consumed, the use of hollow bricks, jointed tiles, or walls so constructed as to include a film of air between the interior and the exterior of the dwelling, have advantages if proper execution can be assured. But ordinary bricks are extremely absorbent. A single brick will absorb as much as a pint of water. Sandstone, such as is often used for building purposes, may contain half a gallon of water in a cubic foot, and Professor Ansted states that even dry granite contains as much as a pint and half of water in a cubic foot. In porous walls wet ascends from the foundations by capillary attraction. If the cleanliness for which the Dutch housewives are so famous be insisted on, and if the face of these walls be subjected to the copious and frequent ablutions which are required to prevent mephitic infection, especially in crowded localities, we are thus at the same time sowing broadcast the seeds of rheumatism and other diseases that are aggravated by damp.

The remedy that should be sought is twofold. We require impervious bricks and impervious cement. We require to free our building industry from the tyranny of the brick-makers. Our ordinary stock bricks are, in this present year of grace 1870, probably the worst in the world. They are such as no engineer or architect, worthy of the title, would have allowed to be delivered upon any works under his direction five-and-twenty years ago. We can trace an incredible deterioration in this respect within the limits of our own personal experience. We are certain that if a single load of such bricks as formed the main portion of one of the largest works completed in London during the past year, had been delivered, say upon the works of the London and Birmingham Railway in 1835, or of the Great Western Railway a few years later, they would not only have been instantly removed by the orders of the engineer, at the expense of the contractors, but the latter would have become very unpleasantly aware of the light in which any attempt to use such shapeless lumps would have been dealt with by Mr. Stephenson or Mr. Brunel. Not that the question in question were unimportant. They were bad enough, in all conscience; but their utter shapelessness was such as to unfit them for any properly construed work. "They are such as every one makes now," said the clerk of the works.

The truth is, that we are very far from realising how far one of the most important branches of industry in the United Kingdom is regulated by the blind obstinacy of those mem-

bers of the craft who do not rise to the rank of journeymen, or even of apprentices. If any man familiar with the working classes were asked to point out the class of men who had most reason to be discontented with their present condition, most to hope for from anything that should raise their daily occupation by the education of skill, or by the aid of machinery, and who ought, therefore, to be most anxious for change, he would probably name the moulders of bricks. The labour of the brick-moulder would seem to be that which, of all others, is the most onerous and painful to the labourer. The work is very hard. The exertion of muscular strength required for dashing each lump of clay into the mould is considerable. It has to be repeated, with unremitting frequency, during the entire day, varied only by other mechanical movements, each of which is performed with hurried rapidity. The position of the work-shed,—shop it cannot be called,—is almost invariably damp, low, dispiriting, and unhealthy. The workman is exposed to the inclemency and caprice of the weather, when he is able to work, and is further exposed to long periods of enforced idleness, when the season is not such as to permit of the prosecution of any of the series of processes which are carried on in the open air. The person and attire of the moulder is normally in the most filthy state, plastered with clay, in all stages of dampness, from the fresh spirt of the mintage, to the dried clot of which it is impossible to ascertain the unbrushed antiquity. Yet it is precisely these men who have resisted, with a savage ferocity to which the annals of labour show few parallels, every attempt to perform the sheer brutal labour, from which one would think they would so rejoice to be set free, by mechanical aid. There can be no doubt, in the mind of any competent judge, that good bricks could be more rapidly and more cheaply made by machinery than bad bricks are now made by hand. There can be no doubt that the welfare of all those who now take part in the labour of brickmaking would be served by the introduction of machinery. The manufacture would occupy a higher place in the social scale, production would receive an impetus, and decent labourers, who sheltered workplaces, would in a very little time take the place of the mud-stained savages of our existing brick-fields. Yet it is in defence of this wretched state of slavery,—a state which in old times was enforced by stripes and blows on the members of a subjugated race,—that our brick-moulders put needles in the clay, and resist improvement by threats, and not vain threats, of murder.

Not only the bricklayer, but the whole industry of the builder, suffers from this obstinate resolve of the brickmaker. Nothing, at this moment, has so powerful an influence in producing the discomfort of the houses of our labouring classes as the cost and bad quality of bricks. The better and more expensive class of bricks are, so far as our information extends, becoming yearly more rare, more dear, and less satisfactory. There are exceptions to this censure; but it must be remembered that the utilisation of the best beds of plastic clay, such as we find in Dorsetshire, in Devonshire, in Cornwall, at Belleek in Ireland, and in other places, is checked to a great extent by the expense of land carriage. Birmingham, Manchester, London itself, are the great consumers, and it is for these ever open markets that stiff clay and breeze are hurried into those shapeless, colourless, absorbent lumps that we now call bricks.

Some of the manufacturers of this country have turned patient and enlightened attention to the improvement of the manufacture of earthenware for building purposes. The State, or at least the Legislature of this country, was for a long period the most oppressive and most formidable enemy to anything like sanitary, economical, æsthetic architecture. It compelled those who built for the poor man to keep him in unwholesome darkness in order to avoid the window tax; and it prevented any improvement in bricks, by the constant watch of the excise-man. Happily these stigmas to the civilisation of the nineteenth century no longer disgrace our statute-book. But it is more easy to commit an injury than to repair it. And although, for purely ornamental purposes, as well as for the manufacture of tiles, chimney pots, and other articles of building earthenware entirely beyond the power of the ordinary moulder to fabricate ever so roughly, we find that manufactures deserving very respectful mention have been established, yet in the grand industry of brickmaking proper reform is still successfully impeded.

Health, beauty, and durability are no trifles. They are impossible in a low-priced house, built of our present ordinary bricks. They would be normal in a well-designed small house, built of such well-formed, well-burned, well-arranged *tesserae* as a very little effort would produce.

The abolition of the excise leaves us no excuse for a rigid adherence to the old legal form of brick, 9 in. by 4½ in., by 3 in., or as near thereto as the different shrinkage of every possible character of clay allows them to issue from the kiln. Our masters in building and our teachers in brickmaking used bricks of a far different form, approaching more nearly to what we call tiles. But the Romans, whether it were for engineering or for artistic reasons, were not in the habit of building lofty walls of one material or of one bond. We find brick courses interposed in rubble walls, that have defied the lapse of eighteen and of five-and-twenty centuries; and in cases where the want of stone was felt, and brick was resorted to as the sole material, we find interposed layers of *opus lateritium*, or coursed work, composed of a sort of tiles, from ½ in. to 1½ in. thick, and of *opus reticulatum*, or network, in which the depth and the width of each brick are equal, and the angles are placed vertically.

In interior walls, and indeed for surfaces exposed to the weather, one end and one side of the bricks should be covered with a vitreous glaze. By using good cement the question of absorption would thus at once be set at rest. Walls might be washed within, and raised upon without, and yet absorb no more damp than a window. Nor need ornamentation be neglected. We have long been familiar with Dutch tiles. We have at South Kensington a few specimens of Moorish, Persian, and other Oriental wall tiles, in which a considerable amount of artistic beauty is combined with impermeability. In the Royal Palace of Cintra is an apartment entirely lined with tiles, a room which, by turning a handle, may be converted into a sort of shower-bath. But in all cases where a flat casing is built edgewise as the lining of a wall, a double expense is incurred, or stability is endangered.

The 3-in. bricks might readily be so ornamented as to form part of a design. This is done with encaustic tiles; it has been done, on a very large scale, by the Della Robbia family, with their enamelled and moulded pottery.

But we possess, in the command of liquid fuel and of gas, a power far beyond the wildest dreams of Andrea della Robbia or of Bernard Palissy. The chief difficulty with those early makers of enamelled earthenware was in the furnace. Every piece of majolica (enamelled ware) had to be fired twice. The management of the fire was a matter demanding the nicest care, and the more so because different degrees of heat affected various substances used as pigments in a different manner. But we have records of past experience. We have the history of the earliest manufacture of enamelled earthenware (an interesting Italian autograph volume, by Picciolpasso, is in the Art Library), and we have the experience of the work of the present century. It is possible to compound a glaze that shall be fusible at a given heat. It is not, therefore, easy to say why this glaze should not be applied to a wall, *in situ*, and glazed by the application of a large salamander, or iron plate, kept at a red heat by gas.

By this method we might supply a great want of this country—the means of wall decoration, that should be at once graceful and permanent, and that should depend for its beauty rather on the touch of a real artist than upon extraordinary outlay. Fresco seems to be denied to us. A few years thence our more ambitious attempts into hideous grimaces. Water-glass weeps itself away. But if, on a surface which renders necessary, by its state when painted on, that breadth of handling and freedom of touch which we see brought to their fullest perfection in the large articles of majolica of Urbino or of Castel Durante, we employ the skill of the artists whom we are commencing to train, and then cover the work with an impervious glaze, by the steady and perfectly-regulated heat applied by the salamander, we shall have solved one of the great difficulties of the builder's art. We shall have invented a novel method of wall decoration, suitable to the climate, of perfect sanitary value, imperishable under ordinary usage, and calculated to awaken in our artists precisely those broad and noble characteristics which the impossibility of fresco work in England has done so much to banish even from our easel pictures. Majolica, even on domestic utensils,

supplies us with examples of what is most striking in Italian art for breadth and boldness of handling. What would Raffaele not have given for the power to paint a panel in majolica! A salamander, heated with gas, places that process within the reach of art.

PUBLIC MORTUARIES FOR LARGE TOWNS.

At a recent meeting of the Royal Institute of British Architects, a paper on Public Mortuaries, so called, was read by Dr. Hardwicke, part of which we may usefully print to carry on the subject long treated of in these pages. The *Builder* has been in advance of the public on this matter, and it is perhaps not too much to say that the descriptions we have printed at different times, of the effects produced by the want of a suitable place to deposit a body before burial, and the views we published, showing from actual observation the rooms of the poor when a death takes place in the family,—the dead among the living,—have had something to do in bringing about the present state of public opinion in favour of providing such places of reception. We take that part of the paper which refers to the sort of building that should be erected:—

"We now arrive at this point—what should be the essential features of a public mortuary, and what the kind of building best adapted for it?"

In any plan that may be proposed, two distinct apartments must be provided.

First. The place for the reception of bodies *received* and brought in, when found dead by the police, or by the coroner's officer or constable, or by the relieving officer; bodies having to await identification, or a coroner's inquest; here also would be to be deposited bodies removed by order of the coroner, or of a medical man, for the purpose of *post mortem* examinations; or of persons having died from a dangerous contagious malady, and rendering immediate removal necessary. This would be the death-house proper. It ought to have fittings for *post mortem* examinations, plenty of light from above, good ventilation, a supply of water, and of deodorising and disinfecting agents, a marble or slate slab with sloping inclination towards the middle, and a fall for drainage into a pail or a trapped sink. On two sides of the room marble slabs, 2 ft. wide at least, ought to be placed for bodies to lie on. Here bodies may have to await the undertaker to place them in shells or coffins, and afterwards to remove them to the mortuary. Spare shells or coffins should be at hand on a shelf for any sudden emergency.

Second. The mortuary proper should be a large building capable of receiving ten or twelve bodies in shells or coffins, to be placed on trestles or a centre slab (to be regulated by the requirements of the town where situated), here to await interment. In Clerkenwell, iron moveable brackets are used for coffins to be placed upon, and when not in use they fall back. Catacombs, or cells in slate or brickwork may be proposed, if desirable, and the body might be closed and locked up until removal. The relatives would come here to inspect the coffins, and the funeral might start from the place.

This building must have some pretensions to ecclesiastical and ornamental architecture both externally and internally, and any attempt to associate it with the idea of its management being concerned with the parish or with poor relief ought to be most strenuously avoided. I am not aware that any plans have as yet been offered on approval better than those furnished to illustrate my remarks.

This most important point connected with public mortuaries must not be forgotten, viz., the removal of the idea that the institution is a parish dead-house; otherwise respectable persons will not be persuaded to allow their deceased relatives to be removed to it. When that is accomplished, and persons have a conviction that an air of sanctity and security is maintained, the first difficulty in overcoming any prejudices against public mortuaries will be removed.

The object will be gained by attention to two things:—

First. The efficient management by a competent sexton.

A public mortuary should be provided with a resident attendant, whose duty should be at all times to receive under his charge bodies brought to him by the police, or by the coroner's constable, or by order from a duly qualified medical man; and that the bodies of persons brought by

relatives or friends, who guarantee the expenses of interment and removal under fixed rules, be signed by them; also that he receive the bodies of persons found dead and who are unknown. The attendant should be responsible for the proper cleansing, disinfecting, and ventilating the rooms generally, and particularly that used for *post mortem* examinations.

He should be required to keep a mortuary register, in which should be entered the name and other particulars of persons brought in, the names and conditions of the persons who are responsible for the removal and for the expenses of the interment of the body deposited; and that a register be kept of the house and place of removal, and of the manner in which the removal has been effected.

He should be also required to give notice at the police station, or to the coroner's constable, when a body has been admitted which is unknown, as well as to the parish authorities and undertaker, and contractor for the burial of the bodies not claimed or known, and also to the persons who have to remove or bury after a coroner's inquest or otherwise. The public should have free access at certain hours either to visit or view the bodies of the persons deposited, or for the identification of bodies found dead and unknown. (In the plans submitted herewith most of them provided accommodation for coroner and jury, as well as a *post-mortem* room.) In certain hospitals, lunatic asylums, and many London parishes, the custom of a coroner and jury going to a public-house to hold an inquest is rendered unnecessary for a suitable room is provided by the authorities, and a degree of dignity is thus attached to the proceedings, which it is almost hopeless to expect to be the case amidst the din and bustle of a tavern. The Middlesex and University College Hospitals, the Royal Free Hospital, Gray's-inn-road, and the Marylebone and Holborn Boards of Guardians, may be mentioned as instances where the inquests are permitted to be held in a board-room.

Secondly. The choice of a situation is of importance.

In the metropolis and in most large towns a very general approval will be given, that the best site is that of a closed burying-ground or old churchyard. These are generally in central situations, and a less objectionable site could scarcely be named. In the parish of Marylebone a faculty has been obtained, enabling the vestry to construct a mortuary in a disused burying-ground, and after an inspection of the plans the rector, the Rev. C. I. P. Eyre, though at first opposed to the proposal, was so much struck with the proposed improvement, that he has given his cordial adhesion to it. The Marylebone structure is very simple, but I am afraid not altogether adapted for its purpose.

It would be also much in keeping with these unused burying-grounds if the walks were well attended to, if they were tastefully planted with evergreens and ornamental gardening, and in shady places seats might be placed for the accommodation of persons who would be glad of a retired and quiet place within easy distance of their dwellings. The residence of the keeper might be at a lodge in the entrance, or as near as possible to the mortuary itself. The cost of these buildings and the mode of raising funds for their erection and maintenance ought not to present any great difficulties with municipal authorities.

The law gives authority to Local Boards of Health, and the Burial Acts have likewise power to levy and appropriate funds for the purpose here indicated.* The estimate for the building or site will of course vary according to the special circumstances of each case, but from the experience of what has been done already it may be stated that an outlay of from 300l. to 1,000l. would be the amount likely to be required. Mr. Hutchinson, the Mayor of Liverpool, gave 1,000l. for the erection of a public mortuary.

In connection with this subject it may be mentioned that a hand-bearer or fever ambulance might be kept in a shed attached to the mortuary; thus the difficulty now experienced as to where to keep those vehicles, owing to their objectionable character, would also be avoided. Disinfectants might be stored or kept here, and the person in charge should be required to possess a knowledge of Stenhouse's method of using dry charcoal for deodorisation, or other means for making the room and coffins fit for view by those who have to enter, and thus the mortuary

would do away with the annoyance and disgust now existing amongst jurymen and others in having to visit the parish dead-house in pursuance of their public duty.

A plan and section for an inexpensive kind of mortuary will be found in our volume for 1867.* It would be desirable, however, to make the building somewhat more dignified and impressive to aid in removing prejudices against its use which still exist. The term "mortuary," to which we took a certain amount of objection in earlier days, has not yet been superseded by a better name. "The Grave House" occurs to us as a substitute, but we are not quite satisfied with it. One objection to "mortuary" is that the word already exists in the language with an entirely different meaning. A mortuary in law is a gift due to and claimed by the minister in many parishes on the death of a parishioner. The meaning of the word, however, in its new application would soon become generally known, and indeed it is already so widely adopted that probably we cannot do better than retain it. So that we get the thing, we will not quarrel about the word.

THE LIVERPOOL CHAPEL ACCIDENT.

INGRESS AND EGRESS.

The recent melancholy accident at a Roman Catholic chapel in Liverpool, in which seventeen persons lost their lives through being crushed among a panic-stricken crowd fighting for escape at the door, is one more proof of the importance, — say rather, the absolute necessity, — of providing adequate means of egress from all buildings intended to accommodate a large concourse of persons; and this, not only with regard to the mere width of the doorways, but with regard also to their situation with reference to each other and to the building, and the means of approach to them from within. Looking at the spot on which the accident happened, it is difficult to say how it could have been better contrived to produce the fatal result which it did, given the circumstance of a panic taking place among those present. At the north-west corner of the chapel a wooden framed partition shuts off a flight of eight steps, between 5 ft. and 6 ft. wide, leading down (at right angles to the length of the building) to a narrow landing. The door at the top of the steps is about 5 ft. wide, the street-door at the bottom only about 4 ft. — a palpable mistake, as the difference in width, if any, should be the other way. On the left of the landing (coming out of the chapel), close to the street-door, opens another door, 2 ft. 10 in. wide, admitting the coopers of the school-room from below on to a landing, already rather small, if it were for the use of the chapel only, to pass out through the same street-door as is provided for those coming down from the chapel. The result of a panic will be at once perceived: a crowd would be precipitated through the wide door at the top of the steps down on to the landing, there to find a second column fighting its way up through the door on the left of the landing. There are other doors from the chapel, but these open into a passage at the east end, involving a turn at a right angle to get to the street-door at the end of the passage, and the door at the west end was probably that most used by the congregation, and to which the majority of them would naturally turn.† This inner door at the top of the steps, before referred to, is a single wide door, opening back against the wall inwards, which is a bad principle for a door in such a position; for if a crowd got up to such a door from within whilst it was still closed, it would be almost impossible to open it at all. With regard to the recent accident, it would have been better could it not have been opened, as the crowd would then have been divided; but, as a rule, all internal doors in such a position should be hung folding, and to open either way. How to deal with the outer door is a more difficult question; but it appears to us that sliding doors might be much more largely used than they are. They would look better, and be more out of the way on ordinary occasions than a heavy hinged door, and in case of a sudden rush outwards there would be no danger of the passage being blocked by pressure against the door.

The moral which this accident teaches, with

* Vol. xiv., p. 424.

† We did not find the large doors, opening outwards, mentioned in our paragraph last week: our informant must have been misled.

* Burial Acts, 15 & 16 Vic., cap. 85, sec. 41, 42.

regard to provision of exit from buildings, however, is two-fold—1st, never to turn two streams of people through one door, but to provide always separate means of exit from galleries above or from a room below; and 2nd, not to rely on extra doors to be used only in case of a sudden rush. A congregation in a panic means a congregation of people who have temporarily lost their head, their judgment, and their recollection: they will infallibly make for the most usual exit to which habit has accustomed them, and therefore the care of the architect must be to provide that the usual means of exit shall be sufficient for exceptional cases, and that doors shall be easily reached without going through a tortuous and angular course to get at them; and, moreover, that always the series of doors to be traversed should widen as the street is approached, so that the crowd may not be sent in numbers through a wide inner door to find themselves blocked by a narrow external one.

Coming away from our visit to the scene of the accident, we observed in the neighbourhood another building advancing towards completion, St. Stephen's Church and Schools, which also consists of a church over and school-room below; and here again the steps from the church are brought down into the same porch which gives egress from the school-room, landing close to the door of the latter. The doors are wider and better placed than in the chapel in Grosvenor-street, but if the school-room and church should ever be used at the same time, a repetition of the Grosvenor-street calamity, not perhaps in so aggravated a form, might still be possible; not to speak of the every-day inconvenience attendant on such a plan.

In speaking on the subject of panics, it is impossible to avoid a comment on the insane folly and absurdity (to give it no worse a name) of persons who make it their business to raise the cry of "Fire!" in a building at every small disturbance, even such as the unexpected flare-up of a gas-jet. It has not been discovered with whom in this case the fatal cry originated; we more than suspect that, if not in this, at all events in some similar cases, it has been raised from mere wantonness, and in a spirit of mischief—a proceeding which amounts to criminality; and even if otherwise, the practice exhibits a degree of folly which, for the sake of the public, ought to be treated as if it were criminal. If it were understood that a summary application of Lynch law would be visited at once on the head of every man calling out "Fire!" in the midst of a crowded assembly, we should be saved a good many of such disastrous occurrences as that on which we have been commenting. In the meantime let sensible people remember that when a panic occurs in a crowded building, from whatever cause, in nine cases out of twenty the safest thing they can do is to sit perfectly still.

THE GREEK CHURCH AT LIVERPOOL.

THE erection of a large church, reproducing, almost in its integrity, a style so exceptional in itself, and so far removed from us geographically and chronologically, as the Byzantine, is an event of some architectural interest. In this case, indeed, archaeology is predominant in a special degree; as the new church for the Greek community in Liverpool is not merely based in general design on the Byzantine style, but is, with but slight variations, an actual and premeditated copy of one particular example, viz., the church of the *Theotokos* at Constantinople, figured in the "Handbook of Architecture," by Mr. Fergusson, whose laudation of the design as a complete model of Byzantine architecture has been, if we are not misinformed, the chief ground for its adoption and imitation in the present case. Those of our readers, therefore, who like to turn to page 956 of the "Handbook" will have at once a general idea of the building we are commenting upon. The principal differences are, that the new church is more than half as large again as its original, and the plan has been simplified by the omission of the inner narthex, or rather by throwing this into the church; and in the west elevation the lower windows have been divided and spaced, so as to coincide in their centres with the large semicircular windows above, which is a manifest improvement. At the east end the smaller apses are externally marked in the manner peculiar to the style, by a sinking in the wall at each side, arched over above so as to cause the outline of the apse to

die away into the main wall-plane. The central apse has a series of narrow windows with the corrupt quasi-classic columns and capitals which students of Byzantine architecture are familiar; the round-arched window-heads above being stilted so as to bring the springing of the arch about twice or three times the diameter of the window above the cap of the column; an ugly and disproportioned feature to which no considerations of archaeology can reconcile us. The building has, like its prototype, four domes; the principal one over the crossing in the centre of the church, and three smaller ones over the centre, and each extremity of the narthex; the varied outline of these domes in the original building has been faithfully preserved in the copy. The main portion of the church is very solidly and well built in red brick, alternated with courses of light-coloured stone, on a rusticated and slightly battered base of similar stone. The whole of this brickwork and masonry is very well executed; the working of the archivolt of the niches (semicircular on plan), on the south and north sides, with alternate voussoirs of stone and brick, is a very neat piece of workmanship. The heavy granite shafts to the windows on the west front, and the deep reveal behind them, combine to give an expression of architectural dignity and solidity to this portion of the building. Internally, the effect is disappointing. The dome rising in the centre of the area, and the cylindrical vault carried on marble columns, with no timber construction visible to mar the unity of expression, seem to furnish a basis of a fine and truly architectural effect. But the life of Byzantine architecture lies so much in coloured decoration internally, that the sight of a blank expanse of plaster on wall and roof (intended, we presume, to be ultimately decorated in colour) strikes the eye as singularly cold and uninteresting in appearance; and the general bare, white appearance of the whole is not even broken by the columns, which are of white veined Carrara marble, with capitals of the same, the small amount of differently-tinted marble in the plinth and base being nearly lost sight of amid the furniture of the church. Whenever the church is coloured internally, we doubt whether these same white columns will not have a bad effect in another way, as contrasting too hardly with the decoration, unless the latter is of a far more delicate and low scale of colour than Oriental taste in general affects. In short, we incline to think that supporting columns of white marble, on a large scale, are an expensive mistake with regard to architectural effect. In strong contrast to the white walls is a coloured-glass border round each of the windows, in strong, harsh colours, and in a commonplace type of design, which ought never to have been admitted into the building. Across the east side of the transept stretches the usual *iconostasis*, or frame for the sacred paintings. This is of oak and walnut, elaborately carved, and apparently, as well as the other woodwork of the church, a very good specimen of the joiner's craft and the carver's art; but as we could obtain no permission to inspect the church, except during service-time, and even then did not contrive to effect an entrance without some opposition on the part of "a doorkeeper" in this "house of the Lord" (not after the model of David), our investigations were somewhat circumscribed, and we can only speak generally on this head. The carving of the capitals of the main columns, as well as the ornament on the architrave and capitals adjoining the west entrance, is all in the flat incised style proper to Byzantine architecture, and is mostly admirable both in design and execution. The three domes over the narthex do not come prominently into the internal composition; the centre one lights the women's gallery, which is over the narthex and projecting a little into the church; the dome on the south lights a staircase to this gallery, and that on the north a room for meeting in connexion with the church. The whole of the vaulting is, we understand, of 14-in. brickwork, with wooden roofing on the exterior.

Looking at this church as a specimen of Byzantine architecture let down into a Northern climate and in the midst of a modern town, it is impossible to feel that the experiment, so far at least as external architectural effect is concerned, is a satisfactory one, or one which we should wish to see repeated. Unquestionably the style is a fine one for internal effect, which, however, for the reasons given above, has not in this instance been fully realised as yet. But when Mr. Fergusson says, speaking of the

original building, that "there is nothing here that could not be practised on a larger scale, and that would not be improved by being so used," we must say that on the contemplation of an actual example (with some improvements) on a larger scale, we feel inclined to differ from him. The peculiar form of dome, springing apparently from a series of light semicircular external arches, must become unsatisfactory, because not giving the appearance of constructive stability, as the scale is enlarged; and in looking even at the moderate-sized cupolas of the Liverpool church, one feels the wish for an assurance that they are adequately tied at the springing. Then the picturesqueness of effect which such a grouping and outline would have on a small scale, becomes when enlarged somewhat *bizarro* and barbaric in appearance; and as the centre dome is not sufficiently large and important by comparison to dominate the others and give unity to the composition, the whole assumes a somewhat scattered and purposeless expression; and, when viewed from the west end, the predominance of the narthex, with its three domes stretching across the front, quite eclipses the rest of the composition, reducing what should be the prominent feature to a secondary position, and exaggerating the shortness and squareness of the plan. Then again, whatever scope for effect there is in an interior of this description, lighted almost entirely from above, there is surely no known case in which ritualistic requirements have interfered more wofully with architectural effect than in the placing of the high *iconostasis* as a screen right across the building, shutting out the termination of the vista, and interposing a horizontal bar across the perspective. The organ-screens, complained of in our English cathedrals, are a trifle to this.

Placed in a modern English town, a building like this appears, externally at least, very much of an architectural deformity; only consistent in that it represents alike the past and present of a Church which (if we may take Dean Stanley's authority) is even more conservative than her rival seated (at present) somewhat uncomfortably on the Seven Hills.

To what architect the credit of the church is due is, as Falstaff says, "a question to be asked," as there are two Richmonds in the field; Mr. Sumner having been understood till recently to be the architect, and Messrs. W. & J. Hay having claimed the merit of making the original plans. Perhaps some of our readers will concur in thinking that the spectacle of two clever English architects of the nineteenth century disputing the credit of a building which is admitted to be a mere reproduction of an Oriental work of the tenth century, is somewhat singular. It is not our intention to take up the cudgels for either side; but we may observe that while no one who is acquainted with the other buildings by Mr. Sumner in the neighbourhood will suppose that he has any need to peruse details from any other architect, it does appear on the face of Messrs. Hay's letter that they originated the suggestion of adopting the *Theotokos* church, and had made plans for the purpose, which their client had in his possession for some months after he had, for whatever reason, declined their further assistance, and called in Mr. Sumner to his aid; and under these circumstances, it seems natural they should think that their name ought to have been mentioned. A further complication is that the client aforesaid, a leading member of the Greek congregation, put forth his claim also, in a letter which did not argue much for his acquaintance with the subject, to the whole credit of the originating and carrying out of the scheme. On this point we will merely say that most architects of any professional experience will have had the opportunity of knowing on what kind of grounds such claims are sometimes set up by clients, and what degree of credit need be given to them.

Iron Casements and Frames.—In the new building for the society of the Inner Temple, of which we gave illustrations and particulars quite recently, the patent wrought-iron water-tight casements and frames made by Messrs. Burt & Potts are used somewhat largely, and the makers naturally enough wish this to be known. We have lately met with Messrs. Burt & Potts' casements in several buildings, and find they keep a good character for excluding wet and wind. They are strong without being heavy in appearance.

A DAY AT DORKING.

What's to be seen at Dorking? Not much that would prove very interesting to the antiquary hunter, or even the geologist. The botanist might pick up a few trifles on the hills and lowlands, and the artist would surely find a dilapidated cottage and a stricken tree by its mill-stream for his "study from nature." But though Dorking is destitute of any important historical interest to-day, yet it presents a fresh field for the operation of the philanthropist and the social and sanitary reformer. In fact, Dorking is a die-away place, with a mildew upon it. If ever a town got the rheumatism, and presented an aching appearance in its body, limbs, and joints, that town is Dorking. There are towns uglier, dirtier, and more pretensions, but few of its size possessing less animation or public spirit. The worthy townsmen and shopkeepers, small blame to them, think their native place the paragon of fashion and the very pink of perfection; and, conscious as they are that they have beaten the world in poultry, they are quite indifferent as to what the outer world may say of their town. Pah! Cambridge might gabble about its geese, Norfolk boast of its turkeys, Aylesbury vaunt of its ducks, but Dorking is, *par excellence*, the cock-of-the-walk for roosters! The Dorking folk need only to remind their critics of what they did at the Crystal Palace a short time since, and so silence them.

But to the point. Dorking, as reached from the South-Eastern Railway Station, is very badly accommodated; in fact, both lines do not come much nearer than half a mile to the centre of the town, and the approaches from the railway station are not the most pleasant, either for the visitor or the inhabitant, particularly at night-time. Why such a stupid arrangement was carried out, originally we know not; but the fact is apparent that a remedy will have to be, sooner or later, applied, for the town undoubtedly suffers in business on this account. In passing up the High-street,—the main thoroughfare of the town,—it struck us that, by removing two or three of the old structures in the centre of the street, on the right, a new road could be carried over the mill-stream to the railway, which would greatly facilitate the ingress and egress to and from the town. Nothing could be more awkward and disagreeable than the present approach.

As to the sanitary condition of Dorking, we may be allowed to say that the sooner a new leaf is turned over on its account the better. It has not yet been placed under the Local Government Act, and whatever is done in the way of cleansing or in repairing the roads at present, it is by the Highway Board.

The great majority of the Dorking folk have set their faces against the formation of a Local Board of Health. They do not understand why such a thing is wanted at all in the town, except (as one of them said) to create offices for pleasure-hunters and crush the people by a system of unlimited taxation. We spoke to a few worthies in the town, who seemed to take a pride in the opposition that they gave to the "place-hunters," and who were jubilant in the idea that they had smashed the egg of the insipid board, and destroyed all hopes of an animated chick. In this opinion we opine they are mistaken.

It is strange, but nevertheless a fact, that those who have been loudest in protesting recently in the town against the formation of a local Board were some landlords, who alleged as a reason for their "disinterested" opposition that it would lead to an increased taxation on the back of those who are ill able to bear it; and yet these same landlords were the very first to belie their principles by raising the rents of their tenants.

The poor want cleanliness and comfort, and the town requires better kept roads and foot-paths, and a proper system of drainage and sewerage. The town also wants to be better lighted.

The main portion of the sewage of Dorking finds an outfall, or rather many outfalls, in a rivulet called the Mill-stream; but where the foulness ends, and where the polluted water eventually empties itself, we do not know.

The sewage of Dorking could be utilised with very little cost, and be turned to a source of profit. The supply would never equal the demand; so the Dorking people need not fear, as they do, that if a proper system of drainage were carried out they would not know what to do with their surplus sewage. To get over the impending evil, they allow it to sink in and sodden the soil of the town, save that small

portion which, after many devious windings, discharges here and there in the unsavoury Mill-stream.

Talking of the establishment of a local board, we asked one of the opponents what they meant to do with the sewage of the town. "Oh," said he, rather puzzled, "that will be an after-consideration. You see, sir, we were not going to be gammoned by those new-fledged humbugs."

Another Dorking native, who was probably never out of his own shire, pointed with an air of triumph to the failure of "the scheme" of boards as carried out in Epsom, Guildford, and Reigate. See what they have done for themselves in those places. Just look at Epsom and Reigate. They told the people in Epsom that the rate would only amount to three shillings in the pound, and that every year there would be a reduction; but it was found out soon that the three shillings related to the quarter and not to the year. "We are not," said our indignant informant, "going to be saddled with twelve shillings in the pound."

We doubted our friend's figures; but "he knew better." So we left it so.

Sanitary education, as well as scholastic, must be made compulsory. Some men refuse to wash their faces or shave; other folk will not clean their dwellings or change their linen; but if eccentric dirty people like to indulge their nasty whims by living in a state of "dry rot," that is no reason why a public plague should be let germinate outside of doors, by not attending to the streets, lanes, and drainage of the town.

The Dorking folk have a proverbial saying that "a shower of rain cleans the town." We witnessed an illustration of this wise saw, on the inverse principle, on the occasion of our visit. A few hours of a good rainpour would undoubtedly freshen the side channels of the streets, and wash the flags, and flush the sinks where it would not have the effect of choking them: the latter is the most common.

In Back-lane, there is no footpath properly speaking, and the open sinks in the locality, as well as the "stopping-places," is in a very wretched condition. The latter is choked up with filth, and is apparently overlooked altogether, though of recent construction. In Mill-lane the houses of the poor are small, dingy, and dilapidated-looking structures. The poor dwellers keep them tolerably clean; but in summer to the fact that the privies are almost upon the kitchen floor, or, in other words, they are placed in a passage between the entrance-doors of both houses, the said opening being hardly sufficient for the free passage of even one person. The poor occupants of these very old structures, half wood, and half rubbish, pay 3s. a week, and are glad to have them even at that price, as house accommodation for the poor is insufficient in Dorking. The Mill-lane is not over clean, and it can hardly be so from the construction of the dwellings, and the nature of the open sinks in the lane.

On the Frankford-road are a series of ill-constructed houses, misnamed Model Lodging-houses. They were not built to last, and the doors and walls will part company some future day, not far distant. They were built by a speculative tradesman of the town, who commenced their erection five or six years since. They were grasped at eagerly by the very poor from their cheapness. They are two stories high, and are built of loose stone, brick, and other rubbish. They contain about seven rooms, and they are rented at about 6s. 6d. per week. To pay this rent, those who take them have to sublet them to others; and so a house that is only intended for one comfortable family, is made to accommodate three or four, with the consequent bad result. The owner has not given them a rub of paint externally or internally, or a coat of whitewash, since their erection. The original priming colour is still to be seen on the window-sashes and some of the doors. Yet he is blessed by some of the inmates for enabling them to have a cheap shelter. The yards belonging to these so-called Model Lodging-houses are in a very bad condition, and the kitchens are dimly dark and damp. The sinks are within the kitchens; and even on the same cold earthen floor some of the poor dwellers can lie down, and feel cheerful that they have a home.

In West-street, on a plot of ground called West-square, beside the National Schools, are Model Lodging-houses of another and better description than the former, but these are not taken to by the poor, and do not meet their pocket.

These Model Lodgings comprise a large block of buildings of four floors, each containing many rooms. The rent and conditions have the effect of keeping them partly unoccupied. For one room 2s. 6d. is charged; for two, 4s. 6d.; and a sort of Malthusian doctrine is carried out that only a certain number of children is allowed to the occupier of one or more rooms; doubtless with good intention, but the scheme cannot be "squared."

On the Horsham-road is situated the Dorking Union, a red-brick building, with its wings. The union is reported to be in a good sanitary condition, as appears by a notice entered in the visitors' book by one of the Commissioners in Lunacy.

In the matter of local trade and manufacture the town of Dorking has none of any account. There is a candle manufactory in the town, which employs a few hands; but the labouring population are mostly employed on the land in the environs of the town.

House building at present in Dorking is almost, and we scarcely noticed anything worth detailing in that line. There is one quarry worked, from which a sort of grey freestone is raised, which is used locally for building purposes, and a chalk stratum is to hand for its ordinary uses, as every one knows. Some very nice villas are out and about the town; many of them neat and not a few fantastical, and pleasant walks and gentlemen's seats are within short distance. Through the town itself the houses are of all fashions and patterns. Old timber houses, cage-work structures, coated with plaster, dashed, distempered, and taboosed, many of which have long since outgrown the recollection of their very ancient personage, "the oldest inhabitant;" hotels, ancient inns, and hostleries of the old pattern, where the jog-trot carman was wont to stop of old, and where "entertainment for man and beast" was provided.

Except on market day, which is Thursday, the ancient town of Dorking is coldly quiet, and naturally dull, and, save on market day, the visitor will not be gratified with a sight of Dorking's pride,—her poultry. In the distance it may be supposed that the poor of Dorking are engaged in rearing this kind of fowl, but people will, no doubt, be surprised to learn that the struggling poor of the town of Dorking are as little engaged in the rearing of poultry, or a great deal less, than in less talked-of places. To rear fowl requires means, room, and open spaces; but we regret to say that the poor of Dorking have scarcely spare room enough to move and breathe in.

The parish church of Dorking is not a very old structure, and as an ecclesiastical edifice, its Gothic deserves no praise. It has one of the tapering weather-vanes description of steeples, covered with lead, we believe. It has also a clock, but what the walls are composed of one can scarcely tell, as a coating of grey cement envelops the outside. A chancel of a better style, free of a cement coating, was added about two years since.

The fittings within the church are very good. Around the side walls are several tablets to the memory of local gentry, but none deserving any particular notice here. Inside the entrance porch, to the left of the doorway, inserted in the front wall, is a tablet to the memory of the Right Hon. George William Earl of Rothes, Baron Leslie, one of the sixteen representative peers of Scotland, who died on the 11th of February, 1817. Over the staircase, on the right, is another tablet to the memory of Catherine, wife of Henry Talbot, daughter of Sir Hugh Clifton, of Stratford-upon-Avon, who died on the 15th of May, 1754.

These Talbotts turn up in a variety of strange nooks and places in the three kingdoms. We have found traces of them north and south of England, east and west of Ireland, and on the Continent.

In the churchyard there are but few tombstones or monuments dating back a century and a half. If there are any older no inscription visible tells us of it.

Reverting to what we have written at the beginning: until the railway accommodation is more perfect, and the town is brushed up by some active local management, Dorking will not progress. At present she is thankful for small favours in her present stagnant state of business. Even a stiff gale of wind is a "god-send" to her idle tradesmen, and her representatives are found thanking Providence that "it is an ill wind that blows nobody good."

The gale that does good in Dorking at

present is that which unroofs houses, blows down chimney-stacks, tumbles walls, and shatters window-sashes. Such a gale came lately as a New Year's gift to Dorking, and her unemployed were truly thankful.

What more need we write to give the reader an idea of the famous poultry town of Dorking? If it will not be improved internally, we must point out that there are Acts that can be put into motion, and that it is better to do things necessary with a free will than to be made to work against the grain.

We wish Dorking, however, better than it wishes itself, and would be glad to assist it from out the rut by a few kindly words and advice well meant and civilly tendered. We might and could write more of the shortcomings and wants of the town, but sufficient for the day is the evil thereof, and glad shall we be to find that not wholly in vain have we spent a morning in Dorking.

ARCHITECTURAL EFFECTS OF DETAILS.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the last meeting of this society on the 26th ult., Mr. G. H. Ridsdale read a paper entitled "Notes on the Architectural Effects of Proportion and Detail." With regard to the question of style, he thought that a style which had been previously very perfectly worked up, as the English Geometric Decorated for instance, could not well be adopted as a starting-point by modern architects; and that the Early French Gothic, which had recently been so much taken up, offered a good starting-point, as combining great boldness of proportion with a certain primitive character of detail which left much scope for further development. After remarking on the important effect that site and surrounding scenery should have in determining the character of a design, instancing as examples the harmony which existed between the Scotch Baronial Gothic and the wild country in which it first arose, and, on the other hand, between the Decorated, with its smaller refined detail and the quiet beauty of English landscape, he made some observations on the treatment of towers and spires. These features, when erected in towns amid crowded buildings, would bear much more elaborate detail and variety of outline than would be desirable in rural sites. The most important portion of a tower was the upper stage; if this were well treated, it was often useless to leave the intermediate portion between this and the base as plain and simple as possible. (The English towers of the Decorated Period he considered the most successful as designs, owing especially to the graduated outline of their buttresses, but also to the refinement and effectiveness of the mouldings and details peculiar to this style. He ventured to say that architectural designing had never been so pleasant to modern architects, as when, fifteen years ago, this style was in fashion, and hoped that more of, at least, the feeling of this style would be introduced into our modern buildings again, and that the satirical description in the *Builder*, "How John the Son of Synthe decorated the House of the Lord," would soon be as true then as it was when it was written. The east, west, and transept ends of the churches formed a peculiarly interesting field for study and design. It would be found a good and instructive study to try the effect of various arrangements of doors and windows in an assumed gable front of some special proportion. Much of the effect of a design depended also upon the proportion and treatment of its secondary features, wherein either picturesque variety might be aimed at, or that dignity of effect which arises from a repetition of the same details in an unbroken series,—a source of effect of the highest and most dignified kind, but more suitable to large than to small edifices. One of the most retrograde movements ever made in architecture had been the recent adoption in so many cases of the order early forms of plate tracery, which would have no recommendation about that of variety, after trying all other forms. The constant striving after something new by modern architects, instead of adhering to some one type of detail and composition, and refining upon it until it was perfected, was much to be deprecated. The efforts of architectural students had been devoted lately to learning all the various forms of their art; it was time now to make this knowledge of styles and detail available by blending them into a modern style, realising Wotton's essentials of architecture, "commodity, firmness, and delight."

SANITARY MATTERS.

The statistics of the last year's proceedings at Barking with the sewage irrigation crops have been completed by the Hon. H. W. Petre, in a pamphlet titled "Notes for the Year ending 31st of August, 1869, upon the Sewage Cultivation of Lodge Farm, Barking" (Wilson, Royal Exchange). Mr. Petre thus reviews the progress of sewage cultivation during the last three years, in which period this farm has been under the system:—

"In the spring of 1868, Lodge Farm, consisting of 218 acres, was obtained by the Metropolitan Sewage and Reclamation Company, and was placed under the charge of Mr. J. C. Morton, by whom one quarter of its area was laid out and prepared for sewage cultivation. From twenty to thirty acres were sown with rye-grass in the early autumn, but no sewage was delivered on the farm until October; the sowing was continued, and in the spring an area of about fifty-five acres was ready for cutting and yielded some heavy crops. With the exception of a few rods of wheat, and about half an acre of mangold, no other crops than rye-grass were that year treated with sewage. . . . In September, 1867, Mr. Morton having been appointed a member of the Rivers Pollution Commission, I undertook the immediate superintendence of the operations on Lodge Farm. . . . Three or four years ago the universal opinion was that town sewage could be utilised only on the growth of grass, and was wholly inapplicable to grain crops. It is now proved beyond a doubt that all ordinary farm and market-garden crops can be abundantly produced by the use of town sewage alone, and that wheat, mangold, and cabbage flourish alike under its application; and I much doubt if in the end it does not prove that such crops will be grown with greater profit than rye-grass when a specific value is placed on the sewage."

We have on a previous occasion given some particulars of the progress at Barking in the course of last year. In the conclusion of these supplementary notes, Mr. Petre expresses his great regret that the means of rendering many thousand acres (much in need of it) in the highest degree productive, should be still running to waste on the Thames, as if it were something to be got rid of at any sacrifice; whilst its equivalent, or rather an inferior substitute, is being imported from Peru and elsewhere at an enormous annual cost.

Two letters from the *Times*, by Mr. J. Bailey Denton, C.E., on "Sanitary Works and Sewage Utilisation," have been reprinted under this title, and published by Spon, of Charing-cross. In these letters Mr. Denton urges various points of sanitary importance, and especially as regards the risk of sewers soddening the subsoil of towns with sewage, and the necessity for drainage of town subsoils. He also urges the necessity, in sewage irrigation, of taking care that the sewage passes not merely over the surface of the land, but through it, to a sufficient depth to ensure its deodorisation and purification.

As to the subsoil of towns, he maintains that sewers, which allow of the subsoil draining into them, must needs allow the sewage flowing through them to percolate into the subsoil, and so to saturate it with sewage; while, on the other hand, if the sewers be water-tight, and no other drainage applied to the subsoil, of course it cannot be drained. The necessity for a separate drainage of the subsoil, therefore, he considers obvious. The only case, he remarks, where this has been carried out is at Salisbury, and he believes that the improved sanitary state of that town is in some respects attributable to this drainage of the subsoil.

In conclusion Mr. Denton says:—

"Since the lowering of the subsoil water in England has been shown to have such a beneficial influence in a sanitary point of view, and since the existence of stagnant water in the marshes of Italy is known to provoke and maintain malaria, which prevails only by reason of the want of suitable under-drainage, surely it is a point worth ascertaining, as the groundwork of future legislation, whether it is not essential to health that all lands irrigated with sewage should be perfectly under-drained. This question, together with those relating to the separate drainage and sewerage of towns and the ventilation of sewers, might be determined by a careful inquiry, conducted by practical men; and questions of such vast national importance should at once be placed beyond the position of subjects for mere controversy and the expression of opinion."

A Report by the Deputation appointed by the Board of Police of Glasgow to visit the City of Bristol and various Towns in England, as to Sanitary Matters," has been printed at Glasgow, by Anderson, of Ann-street. The result of their observations as regards the densely-populated quarters of Glasgow is, that the close staircases and branching lobbies of the tenement "flats" should be better ventilated; that the apartments ought to have the number of occupants diminished; that ash-pits, privies, and water-supply should be increased, deodorising material introduced, and cleansing enforced; that courts and closes should be properly paved; that ventilation and cleanliness should be inculcated by a system of visitation; that in cases of fever

strong chemicals, and especially carbolic acid should be used to destroy the fever germs; and lastly, that an improved construction of poorer class dwellings should be commenced:—

"We suggest [they say] that greater pains be taken to keep our streets as clean as possible. We found that even in the most crowded thoroughfares of London boys are employed to gather the horse-droppings, and that in the viaduct in Holborn recesses are provided for these when gathered, showing the importance attached to their immediate removal, not only to keep the streets clean, but also to prevent their being blown about in dry weather and inhaled by passengers."

With regard to the disposal of our sewage, the subject is one surrounded with difficulties, chiefly owing to its immense quantity and its being so much diluted.

We found most other large towns in earnest in dealing with this great question; and it is most desirable that we also should as soon as possible be prepared to adopt some plan, especially as to water-closet sewage. From all we could learn, we do not think that its being allowed to flow into the river produces disease; but we found a very general opinion to prevail, that its presence in the sewers generated foul and noxious gases, which were apt to find their way into dwelling-houses, and to produce disease there. We would recommend the Police Board to adopt some means, either by the use of chimney-stacks, or otherwise, to draw away these gases from our sewers. We have already indicated our opinion to be in favour of the utilising of our sewage, either by using it in irrigation alone, or by otherwise applying it to the ground for ordinary farming purposes; and we would venture to recall to the recollection of the board a plan suggested by our city architect, Mr. Carrick, some years ago."

The damage and inconvenience which are invariably created in Manchester and Salford by the rapid rising of the River Irwell in times of heavy rain, and the filthy condition of that stream at all times, in consequence of the sewage of the town being thrown into it, have led to frequent and loud complaints. Mr. E. Corbett, sanitary engineer, has propounded a scheme for the prevention of floods and the interception of town sewage in Manchester and Salford. In this scheme the provision for floods, and that for ordinary sewage, are quite separate and distinct. The nature of the scheme may be further seen from the following estimate of the cost by comparison with, and adoption of, the figures used in the several engineers' reports on this subject:—

Flood tunnel, two miles, at 72,000l.	£144,000
Inlet works	6,000
Improving two weirs	10,000
Deepening river-bed for three miles (i.e. Crescent to Thorstle Nest)	6,000
For floods	£166,000
Intercepting sewer, six miles, average 4 ft. diameter, at 2l. per yard	21,000
River-wall and towing-path, four miles, at 30s. per yard	21,000
Sewer junctions, &c.	2,000
For sewage and navigation	£44,000
Total	£210,000

After some criticisms on the schemes of Mr. Bateman and Mr. Hawksley, the following list of towns with acreage under irrigation is given:—

Name of Place.	Acreage under Irrigation.
Aldershot Camp	250
Alwick, Cambridgeshire	350 to 400
Bingley, Yorkshire	30 to 40
Birmingham	130
Brantree	20
Bury St. Edmund's	80
Carlisle	120
Cheltenham	360
Croydon	6
Donlough	130
Hopwood	400
Leek	4
London	6
Mansfield	300
Milton Mowbray	400 to 500
Milverton	5
Mold	90
Nottingham	4
Oswestry	40
Rugby	4
St. Thomas, Exeter	40
Swanham	2
Tarstock	90
Uckfield	4
Worthing	40

Mr. Duthie, of Preston, suggests to all agricultural societies the great necessity of offering prizes for the first, second, and third best systems of utilising town sewage for agricultural purposes, such plans or systems to be shown by models and drawings at the forthcoming shows. The judges in this department, as he remarks, ought to be gentlemen possessing a practical knowledge of agriculture, as well as of civil engineering.

The report of Mr. John E. Palmer, the Rugby town surveyor, to the local board of health upon the Rugby sewage irrigation farm for the past year has been printed. It is only a little more than twelve months since the Rugby system of sewage irrigation was completed and placed under Mr. Palmer's superintendence, although the sewage had been partially disposed

of by irrigation ever since 1853. The report says:—

"Taking into consideration that this is the first year after the completion of the works, and that the arrangements require a great deal of modification and adjustment (being in fact only in their rough state), the results are on the whole satisfactory, and the prospects encouraging. Still more satisfactory is it to your Board that the primary object for which the works were undertaken has been obtained, namely, the non-pollution of the river and the perfect purification of the sewage. This, I think, has been fully done, without the slightest complaint or nuisance to any one, and there is no reason why it should not be fully maintained."

That the atmosphere of the sewage farm is not injurious to health appears from the fact that the family of one of the men resident on it, who had been brought from a confined part of the town in a state far from healthy, have been restored to good health by the removal to the country air, in spite of the irrigating process applied to the land on which they reside. Rugby has the advantage of being able to dispose of its sewage by gravitation, and the surveyor is very sanguine of highly successful results in a year or two. Meantime the receipts already exceed the expenditure by 58*l.*, although the grass grown has only realised as yet 8*l.* a ton, while, where its value is better known, 15*l.* to 21*l.* a ton are readily obtained. The report is a valuable one.

STAMPS ON LEASES.

The alarm sounded in our pages at the commencement of the year has awakened the echoes, which are always more numerous than voices. Since then, an action, as desired, has been decided in the Court of Exchequer, and has made the unfortunate position more certain. This was:—

Boulton, Appellant, v. The Commissioners of Inland Revenue, Respondents.

The question before the Court was whether a lease made in consideration of a yearly rent and of a covenant with the lessee to complete an unfinished house is chargeable under 17 and 18 Victoria, cap. 83, with any duty besides the *ad valorem* duty on the rent. The 16th section of the Act, relied upon by the Crown, states:—

"And in any case when any deed or instrument which shall be chargeable with any *ad valorem* stamp duty in respect to any sum of money yearly or in gross, or any stock or security therein mentioned, shall be made also for any further or other valuable consideration, such deed or instrument shall be chargeable (except where express permission to the contrary is or shall be made in any Act of Parliament) with such further stamp duty as any separate deed or instrument made for such last-mentioned consideration alone would be chargeable with, except progressive duty."

Mr. Manisty, for appellant, said the really simple question was whether land let on lease was chargeable, not merely as a lease, but whether an additional duty is to be imposed if buildings are to be erected on the land.

The Court seemed to think the question too clear for argument, and that the Act expressly met the case before the Court. The words in the section of the statute, "or other valuable consideration," were introduced for the purpose of imposing an additional duty where buildings were being or were to be erected.

Judgment for the Crown.

This affects a large body of persons, and calls for united action to obtain a revision of the Act. Every lease, with scarcely an exception, contains a covenant to repair. Hitherto the extra stamp, now declared indispensable, has never been demanded by the commissioners, far less paid by lessees. The neglect to affix a stamp legally chargeable renders a deed incomplete, or at least useless in a court of law. Except in certain circumstances a delay of two months after the date of the execution of a deed is allowed, within which time the stamp may be affixed without extra charges. After that period 10*l.* must be paid, in addition to the stamp, by way of penalty. Hence it follows that, with the exception of leases executed within the last two months, in which case the omission may still be rectified, every leaseholder is liable to a charge of 11*l.* 15*s.*—i.e., 11*l.* 15*s.* for the covenant stamp, and 10*l.* penalty. Such is the effect of the decision arrived at by the Commissioners of Inland Revenue, and sustained by the Court of Exchequer. The unfair working of the section upon which the above decision has been given is clear.

In the first place, according to the strict interpretation of the section, all leases are chargeable with the additional stamp, without regard either to the purchase or rental value of the property, or to the period for which the lease has to run. While the duty on the mere lease is *ad valorem*, the covenant stamp on an 8*l.* rental is the same as that chargeable on a 100*l.* rental, and a lease for seven years is equally chargeable with a lease for 99 years. The charge is besides a constantly recurring one, since every fresh lease containing the usual covenant to repair and uphold, involves

the payment of the extra stamp. To put an extreme, but not impossible case—a lease for 99 years, which continues without interruption for 99 years, is liable to a single payment of 35*l.* But supposing a fresh lease to be entered into every seven years, the whole sum paid to the Board of Inland Revenue would amount to more than 24*l.*

In the second place, since the same covenant stamp is payable on a ground-rent of 8*l.* as on a ground-rent of 100*l.*, it is clear that a burden is imposed upon leases of small value, which will prove a very serious check to the erection of houses of moderate size. The payment of 35*l.* extra duty may not be seriously felt in the case of a 100*l.* ground-rent, but it will weigh very heavily on ground-rents of as low a value as 8*l.* per plot. It is scarcely to be doubted that Parliament will afford a remedy, if the position be properly pointed out, and steps should be immediately taken to have a Bill brought in with that end in view.

FEVER NESTS IN POPLAR.

At the Worship-street Police-court, on Saturday, Mr. Charles Young, solicitor, applied to Mr. Paget for ten summonses against James Richards, the owner of six many houses in Commodore-court, High-street, Poplar, for permitting a serious nuisance to exist on his premises, which were unfit for human habitation. The ventilation in each building was defective, the privies were foul and dilapidated, there was no water supply, the houses were in a dirty, ruinous, and unwholesome condition throughout, so as to be a nuisance and injurious to health. The Board of Works wished to shut up these fever dens, and prevent the spread of cholera and other diseases which must extend if they were suffered to exist in their present state. Mr. Shadrake confirmed the statement of the solicitor, and said much alarm prevailed in Poplar relative to the tenements complained of; they were dangerous or falling down, and in other respects ought to be closed. The defendant had no defence to the last two summonses, and could have none to these. Mr. Paget said he had heard enough to justify him in granting the summonses. The houses ought to be closed, lime-washed, and repaired, and the cesspools put in order.

THE NEW MECHANICS' INSTITUTE AT BRADFORD.

LORD HOUGHTON has laid the foundation-stone of the New Mechanics' Institute, to be erected at Bradford. Most of the principal persons in the town took part in the ceremony, and a large crowd witnessed it. After having laid the stone, Lord Houghton delivered an address, in which he enlarged on the importance of such institutions as that thus founded. The Mayor of Bradford, Mr. Miall, M.P., and other gentlemen also delivered addresses. The new building will cover 1,000 square yards, and will have a lecture-hall to seat 1,000 persons. The land on which it will stand has cost 12,000*l.*, and the building will cost about 13,000*l.* The site is in one of the most prominent positions in the centre of the town. The advantages of this building over the old one in Leeds-road are many. The lecture-hall is to be much larger and loftier. On the upper floors suites of class-rooms are provided, and also large well-lighted rooms, suited for the exhibition of drawings, models, casts, and other works of art, and forming at the same time drawing-rooms for the school of art in connexion with the Institute. On the first upper floor, facing the Bowling-green, is arranged the library and reading-room, of lofty and ample dimensions, at the rear of which is the lecture-hall. Two large wide stone staircases, entering from Tyrrell-street and Market-street, are arranged to serve the lecture-hall, and also a large central staircase from the Bowling-green entrance to serve the reading-room and library. In case of panic the whole of the three large staircases can be used for the lecture-hall. The second upper floor is appropriated for class-rooms, and the third upper floor is used for secondary class-rooms and the drawing-rooms: these latter rooms are lighted from the top. Each floor is provided with lavatory and water-closet accommodation, and each room will be efficiently ventilated, and more especially the lecture-hall, which will have special ventilation provided. The ground-floor is principally devoted to shop purposes, each shop being provided with a

cellar. The whole of the building is intended to be fireproof. The external appearance of the building is of the Italian style of architecture, and simple in design.

The building was designed and is being carried out under the superintendence of Messrs. Andrews, Son, & Pepper, architects, Bradford. The contractors carrying out the works are for masons' and joiner's work, Mr. Archibald Neill; plumbers', Mr. C. Nelson; plasterer's, Mr. J. Laycock; slater's, Mr. Jos. Hill; painter's, Mr. H. Briggs; fireproofing, Messrs. Phillips & Co.; the whole being under the supervision of Mr. R. Stewart, as clerk of the works.

THE ROYAL EXCHANGE.

Will nothing ever be done to make the Royal Exchange rather more worthy of the City of London? We should all blush to think what the "intelligent foreigners" must feel when he enters from under the imposing portico, with some sentiment of awe, let us hope, at the world-wide importance of all that takes place in that famous building, to find a sloppy, draughty, empty court-yard, with a soot-begrimed statue of her Majesty in forlorn solitude in the centre, and what there may be of architectural beauty distorted and vulgarised, like the interior of our railway stations, with boards of a thousand coloured advertisements. If any arrangement had been deliberately determined upon to destroy the effect and the utility of a great public building, it could scarcely have been more consistently carried out than in the present sacrifice of the great central court of our Royal Exchange.

As we are never likely to enjoy the climate of Southern Italy, where such open courts are appropriate, and from which the design of this one has been borrowed, the obvious and often-urged remedy is, of course, to protect it by glass from the inclemencies of the climate we have to submit to. The effect of this would be to relieve to a great extent the overcrowded and ill-ventilated rooms upstairs, where the special business which may draw men there would be alone transacted; while a grand central hall would be formed which, with appropriate wall decorations and groups of sculpture (where the Peabody statue and Gibson's beautiful statue of Haskisson might find a place), would be worthy of a building of so much pretension, and of so much importance in the City. Whatever engineering or private difficulties may be raised to this, they should be made to give way to an improvement which would gratify the country as much as it would contribute to the convenience of all who have to enter the building. I hope, sir, you will not let this matter drop.

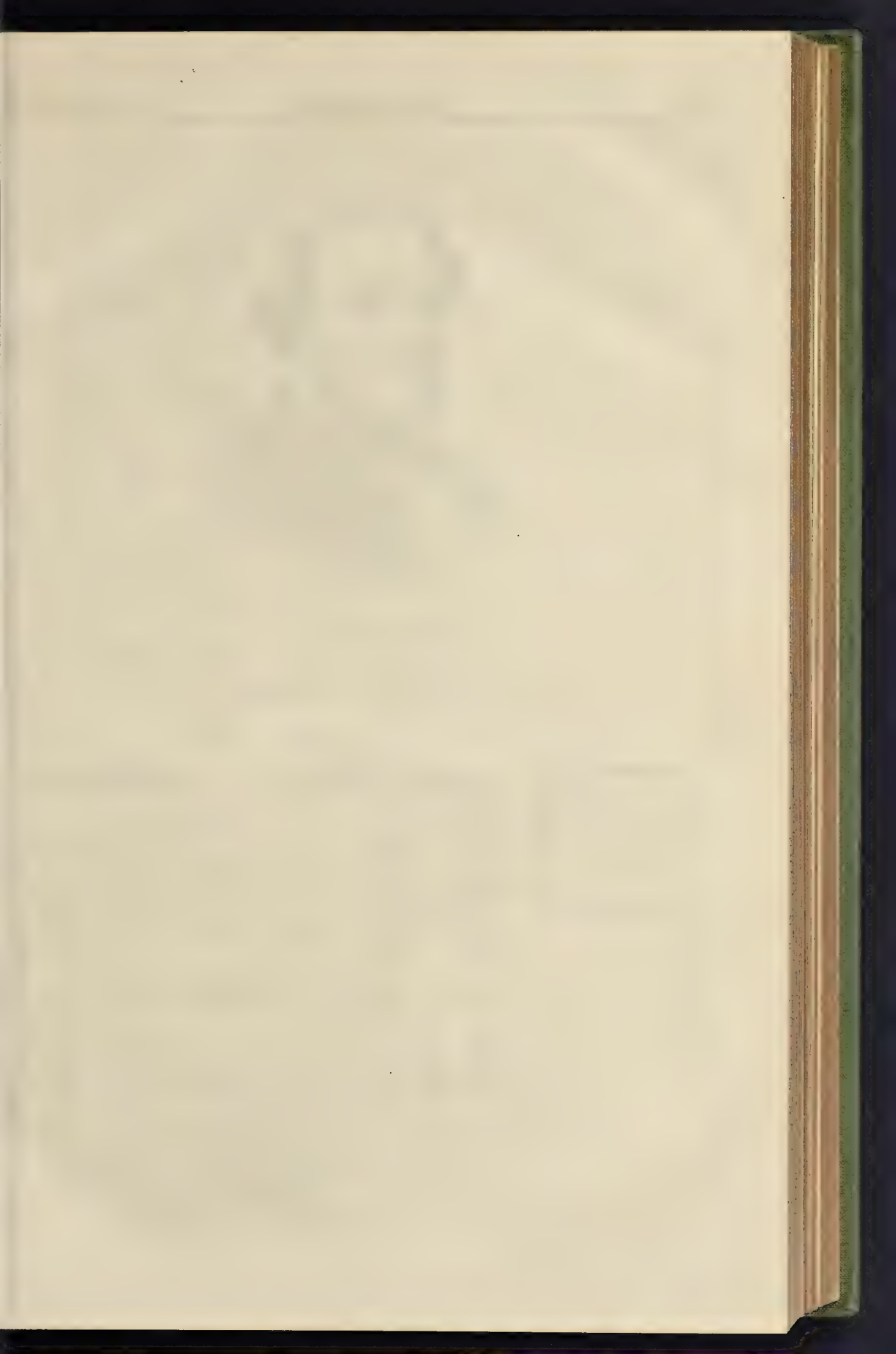
A. P.

ANGLICAN CONVENT OF THE HOLY TRINITY, OXFORD.

This building, with the exception of the chapel and part of the north wing, has been erected for the Society of the Holy Trinity, an Oxford sisterhood which has for its object the education of young girls of different classes, divided into upper, lower, and industrial schools, Earl Beauchamp being the patron. The building occupies an excellent position on the Woodstock-road, at the corner of the Bevington-road, near to the Church of St. Philip and James, and is built of Kirtlington walling stone, with Box stone dressings, the roofs being covered with Stonesfield slates; internally, the walls are lined with red and white bricks unplastered, and the timbers of the roofs, floor-joists, plates, and such like, are wrought, and exposed to view,—the joists being ceiled and parged between at about half their depth. The porch and hall floors, and all ground-floor passages, are tiled; the staircases being of stone, with wrought-iron balustrades.

The accommodation consists of school-rooms, refectories, kitchen, and offices, common-rooms for sisters and probationers, dormitories, visitors' rooms, small bedrooms for sisters, bath-rooms and lavatories, well supplied with hot and cold water; a part of the north wing is fitted up as a chapel until the permanent chapel can be built; this is intended to be vaulted throughout, and is designed in the Early English style, of a simple and somewhat severe type.

The works have been carried out by Mr. J. Wyatt, of Oxford, builder, from the designs and under the superintendence of Mr. C. Buckridge, architect.





MR. CHARLES BARRY, *Architect of Dulwich College.*



ANGLICAN CONVENT OF THE HOLY TRINITY, OXFORD.—PLAN.



ANGELICAN CONVENT OF THE HOLY TRINITY, OXFORD.—MR. C. BUCKENIDGE, ARCHITECT.

John H. A. A. A.

COMPENSATION CASES IN NOTTINGHAM.

The Midland Railway Company, in the course of the recent improvement and extension of their station and works at Nottingham, had occasion, under the compulsory powers which they possess, to purchase from the Corporation of Nottingham, in whom the property vested a certain branch canal, called the West Croft Canal, which they filled up and appropriated the site to the uses of the railway. This acquisition of property necessary for the purposes of the railway was happily effected by mutual agreement to the satisfaction of all parties, and the filling up of the branch canal, which was but little used, and had, in fact, become, on sanitary grounds, a crying nuisance to the neighbourhood generally, was admittedly a great public improvement.

There arose, however, the usual cluster of claims for compensation for injuriously affecting, from owners of property on the banks, who had the right of user of the canal, such as it was. The smaller of these claims became settled by agreement; but certain others, of larger amount, have recently been the subject of arbitration under the 68th section of the Lands Clauses Act, with the results which follow.

1st. Mr. Samuel Morley entered a claim for £1,311, which was heard at the Nottingham Assizes, and was supported by the following professional witnesses:—Messrs. T. C. Hine, R. Evans, F. Jackson, and J. C. Gilbert; while the railway company were represented by Messrs. M. O. Tarbotton, T. Huskinson, J. S. Norris, and F. Bakewell, whose estimates ranged from 75*l.* to 127*l.* The verdict of the special jury was for 800*l.*

2nd. Mr. James E. Hall claimed 2,500*l.*, and was supported by Messrs. F. Jackson, R. Evans, T. C. Hine, and H. Goddard. The railway company's witnesses were Messrs. T. Huskinson, M. O. Tarbotton, J. S. Norris, and F. Bakewell; and, after a consultation at the hearing, it was agreed that the award should be for 1,300*l.*, plus a strip of land lying in the rear of the premises, formerly the bed of the canal. The arbitrator for the claimant was Mr. Jeremiah Matthews, and for the company, Mr. C. E. Cawley; the umpire, Mr. Ryde, of Westminster.

3rd. Messrs. Shepperley and Whitehead entered a claim for 4,000*l.*, which Messrs. R. Evans, F. Jackson, and H. Goddard supported, and which was met on the part of the railway company by Messrs. J. S. Norris, F. Bakewell, M. O. Tarbotton, and T. Huskinson, whose estimates varied from 500*l.* to 664*l.*; the umpire, Mr. Hunt, of London, awarding 1,150*l.* Mr. Matthews and Mr. Cawley were again the arbitrators.

4th. Mr. Henry Hind's claim, the last settled, was for 3,000*l.*, and was supported by Messrs. Williamson and R. Evans, surveyors, and Mr. T. Hubbard, accountant. The railway company's valuers were Messrs. M. O. Tarbotton, J. S. Norris, T. Huskinson, and F. Bakewell, who gave estimates of the damage sustained, varying from 332*l.* to 520*l.* The arbitrators were, for the claimant and the railway company respectively, Mr. Henry Goddard and Mr. C. E. Cawley; and the umpire, Mr. Powall. The last-named gentleman has just published his award, which is for 750*l.* in full of all claims.

ARCHITECTURAL TERRA COTTA.

CONSEQUENT on receiving a trade-book of priced designs, manufactured in terra cotta, by Messrs. Doulton & Co. (a book that some of our readers would find useful), we looked at what this firm are now doing, and saw some very good work of its kind. There are several very important points to be considered in the production of terra cotta, a failure in any of which will prove disastrous. Much care is needed in the preparation of the clay, to render it equal throughout in its character; for without this the shrinkage will be irregular. Special care is also needed in the firing, both for colour and hardness, to secure imperishability; for if the firing is insufficient and unequal, it will turn out soft, and subject to decay.

The selection of clays is another important matter. The clays in use in Lambeth are those of Devon and Dorset, from which articles can be produced of close texture, fitted to resist thoroughly the action of the atmosphere, and in large cities and manufacturing districts that of smoke and acid vapours, which fire-clay goods, unless in special cases, often fail to do, on

account of their openness, and consequently the absorbent nature of the material. The goodness or badness of the decorative forms taken by terra cotta of course depends on the artist employed. Messrs. Doulton have resorted to the Lambeth School of Art for assistance in this direction, and some of their modellers have secured honours both at South Kensington and the Royal Academy: to one of them the gold medal of the Academy was recently awarded. It may be expected, therefore, that they will be able to carry out the designs of architects in a satisfactory manner.

The character of the art applied to terra cotta is of course of the utmost consequence; it is capable of receiving the most delicate as well as the boldest touches of the artist, and while in its plastic state can be undercut, so as to produce the deepest shadows it is possible to obtain in the most elaborate carving. The cost, in comparison with hard stone, is moderate; where repetition and high decoration are wanted, it can be produced at about one-half the price of work in good Portland stone.

As long as thirty-five years ago, the firm executed the statue and coat of arms of Sir John Crosby, which are attached to the exterior of Crosby Hall, Bishopsgate-street, and endure well. The material they are now making is of a more homogeneous body, and has more uniformity of colour; it rings clearly when struck, and resists a sharp-pointed instrument,—both important tests in determining the probable value of terra cotta.

DANGEROUS STRUCTURES UNDER THE BUILDING ACT.

OUR readers know that previously to the commencement of the present year all cases of dangerous structures were brought before the magistrates by the police, acting under the directions of "The Dangerous Structures and Lodging-house Department" of the police of Scotland-yard. By the passing of the 32nd & 33rd Vict. c. 82, 1869, the work of the police relating to "dangerous structures" has passed into the hands of the Metropolitan Board of Works, and on the 27th ult. the owners of 21, Bell-alley, St. Luke's; 7, Little Saffron-hill; 17, Union-court, Holborn; and 10, Seabrook-place, White Lion-street, Clerkenwell, were summoned by Mr. Fry, on behalf of Sir John Thwaites, under the provisions of the Metropolitan Building Act, 1869, to show cause why, there having been a survey made of the structures by a competent surveyor, and the structures having been duly certified as having been in a dangerous state, they the owners had not done the work which was called for by the Board.

In all cases orders were made for the work required to be done.

THE NATIONAL EDUCATION QUESTION.

THE great question now is whether thousands and hundreds of thousands shall be allowed to grow up in the densest and deadliest ignorance, because their friends and well-wishers cannot agree as to the course that should be pursued. The denominational system, as it is called, has failed to do all that was required, and will fail to do all that is required. No sooner is the "National Education League," established with a view to effect what has been left undone, than the "National Education Union" starts into life, less to bring about what is absolutely needed, than to oppose, tooth and nail, the doings of the League. A large proportion of the population cry distinctly,—This shall not go on: something shall be done. The Council of the Society of Arts, with a view to bring parties together, if possible, have invited a conference for Monday next (7th), "to discuss the best means of providing throughout the country a national system of education, whereby every child in the kingdom may have opportunities of obtaining elementary instruction, of a character at least equal to that which is within the reach of all in Prussia, Saxony, Switzerland, and other Continental countries." Two years ago the Society of Arts held a conference on "Technical Education." The conference was well attended by leading manufacturers, members of Parliament, and others interested in education, and much valuable information was elicited. A committee appointed at that conference drew up a report, in which the absolute necessity of an improved and extended system of scientific instruction was pointed out. At the same time, it was felt

by the committee, and the council are strongly of opinion, that it is of comparatively small value to provide means for the teaching of science and art, unless, in the first instance, the people are prepared to take advantage of it by an extended and improved system of elementary or primary instruction. The council are desirous of discussing how far the various schemes may be harmonised, and whether the common object, the education of the people, may not thus be attained; and they have framed a programme for discussion, in which it is attempted to combine and supplement, in a scheme practicable at the present time, the best features of the National Education Union, the Manchester Education Bill, and the National Education League proposals.

The conference will commence at eleven o'clock, adjourning at half-past one for half an hour. The discussion will be resumed at two o'clock, continuing till five, when it will be adjourned till seven o'clock in the evening.

We would mention that a full report of the proceedings of the first general meeting of the National Education League, held at Birmingham, has been published by Simpkin & Marshall.

THE WORD "THOUSAND."

I WAS sitting this morning in one of our public libraries, discussing Professor Huxley's "Celts and Saxons," when my neighbour told me that those incompetent people, the Saxons of old, could not count beyond one thousand. "Why," said he, "the word itself proves it: it is 'thus-and'—*finis*."

When at leisure, I took up the *Mæso-Gothic* Gospels, and made the following extracts:—

Mark viii. 9.	Mark viii. 20.
Thousandyo, Mæso-Gothic	Thousandyo, M.-G. = 1,000
Thousand, Anglo-Saxon	Thousand, A.-S. = 1,000

N.B.—The Anglo-Saxons took the liberty of changing the second *u* into *e*, thus making "end" = *hais*.

II. Luke xiv. 31.
Taihun thousand, Mæso-Gothic = 10,000
Twin tigum thousand, ditto = 20,000
Tyn thousand, Anglo-Saxon = 10,000
Twentig thousand, ditto = 20,000

III. Luke xv. 4.
Taihuntehund, Mæso-Gothic = 100
Hund, Anglo-Saxon = 100

The word "hund" is formed from *tai-hun*, by the addition of a final *d*; and originally stood for *ten*.

Hundred is an abbreviation of *taihunte-hund*, and stands for *ten-tens*.

The word "thousand" is formed by an extension of the same system, thus: we should have, I suppose, *taihuns taihunte-hund*, i.e., ten times ten-tens, which is abbreviated to *tai hu n s h und* = "t-hus-and (yos-um)," and finally *thousand*; the chief anomaly being, that "n" in *taihun* and "h" in *hund* are omitted. Thanks to good Bishop Uplilas, who is said to have done all this for the Pagan Goths more than *twelve-taihunte-hund* years ago.

Few etymologies could be more clear; and it follows that the fanciful "thus-and" is a corruption of the common-sense *ten-hund*.

A. H.

DEATH OF AN AMERICAN MUSICIAN.

THE obituary of the *Times* announces the death of L. M. Gottschalk, the celebrated pianist and composer, aged 40. The accompanying extract concerning him, from a letter just received from Rio, may prove of sufficient general interest for your journal.

F. S.
"During the past six months we have had a good deal of musical excitement here, which, I regret to say, has just ended with the death of its originator, the famous American pianist, Gottschalk. G. arrived here about May or June last, and took the world here by storm as soon as he appeared in public; his extraordinary skill and extreme refinement in playing being something never yet heard in Rio, whilst the originality of his compositions was also much admired. I never heard anybody in Europe to equal him in refinement and exquisite delicacy of execution, though I have heard pianists that played with more expression. In addition to his musical genius, Gottschalk possessed all the polish of a gentleman and man of the world to a degree seldom met with in Americans; his talents as a linguist were very great, as in addition to English, he spoke French, Spanish, and Italian remarkably well, and during the short period of his stay here he had already learnt to speak

Portuguese very fairly. His amiability of character made him many friends among the Brazilians and strangers here, and his loss is universally felt. I became acquainted with him soon after his arrival, and saw a good deal of him. One of the great novelties which he brought before the public was a concert in which sixteen pianos were played together by thirty-one pianists (amateurs and professionals, myself among the former), accompanied by a grand orchestra, and the effect produced was very fine. It took immensely, and would, I think, have made a sensation in England too. There were several repetitions of the performance subsequently, so we had to appear before the public pretty often. We played in the opera-house, which is about the size of Covent Garden, or little short of it. A month ago, G. gave a monster concert of 650 performers, which he managed to get together by the most indefatigable exertions; the concert proved a great success, but the incessant trouble and fatigue he had in copying out the different parts and drilling the musicians proved too much for him, the more so as his health was already undermined by the continual excitement inseparable from a life like his. His funeral was attended by an immense number of people, the body having previously been embalmed and laid out in state."

THE ROADS IN HYDE PARK.

HAVE you ever picked your way over the Rotten Road of Hyde Park, after a little rain? If not, do so, as one of the curiosities of famed London. But pray take a pair of stilts with you. It is really a disgrace to the park management. Poor pedestrians who have to cross have the satisfaction of wading through a disreputable mass of slop, which can only be compared to the swooshing of a bad road against the curb, waiting to be carted away, with this difference, that the late supposed mending of the road with brick-rubbish containing an amount of lime, causes the delicious hodge-podge (a kind of thin mortar), when dry, to stick tightly to the boots of the unlucky wearer. If one penny out of each hundred pounds spent in ornamentation were appropriated to make a useful and decent crossing or two, many of both sexes would be thankful; and I feel sure that none of the riders would complain of their horses having to pass over a few feet of a paved way.

DEPRESSED STATE OF THE BUILDING TRADES.

SIR,—It is a sad and lamentable fact that there are thousands of families in this metropolis who are literally starving; tradesmen who are well able and willing to do a day's work cannot obtain it; and what makes it more distressing is, that we cannot see when this state of things will end. The future prospect is no brighter than the past. Industrious, respectable, and persevering men find themselves in a dilemma from which they know not how to extricate themselves. The savings of bygone years have been spent; every available article of furniture has been parted with; credit has been obtained to its farthest limit. All this has been endured with the hope that something would turn up; but there seems no more chance of its realization than there was three months ago, and the workman is put to his wits' end, not knowing what to do. With such a state of things as this, we need not wonder that the police and magistrates are kept busily engaged, or that many choose to end their troubles by putting an end to their own existence. I take my own case as an illustration, having completed a large and important building some six months back. I have since tried every means to obtain another situation, but in vain, although possessing very highly satisfactory references as to character, ability, &c.—a plain proof that no matter whatever capabilities a man may possess, or however desirous he may be to obtain work, in this present depressed state of trade he will have great difficulty. It would be well if mine were an isolated case, but I know there are vast numbers in the same position.

Surely this is not as it should be. Cannot something be done to give employment to those who are both able and willing to work? A heavy responsibility rests somewhere, for it cannot be expected that a continuance of such deep affliction will be always patiently endured.

BUILDER'S FOREMAN: A MASON.

EASTER ISLAND, OR RAPA-NUI (GREAT RAPA).

I HAVE read with great interest the articles which have lately appeared in the *Builder* upon the subject of the Easter Island statues; and having myself visited that island in the *Topaze*, and explored it as thoroughly as the time permitted, it may interest your readers to hear the reasons which have induced me to form a different opinion from your correspondent's, and to conclude that the monuments were the work of the ancestors of the present Polynesian inhabitants.

Your correspondent considers his views as to a pre-historic race confirmed by Professor Sedgwick's "aspiration that Polynesia was once a continent;" and he assumes that Easter Island has "an identical flora and fauna" with the other islands, and that it is "crawled over by the same families of flies and beetles;" but had he visited it, he would have found only one animal, the rat (*kio*), and one land-bird, namely, the domestic fowl: these, as well as the sweet potato, are known to have been carried by the Polynesians in their migrations; and the scanty flora is, at least, as much New Zealand as Polynesian. To the latter I attribute the sugar-cane, paper-mulberry, and banana; to the former the ferns,* the *toro-miro* (an acacia-like shrub), and the tufted grass. The only other plant which was seen in any quantity was the vervain, said by the natives to be also an importation. I saw but one insect, a yellow butterfly, and no reptiles.

I believe that your correspondent is misinformed as to there being a cave in which "are two large images, below the sea-mark;" but should it be a fact, it must be considered with reference to the volcanic formation of the island, every hill upon it being a crater; and the subsidence of the side of one of these volcanoes is surely slight evidence upon which to decide that an entire continent had sunk beneath the waves; how deep, we can only infer from the clear dark blue of the surrounding ocean; which, even your correspondent thinks, must be as deep as Cotopaxi is lofty; and surely an idea so extraordinary as this subsidence of a continent has seldom occurred to any one's mind, for the statues (which are generally placed round the coast, and not inside the craters) must then have stood breast deep, at least, in the perpetual snow.

We have, however, sure records, that the Polynesians in the Sandwich and Marquesas Islands actually built stone platforms, just such as we found at Easter Island; and that on those platforms were mounted large wooden images. Now, what would such a race do on their arrival at Easter Island? First, no doubt, they would plant sweet potatoes, which would give an abundant increase; then, with leisure, their propensity for carving would return; and having built their platforms, how could they get images to set thereon? Wood could not be got, for the island was treeless; but the stone was easily worked, and would naturally be made a substitute. As they cut more deeply in the stratum of rock, they would cut larger blocks; and their greater experience would enable them to place them in position.

It is true they had "no metal, nor even flint," from which to make their tools; but they had a harder volcanic rock, and abundance of obsidian, with the powder of which it could be ground into shape. The implement used for carving, when finished, was called a "tingi-tingi,"—a name which bears proof, as you pronounce it, of having been given by the race who had heard the sound of its sharp blows, followed closely by the echo from the sides of the crater around it.

That the present race were stone-workers is certain, for all over the island we found stone foundations neatly squared and let into the ground, ready again to receive into the holes, which were at regular distances, the ends of the branches which formed the framework of the huts, as Captain Cook describes; and under three statues which had fallen from a platform was a vault, the entrance of which was formed of hewn stone, proving that they continued to work in stone after the statues had fallen, possibly within the last hundred years.

Your correspondent doubts if the carving on the sides of the heads of the statues represent ears. To convince himself of this he must look first at the likeness of the Easter Islanders in Captain Cook's voyages, and imagine the long, loose flaps of these ears filled with the ornaments which they used: then let him compare

an ear so ornamented with the ears of the wooden domestic images; these again with those of the statues, and he will have traced a distinct connexion between the ears of the present race and of the statues. Is it credible that two races inhabiting the island at such distant periods, would each have invented so peculiar and uncomfortable a custom?

Every statue on the island has a separate name or title.* Would an alien race have cared thus to rename them? or is it likely the pre-historic race would have coloured them with head-dresses of rock of the red colour which the Polynesian chieftains so highly prized?

I do not understand what your correspondent means by "carved emblems of nature worship, and of his-headed figures." The rocks, it is true, were scored with rude figures of birds, ships, &c., but the birds resembled gulls, or domestic fowls, quite as nearly as they did the Egyptian ibis.

When Captain Cook visited the island, perhaps two-thirds of the statues which he saw were fallen, and none of those then seen are now remaining erect; one third have, therefore, fallen within one hundred years. How long is it probable that the two-thirds fallen before his time remained standing? Those which are standing at the present day are planted in the earth, having been too narrow from back to front either to stand alone or to support the circular stone head-dress, which may have helped to topple over the rest.

As to the number of people necessary to transport the statues, we know that the Peruvians kidnapped 1,500 from this island some seven or eight years ago, that several hundreds more died of small-pox, and that 800 or 900 still remain. As none of the statues which were taken to a distance weighed so much as 20 tons, they had ample numbers; and the grass of the island made excellent rope.

I once took an intelligent boy, a native of Tahiti, into St. Paul's Cathedral in London, and felt much mortified when he asked me if the statues there were the images which our ancestors used to worship. I think your correspondent has retailed upon the South Sea Islanders, and if the mistake of the young Tahitian caused me such mortification, what would be the feelings of the Easter Islanders, after hearing of the sins which are imputed by your correspondent to their predecessors, and his vivid and terrible (though, I hope, imaginary) description of the punishment which overwhelmed them? We found them most friendly, honest, and amiable; but if he were to venture among them, after such provocation, it would not be surprising if their old cannibal propensities were to revive, and they were to gratify them at his expense.

R. S.

THE LONDON WATER SUPPLY.

AT last week's meeting of the Metropolitan Board of Works the adjourned debate on the report of the Works and General Purposes Committee, on the subject of the water supply of the metropolis, was resumed by

Mr. Roebuck, who said he had placed an amendment on the paper; and his object in doing so was to affirm the necessity of a constant supply. He denied that it was expedient that the supply should be in the hands of a municipality, which in this case meant this Board. So far from this Board being enabled to supply water at a less cost than the consumer had to pay now, he maintained that the cost would be larger. He had calculated that the cost of the supply by the Board, after purchasing up the companies, would be 954,000*l.* a year; and after deducting 175,000*l.* a year for water supplied for trade purposes, 779,000*l.* would have to be raised from private consumers, which would require a three-penny general rate, and a domestic rate of one shilling. He thought that 5,000*l.* or 10,000*l.* a year expended by this Board in controlling the companies would be much more effective in the way of obtaining a constant supply than their taking the supply into their own hands. He moved as an amendment:—

"That this Board does not concur in the conclusion arrived at by the Royal Commission on Water Supply, viz., 'That the constant-service system cannot be effectually carried out in London, so long as the supply remains in the hands of private companies.' That this Board concurs in the general policy enunciated in the report of the Select Committee on East London Water Bills (1867), viz., 'That every metropolitan water company should be compelled to afford a constant supply of water within the

* I have ascertained this fact from the authorities at Kew.

* The larger of the two brought home in the *Topaze* was called *Hoa-haka-nana-ia*; the smaller one, *Hava*.

metropolitan area, so that it may be drawn direct from the pipes at all times during the twenty-four hours; and that the Board should be entrusted with adequate powers of compelling the companies to fulfil their obligations."

After the amendment was seconded, and some discussion had taken place, the Chairman put Mr. Roche's amendment, and declared the numbers to be for it, 10; against it, 18. The debate was again adjourned.

CASES UNDER METROPOLITAN BUILDING ACT.

LIABILITY FOR FEES OF DISTRICT SURVEYOR.

THE case "District Surveyor of Stratford-le-Avon and Poplar v. The West London and General Permanent Building Society," which was heard at Worship-street Police Court, before Mr. Ellison, last month, will answer some inquiries on the subject of fees that have been addressed to us—

In May, 1866, notice was given by a builder named Harris, of North Bow, for the erection of five houses in Cleve-road, North Bow. The works having afterwards been suspended, a fresh notice was given in October following, by Williams, of Old Ford-road, for proceeding with the works, and the houses were covered in the same month. The houses remained unfinished for some time. The builder, Williams, could not be found. Subsequently the houses were completed, and some of them occupied by weekly tenants, but the district surveyor could not discover the owners.

In August, 1868, the district surveyor ascertained that the defendants were the owners, and made his claim for fees, and on payment being refused took these proceedings.

The defendants it was contended that they were only mortgagees, and not owners within the meaning of the Act, at the time the fees became due.

The magistrate said the fees were to be paid by the builder, or owner, or mortgagee; that one month after the buildings were covered in the fees became due, and that there was no limit for the time of payment; that the owner was liable for the fees if he were owner at the time the claim for the fees was made, and he was clearly of opinion that the defendants in this case were so liable. Order made for payment of amount claimed, with costs.

THE ST. LOUIS INSTITUTE OF ARCHITECTS, MISSOURI, U.S.A.

THE secretary of this new society, Mr. George A. Rand, writes,—

I take the liberty of enclosing to you a copy of the proceedings in organising the above society, which is founded on the same principles as all the Architectural Societies of this country and of England, for mutual benefit and pleasure, as well as to endeavour to raise the public taste in matters of architecture and art.

"THE ST. LOUIS INSTITUTE OF ARCHITECTS."

The organisation of this society was completed on Tuesday evening January 11th, at a meeting held at the office of Randolph, Bros., by the election of officers for 1870. The following were elected:—President, Thomas Walsh, Trustees, M. Randolph, John F. Mitchell, George L. Barnett, Secretary and Librarian, George L. Rand, Treasurer, R. Desbanno.

A vote of thanks was then passed to the chairman, Mr. Mitchell, and to the secretary pro tem, Mr. Randolph; and also a vote of thanks to the members. Randolph for the use of their offices; and the meeting adjourned.

The next regular meeting of the society was held at the office of Randolph, Bros., on Tuesday, January 18th, at eight o'clock p.m. The office of the secretary, Mr. G. Rand, is at 305½, Oliver-street.

The society will at once secure rooms for its accommodation, and commence the formation of a library, contributions to which are invited.

We cordially wish the new society success and hope to hear of its proceedings.

MADDENING BEER.

881n.—In reference to a paragraph which appeared lately in the *Builder*, in which insanity was said to be attributable in many cases to the use of adulterated malt liquors, I am desirous of pointing out that the officers of the Excise have no remedy, or rather punishment, for adulterating malt liquors, entirely in their own hands. The beer licence expressly states that the licensee is not to sell any beer, ale, or porter made otherwise than from malt and hops; or mix any foreign or other pernicious ingredients, or fraudulently dilute, deteriorate, or adulterate any beer, ale, or porter he may have for sale. The licence furthermore states that it (the licence)

This is entirely in accordance with another decision.

"shall cease, determine, and become void" in case any of the conditions contained therein are transgressed.

Why cannot samples of the different malt liquors sold in London and elsewhere be purchased by the Excise officers, and submitted to the chemist of the laboratory of Somerset House to be analysed? If found to be adulterated, first warn the sellers; if other samples are also adulterated, withdraw the licence. If this were done, I feel convinced that we should have an effectual check put upon the rogues who poison us now with impunity.

W. T. S.

"BELLS."

A RAMBLING article on "Bells," containing several blunders, appears in the *Contemporary Review* of this month.

Among other trite matters the author mentions the great bell of St. Paul's Cathedral, and, going out of his way expressly for the purpose, tells his readers that the writer of the lines so confidently stated in the *Builder* that the bell was made in 1709.

Now, the author well knows that I made such a statement on the authority of Messrs. Mears, bell-founders, and that having subsequently examined the present bell myself, I stated in the *Builder* that it was not in 1718. He also knows that my articles printed in the *Builder* of the 11th, 18th, and of April 4, 1868, contain the most accurate and complete account of the bell that has ever yet been published.

THOMAS WALSH.

EDUCATION AND THE WORKING CLASSES.

81n.—In venturing to remark on "Jack Plane's" letter in your valuable pages, I have no intention of going into the merits or demerits of the schemes advocated, but the subject is of the greatest importance, and I would beg him and parties whose sentiments he represents, to avoid hard names and angry words, and thus to gain attention and sympathy. He says, "I believe the working men who know the issues at stake look with dismay on the revival of the *Sectaries*." Whom does he mean by *Sectaries*? It means people whose religious conviction impels them to assist their ignorant fellow citizens, by providing means of education for their children, why is he dismayed? For to whom have this country, and its working classes been indebted for the means of education but to those of the public, who usually act on the dictates of conscience? He refers reproachfully to "catechisms and dogmas;" but he ought to be aware that a very large portion of those persons most earnestly attached to Christian principles are scrupulous to avoid imposing them. It really appears ungrateful to sneer at the good already effected by the liberal expenditure and active exertion of Christians, or to blame them as "*Sectaries*," for the narrowness of a few. Why is he "forced to continue, if he does not like the school?" I suppose he concedes the right of subscribers to manage their own institution, and when the working men subscribe generally, their votes will control the education given in the way they desire. But have they yet shown any real determination to deal with the matter as an affair demanding their highest consideration? Surely a very small part of their money wasted in devices would suffice for all that is required, without agitating the country, worrying the generous, or troubling Government. His representation of working men is discouraging and contradictory. He says, "I believe success largely depends on the enlistment of working men, who are aware of the deficient state of education, and who are earnest to provide a remedy;" but he further states, "the best of the working classes are only half interested about their children's education." Again, "Only think of a drunken, ignorant parent caring anything for intellectual food, &c." "Jack Plane" may do much good by discussing the subject consistently, and with a charitable regard to others who have the same grand object to promote.

H. C.

MASTERS AND MEN.

THE HOUR SYSTEM.

In the Bloomsbury County Court last week, before Mr. G. L. Russell, judge, a case of some importance to masters and workmen was heard and decided, in which William Pierman, a journeyman painter, brought an action against Mr. Bradwell, house decorator, &c., No. 11, Great Portland-street, Portland-place, to recover the sum of 73d., for one hour's loss of time, under the following circumstances. Plaintiff stated that in December last the defendant, who had for some time previously been employed in ornamenting and decorating the Globe Theatre, Strand, pursuant to its opening on Boxing night, engaged him and other men on a "job" to get it finished in time, to work on Christmas Day, Sunday, and the Monday up to five o'clock in the evening, when they left off at half an hour after, they in a body waited upon the defendant in the green-room for payment, when, without any angry words taking place between them, he said he shouldn't then pay them, and if they didn't go away he would call in the police and have them turned out; ultimately, however, telling them to be at his house the following morning at ten o'clock. Witness accordingly went at that hour, and after waiting some time, received what was paid him for his work by time; but, defendant refusing to pay him 73d., one hour, which was what he charged for the time in going to be paid, although he lost half a day in so doing, and defendant still persisting on subsequent application, in his refusal to arrange the matter, he, for the benefit of himself and fellow workmen, who wished to know the law on such a point, took these proceedings.

In answer to the judge, plaintiff said it was a rule in the trade that jobs, which were invariably by the hour, should be paid for when finished; and, if not, the men claimed for loss of time in afterwards going for their money.

Thomas Smith, Henry Godfrey, Thomas West, and Henry Lloyd, painters, who worked with plaintiff on the "job," all corroborated his statement as to what took place at the Theatre after finishing it, and expecting to be paid; the former adding that it was a rule in the trade, as far as

he knew, for men to be paid extra when having to go purposely for their money, mentioning the names of Messrs. Morxon, Earle, Collman, and others, who acted on that principle.

Defendant, in reply, said he never heard of such a system; and, as for threatening to send for the police when asked for payment at the Theatre, he might have done so, being much excited and busy at the time, which was fast approaching the hour for the doors to be opened.

His Honour observed, that by the evidence of plaintiff and his witnesses, and the names of the respectable firms mentioned, his decision would be guided, which was that the claim was a just one.

Judgment for plaintiff, and all costs.

DURABILITY OF TASMANIAN TIMBER.

THE inclosed item of information, sent from the *Launceston Examiner* of 4th of December last, which I have just received by the Australian mail from Tasmania, may possibly be of use to some of our readers:—

"The durability of Tasmanian woods has often been spoken of, and another very satisfactory proof of their excellent qualities in this respect has lately been afforded. A post of peppermint-wood, which was used fifty-five years ago in constructing a fence on the farm of Mr. Stanfield, Clarence Plains, was lately taken up, and found to be in excellent preservation. The portion above ground has been but little affected, even the splinters on the surface being 2 ft. in the earth was also sound, and but very little eaten away, so little indeed that were it not well known that the fence was made some fifty-five years ago, one would be disposed to say that the post had not been used more than eight or ten years. This fact, taken in conjunction with the statement that the other remaining posts appear equally sound, proves incontrovertibly that this kind of wood is admirably adapted for making railway sleepers, or for any other purpose in which durability is a primary requirement."

So the new route, *via* the Suez Canal, may shorten the distances that a trade in timber from our remote colonies may be long spring up and continue. All will, I suppose, remember the fine timber trophy from Tasmania exhibited in our 1861 collection of products from the colonies.

W. H. E.

ROADS IN THE PARISH OF ST. PANCRAS.

81n.—Seeing recently a letter in your journal, complaining of the roads in the vicinity of Norwood, I am of about to ask your insertion of a few lines about the roads and footways in our neighbourhood, known as the "Mud Island" district in St. Pancras.

Several of the authorities in the vestry take credit to themselves for our parish having the best roadways in the metropolis, and I believe the leading thoroughfares are not to be surpassed by those in neighbouring parishes. I also admit that many of the private streets are well paved and lighted. But I am sure the neglected and unfinished condition of Lismore-circus, Weddington-road, Langford-road, Alcroft-road, and streets adjoining in that part of Kentish Town, is a disgrace to our Parity Board, and such as makes the unfortunate residents frequently exclaim,—"*What are the authorities about in allowing such a state of things to continue year after year?*"

If you visit our neighbourhood do not come in wet weather.

A RATEPAYER.

TREATMENT OF SEWAGE WITH CARBON.

81n.—For the information of your correspondent, Mr. Hines, I beg to state that the patent system of sewage treatment referred to in my letter to the *Builder* has been in operation nearly two years, and that the patent has never been disputed. Moreover, it has lately been subjected to the scrutiny of Counsel, and pronounced perfectly valid.

Your correspondent errs in supposing that the use of carbon is at all claimed as part of the patent. No sane man would ever dream of making such a claim, the use of carbon for disinfecting purposes being as old as the Levitical Law—at least. What the patentee claims is the *peculiar mechanical arrangement*, which is equally applicable to closets as to sewers.

The system is a complete success here (Newcastle-under-Lyme), as the enclosed certificate from the Stoke guardians shows.

E. JOHNSON.

LAMBETH WORKHOUSE COMPETITION.

SOME time since premiums were awarded for complete designs for an infirmary and ground plan only of workhouse, particulars of which we gave at the time.

The guardians have since decided not to erect the infirmary, but to build a new workhouse, and to convert the present workhouse buildings for infirmary uses. They therefore instituted another competition for complete designs for a new workhouse.

The following architects were invited to compete:—Messrs. Arthur & C. Haselden, H. Jarvis, T. E. Knightley, W. Lee, Beeson & Son, F. Marable, F. H. Fowler, C. Poleham, Stanning & Lepard, J. Crawley, R. E. Tyler, Searle & Son, Luck & Rushforth, McMurdie, Newman & Hewitt, and R. Parris.

The designs of those who responded have been hung at the old workhouse in Lambeth.

* Patent dates A.D. 1867, Oct. 24th. No. 2899.

ZINC FOR ROOFING.

A TRADE-BOOK, just now issued by Messrs. F. Braby & Co., contains a considerable amount of information on zinc as applied to roofing purposes, with working drawings. One of the diagrams shows iron rafters covered with zinc, and we know this union is now not uncommon. The impression used to be that under such circumstances an action might be set up that would injure the metal. Is this disproved? Or what precautions are adopted to obviate it? We have the remembrance of finding on one occasion a hole in a zinc flat produced by an iron nail which had rested on it for some time.

MONUMENTAL.

A MONUMENT has lately been erected in the Shenchan Free Church, Stranraer, Scotland, to the memory of Major-General McDowall, C.B., and Miss McDowall, who, during their lifetime, were the generous benefactors of the congregation. The monument, which is of white Sicilian marble, has three pointed crocketed pediments, with bosses set at the angles and floriated finials at the apices. In the middle of the centre pediment there is a cusped panel, with the monogram "I.H.S." The monument stands on a corbel table of flowered marble, projecting boldly from the face of the wall. The design was supplied, and the execution of the work superintended, by Mr. John McLauchlan, architect; the sculptor was Mr. John Rhind, both of Edinburgh.

KENSINGTON WORKHOUSE INFIRMARY COMPETITION.

THE Kensington Board of Guardians having determined to enlarge their workhouse by the addition of a new infirmary and wards for aged and able-bodied women, invited three architects to send in designs for these works, to each of whom the sum of 30*l.* was paid "as compensation towards the expense of preparing their designs." These designs are now before the Board. The competing architects are Mr. Stanham, Mr. Williams, and Mr. H. S. Snell.

A PAVEMENT BRIGADE.

SIR,—Our roads get swept and scraped, but the pavement in many places never; accumulations remain all the year round—slippery mud, drifting dust, or cakes, may be enjoyed in all directions.

It is asserted that cleanliness is next to godliness, but Bumble thinks otherwise; for the pavements in front of our churches are sadly neglected. Once a week he ought to prove himself useful as well as ornamental. Why not promote some of the veteran scavengers to sidemen, with long india-rubber scrapers, to perform this cleanly and expeditiously? Men would not then forsake the right paths of life, with a hurrah for the road!

R. T.

NEW CHURCH, BEXLEY HEATH, KENT.

WE understand that the committee have decided to adopt Mr. Burgess's selection. The design by Mr. Knight, of Nottingham, who was placed first by the referee, is to be carried out; Mr. T. E. Knightley and Mr. Blackwood, of London, being second and third respectively.

CHURCH-BUILDING NEWS.

Fundenhall.—The old church of this parish, which has been closed during the last nine months for the purpose of undergoing restoration, has been re-opened for divine service. The restoration of the nave and tower was undertaken by the parishioners; Mr. R. M. Phipson, of Norwich and Ipswich, being the architect, and Mr. G. Grimwood, of Weybread, near Harleston, the builder. The seats in the chancel are of oak, the floor being in Portland cement. A piscina which was formerly in the south-end corner is now built up. The nave is fitted with oak benches, and is paved with Minton tiles. The whole of the windows in this portion of the church are new, the early character of the building being represented in their design. The porch is new. In clearing away the mortar on the west side of the north door an ancient stoup was found, which has been preserved. On the south side of the church is a Norman doorway,

which is left in its original form; as also are the tower arches, which show signs of the same early character. An old rood-screen formerly spanned the western arch of the tower, and is now (for the sake of preserving it) placed under the west window. The whole outlay on the restoration of the church amounts to 1,400*l.*

Taunton.—The opening of the chancel and unveiling of the new reredos in St. Mary Magdalene's Church have taken place. The plan of raising the floor 2 ft., and placing a new reredos and sculptured entablature behind and about the altar, was acquiesced in by the parishioners. The offer of Mr. John Marshall, of Belmont, to raise the chancel floor and supply the reredos, was scarcely accepted before it became evident that the four arches in the chancel required to be raised correspondingly. The funds for this undertaking were readily supplied by Dr. Edward Liddon, and the work has been accomplished by Mr. H. Davis, builder. Encaustic tiles have been laid on the chancel floor, and brass standards light the sanctuary with gas. The roof of the chancel has been re-decorated from the designs and under the superintendence of Mr. A. Stansell, of Taunton. A large vestry for the choir has also been constructed through the joint liberality of Miss Bampton and Dr. Kelly. The canopied reredos, with its niches and crockets of yellow Mansfield stone, the altar-piece of pure white Caen, representing our Saviour's agony in the garden, sculptured in alto relievo, from the designs of Mr. G. E. Street, R.A., by Mr. T. Earp, Lambeth, together with the standing figure of the Virgin Mary, Mary Magdalene, and the four Evangelists, are said to be well executed.

Market Harborough.—Fleckney Church, Leicestershire, has been re-opened by the Bishop of Peterborough, after a restoration. Until the recent restoration, the church consisted simply of one large open space, unbroken even by a chancel arch. There were no windows in the north wall, that part of the church being entirely dark. The south wall has been taken down, and an aisle and porch built. A chancel arch has been put in, and windows inserted in the north wall; a vestry has also been added. The church has been re-roofed, and paved with Whetstone's tiles, both in the chancel and in the body. Deal stained open seats have been substituted for the old pews, and a chancel screen has been laid down. A new heating apparatus has been put up. This work has been done by Mr. Conquest, of Fleckney; Mr. Kellett, of Leicester; and Mr. Wilson, of Kibworth, from the plans and under the direction of Mr. C. Kirk, of Sleaford, architect.

Oundle.—The work of restoring the church of St. Matthias, at Great Gidding, bordering on Northants, Oundle, has been completed, and the church re-opened. The edifice consists of tower and spire in the Early English style of architecture, with nave, north and south aisles, and chancel. The fabric, from want of means, was in a very unsatisfactory state. A new east window of painted glass has been inserted in the chancel window by Dr. Hatfield, of London and Sawtry, in memory of the Hatfield family. The subjects are "St. Paul," "Our Saviour," and "St. Peter," life-size, forming a three-light window of the Medieval period. Mr. Webb was the artist. The original contract for restoration was 1,380*l.*, by Mr. C. Bennett, of Lynn; Mr. J. Fowler, architect. The church is heated on the hot-air principle.

Prittlewell.—A fund has been opened for the restoration of the old church at Prittlewell. Mr. Christian, of London, architect, has surveyed and reported upon the edifice. He is of opinion that, if it is desired to restore the church to its original form and beauty, it should be re-roofed and re-seated throughout, for which latter work he has prepared a plan, by which, while giving ample room in the sittings, the accommodation of the building will be increased fully one half. The cost of these works, if carried out in a substantial and durable manner, together with that of the necessary repairs to walls, windows, and tower, and including warming and lighting apparatus, is estimated at nearly 6,000*l.* Towards this sum upwards of 1,400*l.* have been already subscribed.

St. James's Hall.—Mr. Henry Leslie has commenced his spring series of concerts. They comprise concerts of unaccompanied music, by Mr. Henry Leslie's choir, and orchestral and choral performances. The first took place on Thursday evening, the 3rd. March 3rd is the date of the second.

Books Received.

Letter to the Right Hon. the Lord Provost of Edinburgh as to the Sanitary State of the City. By WILLIAM THOMAS THOMSON, F.R.S.E., &c. William Blackwood & Sons, Edinburgh and London. 1870.

MR. THOMSON is, we understand, an eminent Scottish actuary, and manager of the Standard Life Assurance Company. In this letter to the chief magistrate of Edinburgh he points out with peculiar emphasis the causes of the high death-rate of that beautiful city. The gist of his observations may be gathered from the following sentence:—"While we are busily engaged in providing new accommodation for the sick and suffering poor, we are dealing with a section merely of our sanitary requirements. The mere question of site for our hospitals should not, important as it is, absorb all our attention, for hundreds are yearly being cut off around us who would, in all probability, have been more alive if our sanitary regulations had been more perfect, and our advisers more acute and active in their inquiries. The public health is surely a question as large and as important as that of accommodation for our sick poor." The subjects mostly referred to by Mr. Thomson are "over-crowding," "water supply," and "irrigation by sewage."

A History of Lichfield Cathedral, from its Foundation to the Present Time, with a Description of its Architecture and Monuments. By J. B. STONE, F.G.S. London: Longmans & Co. 1870.

LICHFIELD CATHEDRAL, always interesting, has been rendered even more attractive to sight-seers than it was before, by new works and modern adornments. To meet the wants of those who are thus led to descend upon it, Mr. Stone has prepared this volume, in some respects a superior sort of guide-book. It is a pleasant enough popular history of the cathedral, but we have a very strong feeling that, to describe a noble piece of architecture, knowledge of architecture is necessary. Mr. Stone quotes Murray's "Handbook," and quotes Willis; but he apparently knows little of this department of his work himself. The work is very nicely got up, and is illustrated with five charming photographic views.

Wherever any damage is done, the author, like many other antiquaries under the same circumstances, at once ascribes it to the puritan soldiers, the correctness of which ascription is by no means so certain as some assume it to be.

The new pulpit in Lichfield Cathedral, of metal, is probably unique. The principal windows of the choir, it may be remembered, are filled with some remarkable sixteenth-century glass obtained from the dissolved Abbey of Herkenrode, near Liege, through Sir Brooke Boothby.

A pleasant and not unprofitable day may be spent in Lichfield.

VARIORUM.

THE *Quarterly Journal of Science* for January contains some interesting papers,—especially on the Principles and Methods of Sewage Irrigation; on the Total Solar Eclipse of August last, by Mr. Crookes, F.R.S.; and on Light and Sound. The paper on sewage irrigation is entirely in its favour as a solution of the sewage problem. It points out that sewage irrigation is of very ancient origin, not only as a deodoriser and neutraliser of excreta, but as a promoter of vegetation. The recognised power of earth to act as a disinfectant is traceable to the Mosaic lawgiver, as we have ourselves ere now observed; and the King's Garden at Jerusalem in ancient Jewish times appears to have been irrigated by sewage conducted through the rock tunnel sewers which still exist. The author of the paper reviews what has been done in modern times towards the establishment of the system and the application of the sewage to the soil. The paper of Mr. Crookes gives an excellent review of the observations of astronomers on the late total eclipse of the sun. It is accompanied by coloured and other diagrams of special interest. There is one point, not seemingly noticed by astronomers, to which we should like to draw Mr. Crookes's attention, if we may presume to do so. In the large coloured diagram, that "strange phenomenon, the corona," as Mr. Crookes calls it, has this peculiarity, that its

Miscellaneous.

greatest breadth lies exactly in the line of the moon's path, whilst its narrowest breadth lies at right angles to that line. Does not this peculiarity denote a special relationship to the moon rather than to the sun, to which the tendency of astronomers at present seems to be to refer? All these remarkable phenomena? Moreover, even the roseate and cloud-like protuberances seem to be arranged in a similar way; that is, they lie more on the line of the moon's path, than at right angles with it in the total eclipse. As regards the corona, would not the peculiarity just noted, as well as its existence at all, be explicable if we stipulate the existence of a lunar atmosphere, and perhaps an ocean as well, impelled, by the centrifugal force, to the outward and unseen hemisphere of the moon? This atmosphere and ocean, with perhaps cirious clouds floating in the atmosphere, would seem to be just such a condition of things as would produce that brilliant silvery white irradiation, with radial striae, "of a fibrous, slightly curled or twisted character, somewhat like a cirious cloud." And would not the form of the lunar atmosphere be modified by the moon's onward motion, so as to be narrower at right angles to the path than in a line with it? The fact that the roseate protuberances appeared partially protected on the face of the black disc of the moon, surely itself implies the existence of a refracting atmosphere behind or on the far side of the moon, and through which these cloud-images have passed. The idea that the red protuberances are clouds rather than flames, as we ventured to suggest previous to the last eclipse, appears to be now fully recognised; although the fact that similar clouds (or flames) have been seen surrounding the sun, apart from eclipses, would seem still to be held to corroborate the idea that they exclusively belong to the sun, and none of them to the moon. In speaking of Professor Zöllner's remarks on the protuberances, Mr. Crookes says,—

"In comparing the general impression of the protuberances with terrestrial phenomena, the author states that the great majority remind him of the different forms of our clouds and fogs. The cumulus type is completely developed in the cases here referred to. Other formations remind us of masses of clouds and fogs floating loosely over low lands and seas, whose upper parts are driven and torn by currents of air, and which present the well-known, ever-varying forms when viewed from the tops of high mountains."

There is not much indication here of a "fiery" nature, or of "solar flames," nine or ten thousand miles high and forty thousand long! — London Water-supply, from the Sources of the Wye, in South Wales. By H. H. Fulton, C.E. London: Stanford. Mr. Fulton's scheme is to catch a supply of fine soft water to the different water companies of London from the sparsely populated district of the sources of the Wye, in South Wales, by gravitation. To bring 130 million gallons a day, as a portion of the scheme, he estimates would cost 7,000,000*l.* And the entire scheme, for 230 million gallons a day, it is estimated would cost 9,000,000*l.* The serious dearth of employment at present, he remarks, renders this a fitting time to carry out such a scheme. — "The Australian Handbook and Almanac for 1870. Gordon & Gotch, Melbourne-hill." The idea of this almanac is a good one: it contains a good deal of information on the Australasian colonies, besides the usual matter of a shilling almanac. — England at Home. By W. B. Littlewood, M.A. London: Cassell & Co." This is one of Messrs. Cassell, Petter, & Galpin's little school-books, and contains a very brief and familiar description of the principal physical, social, commercial, and topographical features of England and Wales. The author was himself the head-master of a school and author of an Elementary British History. — "The Useful Weather Guide for the next Six Months of 1870. By Eleanor Rugg. London: Spon." The object of this guide is said to be "to suggest to the observer which weather as well [perhaps?] prevail at the time of the moon's entrance into her half quarters, quarters, full, and change; showing the moon's influence on the atmosphere, and representing the variations of the weather by morning and afternoon indicators." — The City has a readable and sensible article on the architecture of the City.

Society of Engineers. — At the next ordinary meeting of the society, to be held on the 7th inst., the president will present the premiums awarded to papers read during the year 1869, and will deliver his inaugural address.

Reclamation of Land. — In Tattershall parish are hundreds of acres of waste land, producing food for neither man nor beast—a dreary moorland, where wild grass and ling grow feebly between the roots of Scotch fir-trees out down some years since. This land, although never heretofore worth sixpence an acre, has been ascertained to be capable of bearing good root crops when properly cleared, drained, and clayed. Small attempts have from time to time been made in this direction with more or less success, the chief obstacle being the great expense of manual and horse labour in digging out and carting away the roots of the trees. According to the *Lincoln Mercury*, it has been reserved for Mr. John Robert Bankes, Lord Fortescue's agent and steward, to attempt a bolder experiment by calling in the power of steam to free the land from roots and plough the ground. After a consultation with Mr. Toppelf, of the North Lincolnshire Steam Cultivating Company, Mr. Bankes made a contract with him, and allotted the company a tract of ground on which to commence operations. The land, which is of a light, sandy, and gravelly nature, is studded with the stumps of Scotch fir trees, about 8 ft. or 10 ft. apart, in rows at the same distance from each other: most of the trees have been at the base 12 in. to 20 in. in diameter. When fairly at work, two engines extract the roots, pulled at the rate of one a minute. Two other engines of less power are engaged in drawing the released roots off the land into large heaps (to be burnt when the dry weather comes, if not worth removing), and thus preparing the land for the six-furrow plough which stands close by.

The Habits of Workmen. — The *Scientific Review* says,—"The careless and slovenly habits which are met with amongst a very large proportion of workmen is referred to in the *Scientific American*, in strong, though it must be admitted not altogether unjustifiable, terms. The shops, it is observed, in which cleanliness and order prevail are rather the exception than the rule; and the individual workman who, in the midst of all the carelessness which prevails in this regard, maintains a scrupulous care for personal cleanliness, order in the arrangement of his tools, and method in the performance of his work, may be regarded as a rising man. On our occasional journeys at times when workmen are returning from their daily work, we frequently notice them with begrimed faces and smutty hands, on their way to homes perhaps no less attractive than their persons. If this were compelled by circumstances, and the unavoidable conditions of their toil, it would be unkind indeed to find fault with it. We should, indeed, be the very last to look down upon the necessary accessories of honest toil; and if any workman is so situated that he must utterly disregard cleanliness, let it be distinctly understood we do not complain of him. But cases of this kind are rare, if they exist at all. What, then, is the reason for the inexcusable slovenliness of a large majority of workmen?"

The Post-Office Telegraphs. — An official notice has been issued by the Postmaster-General that on (this) Saturday, the 5th inst., the transfer of the property of the Telegraph Companies to the Postmaster-General will have been completed, and on and from that day the conduct of telegraph business within the United Kingdom will be undertaken by the Post-office. A list of the postal telegraph offices, which will on that day be opened to the public will be then ready for exhibition to the public at all post-offices in the United Kingdom. The postal telegraphic system will be extended as rapidly as circumstances will permit, and due notice will be given from month to month of the opening of additional offices. The charge for the transmission of an inland message will be uniformly, and without regard to distance, 1*s.* for the first 20 words, exclusive of the address, for which no charge will be made, and 3*d.* for each additional five words or part of five words. The message forms for inland messages will be of two kinds, viz., forms with a 1*s.* stamp embossed thereon, and forms without any such stamp.

The Henley-on-Thames Town Surveyorship. — The election of Town Surveyor to this place has been finally decided by the Local Board in favour of Mr. Frederic Haslam.

Dr. Lyon Playfair on Technical Education. — Dr. Lyon Playfair, M.P., in his second lecture on education to the members of the Edinburgh Philosophical Institution, confined himself mainly to technical instruction. He contrasted the educational efforts made and the results attained by various Continental States—Switzerland especially—with the paltry provision made by the British Government for the instruction of the working classes. The limitation of the Revised Code to the three R's rendered it useless for the purposes of that section of the community; an elementary knowledge of the principles of science and art involved in the occupations of the people should be introduced into primary schools, and indirect compulsory education of a primary character should be secured by making it a condition of the employment of the poor. When elementary education was made the key for entering workshops, then the schools attached to them should be made secondary, and afford instruction applicable to the employments in which the pupils were engaged. A higher education in relation to the industries of the people was an essential for the continued prosperity of the nation.

Metropolitan Municipal Association. — A meeting was held on Monday last week, at the Rooms of the Association, 209, Piccadilly, to consider amendments to the proposed Bills, and to meet objections urged in the last debate in Parliament. Objection had been taken to the number of mayors and aldermen proposed to be created in the Bills, and the discussion mainly turned on the means to establish both local municipalities and one central in London, in which the local should be neither too weak nor too strong in connexion with the chief municipality, but strong and harmonious as parts of a great whole. The example of Manchester, with its various townships in union, was much relied on. The decision was in favour of proceeding with the Corporation of London Bill to establish one municipality for London. The creation of local municipalities, it was suggested, should be as minor parts of a great whole. The true policy was levelling up, and the rest of the metropolis placed on the City footing. The committee authorised a revision of the Bills as modified by the discussion. The Government would support the second reading of the Bills. It was estimated that at least 2,000*l.* must be forthcoming, and an appeal for assistance is to be made.

The Improved Industrial Dwellings Company. The directors, in the report of their proceedings for the half-year commencing 1st July, and ending 31st December, 1869, state that a further sum of 67*l.* 1*s.* has been expended on buildings now completed, and 6,736*l.* 9*s.* 1*d.* on works in progress, making an expenditure of 6,804*l.* 8*s.* 1*d.* during the past half-year, and a total expenditure of 133,855*l.* 0*s.* 3*d.* since the formation of the company, on capital account. The gross rents received during the past half-year amount to 6,657*l.* 7*s.* 10*d.*; and after paying all charges, and crediting the proper amounts to the repairs and leasehold redemption funds, there is a net profit of 3,606*l.* 10*s.* 7*d.* The sum of 5,229*l.* 13*s.* 7*d.*, which includes 1,623*l.* 3*s.* brought forward from the last half-year, is available for division among the shareholders, but the directors recommend that a dividend at the rate of 5 per cent. per annum only be paid, which will absorb the sum of 2,944*l.* 13*s.* 9*d.*, and that the balance, viz., 2,284*l.* 19*s.* 10*d.* be carried forward.

A Mental Calculator. — John Alexander, post-runner between Nairn and Cawdor, according to the *Elgin Courier*, has proved himself to be an extraordinary mental calculator. He has given the correct answers to questions such as the following in less than a minute:—"Two chests tea, each 80 lb., at 3*s.* 6*d.*; 12 bars brown soap, each 3½ lb., at 4*d.*; 17 bars white soap, each 4 lb., at 5*d.*; three bags sago, each 27 lb., at 4*d.*; and seven bags barley, each 19 lb., at 1½*d.*" He was asked how many letters there would be in a year's file of a daily newspaper of eight pages, each seven columns, each 190 lines, each forty-two letters? The answer, 139,873,440, was given in a few seconds.

Society for the Encouragement of the Fine Arts. — The first special meeting of the session took place on Thursday last, at the House in Conduit-street, when an exhibition was made of some of the works of the late Mr. F. Y. Hurst. The President of the Royal Academy was to preside.

Street Improvements in Leeds: Corporation Sales.—The seventh sale of building land for the corporation of Leeds, in connexion with street extension, has taken place. There was a large and influential attendance, and Mr. Hepper, auctioneer, offered the various lots. Lot 1 was a corner site, opposite Trinity-street, having a frontage of 16 ft. 6 in. to Boar-lane, with a depth of 63 ft., the total area being 150½ square yards, or thereabouts. The first bid was 21l. per yard; the highest, 23l. 10s., and therefore the lot was withdrawn. Other two lots were also put up, but withdrawn. The next lot offered was a corner site opposite Trinity Church, and excited some spirited bidding. It has a frontage to Boar-lane of 11 ft., and to the road-way on the west of 18 ft., with a depth of about 21 ft., and containing 28 square yards, exclusive of roads and canseways. The first offer was 20l. per yard, and it was ultimately knocked down at 33l. 10s., the buyer being a wholesale druggist. One or two more lots were also withdrawn.

New Carving Machine.—In the machine invented by Mr. Gear, of Newhaven, U.S., the wood to be carved is fastened firmly to the bed by movable clamps adjustable to suit any required size of wood, and the cutters are fastened to a spindle moved by a universal joint in any direction upon the bed of the machine. The cutter is guided by hand, the guide resting against the pattern. The carving can be gauged to any required depth, and made to conform to any required pattern. A fan blows away chips as fast as they are produced, leaving the work constantly in view of the operator. The same tool which cuts the mortise also cuts the tenon, the two pieces of work to be dovetailed being clamped together to the end of the table. Every kind of finish hitherto made upon the edges of lumber, and which has hitherto been mitred and glued upon the face to create a finish, is planed, beaded, and moulded upon the piece itself by this machine.

Work and Wages in America.—It appears that since the civil war there are great complaints as to the quantity of work per day done by artisans and others in the various States throughout the country. The diminution is variously estimated in the different localities at a fourth, a third, and so on, of the work done previous to the war. The wages during the war, and even now, are higher than they were before the war; but it is said that the men are dissatisfied because everything is so much dearer (on account of these very wages chiefly) that they consider themselves worse off than they were. On the other hand, there is a very general movement throughout the country for a reduction of the present wages. These wages are injuring the masters, it is stated, no less than the men, and it is to be hoped the latter will see that the reduction will be to their advantage no less than that of the masters, since they complain of the dearthness of everything, just as the masters do of the want of business.

Safety of Old Warehouses and Public Resorts, Liverpool.—At a special meeting of the town-council, the mayor said he might throw out a hint regarding two points which the corporate body of Liverpool might with advantage bear in mind on next going to Parliament. They should consider how far the council ought to take supervision in respect to the safety of warehouses, particularly the old warehouses throughout the borough of Liverpool. If a man erected a warehouse, particularly for corn, there was no limit as to the weight he should put into the room. He also thought it might be within the scope of their duty as a municipal body to see that there were proper and sufficient modes of ingress and egress connected with buildings where large masses of people were in the habit of assembling. He thought these two points were well worthy of the future consideration of the council.

How to make Artificial Porphyry.—The *Chemical News*, giving an abstract of a recent paper by MM. Sepulchre and Ohressen, says that these savants have perfectly succeeded in utilizing the slag of the iron blast furnaces for the manufacture of paving stones, which withstand a crushing weight of more than 400 kilos. per square centim., and have answered for the purpose of paving several streets at Brussels and Paris, and stood heavy traffic far better than even the celebrated Quenast stones. The streets paved with this material at Brussels have a heavy gradient.

New Reservoir for Oswestry.—By the recent decision of the town council, the borough surveyor, Mr. E. B. Smith, has been charged with the construction of the new reservoir, capable of storing between six and seven million gallons of water, making, with the present reservoir storage, ten million gallons. The works have been commenced, and there are now about forty men engaged in the excavations, and certain other preliminary works, before the full staff of men are put on. The excavations are being made through a bed of blue clay, which will afterwards be utilized, by making it into bricks. There are upwards of 40,000 cubic yards of earth and clay in all to be removed.

Explosion of a Boiler in the South of England.—An explosion has occurred at a boarding-school, Ashley House, Gateford-road, Worksop, which killed a female servant on the spot, and also severely injured another person, so that she is not likely to live. The boiler which exploded was supplied with water-pipes, and fixed in the wash-house, which is divided by a passage leading to a play-ground from the wash-house, and a partition wall destroyed. The place was a complete wreck. We have had no reply yet to our query why so many more of these explosions occur in the north than in the south of England.

Proposed New Street from Charing-Cross to Tottenham-court-road.—A joint deputation from the parishes of St. James, Westminster, St. Margaret and St. John, Westminster, and St. Anne, Westminster, waited on the First Commissioner of Works to urge upon the Government the propriety of making a communication between Pall-Mall and Leicester-square, along the west front of the New National Gallery. The First Commissioner stated that it was not the present intention of the Government to build any west front to the National Gallery, but that if the Metropolitan Board of Works, or any local boards, proposed to make a good street to Leicester-square in that direction, they would take the matter into consideration and modify their plans if possible so as to allow the street to be made. This ought to be taken in hand at once.

Hoisting the Great Bell of Worcester Cathedral.—This bell has been successfully hoisted into the tower of the cathedral. The bell weighs 4½ tons, but it was got up to its proper position with comparative ease by the aid of three powerful crabs worked by several strong men. The Earl of Dudley, Lord Eloho, the Rev. R. Cattley, and several gentlemen of the city and neighbourhood were present at the hoisting of the bell, and much interest was taken in the method adopted. Lord Dudley, before leaving, presented the workmen with a sum of money, and also promised a further donation to the Clock and Bells Fund of 100l. The twelve other bells composing the peal are all hung ready for work.

Linlithgow Parish Church.—Attention has been directed of late to the propriety of restoring this ancient and beautiful ecclesiastical building to something resembling its former condition. Encouraged by the success attending the improvements made in the Glasgow Cathedral and the High Church at Stirling, the latter, by the way, bearing a strong resemblance in many points to the church of Linlithgow, it has been resolved to make an effort, and strive, if possible, to have the interior of the church, as it exists at present, altered and re-arranged. It has been announced that Mr. David Hutchison, of the firm of David Hutchison & Co., Glasgow, has offered to subscribe the sum of 500l. towards the contemplated restoration.

Italy and the Workmen's International Exhibition.—The Florence journals publish a circular, addressed by the Italian Commission for promoting the London Workmen's International Exhibition of next July, to the various municipalities, presidents of the Chambers of Commerce, and managing committees of working men's clubs, throughout the Peninsula. Of this commission, the Marquis Rodini, the late Minister of the Interior, is the president.

Carpenters' Company.—There is a vacancy in this company's almshouses at Twickenham, for a freeman or liverman, aged fifty-five, or a widow of a freeman or liverman, aged fifty. Applications to be sent to the hall before 26th February.

Abandonment of Improvements at Liverpool.—The Liverpool town council, in consideration of the present heavy local taxation, have now resolved to withdraw their Improvement Bill, prepared for the ensuing session, involving an expenditure of over 500,000l., it being understood that next year they will expend upon improvements about 100,000l., for which they have already procured powers. In the course of the discussion, it was stated that the mortgage debt of the corporation amounts to 1,324,464l., the interest on which requires 10d. in the pound out of the rates.

Use of Steam in Brick-kilns.—Among recent American inventions is one which consists in so constructing a brick that the products of combustion from fires contained in furnaces at one end of the kiln are caused to forcibly permeate the mass of bricks by the action of jets of steam or other equivalent exhausting device, situated at the opposite end of the kiln, and *vice versa*. Jets of steam are also directed into the combustion chambers, and over the fuel of those fireplaces which are in action for the time being, as well as into their corresponding ash-pits.

Crystal Palace.—Next Tuesday, besides the pantomime and the performances of the American skaters, the annual show of the National Peristerion Society will be held in the Tropical Department. From the title of this amateur association few people probably understand that its objects are to improve the breed of pigeons, and by holding these annual exhibitions, to enable pigeon-keepers to improve their collections. The show is of an interesting character.

Cologne Cathedral.—The progress made in the construction of Cologne Cathedral during the year 1869 was satisfactory. The northern tower has reached a height of 180 ft. above the ground. The state of the southern part was so bad that a great deal of the masonry had to be removed; 20 ft., however, have been rebuilt. The scaffolding for 1870 is almost ready, and the stone required has been purchased. The towers will now rise isolated above the building. They are to be built to a height of 30 ft. a tower.

Proposed Church of St. Paul, Leicester: Church Extension Association.—The Building Committee met last week to open tenders for the erection of this church. The following were the tenders:—Bradley, 6,467l.; Myers, 6,849l.; Jackson, 5,758l.; Dove, 5,475l.; Widows, 5,250l.; Fira, 4,887l.; Neale, 4,765l.; Osborn, Brothers, 4,436l. The lowest tender will be, of course, accepted, on the requirements of the architect being complied with. The work will, therefore, again fall into the hands of a local firm.

Art-Workmen.—The response made to the prizes offered by the Society of Arts for specimens of art-workmanship is in some respects better than it was last year. The catalogue will be out next week. The same gentlemen who have before acted, Sir M. D. Wyatt, Mr. Redgrave, and Mr. Godwin, with a fourth not yet named, will report on the works for the assistance of the council in adjudicating the prizes.

Test for Hardness of Metal.—The hardness of metals may now be ascertained by aid of an instrument invented by a French engineer. It consists of a drill, turned by a machine of a certain and uniform strength. The instrument indicates the number of revolutions made by the drill. From this, compared with the length of bore-hole produced, the hardness of the metal is estimated. It is said that a great proportion of the rails now employed in France are tested by this instrument.

Fall of a Railway Bridge.—An alarming accident has occurred at Ingham. Several men were repairing a bridge which belongs to the Thetford Railway Company, and had been badly built. Just as the men were about to leave off work for dinner, a train is said to have passed, when the bridge gave way, and fell with a loud crash into the street below. All the men escaped serious injury except a bricklayer, who was severely hurt.

King's College Girders.—We were present a few days ago, with Mr. C. J. Freake, Mr. E. Beckett Denison, and others, when Mr. George Dines, to whom the restoration of the damaged at King's College Dining-hall has been intrusted, broketwo of the old girders to learn their strength. As a few diagrams will make the matter clearer, we defer mentioning the result till these can be prepared.

New Dock for Liverpool.—The Mersey Dock Board, after a protracted debate, have resolved, by 17 to 6 votes, to construct a new dock for the steam trade at the north end of the port. The estimated cost is 150,000*l.* The minority wanted by differential rates to utilise the Birkenhead Docks.

New Covered Market for Preston.—At the meeting of the Preston town council, on Thursday last, it was unanimously decided to erect a new covered market, the cost of which is estimated to be between 6,000*l.* and 7,000*l.*

The French Academy.—We learn from the *Art-Journal* that Mr. J. R. Herbert, R.A., has been elected a corresponding member of the French Academy of *Beaux Arts* in the room of the late Baron Leye, of Antwerp.

Society of Female Artists.—The exhibition made by this society will be opened to private view on the 12th inst., and to the public on the 14th.

Female School of Art.—The distribution of medals and prizes will take place in the New Lecture Theatre, South Kensington, on the 9th inst. Sir Stafford Northcote will preside.

The Free Libraries Act.—At Willenhall a public meeting has been held, at which, after a good deal of discussion, the Free Libraries Act has been adopted, by a majority of 93 to 41.

TENDERS.

For four houses at Southend. Mr. C. Kirkby, architect. Quantities supplied by Mr. F. Johnston:—
Wharf £1,790 11 0
Wicks & Bang 1,700 0 0
Felling 1,800 0 0
Allen 1,422 13 0
Smith (accepted) 1,231 0 0

For a Wesleyan meeting-house, Weeley, Essex. Mr. John Leaning, architect:—
Dobson £389 0 0
Canham 341 0 0
Shepherd 340 0 0
Everett & Son 318 0 0
Saunders & Son 308 0 0

For villa residence at Richmond, Surrey, for Mr. James Alabaster. Mr. G. H. Page, architect. Quantities supplied:—
Sweet & Son £1,624 0 0
Gasson 1,550 0 0
Arles 1,530 0 0
A. & J. Smith 1,477 0 0
Brown & Sons 1,473 0 0
Bass (accepted) 1,460 0 0

For houses of twenty-two houses, at Leyton, Essex, for Mr. J. D. Meads. Messrs. John M. Dean & Kingston, architects:—
Hunt & Elkington £3,500 0 0
Davis 3,310 0 0
Turner 3,300 0 0
Cardozo 3,113 0 0
Boyer 3,090 0 0
Bayer 2,980 0 0
Fought 2,959 0 0
Aitchison & Walker 2,890 0 0
Holding & Dickens 2,820 0 0
Kelly 2,817 0 0
Ingham 2,785 0 0
Mansfield 2,735 0 0
Bates 2,640 0 0
Fitch 2,634 0 0
Russell & Parsons 2,618 0 0
Brickell 2,420 0 0
Barnes 2,400 0 0
Ladd 2,300 0 0

For three new warehouses in the City. Mr. Hill, architect. Quantities supplied by Mr. Joseph Gibson:—
Brown (accepted) £9,913 0 0

For new farmhouse and homestead, Little Wenham Hall, Essex, for Mr. Joseph Baxendale. Mr. Fred. Chancellor, architect. No quantities supplied:—
Brown £3,180 0 0
Saunders 3,112 0 0
Bell & Sons 2,984 0 0
Glascock 2,905 0 0
Cole, Brothers (accepted) 2,783 15 0

For four new warehouses in Oak-lane, City, for Messrs. Knight, Wells, & Braham. Mr. Fred. Chancellor, architect. Quantities supplied by Messrs. Karlake and Mortimer:—
Turner & Sons £8,897 0 0
Brown 8,800 0 0
Gill & Son 8,751 0 0
Comber 8,650 0 0
Rider & Son 8,375 0 0
Colls & Son 8,100 0 0
Henshaw 7,889 0 0
Hill, Keddell, & Co. 7,915 0 0
Brown & Robinson 7,790 0 0
Brass 7,738 0 0
Bell & Sons 7,280 0 0
Crabb & Vaughan (accepted) 7,215 0 0

For taking down and rebuilding the Dover Castle public house, Church-street, Greenwich. Messrs. Church & Rickwood, architects:—
Vaughan (accepted) £990 0 0

For a detached residence to be built in The Avenue, Blackheath, for Mr. D. Davis. Messrs. Church & Rickwood, architects. Quantities supplied:—
Anley £1,658 0 0
Tongue 1,550 0 0
Pinkey 1,627 0 0
Blake (accepted) 1,444 0 0

For lairs and slaughter-houses, for the Town-hall and Markets Committee of the Borough of Salford. Mr. John Bowden, C.E., architect. Quantities supplied:—
Squires £3,215 0 0
Yates 3,027 0 0
Johnson 3,214 0 0
Parry & Son 2,773 0 0
Simpson 2,690 0 0
Forlington & Son 2,684 0 0
Ledger 2,650 0 0
Wade, Brothers 2,686 0 0
Jackson 2,675 0 0
Strickson & Son 2,522 0 0
Stratham & Sons 2,485 0 0
Wilkinson & Helm 2,475 0 0
Warburton, Brothers (accepted) 2,450 0 0

The following are for works on estates belonging to the United Land Company:—

Willenden Estate.—Roads.
Pizze £450 0 0
Young (accepted) 436 0 0
West Hill Estate, Wandsworth.—Roads.
Young £2,305 0 0
Robinson 2,050 0 0
Wigmore (accepted) 1,725 10 0

Muswell Hill Estate.—Drainage and Road Works.
Young £905 0 0
Pizze 880 0 0
Strickson (accepted) 740 0 0

West London Estate, No. 2.—Drainage and Road Works.
Pizze £345 0 0
Young 530 0 0
Strickson 500 0 0
Coker, jun. 490 10 0
Wigmore 460 0 0
Blackmore (accepted) 423 0 0

Hammermith Estate.—Drainage and Road Works.
Strickson £700 0 0
Coker, jun. 695 0 0
Blackmore 670 0 0
Wigmore 600 0 0
Young 588 0 0
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In type.—Registration of Disease; Death by Suffocation; &c.—Data (we do not know any agency in London for the negotiation of architectural patronage); E. P. (all in good time);—M. & W. (tenders were not enclosed);—W. C. (it is very curious that we did not insert it, there was reason for doing so);—F. H. G. (shall hear from us);—Z. (correspondents should not be impatient; the mass of information received from all parts of the kingdom has to be sifted and sifted unavailingly);—A. O. H.;—J. W. H.;—H. H. S.;—B. M. S.;—F. G. K. W.;—T. M. W.;—F. C. A. M.;—Mia W.;—I. W.;—J. H.;—T. V.;—J. L. W.;—W. A.;—D. O. A.;—L. J. W.;—W. H. K.;—R. W.;—G. D.;—R. J. L.;—B. W.;—B. H. L.;—C. H. H.;—D. R.;—K. A. H.;—T. C. A. H.;—Col. F. J. S. N.;—G. W. H.;—W. K.;—T. V.;—O. C. H.;—F. C. J.;—G. J. W.;—F. E. R.;—B. J.;—R. W.;—C. R.;—T. H. V.;—B. & Co.;—W. F. C. G. Q.;—F. R. T.;—J. F.;—G. D. B.

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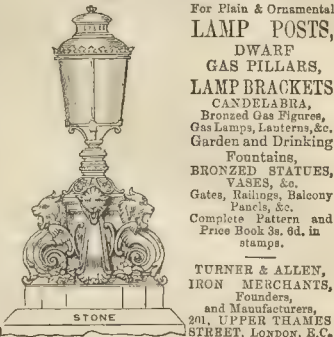
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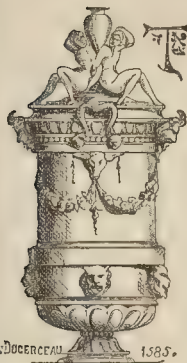
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The Builder.

VOL. XXVIII.—No. 1410.

A Visit to Bethlehem.



THE most sacred spot on earth after Jerusalem, the place of sepulture of our Lord, is Bethlehem, His birthplace. There are doubts about the exact site of the holy sepulchre, but the same degree of uncertainty does not exist about the grotto of the Nativity. It has been urged by some that a cave underground could not have

been used as a stable; but those who have travelled in the East will be able to remember many towns and villages built upon rock in and around which are caves used by the inhabitants as stables and pens, for their horses, asses, cows, and sheep. The fact of the grotto being underground is easily explained when we consider that even in the course of a century the level of the ground in the vicinity of the dwellings of men is perceptibly raised by the accumulation of *débris* of all sorts, and that therefore in the three hundred years which elapsed between the commencement of the Christian era and the period when St. Helena erected the basilica over the grotto, there must have been some such raising of the soil. We know that this was the case at Jerusalem, and that the holy sepulchre was buried beneath heaps of rubbish until the time of the Empress's visit. Then everything was cleared away, and the rock cut to a level all round, to admit of the erection of a sanctuary surrounding the tomb; but here the Empress or her architect found it a better plan to build over than around the grotto, in such a manner that the high altar should stand above it. In addition to the evidence of common sense, we have the testimony of reiterated tradition in support of the authenticity of the site.

But beyond the sacred associations connected with the place, it has an especial interest for the architect, arising from the fact that the church itself is the earliest basilica in existence, and the only one which has come down to us in an unaltered condition.

Sta. Maria Maggiore and San Giovanni in Laterano have been so frequently rebuilt, and are so overloaded with extravagant ornamentation, that but little can be traced of the original structures beyond the plan. San Paolo fuori le Mura, as we know, has been lately reconstructed. San Clemente and Sta. Agnese preserved many of their primitive features, but have still endured many alterations since the time of their foundation; and the Church of the Holy Apostles, built by Constantine in New Rome, and his basilica at Jerusalem, have totally disappeared; but the church of Bethlehem remains as it was left by the Empress; the only addition being the internal mosaics of the twelfth century, a modern roof, and a monstrous wall, which has been built between the nave and transepts as a barrier,—a practical and tangible excommunication of the Greeks by the Latins, or of the Latins by the Greeks.

Perhaps the church owes its preservation to its being situated in a village and not in a city, as in the case of many of our village churches, which have escaped; while our cathedrals, one and all, have suffered at the hands of the destroyer or *soi-disant* restorer. We remember, on the occasion of a visit to the Church of Dôl, in Brittany—a cathedral situated in a small town,—being delighted with its untouched condition. No new work was to be seen either inside or out, and the columns of the nave had here and there an attractive tint of green mould on them. The worthy curé, who accompanied us, did not, however, share our gratification. Our town is unfortunately so poor, said he, that we cannot raise a sufficient sum to enable us to gain a grant for the restoration from Government. "*Tant mieux pour vous et pour votre église*," was all we could say to our astonished cicerone. His mind, like that of many other pastors, both in France and England, was bent upon the attainment of something new,—of scraped walls and mouldings, dainty tiles and tawdry decorations, and the classification of his church as a *monument historique*. Like the Cathedral of Dôl, the basilica of Bethlehem probably escaped on account of its somewhat remote position in a poor village.

Such being the nature of the interest attached to Bethlehem, our readers, probably, will not object to accompany us on an excursion thither. Bethlehem is only about two hours' ride from Jerusalem, and the trip may be made in peaceful times without an escort,—at least, we found by experience that it could be; and since the time of our visit, we hear that the Bedouins do not, as they did formerly, approach the walls of the Holy City, and pick up the incautious stragglers, being deterred by a wholesome dread of the breech-loaders with which the Turkish army is, in part armed.

We left Jerusalem by the Jaffa Gate; but instead of following the Jaffa road, which runs beside the city walls, and then turns to the right over a high ridge, we descended into the valley on our left, and after passing an empty reservoir, the Birket Es Sultan, at the bottom of the valley, began to ascend near a row of ugly cottages, built by that benefactor of his race, Sir Moses Montefiore, as almshouses for his poorer compatriots, and so reached the summit of the hill situated on the south-east side of Jerusalem, adjoining that of the Hill of Evil Counsel. On turning round towards the Holy City, we had a view, interesting indeed, but inferior in interest and in beauty to that which is obtained from the Mount of Olives. Before us lay a ravine, the valley of Hinnom (on the sides of which grew a few scattered olive-trees), which deepened as it proceeded towards our right; and immediately opposite, upon a rocky eminence, about as high as that on which we stood, was the south-east angle of the city walls. Not far from the angle rose the towers of the Citadel of David, and in front of the wall, on the shoulder of a hill, stood the building dignified by the title of the House of the Last Supper. Immediately inside the walls were the roofs of the Armenian convent; but few roofs or minarets were visible as the city falls off from this, its highest point, towards the valley of the Tyropœon.

Pursuing our road towards the east, we soon came upon a tract of barren table-land, through the midst of which the road ran in a straight line. This plain was treeless, and at the season in which we visited it—autumn—without signs of vegetation; so that we were not at all sorry, after about three-quarters of an hour's ride, to reach a wood by the road-side, in which we saw one or two encampments occupied by consuls, who wisely take advantage of the fine autumnal weather to get away from the dust, dirt, heat, and bad water, all which, towards the end of September, render a residence within the city-walls almost insupportable. Opposite the wood

was a large Greek convent, dedicated, like many of the Greek churches, to the Prophet Elias, who is especially venerated by that community.

At this point we turned to the right, and entered a road running along a ridge, and skirting a deep ravine which lay on our left hand. We soon observed on our right a small domed building,—of no great antiquity itself, but marking the site of one of the landmarks of the ancient world,—Rachel's Tomb, about the situation of which Christians, Jews, and Mahometans are for once agreed.

A little beyond this point we saw, crowning the summit of the opposite side of the ravine,—which, on account of its numerous terraces covered with vineyards, presented a striking contrast to the valley we had left an hour or so before,—the village of Bethlehem, which no doubt obtained its name,—signifying in Hebrew, house of bread, and in Arabic, house of meat,—from the fertility of the district in which it is situated. Conspicuous amongst the buildings was a vast buttressed edifice at the edge of the ravine,—the Convent of the Nativity,—which no doubt will be the principal feature in Holman Hunt's forthcoming view of Bethlehem.

In half-an-hour's time after our first view of it we reached the village, and seeing no visible sign of the Basilica, we made our way to the convent, and, upon stating our wishes, were immediately conducted to the guest-chamber. On our way thither we passed through a bare-looking cloister, the floor of which was stained with the purple juice of the grape. A sturdy peasant, with naked feet, was employed in treading out grapes in a large wooden trough, and this view of the preparatory process did not certainly act as a shoeing-horn when we had wine set before us by the hospitable monks.

We were agreeably surprised to encounter in the guest-chamber two Englishmen who had accompanied us in our ride round Jerusalem some days before. They, however, had done all the sight-seeing, and were on the point of departure for the Dead Sea; so that we had not the pleasure of their company in the church. As soon as we had finished our frugal repast, we followed the monk who had been deputed to guide us through the cloisters and surrounding chapels, and finally emerged on the south side of the chancel of the basilica. Here we must confess that at first we had some difficulty in orientating ourselves, as the monstrous wall-screen before mentioned as cutting off the nave from the transepts had quite altered the internal aspect of the church. Entering a small door in the wall of the substructure of the choir, we descended by a flight of eighteen or twenty steps to the grotto of the Nativity, which is situated, as far as we could judge, under the high altar. This grotto has been so frequently described, and with such accuracy, that we need only say that it is a natural cave, about 36 ft. long by 12 ft. wide, and 9 ft. high, and that it has been so thoroughly cased with marble that but little, if any, of the live rock is visible. Another staircase led us past other chapels and caves into the opposite side of the church to that from which we had descended. Here we had an opportunity of examining the building more at our leisure. It is cruciform in plan. There is a wide nave, with double aisles, and eleven bays, marked by monolithic columns, about 18 ft. high, with Corinthian capitals and bases. The columns support a regular entablature, consisting of an architrave of three faces; a frieze, enriched with sculptured foliage, and a rich cornice. The capitals are quite classical in character, and would not have disgraced a purer period of architecture; but the overloading of ornament on the frieze and cornice shows a considerable departure from the simplicity of earlier times. The transepts are of the same width as the nave, and terminate at the north and south ends

in semicircular apses. The choir has two bays with aisles, like those in the nave; at the east end is a semicircular apse. There is a row of plain windows in the clearstory. The wall space above the architrave and between the windows is occupied by a series of mosaics, representing biblical subjects, executed in the twelfth century. The roof, which is of cedar, is of the sixteenth century.

It is almost superfluous to allude to the statement made by some authors, upon the authority of Monkish historians, that the church was rebuilt by Justinian; for, as will be perceived from the foregoing description, the character of the architecture entirely contradicts it. The trabecate system here observable died out in the time of Constantine, and was replaced by the arcuate system, which became universal before the time of Justinian. In truth, the architecture of the basilica approaches good Greco-Roman more than that of any other edifice erected in Constantine's reign; and in style it is superior to the contemporary buildings at Rome and Constantinople; for in those cities the materials employed in the erection of new edifices were taken from the temple and other ancient structures; consequently, we find in them capitals and bases too large, or too small, for their respective columns, and architraves, friezes, and cornices squeezed into positions for which they were never intended; while at Bethlehem the columns, which are all monoliths, were evidently quarried in the neighbourhood, and the capitals sculptured to fit them near the building for which they were destined.

There has been an abscism before the church, but there are few traces of it now.

Upon entering the nave, we were surrounded by a crowd of boisterous ragamuffins, who seemed to think it was our bounden duty to purchase their stock of rosaries and carvings in mother of pearl; and who, when we had selected one of the latter, fell upon the favoured mortal who sold it to us with such violence that we could not help exclaiming, "as we forced our way through them,"—"Are you Christians, and of Bethlehem?"

THE ABNORMAL DEATH-RATE IN EDINBURGH.

THE death-rate is assuming a very serious aspect in Edinburgh. Last week we noticed a letter on the subject, which had been addressed to the Lord Provost (Laird) by Mr. Thomson, a Scottish actuary, which showed that the death-rate of Edinburgh for a given period was only exceeded by two of the large cities of Europe, viz., Glasgow and Berlin, the former city being the highest. On the same day of publication it happened that a leading article appeared in the local *Daily Review*, commenting on the said phenomenon in strong terms; and, from a paragraph in the next column of the same journal, we gather that the author of this article is the editor himself, Mr. Henry Kingsley. The paragraph in question goes on to say that

"Since we wrote the leading article this morning, we find that, for the week ending the 29th of January, Edinburgh has not only surpassed herself, but every other city in Europe. The death-rate here is 47, while Glasgow is only 38, Berlin 39, London 26, and Portsmouth 21. We also now know the reason of the hideous mortality at the Albury, and mean to speak of it. What will be the death-rate in the new workmen's houses which are building in that quarter?"

Once more, still on the same day, the *Scotsman* gives prominence to the following paragraph, which, while admitting the truth of the weekly statistical returns of the medical officer of health, tries—unsuccessfully, as we think,—to palliate their logical effect by an attempt to deny the truth of the census returns of 1861:—

"The high rate of mortality in the city during the week, indicated by the returns published by Dr. Littlejohn, the medical officer of health, has created a good deal of anxiety in the public mind, and it may not be out of place to call attention to some facts which may tend to allay any uneasiness that may exist. It is now pretty generally admitted that the population of Edinburgh was considerably understated in the last census returns, and consequently any comparison of the death-rate with that of other cities places Edinburgh in a somewhat unfavourable position. A death-rate of 46 per thousand, even putting the population considerably over the present estimate, is, however, considerably in excess of the average; but it will be observed that the proportion of preventable diseases is considerably lower than usual, there being only nine cases of death from fever, six of which occurred in the New and three in the Old Town. The highest death rate is to be found among the very old and the very young; while there has been an unusually large number of deaths among the pauper population, and those verging on pauperism."

Finally, one or two of the magistrates and town councillors have also printed letters and

pamphlets on the subject; and, in fact, the inhabitants of Edinburgh, and the strangers who are resident in that city, seem to have become thoroughly alarmed at this unwanted and abnormal rate of mortality.

The condition of Edinburgh is not a new subject with us, as our readers are aware; although many of our suggested precautions have been treated with a sort of Cassandra-like indifference, if not with actual neglect. Only about a year ago, for example, to go no further back, we pointed out several circumstances concerning the sanitary condition of the old town of Edinburgh. More particularly, we have shown, in the first place, the urgent and imperative want of a liberal supply of water; secondly, of more water-closet accommodation in the closes of the old town; we then referred to the sanitary condition of the New Town of Edinburgh as being, comparatively speaking, as much in want of sanitary improvement as the Old Town itself; and, finally, we pointed out that no attention was bestowed on the disgusting condition of the gasworks and irrigated meadows, and of their evil influence on the Palace of Holyrood; besides supporting, as best we could, the removal of the medical hospital to a new site; and the urgent need for improvement in the whole system of the drainage of the city.

It is the misfortune of all true disciples of the modern science of sanitary economy that their labours constantly bring them into dangerous collision with the novelties and the pook. The story which we have to relate, however true it may be, is always dull, prosaic, and uninteresting. There is no romance about it. On the contrary, it frequently becomes a duty to destroy, in a great measure, the preconceived and popular idea with regard to a picturesque city like Edinburgh, which most people suppose, from the circumstance of its being beautiful, should at the same time be salubrious and healthy. And the capital of Scotland is so surrounded with romantic associations, natural and artificial, that whenever we come to report on its actual condition we are, in all probability, accused of a *suppressio veri* or an *animus hostis*,—a design of either withholding our admiration, or of positively perverting the character of the place. We cannot do better than enter once more our strong disclaimer of any such intention. Although it has been, and will be, our study, to tell some disagreeable truths concerning this fair city, we have always endeavoured to do so as temperately as possible. Our business is to deal with principles, whether of local or central administration or of popular practice, and if we can show these to be antiquated or injurious to the cause of progress and public health, the fault is not ours if we may say unpalatable things.

Edinburgh, in fact, even with regard to its recent sanitary legislation alone, and totally irrespective of its being the capital of Scotland, is a city which no denizen of the British Empire can regard with indifference. Occupying not altogether unworthily one of the finest sites of which a modern European city can boast, Nature has also been profuse in supplying it with the best of all our building materials. There is no sandstone with which we are acquainted superior in point of quality to that of the Craigleith, Binnie, and Redhall quarries; and, putting the element of design out of the question, it may be added that when occasion serves there is not better building to be seen anywhere than in Edinburgh. It is true that the division of labour is not carried out to the same extent in this northern metropolis as it is by the English, and more particularly by the London builders. But that is neither here nor there. Those who have examined the ashlar work of the Register-office and the Edinburgh and Glasgow Bank, the rubble work of the Edinburgh prison, or even the brickwork of the India-rubber manufactory, will speedily arrive at the conclusion that in Edinburgh there is not, and never has been, a lack of high mechanical skill in her building trades.

Nor is it possible to find fault with her present race of architects and engineers. Faults have, doubtless, been committed, and grave ones, in our estimation, in the mere planning of the streets and buildings of the new town; and most of the principal streets and squares, although spacious and handsome, are tame and monotonous in their design and construction. Hospital construction, which has reached one of its highest forms of development in Edinburgh, does not result in medical hospitals; but a curiously connected series of palatial edifices, certainly ornamental to the city, the ostensible

purpose of which is to give a limited quantity of accommodation to a small number of healthy boys or girls, and their teachers, regardless of expense. Accordingly the whole funds nearly are lavished on the external walls, and on heavy, florid, and cumbrous enrichments. Hence, while speaking with a certain qualified admiration for this kind of architectural work, it is to be feared that the architects have fallen into a grand and irretrievable mistake,—that is to say, of designing palaces in place of hospitals. At the same time no one will say that the Scottish architects are not capable of planning and constructing decent ordinary houses, if only the genius of their country or its climate—we do not know which—would permit them to get rid of the dangerous and unwholesome practice of planning common stairs.

These common stairs lead to much of the high death-rate of Edinburgh; and are, we can confidently assert, from repeated and painful examination, nothing more nor less in most cases than a common nuisance. They are never clean, seldom ventilated, and almost always have the water-closets, if there be any, communicating with them.

The house-drainage of Edinburgh is also sadly defective. Even in the best streets of the new town those pestilent abominations which we term "cesspools" are still commonly employed and counted as by the local authorities. Illustrations of these will be found in a previous volume. But the drains upon the whole seem to be much superior to the common sewers of the city. A report of one of the principal sewers of the southern districts lately published shows that it is in a dangerous and disgraceful condition.

As to overcrowding the population, we must turn to the Old Town; but with regard to it we shall be very brief. So much has been said and written of late about the architectural beauties and blemishes of these ancient and dingy remnants, that we may assume this subject to be well enough understood. Besides, when we find a community fully alive to the evils under which they suffer, and doing their best in the shape of levying assessments, and trying otherwise to effect what Lord Provost Chambers calls "a perfect cure," we must confess that we do not think ourselves justified in taking up minor defects, or squabbling about minute differences of principle. And really it must be said that the Edinburgh people are at length thoroughly ashamed of the Old Town and its insufferable nuisances. Indeed, they seem almost disposed to raze the old closes to their foundation rather than be longer annoyed with them. But we are afraid it is not for poor Edinburgh to proceed in this imperial and cavalier fashion. Even with Mr. Chambers's comprehensive scheme,—which will cost, it is estimated, 300,000*l.* for the mere acquisition of old property and laying out of new streets, and which will occupy upwards of thirty years to complete it,—even with this scheme carried into effect, by far the greater bulk of the densely-populated quarters of the Canongate, the High-street, the Cowgate, the Grass-market, and the West Port, will still remain in their pristine condition, and therefore still continue to exercise their fatal influence on the statistics of poverty and crime, as well as disease and pestilence.

In order to give some idea of the condition of these tenements, we shall extract from Dr. Boggs's little book on "Working Men's Houses" some statistics which bear on the question. The details of the whole of this part of the last census have not been tabulated, we are told, in regard to the principal towns and country districts of Scotland, "in consequence of the parsimony of the Government and the indifference of the people." But they are given in regard to Edinburgh and Glasgow, and are, no doubt, exceedingly important.

In Edinburgh, 121 families live in single-roomed houses, each without a window! It further appears that 13,208 families in Edinburgh, representing at least 50,000 of the inhabitants, live in houses of only one apartment each. But even this does not indicate the full amount of mischief; for 1,530 of these have from six to fifteen inhabitants residing in each (census, 1861). This, we must admit, at once presents a most shocking state of things; and putting aside the abstract question of supplying houses to this class of the population, which we shall not discuss at present, although it constituted part of the late Lord Provost's programme, we ask, in all humility, how such an unspeakable quantity of abomination as this

overcrowding must represent should be tolerated for a moment at Edinburgh? It is now some years since we indicated the only absolute remedy for it, which is simply that those tenements ought to be as regularly inspected as the common lodging-houses.* It is no proper answer to this reasonable request, which we have more than once heard cropping out, that we "shall invade the sanctity of the domicile." No philanthropist or humanitarian can possibly have a greater respect for domestic liberty and security than we have; but the conditions of the social contrast, so to speak, are entirely changed when this domicile is transformed into a den of thieves or a hotbed of contagious fever; we therefore earnestly and sincerely recommend the Edinburgh authorities to give some attention to the necessity of inspecting these over-crowded tenements.

As to the method of surface cleaning out the closes, to which we have often referred, there can be no doubt whatever that it stands in great need of reformation. It is quite true, we believe, that considerable pains are taken by the scavengers to remove the surface ordure every day. And if the theory that the poor inhabitants who are supposed to carry their pails down the interminable stairs to the police-carts at certain hours were actually borne out by the facts, then it might be admitted that the system of cleaning these closes is, practically as well as theoretically, what its supporters claim for it, the best system, not only for Edinburgh, but for other large towns of the kingdom.† But the difference between the beautiful city of Eden on paper, as Charles Dickens describes it, and the beautiful city of Eden in fact, is not greater than that which exists between the theory of the local authorities and the practice of the poor inhabitants. Not our experience alone, but the united testimony of every Englishman who has ever looked into these dark, dingy, and pestiferous alleys, goes to prove that not so much during the day perhaps, but almost invariably during the night, they are literally converted into the purposes of open sewers! The smell, after a certain hour, is literally the worst thing in its way we have had the fortune to encounter. The fact is there is no use in setting down certain difficult or impossible conditions, and expecting us to believe they are complied with. Acts of Parliament are of little use; Police Bills, as Tom Hood said, are *purgatory*; and even punishment ceases to have its terrors. In the first place, to carry down a pail of putrid filth ten or twelve stories might be, and is, we believe, generally done by the poor women. But to proceed still further with their ghastly burthen, up a close 300 ft. in length, with a gradient of 1 in 5, in order to wait there for the police-cart, is a thing which they will not do, and which almost nobody expects them to do! Secondly, this surface-filth, of which there may be several thousand square yards collected every morning by the scavengers with wheel-barrow, constitutes a most valuable element of the city revenue, under the head of farm-yard manure; and although we have not been able to ascertain that such is the case, we have no doubt that it is sold separately and at a higher price than the other heterogeneous ingredients of which that commodity is composed. If so, of course the authorities would be interested in obtaining it *pure et simple*, and hence they might be supposed to connive even at a systematic infraction of their own ordinances. As we have said, we do not know such to be the fact; all we can say is that the results look uncommonly like it. In the third place, as we have previously pointed out, the water-supply to these closes is so scanty and insufficient as to make it a disgrace to the city; and this fact of itself is sufficient to account almost for the correlative parts of the phenomenon.

Indeed, we never mention the Edinburgh Water Company without experiencing a certain degree of regret, as well as a disposition to find fault. There can be no doubt that it is well managed, that its interests are carefully protected, and that it had all the legal right to sell its water to the best advantage which repeated

Acts of Parliament could confer. But as a joint-stock company of private traders, looking more to their own interest than to that of the community, and particularly the poorer classes of the community, we could not do otherwise than support the principle which ultimately led Parliament to hand over its property and vested rights to the town council. Let us hope the change may be for the better. Let us hope the municipal government of Edinburgh, under the guidance of Lord Provost Law and his able legal advisers, may rise to the occasion of this warning death-rate. It has been jocularly said that Edinburgh is this moment "under the reign of Law;" let us hope the expression may not undergo a change to "the reign of Terror."

THE EXCHANGE BUILDINGS, LIVERPOOL.

THIS large and important pile is now as nearly as possible completed externally, so that an idea of its general success as an architectural design can be formed. Occupying three sides of a large quadrangle, the fourth side of which is nearly filled up by Wood's pleasing and artistic composition, the Town-hall, and in the centre of which is Nelson's monument, an unusually good specimen of composition, motive, and outline in this class of work, it may be said that few large buildings have been recently erected under more advantageous circumstances for the attainment of a striking and dignified architectural effect, so far, at least, as site is concerned. The requirements of the building, however, have in some measure stood in the way of the architect. The best point about the old quadrangle, *viz.*, the heavy rusticated open arcade, with its massive piers and deep shadows between, which formed the ground story of the building architecturally, — is replaced in the new building by an arcade covered way running around the quadrangle, but standing out from the line of the main building, to which it forms, in fact, only a continuous portico, with a glass roof, to admit light to the office windows, opening upon it. This was almost necessary, in order to obtain a sufficiency of light; but it certainly has not the fine effect which a real arcade ground story would have had; although the new arcade, with its rusticated piers, flanked by sub-shafts of granite, is very picturesque and piquant in design. A little colour in the glass roof might have been introduced with very good effect, and would also have given a little more shadow within the arcade.

The general style partakes most of French Renaissance, with a very chateau-like air and outline about it. In the centre of the west side of the quadrangle is the entrance to the great news-room, through a vestibule with a tiled ceiling very rich in colour. The news-room is, taken altogether, a very fine room; — a large square area, with galleries on two opposite sides, and lighted from a large glass dome in the centre, which, however, rises in rather an unsatisfactory manner directly out of a flat ceiling. Were the dome not entirely glass and iron the effect would be very bad; as it is, it is less objectionable in appearance. The ceiling springs from the wall in a cove of considerable radius, intercepted by real or apparent vaulting-ribs springing from the pilasters which divide the wall-space into compartments, thus leaving the cove, in fact, a series of pendentives, the tympana between which are filled in with alto-relief Scriptural designs of considerable interest; the only drawback being that owing to the position of these designs with regard to the cove overhanging them, the upper half of the figures is in perpetual shadow, the light from the dome not reaching them directly. In the centre of the north side of the quadrangle the composition is emphasised by a projection to the line of the arcade and a loftier roof, and under this centre is a broad passage right through to the street outside, the height of the ground story, the floors above being carried on stone columns which had the same purpose and position in the old building, save that they then stood on the ground level and carried a vaulted ceiling, whereas they are now elevated on pedestals and carry a flat ceiling divided in panels by soffits crossing at right angles, and meeting rather awkwardly upon the broad flat abacus at the head of the columns. The elevation of the columns on pedestals is an improvement, but we should have much

preferred to see shorter new columns (or the old ones shortened), and a vaulted ceiling as before; more might certainly have been made of this passage-way if so treated. The internal arcade on the north side is continued under the east block of building to form another exit into Exchange-street East, through an archway with a heavy archivolt springing from brackets and trusses. At the north-east external angle of the building a feature has been added not contemplated in the original design: the angle is a rounded one, and above the roof-line rises a small circular tower of the same radius on plan as the sub-structure, and capped with a picturesque, somewhat Chinese-looking, conical or bulbous roof. A feature here was wanted, but it is a pity this was not foreseen, as, of course, the present tower is a kind of sham, having no basement of masonry except on the external side which comes down to the ground; and this is so palpably the case, that the design above the roof should, at any rate, have been as light as possible, both in reality and appearance; whereas, in fact, it is almost solid wall all around, only broken by four small windows alternating with four pilasters of very slight projection. These slightly-projecting pilasters are a feature in the building, and proper, indeed, to the style, but such a very slight projection is detrimental to the effect of dignity and solidity. The predominance of rusticated pilasters in the lower portion of the building, too, does not please every one; but as to this feature in architecture tastes differ. There is some sculpture on the internal facade, by Mr. Woodington, of London, worth notice. Over the centre of the north side is a large tympanum, filled with a design representing Philosophy sending out Commerce and Science (we believe), to enlighten the minds and ameliorate the condition of the less advanced nations of the world, who are shown springing forward to receive these emissaries; a composition which is not only notable for a considerable breadth and dignified simplicity of treatment, but also has the merit (rare in sculpture of this kind) of really telling its tale, and expressing its general motive clearly and intelligibly; though it was hinted to us that Philosophy was not very much known on the Liverpool "stage," which may be the reason she has been "skied" at the top of the building. In a smaller tympanum, on the west side of the quadrangle, are figures said to represent the four quarters of the globe, and we see no reason why they should not: the Yankee and African types are, at all events, apparent. A similar tympanum on the opposite side shows Raleigh, Drake, and Cook consulting together for the good of their country, — an anachronism which was scarcely necessary. Was there no other Elizabethan worthy who might have made a third with Raleigh and Drake? Let Mr. Kingsley or Mr. Froude answer for us. There are also six statues at the first-floor level in the quadrangle, — two, those of Galileo and Mercator, over the central passage on the north side, two very dignified figures; the other four standing out, on the east and west sides, upon the front wall-line of the arcade; on the west, Drake and Columbus; on the east, Raleigh and Cook, the keen, eager face of the latter making a capital subject for the sculptor, which he has well availed himself of, and the treatment of the costume being very successful as a combination of realistic with artistic effect. We regret we cannot say so much in praise of the sculptured ornament on the building; not that there is any fault to find with the execution, which is clear and sharp enough, but that much of it is of a type somewhat commonplace, and which we had hoped we were getting rid of, as wreaths and festoons, in "the old Roman way."

With regard to internal plan, the staircases are very light, airy, and commodious, and there are some very good offices in the building; but, from what has been said to us by commercial men on the spot, we should fear that the architect has made his rooms a little too deep in proportion to the size of the windows, in many cases, for them to prove convenient working-rooms for a large staff. But really the problem how to make an architecturally successful building, and yet give the amount of light which cotton salesmen seem to expect, is a task almost beyond the ingenuity of any architect. Taking the building as a whole, it is an interesting piece of architecture. There are, as we have said, some rather commonplace details in it, but nothing that could be called "vulgar" about it (and of how many modern buildings of this class can we say so much?); and it has not

* *Vide Report of the Social Science Association, 1861. Compare further "Another Blow for Life," London, 4to, 1861. The Scotsman, it would appear, adopted our view to a limited extent only. See that paper, March 9th, 1868.*

† The system of cleansing pursued in Edinburgh (which I am prepared to prove is not only the best adapted for Edinburgh, but for other large towns) consists in the removal of all refuse and filth which, if not passed into water-closets, is ordered to be laid upon the streets." — Dr. Littlejohn's Sanitary Report, p. 108.

* A view of this will be found in a previous volume of the *Builder*; also a view of the exterior of the building.

only a generally picturesque appearance, but there are many little "incidents" in the design which are pleasant and original—the treatment of the external archways over the entrances for lowering goods into the vaults, the entrances to one or two of the staircases, particularly that out of the western arcade near Chapel-street, with a straight lintel and a granite shaft in the centre—and other bits, external and internal, which might be mentioned. The little erections projecting towards the flags from the centre of the north side, consisting of two Corinthian columns standing well out from the face of the wall, with an entablature, and then two similar columns repeated in a second order over them, form a very pretty feature in a bright sunlight; but when we find this feature culminating in nothing but two scrolls which fall back against the face of the wall, our pleasure is lessened. Had it supported a good group of statuary, this would have made all the difference. So with the large engaged columns on the external north front towards Old Hall-street, which also terminate in nothing but scrolls. Despite of points of this kind, the whole building is a pleasing and picturesque design, more remarkable, however, for a rich and pretty effect than for grandeur.

STATE AID TO SCIENCE.

It would be difficult to imagine a more crude, ill-digested, and, we fear, mischievous step than that which was taken, no doubt in all good faith and with the best intentions, by eighteen gentlemen, each of whom writes F.R.S. after his name, on Friday in last week. Those gentlemen waited on the President and Vice-President of the Committee of Council on Education, in the capacity of a deputation from the British Association for the Advancement of Science. Their object was to ask for the appointment of a Royal Commission to inquire into the relations of the State to scientific instruction and investigation. Such an application, if properly defined by the language of those who made it, is without precedent in our country. It does not follow from that fact that it is wrong. Questions such as those of the relation of the State to any members of the community are necessarily, and often very warmly, discussed in our Legislature. Even there, however, it is felt that the more discussion is confined to practical points, and the less men endeavour to lay down theories, the better.

Not only, moreover, was the form of the application manifestly ill considered, but the undesirable spectacle was presented of a wide divergence of opinion, not only among the great body of scientific men outside, but even among the members of the deputation. "We are unable to agree upon first principles," was, in fact, the statement of the spokesman. "We want a commission to hear all that everybody has to say, and then to add its own confused and confusing utterance to the general Babel."

Earl de Grey said he understood that Professor Stokes did not express on the part of the deputation any opinion as to the two points raised—Government aid for scientific education, and the mode in which such education should be encouraged. Neither had the professor any opinion to express as to whether it was desirable that Government should give any aid at all, or whether the matter should not be left to private impulse and support. Their lordships—with as blank faces as courtesy would allow,—finding that the spokesman of the deputation had then no story to tell, inquired if any other gentleman could explain what they did want.

To this Professor Huxley replied, on the ground that he was especially unfitted to answer the question, because his opinions differed very widely from those of his colleagues. He thought a commission would be a very useful body if it could consider and report upon opinions which, at the present, were "somewhat chaotic." For himself he dissented from any Government aid being given to scientific education, and thought that support from the State would lead to "a sort of decorated and endowed idleness." Finally, if the report can be relied on, the professor was anxious for a commission, "because it would put a stop to a great deal of discussion which was now going on, which would, he believed, if duly considered, come to an end of itself!"

Dr. Williamson expressed an opinion that there were institutions now existing which are not as useful as they might be. Professor Sylvester said that there were only thirty matri-

culated students in Piccadilly (a point as to which the cruel want of room for those who are actually admitted must have been well known to at least some of those present), and Professor Stokes kept up the general discord by observing that Professor Sylvester was "only expressing his individual views." In fact, each spokesman seemed to be anxious rather to divert into some other channel the support now actually given by the State to some individual object, than to agree in any constructive recommendation. Mr. Stokes had a stone for South Kensington, because in that institution "two very distinct things, science and art, were so mixed together that it was not easy to find out what share fell to the one, and what to the other." A study of the reports or a visit to the schools would enable any one to solve this difficulty.

But there is something more than a display of purposeless divergence of opinion on a great subject, among men eminent in their individual pursuits. The cause of education is perilled by such a display. Never was there a time when it so much behoved the friends of education to stand shoulder to shoulder,—to drop minor differences, and to devote every effort to enabling England to make up her lee way. We have drifted behind other nations in this respect. Even Austria—the Government reports tell us—is before us. Only the Patrimony of St. Peter, out of all Europe, is less educated than England. Commerce and manufacture are showing ugly symptoms of seeking other centres. Education in art applied to manufacture is one great means that we have to arrest this process of deterioration. In that line we are certainly doing something, if not all that is desired. We must do more. We must not grudge the seed corn necessary for our future harvests. We must sow broadcast round the land that education for which our industrial classes are beginning so hardly to call. Professors may doubt, in the solitude of their lecture-rooms, how far the aid of the State should be given to industrial education. But the artisan does not doubt,—the craftsman, whatever be his craft, does not doubt. They ask for their children not bread, but that technical training and teaching which shall enable them to win bread by of their own hands, and by competition in the market of the world.

The danger is not from behind alone, nor, indeed, in the first instance. It is from above. There may be, and no doubt is, room for very widely opposed opinions as to the policy of the extreme detail of retrenchment attempted by the present Government. But as to the fact there is no doubt at all. Here a limb, and there a limb, and then a whole trunk falls before the axe of retrenchment. It is clear that it is not safe to give any opening for this keen spirit of reduction. Large sums of money are now, in one form and in another, devoted to educational purposes, which would, if not so paid, make a material figure, by way of diminution, in the national balance-sheet. Now it is attributing to a retrenching Government, a virtue and patriotism almost more than human, to suppose that they can resist the temptation of withholding or diminishing any grant which those who ought to be most eager to advocate hint to be of questionable policy. What would be the natural reflection of a Chancellor of the Exchequer? "Shall I spend this large sum, when eighteen F.R.S.s tell me it is perhaps doing more harm than good? If the value secured by the expenditure is questionable, the value of the reduction is certain. Positive £. s. d. on the one hand, against doubtful moral results on the other. Scratch the grant!"

Now, we think that any gentlemen who had come forward with the innocent, and, perhaps, not unreasonable, wish that they might direct some rill of the national irrigation into their own particular trench, would be likely to stand aghast at such a result of their pottering with the distribution. As to all that they urge in favour of no payment, a ready and willing ear will be turned. As to all that they urge as to payment, they would be on the deaf side of the Chancellor of the Exchequer. As to that there can be no doubt. Men do not absolutely cease to be human when they become Ministers; and to take that part of counsel which suits you, and to forget that part which does not, is human nature. How will these gentlemen relish it, if, in moving the estimates, the vice-president comes forward to say that a Royal Commission on the subject of education has been suggested by certain persons of such eminence that the Government felt bound to give every attention to their views. These, however, were so absolutely discordant as to show

that any such Commission (even if restricted to the limits of possibility, which the proposed Commission would have altogether exceeded), would be utterly fruitless and premature. The very bases of its action were undetermined; formed, as it must be, in order to be fair, from opposing elements, its course would only be one long struggle. Each member would cross-examine each witness in his own sense and in support of his own views, and when the long action was summed up—say, in 1878, or thereabouts—there would probably be at least half as many distinct and divergent reports as there were members of the Commission. Still, as all these gentlemen were of opinion that the relations of the State to education were entirely unsettled, and that it was only too possible that private enterprise, in the matter of tuition, was being strangled and impeded by the State aid that was given in different directions, all that the Government could see their way to do was, to suspend all further grants for educational purposes until Messrs. Stokes and Huxley, Williamson and Sylvester, and those whom they represented, could come together with some more satisfactory result than that of ventilating their individual differences of opinion in the presence of the department.

We believe no men would be more startled at such a result than those eminent persons who so unfortunately agreed to differ. But we put it to them: is it not this to which their interview of last Friday directly tends, if it tend to any whither? Do they desire such an upshot?

THE WATER-COLOUR DRAWINGS AT THE DUDLEY GALLERY.

The sixth selection from the numerous drawings that are submitted time after time to the committee of taste who arrange the recurring exhibitions at the Dudley Gallery, indicates as strongly as ever the wide radius of a certain artistic talent,—now a distinguishing mark of the period,—and that a collection of drawings of sufficient merit and interest may be made very readily, with no great help from those professors of water-colour painting whose names are always a promise of attraction, sufficient to satisfy any but the satiated.

A clever, classic representation of "Poetry" (163), is contributed by Mr. E. J. Poynter, A.R.A., whose name grows bigger every day; and this nearly half-length figure, with its handsome head and dark, dreamy eyes, will help to show how well fitted he is to deal with exalted themes. That in his practice he may adopt any medium, from miniature-stipple to mosaic, may be seen in smaller works here and a larger one elsewhere, that proclaims him by "St. George"—a risen artist.

An illustration from German fairy-tales, by Mr. H. S. Marks, "The Princess and the Pelicans,"—her transformed brothers,—(169), whom, to while away the pains of enchantment, she is amusing by reading the romance of Sir Bruno. The pelicans are the very pink of pelicans, and their kind sister, "Pimpinella," a more real-looking princess than one might expect to find in a castle in the air; but then the terrace, with its fountain and the old German buildings, add probability to the story, and make it of more dreadful significance; for who is there who, "would he were a bird," would choose to be a pelican? A decorative design for the Prince's Theatre, Manchester, emblematical of Shakespeare (543), is a very able adaptation to the purpose, very well composed, so as to introduce many of the leading characters in the plays, and linked with due regard to lightness and clearness. Mr. G. D. Leslie, A.R.A., lends more than his name, for he has a very broad and agreeable drawing. The pretty little girl in a punt suggests the point of sight from which he got the glimpse of "Bray Vicarage" (231), with an opportunity of painting still water and a sword-bank. More delicate, if less powerful, workmanship has been employed on a charming fancy portrait of a "Grandmamma" of years ago, years before she could have been of such relationship, for—

"This relative of mine,
Was she seventy and nine
When she died?" (112)

is sweet seventeen at most, leaving it very difficult for her to frame an answer to the inquiry. She is very pleasant to regard now in her blue Joseph and spotless cambric neckerchief, though she may have been the very opposite of Mr. J. B. Burgess's devout nun in "The Convent Garden"

(255), of which he has made so forcible a picture. (187) "Study of a Head," that of an old priest expressive of benediction, by Mr. A. Legros, is singular for the strict simplicity of its treatment—its style, that seems to eschew all style. Mr. S. Solomon is seen to best advantage in a small highly-finished rendering of Biblical text, "The Three Holy Children in the Fiery Furnace" (45), which is devoid of any attempt to poetize: the heads of the angel and the mortals immortalized are of the accepted type, and there is no exaggeration when exaggeration might have been expected, indeed, there is need to refer to the catalogue to ascertain what the subject is,—but there is considerable power and completeness of execution to give value to the drawing. "A Young Rabbi carrying the Scrolls of the Law" (51) is very admirable for its rich colouring. But to what country, to what period, do the youths and maidens belong who are walking in procession, "In the Summer Twilight?" (121), whence do they come, and where are they going? In this, and even to a greater degree in his "Pair of Lovers" (324), Mr. Solomon shows a commingled appreciation of the old master, R. Westall, and the younger originator,—whoever he might have been,—who instituted a peculiar sect of poet-painters! There are instances here, in this gallery, to denote that even a narcotized dreaminess might be offered as poetry,—and the narcotic has been toleration, and even praise sometimes; but it is far easier, always, to emulate the eccentricities of excellence than the excellence itself.

It is gratifying to find so many ladies affording assistance to the success of this association for the spread of fine-art tastes.

"After the Ball" (in French, with a verse from Théophile Gautier to illustrate,) has suggested to Miss or Mrs. (why not make clear in catalogue?) Lucy Madox Brown a fair chance, it would seem, to make a clever picture. A belle who is fond of dancing (Terpsichore only knows how many arms may have encircled her waist; but her muslin frock is very rumpled) on her return home, has fallen asleep before her attendant can assist to disrobe her, and with swimming head is waltzing again whilst day is breaking to tell her that she was happier yesterday (12). With deep tones and good effect the lady artist has told all the circumstance, and it is to be hoped that the bright sunlight to-day may bring more invitations to the lady who dances and the lady who paints—not her own face, but others; and some as bright, even though as humble, as "Yvonne's" (36), by Miss F. M. Alldridge, to whom the sea-breeze has been the only "cosmetique." But other winds blow fresh complexions, too. Look at Miss Constance Phillott's "Shepherd Swain" (172),

"Piping down the valleys wild,"

although he doesn't happen to be piping, but only preparing to pipe. Miss Kate Greenaway places a young lady near the tree of mischief, and calls her "Apple Blossom; a Spring Idyll" (183),—a pretty drawing, notwithstanding its green shadows, and though it shows no such command over the *porte crayon* and brush as the idealized life-size study by Miss Marie Spartali, (369), "The Romantic of the Rose."

Miss Adelaide Claxton relates, with strong light and dark effect, "The Old Housekeeper's Story" (385), aunt the doings of an Elizabethan ancestor, so interesting and horrifying to the younger of the sister listeners that she fancies the ghost of the defunct cavalier to be close behind her: and so he is,—one of Miss Claxton's best ghosts. Miss Florence Claxton depicts a timid little French Governess nervously awaiting an interview for engagement (447); and Miss O. P. Gilbert, a young lady too far advanced to need any such instruction as one of her own age could impart—she is twisting the globe, and going through a light course of "Astrology" that will not cost her a headache (417).

With some choice specimens of flower-painting, signed Ellen Coleman, Caroline Eastlake, and others, there is many another clever emanation from lady-artists among the most important items of the collection; for instance, "Lady Betty" (209), by Mrs. Charroite, so bright and winsome, and Miss Topham's "Portrait" of a flaxen-haired child, is as light and lively as those who think her most lovely would wish her to be. Miss Juliana Russell depicts "A Lover's Quarrel" (279), and so well, as to make it interesting to more than a third party; but only so far as clever narrative can account for, as

"Sudden storms are short,"

the method of relating the incident is far

more consequence than the matter it treats of. The drapery on the female figure here is especially well done.

"The Pilgrims of the Night" (25) are not to be so easily understood as Mr. A. B. Donaldson's capital studies from positive facts; see (110) "Nuremberg Walls, with the Church of St. Lawrence," with more from the same locality, sketched with vigorous ease, if not with the elegance and extra manipulative care that Mr. C. Earles's similar subjects, "The Citadel of Nuremberg" (63), and "The Old Hospital, Nuremberg" (305), show on his part. Mr. T. R. Marquand always draws conscientiously and unpretentiously, as the several specimens of his skill to be found here will testify, none better than (32) "Cloisters—Padua."

A run through the catalogue recalls numerous works that would serve as proof of an aggregate degree of excellence obtaining throughout the exhibition, with variety to assist in its interest.

Child-life is pleasantly illustrated by Mr. R. T. Waite, whose pinky-faced peasant boys and girls are hanging "The May Garland" (26) at a neighbour's doorway; by Mr. W. Wise, who depicts a little girl when "Shy" (43) naturally and unaffectedly; Mr. Briton Riviere, a kind, motherly little body, who is feeding lambs, "Orphans" (156); Mr. J. Hayler, one who would be naughty if she could, for she has been plucking strawberries— forbidden fruit, as the strangled blackbird at her feet clearly makes known—and would eat them too if she were not deterred by "The Awakened Conscience" (425); and by Mr. R. W. Macbeth, who records child aptitude to see fun in everything, by means of his funny little French provincials, who are all agog with curiosity and excitement to know more about "Des Etrangers," who, fashionably-attired, have come to the village church to say their prayers with humble equals. A very successful drawing this, and an agreeable one to see often.

Landscapes; sea-pieces; rocks, mountains, and hills, are no mean features in this general exhibition of water-colour drawings.

Mr. Soper's view of "Godalming" (16); Mr. J. L. Rogee's bit on the "Coast of Guernsey,—Le Portalet" (17); Mr. H. Macallum's (57) "Morning Breeze"; Mr. C. J. Lewis's (6) "Sheep Washing, Kent"; Mr. G. A. Scappa's "Richmond Castle, Yorkshire" (90), with (113) "Near Tamerton Foliot, Devon," by Mr. E. M. Wimperis; "The Bracken Boat" (128), by Mr. Macallum again; "Haymaking,—Seantollar" (164), by Mr. C. E. Aston; Mr. Arthur Severn's panoramic view, "From the Shot Tower at Waterloo Bridge" (168); "The Old Town of Moret (Seine et Marne), France," by Mr. G. Mawley (184); "The Lamb's Hill, from Llyn Gwynant" (185), by Mr. T. Danby, a very beautiful work; "Near Hastings" (261), by Mr. H. Moore; "Cookham Loch, Berkshire" (299), by Mr. J. Parker; "Pendennis Castle,—Ebb-tide: Evening" (333), by Mr. C. P. Knight; "Evenings on the Tiber, Rome" (461), by Mr. M. Brennan; "Houses of Parliament" and the "Victoria Tower and Westminster Bridge" (479 and 492), by Mr. W. E. Beverley; "The Babal el Nase, or Gate of Victory, Cairo," (494), with Mr. A. Goodwin's clever hazy landscape "Arundel" (526), are things we saw and noted. Mr. J. Richardson's "Blackmail passing the Blackmoor on their Way to the Lowlands" (52), and Mr. H. Hardy's admirable illustration of "The Fox and the Sick Lion" (452), lead in their special department.

HOUSE ON RICHMOND HILL.

A commodious dwelling-house, of plain Elizabethan type, has been erected on Richmond Hill, under the direction of Mr. F. H. Groves, architect. It was commenced by the order of the late Lord Justice Selwyn, who unfortunately died before it was completed, and it may be mentioned in connexion with the residence at Chertsey, illustrated in our present number, inasmuch as it exhibits in parts of the construction, the use of concrete. The basement includes housekeeper's room, butler's pantry, servants' hall, kitchen, scullery, and storerooms.

The ground-floor consists of drawing and dining rooms, library, and business-room (the two latter are accessible from the inner lobby, without entering the body of the house), principal and back stairs, and the first and second floors provide bed and dressing rooms.

As to the construction, the whole of the basement, excepting the housekeeper's room, is arched over with Portland cement concrete. One ceiling is panelled.

The whole of the back stairs and offices adjoining, within the outer walls, from the basement to the roof, inclusive, are formed in the same material, viz., Portland cement concrete, and are extended so as to separate the eastern half of the house from the western half; and again, the latter (western half) is divided into two portions, the south-west angle rooms being separated by the principal stairs, which, to the height of the second floor, are formed of the same material, from the north-west angle rooms, and by walls on the second floor to the roof.

The ceiling of the principal stairs is arched with a fangroin ribbed ceiling, as are the ceilings of the inner lobby and stair landings.

It is held, and with some reason, that the house is largely fireproof.

"THE PAINTERS' DESIDERATUM."

THERE are many occasions when it is desirable that one coat of paint should follow over another much more rapidly than the mediums at present in use permit, and very few occasions when the avoidance of the smell that now attends the operation of painting is not desirable. To meet these desiderata a medium under the title at the head of this notice has been recently patented, and is now obtainable. It is intended for mixing with white lead and other pigments to form paint, in liers of linseed oil, boiled oil, turpentine, and dryers; and the patentee claims for it that it is perfectly inodorous; that in less than half an hour after application it is sufficiently dry and hard to receive another coat; that it does not blister on exposure to heat; that it is more durable than ordinary paint, cleans readily, and is not injuriously affected by soap or alkalis. He says further:—

"It is economical in use. In consequence of the 'body' contained in the composition three coats of paint mixed with it are equal to four of ordinary paint; and upon the principle that 'time is money' the great saving in the time always lost by workmen in waiting until such paint is dry, or going from one job to another, is more than sufficient compensation for the greater original cost. For example, a street-door which requires the attendance of a workman on five several days to complete the painting and varnishing, can, by the use of this composition, be painted with four coats and varnished in one day. It is particularly applicable to iron railings and work exposed to the contact of passers-by, rendering unnecessary the caution of 'Wet Paint.' In consequence of its quick-drying properties it is not subject to injury by dust or rain, as is the case with ordinary paint."

We have seen for ourselves that the material works very pleasantly, and affords sufficient time in drying for the painting to be properly done. As to its durability we are unable to speak, but we may safely say that if the advantages claimed for it can be maintained, "the Painters' Desideratum" certainly deserves attention.

THE PARIS OPERA HOUSE.

REMEMBERING all the years passed and all the millions spent, most of our readers will be surprised to learn that the exterior alone of the new Opera House is approaching completion. The interior is a perfect void: a few iron columns alone mark the position of the boxes and lobbies that are to be. We should think it will be a year before the interior is completed. We obtained admission with some difficulty, as a special favour, and learnt that any Frenchman applying would be refused point blank. Apparently the powers that be wish to keep the public in ignorance of the fact that the gorgeous façade of the Opera House is a mere empty shell.

ON THE ORNAMENTAL FEATURES OF ARABIC ARCHITECTURE IN EGYPT AND SYRIA.*

I PROPOSE to call your attention more especially to the various ornamental features of the Arabic architecture of Egypt and Syria. But in order to do this explicitly, it will be necessary for me to touch to some extent also on some peculiarities of construction; and to point out some of the special features and stepping-stones of its development and growth.

It may be broadly stated that Arab architect-

* From a paper by Mr. John D. Crace, read at the ordinary general meeting of the Institute of British Architects, on Monday, the 31st ult.

ture commenced as a distinct style about the middle of the ninth century, a little more than 250 years after the famous Haroun's flight,* or about seventy years after the famous Haroun's escape of the "Arabian Nights."

The earliest Arab monuments in Egypt upon any records of which reliance can be placed are the "Nilometer," first completed A.D. 861, but altered and added to A.D. 873 by "Ion Tootoon;" and the *Tootoon Mosque*, built A.D. 876. As is well known to most of you, both these buildings possess pointed arches, which are often quoted as the earliest known examples in systematic use. In addition to this, however, both present many features which continued throughout the best periods of the style. It may be as well here to note that the *Tootoon Mosque* is entirely built of burnt brick "stuccoed" to resemble stone; the ornament, which is of a bold and artistic character, being cut in the stucco by hand—not cast. In both this and the Nilometer the inscriptions are in the "Kufic" character, which bears the same relation to modern Arabic writing that our old black-letter does to our modern type.*

From the foundation of the *Tootoon Mosque* about a century elapses before we arrive at another distinct landmark in Arab architecture. This is the Mosque of "El Hákím" (the founder of the Druses). This mosque was founded A.D. 1003, and has much of the same character as that last mentioned, but is richer in detail. The writing here is also Kufic and, intermixed with excellent scroll ornament, forms an admirable frieze. The open parapets here, of simple geometric pattern, are worth attention.

The examples which I have so far quoted, whilst possessing a distinct Arab character, show almost as wide a difference from the subsequent Arabic monuments as our own "Norman" work does from the English work of the succeeding century. A certain massive, heavy appearance distinguishes them; nor was there as yet, apparently any extensive use of the variegated materials which become so conspicuous a feature in the exterior of most of the later buildings.

I may here notice one very interesting monument of Cairo. Close to the "Morostan," and opening to the Kalaon Mosque—in one of the most picturesque streets of Cairo—a very beautiful pointed doorway arrests the attention. Most people are struck with it; but the architect most so, for he at once recognises the familiar mouldings and grouped shafts of the Early Pointed architecture of Northern Europe. Its history is curious and very interesting. In A.D. 1291 Akka was taken by the Sultan Khaleel, the son of El Mansoor Kalaon, the founder of the Morostan. Gibbon says of Akka (which was, for some years previous to the siege, the metropolis of the Latin Christians)—"It was adorned with strong and stately buildings, aqueducts," &c.; and that, after its capture, "By the command of the Sultan (Khaleel), the churches and fortifications of the Latin cities were demolished." He there found this beautiful doorway, the work of crusaders, and removed it to Cairo, where it adorns the mosque which bears his father's name. The Arab historian "El Makreezee" speaks enthusiastically of its beauty. I mention this doorway because it

* The modern Arab character was not used at all till the middle of the tenth century. Even then the "Kufic" only was used on buildings till the end of the "Fatimita" dynasty, about A.D. 1173. After that the Arabic and Persian were both employed. Even as late as our fourteenth century, single inscriptions are occasionally written in both characters side by side.

is earlier than any of the more elaborate Arabic buildings of Cairo, and evidently excited considerable admiration in the Arab mind. An Arabic inscription on the lintel gives the date of its erection as 698 A.H. (or A.D. 1299). The Kalaon Mosque was founded A.D. 1286, and completed A.D. 1305. The Mosque of Sultan Hassan dates from about A.D. 1354, and is probably the most important of the mosques of Cairo. In it we find the details of Arabic ornament wrought to their greatest perfection. It would be impossible to find, for instance, a more exquisite specimen of writing, treated ornamentally, than the frieze of the great court and alcoves. The scroll interwoven with the Kufic writing is admirable. One door in this mosque is plated, as usual, with bronze in geometric patterns, but has raised bosses, exquisitely inlaid with the most delicate niello ornament in silver.

The noble recess of the main entrance of the Mosque of Sultan Hassan is a well-known feature; and its details of inlaid coloured stones, sculptured and interlaced patterns, are among the most perfect examples of Arabian art. The style has here attained its full development; combining the most perfect and highly-finished details with the noble severity of the lofty walls, upwards of 100 ft. high.

We have now arrived at the middle of the fourteenth century (the period of Yusuf's Alhambra). We may turn to the beautiful group of domes and mosques known as the "Tombs of the Caliphs," about two miles out of the city of Cairo. We there find the grand sepulchral Mosque of "Barlook," a most worthy example for study. This dates from the close of the fourteenth century ("Barlook e Zahir," died A.D. 1399). For breadth of mass and effect, good proportion, picturesque parts, and judicious detail there are few better examples. Here (as in most of the same group of buildings) we find the use of striped courses of dark and white stone.

The mosque of "El Moitid" in the city, with its spacious open cloister and well-proportioned arcades, follows a few years later, about A.D. 1415; and in its ceilings and cornices we find an elaborate specimen of coloured decoration; the colouring being nearly confined to black, white and gold, with a relief of blue and red. Its masonry, both interior and exterior, is of red and white courses; the columns (being, as in very many of the Cairo mosques, borrowed from more ancient buildings) are of red porphyry.*

Then, at the close of the fifteenth century, we have the Mosque of "El Kaibai," who was buried here A.D. 1496 (when the Moors had already been driven from Granada). This is another of the groups known as the "Tombs of the Caliphs," and at once the most perfect and the most picturesque. It would probably be difficult to find in any country, or in any style, a more charming group of building than this mosque, with its high, graceful minaret, and its delicately-sculptured dome, standing out from the pale desert against the rocky distance. The minaret may, I think, be considered the most elegant of all the Cairo minarets. The detail and interior decoration of the building are worthy of its general aspect. I shall presently refer to them again. With a view to making more clear the relative ages of the buildings I have mentioned, I have prepared a table showing their dates, side by side with those of the Alhambra.

* I have observed not only Roman but ancient Egyptian capitals in use as both capitals and bases of columns in mosques.

The Dates of the Arabic Buildings of Cairo, compared with the Alhambra.

Date.	Cairo.	Alhambra.
A.D.		
376	Mosque of Ibn Tootoon.	
1003	Mosque of El Hákím.	
1272	...	
(1291)	The Gothic portal removed from Akka re-erected 1291.	Death of Ibn-ul-Hamra at Kier-ul-Hamra. The first Moorish king who resided there.
1286	"Morostan," and the "Mosque of Kalaon."	
1305	...	
1302	...	
1310	...	Death of Mohammed II, who had continued the building. Mohammed III. erected the "Mejid-el-jami," described as having "Minarets and delicate tracery."
1333	...	Yusuf built and decorated the Courts of "the Fishpond" and "Ambassadors," the "Hall of the two Sisters," the Bânos, and the "Madrishah." (A.D. 1319).
1354	...	
1391	"Mosque of Sultan Hassan."	
1393	"Mosque of Sultan Barlook."	
1420	"Mosque of El Moitid."	
1496	...	"Boabdil" surrendered Granada.
1496	"Mosque of Kaibai."	

My object in enumerating the buildings I have quoted is to afford the opportunity of tracing the development of Arabic architecture by means of distinct and important landmarks. The list might be largely increased, and the intervals shortened, but without any very useful result.

It is now my purpose to consider the various details of Arabic buildings, without reference to date except where special notice is called for. It is, however, first desirable that I should set before you a few of the leading types of the structures themselves. They may be classed as follows: "Mosques," "Sobeels," "Gates," "Khanes," and "Dwellings."

The mosques vary much in plan, according to the special conditions of their situation. The original form is an open court, surrounded by a covered, arched cloister of one or more aisles; the number of aisles being usually larger on one side than on the others, as two, three, or even five under the widest covered part in the "Mehrab," or sacred recess, towards Mecca, and the high pulpit ("mimbar"). The decoration is also usually richer in this part. A fountain, or large covered cistern of water for ablution, usually occupies the centre of the open inclosure. This type is taken from the first mosque at Mecca, and examples of it are found in the grand mosques of Damascus and Hebron; and at Cairo, in the mosques of "Amr," "Tootoon," "El Hákím," "El Moitid." But some of these, as notably that of Damascus, have the sanctuary altogether enclosed. The second type has an open court, having a centre fountain, with one or more large arched recesses or alcoves opening to it. Such is the Mosque of Sultan Hassan. Under the third head may be classed the mosques which are either altogether enclosed and roofed over (of every variety of plan) or are only partially open to the air. A fourth group may include the Kubbees, or square-domed structures, which exist in considerable number near Cairo, and have been, in fact, mausolea. Some of these are beautifully and richly ornamented.

The "Sobeels," or drinking-fountains, are very numerous in Cairo, and among the most striking of its buildings. They are, most frequently, at the corners of streets, or in prominent places. Below is a single closed chamber, lighted by one or more large metal grilles, sometimes simple, sometimes very ornamental. Within is the water supply, with which a tube communicates, and, terminating in a small brass pipe or nozzle, allows the wayfarer to quench his thirst by suction, for the water is rarely allowed to run to waste.

The upper story of these buildings is almost always a school. They have usually been built as an act of charity by some person whose name they afterwards bear. "And thus," say the Arabs, "the thirsty man remembers gratefully the name of the founder; as also does the youth who is trained (and caused) in his school."

The residences, or private houses of Cairo, are of every variety of general plan; most, but not all, of the better class having an open court, into which the reception-rooms open. The other rooms are built with a special regard to privacy. The rooms of the harem are generally on the first floor, and some of these are very handsome. I shall perhaps best explain myself by describing to you one or two of these Cairo houses (built when Arabian art still flourished) which I have visited.

I will take first that of Ibn el Sadid, the head of one of the oldest Arab families of Cairo, and a rich man. The visitor enters by a double gateway from the street into a large open court. Upon his immediate right a considerable space is screened off by ornamental trellis-work. This is a private mosque, used for the devotions of our host and his household. There are chambers over this. On the left, an upper chamber, having a large window (a very exquisite specimen of the "Mushrebeyeh"), is supported at its outer angle by a single column. The remainder of the court is surrounded by buildings with screened windows, but a deep, open recess, with divans and cushions, occupies the angle furthest from the entrance; a passage near this leads to the garden behind. The grand reception-rooms occupy nearly the whole of one side, the rooms being the full height of the building. These rooms I shall endeavour to describe. In plan they are three; but, except by a step in the floor, and the arrangement of the ceilings, they practically form one large saloon, called *Mashrah*. Entering a small doorway from the court, the first room is lighted from above by an octagon lantern or opening in the centre of a ceiling of wood elegantly panelled by mouldings into

geometrical devices, and having pendants at intervals. This ceiling is higher than those adjoining. From the ceiling downwards the walls of this, as also of the other apartments, are lined with old Persian glazed tiles—blue and green on a white ground*—to within perhaps 9 ft. or 10 ft. of the floor, the total height being possibly 25 ft. or 30 ft. The lower part of the wall is plain. At the end facing the other apartment is a niche or recess in the wall, with a small cascade, having shallow steps of marble. This first room is, in fact, an ante-room, or the "darkah" to the other, called the "leowan," which is entered by a low step, at which the domestics invariably take off their shoes, even when serving.

In the opening a transverse beam, with deep trusses, or brackets, which terminate in corbels of gilt honeycomb work, carries the roof.

In another room large parallel beams or girders, about 12 in. thick, and perhaps 18 in. apart, are carried from side to side. These are elaborately chamfered from the ends, the centre length being rounded or octagonal on the lower face. The whole of this surface is decorated with ornament in gold, with grounds of blue or other colour, each beam differing from the next; the chamfering of the ends is also gilt and ornamented. The space between the beams are divided into small square and oblong panels, the framing of which, as well as the panels themselves, is elaborately decorated and gilt. The whole effect is rich and harmonious to the last degree.

In dining with the master of the house, I observed that whilst we dined in the central saloon, the household servants (*as well as stray objects of charity*) took their meal in the first ante-room, within our view. We afterwards retired to the further bay for the post-prandial chibouque.

The house adjoining the one just described is at present occupied by Haleb Pasha, who kindly allowed me to see a splendid room on the first floor, the "Kāah," a part of the harem. This, in addition to having very beautiful ornamental coloured ceilings, was lined to a height of 10 ft. or 12 ft. by marble, arranged in upright panels, divided by inlaid margins of elaborate design; the whole being surmounted by a broad inlaid frieze, broken at intervals by circles of coloured marbles, somewhat like that at St. John Lateran, at Rome. On one side a cascade fountain is received in the marble wall, and the water from this flows through a narrow channel into a small circular basin in the floor, curiously carved with entwined serpents. From this it is again carried to the basin of a fountain in the centre of the floor, the floor itself being paved with inlaid marble.

The next house at Cairo which I shall describe is a very neglected and ruinous state. It is known as the house of the Chief Mufti, or head magistrate, and seems to have been intended for reception only. It is a very interesting specimen of Arab domestic architecture. In general plan this resembles the reception-rooms or "Mandarah" already described, the ceilings being of the same description. They are, however, very much smaller. Below the ceiling beams is a wide cove, which is painted in panels, with conventional groups of flowers on grounds alternately blue and reddish-brown. Below this the wall surface, for a height of 2 ft. or 3 ft., is painted with roughlandscapes of most elementary treatment, and probably of later date than the rest, under which there is a very elegant frieze of ornament incised in white marble, and filled in with black and red cement. The wall below this level is much cut up with doors, windows, and wooden cupboards, all of varied design; but the intervals between them are lined with blue and white Persian tiles. The cascades again occur here, and are richly ornamented with gilding and inlaid pearl. The upper windows are filled with beautiful stained glass, in the Persian manner; that is, in a setting of a deeply-ot plaster or cement. The floor, with its centre-shaped fountain basin ("faskesheh"), is an admirable specimen of inlaid marble.

Let us now turn our attention to the interior of the buildings, and observe the decorative treatment adopted. In the first place, it must be remembered that the same use of alternately coloured courses which we notice in the exterior is very frequently extended to the interior; and, even where they are not built in coloured material, the imitation is carried out in red and white, or black and white colours. This may be seen not only

in the mosques and other large buildings of Egypt, but in the courts and rooms of the private houses, both of Cairo and Damascus. At the latter place there is scarcely a court of any large house but presents an example of this system, more or less consistently carried out; whilst the great "Khan of Assad Pascha," in the same city, although modern and scarcely "Arab" structure, is a good example of the principle carried out to its fullest extent. ([Date 1472 A.D.) The interior of the cupola is not frequently decorated upon this system. At the base is a frieze consisting of inscription, either carved or painted, on a dark ground. Over this the upright circular wall (the drum), which supports the dome itself, is pierced with pointed windows at short intervals. These are sometimes filled with pierced tracery, or have formerly contained coloured glass, which, however, few now retain. The intervals between the lights are sometimes plain, sometimes banded,—in other cases are panelled and ornamented in colour or relief to agree with the windows. The cupola itself is often partially banded in white, black, and red, relieved by zig-zag courses; and towards the top has a radiating, counterchanged ornament of the same kind as that already described. This is one treatment, and specimens of it are to be seen in the "Tomb of the Caliphs," notably in that of "Barkook."

Occasionally, however, the cupola is far more richly decorated. That of the "Kubbet el Fedaweyeh" has a bold and elaborate Moresque diaper in relief, the face of the ornament almost entirely gilt, whilst the grounds enclosed by the leading lines of the ornament are coloured blue, red, green, and white. The whole is most rich in effect, although, unfortunately, the building is in a very ruinous state. As it is a fine example of the "Kubbet," I will continue a description of its interior ornamentation.

Below the cupola windows is the usual frieze of writing, on red ground, under which runs an Arabic fret border. From this line the pendentives commence, and the construction of these is very uncommon. Across each angle of the square is thrown a plain pointed arch, the apex of which meets the ring of the dome. The archivolts are in red, white, and black stones. The curved face of the pendentive is decorated with flat relief arabesque in stucco; light on a coloured ground; as also are all the plain wall faces in the same story. The alcove, which is recessed to the angle, is the remarkable part of the pendentive, being constructed on the system of fan-vaulting and meeting in an octagonal alcove. Another fret border or string course is carried round the building from the springing of the pendentives,—the pointed windows in the angles breaking it,—whilst those in the lunettes range above it. The walls of the next lower story are very ruinous, but seem to have been nearly plain, with a dado of marbles inlaid in narrow upright panels; possibly the wall was lined with tiles, or painted with coloured designs; but this is only surmise.

The flat ceilings, whether of mosques or other public or private buildings, are treated, without distinction, in one of two or three ways. The handiest, producing the richest effect, is the beam and panel arrangement already described, which seems to have prevailed largely in mosque, sebel, or dwelling. The finest examples are to be met with in the "Mosaid," "Mahmondie," and "Kaidbat" mosques; in some of the older sebels; and in the houses "of the Sheikh, of the Mufti," and "Ebn el Sadid," both before referred to. There are, however, many others in the older private houses, but they are difficult to find out and not easy of access, great numbers of the older houses having been destroyed during the last few years.

A simpler form of ceiling is that formed by "beam and match boarding." Here the boarding is probably placed diagonally, and the narrow boards are painted successively in various colours, with perhaps a running pattern of conventional flower ornament, or arabesque, on each—the beam being elaborately decorated (as in an example at Damascus); or the beam is decorated with rich diaper or geometrical pattern, and the boarding painted in panels without the division of framing.

The flat ceilings in which the beams do not show, but which are divided by small mouldings into elaborate geometrical panels, more or less decorated in colour, are of great variety. As I have already incidentally mentioned, they occur in buildings of all descriptions, and are used both internally, as the ceilings of rooms, and externally, in the soffits of the "Mashrebeeyehs,"

or other wooden structures. Occasionally these are elaborated and enriched by bold pendants marking the central points of the device; and in some instances this system is combined with the beam treatment, as in the entrance corridor to the old "Morostan," at Cairo. There we find the ends of the beams cased, and ornament is carved on the casing. In the same place is a good specimen of wooden cornice formed of a series of polygonal pendentives—a style of cornice to be met with both in Cairo and Damascus (House of Assad Pascha). The most frequent form of interior cornice, in large buildings, is the bold hollow or cove which is divided by coloured decoration into ornamental panels, with rich borders. Korā sentences, in white and gold, on rich blue grounds, are often introduced in these panels, the surrounding colouring being in more subdued tones, and the top and bottom lines of the whole cornice being strongly marked with black and white, bright red, or other vigorous colours.

Below the cornice is usually a frieze, almost always of writing. How beautifully the Arabic character lends itself to ornamental purposes is well known. Probably in no other style of art has writing been so largely used for this end. For, whether externally or internally, wherever there is a frieze in an Arabic building, it consists of writing. Beautiful effects are produced by intermingling the character with delicate scroll work, the latter being gilt, and the writing white, both on a blue ground, as in the "Mahmondieh" Mosque at Cairo. And the writing itself is often wrought into ornamental monograms, whole sentences being so entwined as to be difficult, even for the expert, to decipher. The same use of writing extends to every object in which Arabic ornamental art is expended. Witness their metal vessels, in which the whole surface is frequently covered with inscriptions. The practice doubtless originates in the preclusion of the representation of animal life; the instinct of the artist to appeal, in some direct way, to the understanding and sympathy of the beholder being too natural and too strong to be altogether repressed.

I have already alluded to the use of coloured marble inlay, and tiles for the internal wall decoration. At Damascus the taste for mosaic decoration was evidently very strong, much more so than at Cairo; and the examples of real and imitation mosaic are of untold variety. A mosaic of geometric or other ornament, out perhaps a quarter of an inch deep in the stone, and filled with hard cement of various colours—black, red, blue, or yellow—was also in extensive use with very excellent effect. I must also notice that, at Damascus, interior coloured decoration, of essentially Persian character, exists in considerable quantity. Here the walls are divided into panels by bands of rich colour, the ornament being in slight relief, and gilt or silvered. But this is late, and cannot be considered as pure Arabic work. There is another branch of interior ornament, which is of infinite variety, and deserves much study. I have already remarked that wood, as a material, must be considered scarce in the region of Arabic architecture. Not only this, but a climate of extreme dryness and extreme temperatures makes its use, in large sizes, difficult or undesirable. Probably, from these causes, all Arabic woodwork is made up of a number of small parts, framing and panels, ingeniously wrought into every variety of rectilinear form and design. Doors, panels, window-shutters, cupboards—all are made after this fashion; and no two seem to be alike. I agree with those who consider that to this system of woodwork may be traced the wonderful variety of geometric design applied to all materials by the Arabs and Moors. A workman at Damascus showed me a scroll in his possession, containing about two hundred traditional designs of rectilinear geometrical forms for wooden panelling. This panelling usually has the narrow framing moulded, and the panels bevelled at the edge. The panels are sometimes left plain, sometimes are painted; but they are also, as you see, occasionally inlaid with ivory or pearl.

The richest specimens, and those most elaborately worked, are also, as I believe, the oldest. These are the screens in the Coptic Churches of "Fostat," or "Old Cairo." In some of these the wooden panels are delicately and minutely carved; in others the panels are inlaid with ivory as ornament; or again the ivory, let in, is itself carved in elaborate arabesques. Even the full-sized drawings which I show of these screens give but an imperfect idea of the minuteness and delicacy of the work; and it must be borne

*believe that, until about a hundred years ago, tiles of this description were still manufactured at Damascus.

in mind that each panel, and each straight piece of framing, is a distinct piece of wood; and that, moreover, in the original each screen contains several superficial yards of such work. This style of woodwork is now almost extinct. A few workmen, and only a few, are still to be found at Damascus, where, in the richer houses, there is yet a limited demand for it; but it is no longer in general use. The pretty and characteristic furniture, inlaid with pearl, is still found in Arab households; but all Arab art virtually belongs to the past. It is rapidly being pushed aside by the garish and tawdry products of Southern Europe.

It is melancholy to feel that almost every example I have quoted is a portion of a ruin, or is doomed to ruin by those sure destroyers, neglect, apathy, and selfishness. Monuments worthy of world-wide fame are dropping to pieces, either by utter disregard, or by dishonesty, or by the mildew of a fatalism which never repairs. Inquiring once of the Imam, or priest of a mosque, why, since a devout man had built so beautiful a structure to the glory of God, no good man was found to keep it in repair, I received this reply:—"Truly he was a good man who built this place for the worship of God; but it now belongs to God, and, if he wills it so, it will surely crumble and fall. It is as God pleases!"

Such is the Mohammedanism of to-day. We may well look around and ask these ruins if it was such when they were in their splendour. Did they who built them look for this? Was he, who, from the Mosque of Toooloon—just a thousand years ago—called the faithful to prayer, even such a one as the blind Mueddin, who, to-day, from the crumbling minaret, sends a wailing voice over the city as he cries (sadly, as it seems), "God is most great! There is no deity but God! Mohammed is God's apostle. Come to prayer—come to security! There is no deity but God alone!"

NEW POST-OFFICE FOR NEW YORK.

The new Post-office which has been commenced in New York is of large size, and has considerable pretensions. It is being erected on the triangular portion of the Park at the junction of Broadway with Park-row. It will have a frontage on Broadway and Park-row of 262½ ft., 144 ft. on the south-west front, and 279 ft. toward the Park, the plan conforming to the shape of the ground, enclosing an opening or court. There will be three stories, together with basement, sub-basement, and attic. As to the interior arrangement, the sub-basement includes the whole area of the building and that portion of the side-walks covered by Hyatt lights, and bounded by the retaining walls, and will accommodate the furnaces and necessary machinery, coal-vaults, &c. The entire basement will be used by the Post-office Department, and, like the sub-basement, includes the whole area within the retaining walls. It will be well lighted by the Hyatt light side-walk, and the illuminated floor in the principal story.*

The principal story of the building will be devoted to the use of the Post-office Department. It has no interior partition walls, the official and public spaces being separated by the screen formed by the Post-office boxes, the whole of the walls above being carried on iron columns. The court-yard will be covered by a roof of iron and glass, so that the whole of the space inclosed by the outer main walls of the building will be utilised.

There are to be seven doors on Broadway, a like number on Park-row, and three on the south front, with ample corridors. Four hoistways are provided.

The floors are to be formed of rolled iron beams carrying brick arches, the haunches of which are to be filled with concrete, on which is to be laid the marble tiling, or board flooring. The roofs will be constructed of iron, covered with slating and copper.

The style of the building is to be the Renaissance, each story being carried up in a distinct order in the Doric style, increasing in richness as the top is reached. The roofs are to be carried from the main cornice, and crowned with iron railing. On the four principal angles hexagonal pavilions will be erected; these will

conceal the awkwardness of the angles which the form of the lot entails on the building. In the centre of the Park-row and Broadway fronts, pavilions are to be carried up, crowned with finely-proportioned square Mansard roofs.

At the south-west end, or apex, the whole frontage between the hexagonal pavilions is to be thrown forward to form a grand mass 87 ft. wide, which is to be carried up and crowned with a dome. The central pavilion is to be of similar design, and is to be connected with the corner pavilions by curtains similar to those on the Park-row and Broadway façades.

"PETRIFIED CONCRETE."

SOME works have recently been established in the neighbourhood of Victoria Park for the manufacture of artificial stone by a new process. The *Pharmaceutical Journal* says:—

"It has been known for some time that Portland cement, or any concrete containing lime, can be rendered extremely hard by immersion in a solution of silicate of soda. Under these circumstances, the silica is absorbed by the lime, and the cement thereby converted into a true stone. But the cost of the silicate of soda has hitherto rendered such a process too expensive for general application. The proprietor of the works we refer to has overcome this obstacle in a most ingenious manner. Beneath the chalk beds of Surrey, in the neighbourhood of Farnham, there exists a plentiful deposit of a soft stone, containing 25 per cent. of silica, in a condition in which it is soluble in a cold solution of caustic soda. This material the inventor grinds up and diffuses through the bath of silicate of soda, containing the concrete to be petrified. The lime, removing silica from the solution, liberates caustic soda, which dissolves fresh silica from the Farnham stone. The process thus becomes a continuous one. The soda acts as a carrier of silica from the stone to the cement. By due care, the solution of silicate of soda may be maintained of constant strength, and is therefore capable of performing an almost indefinite amount of work. The expense of the silicate of soda being once defrayed, the cost of 'petrifying' the concrete is simply the value of the Farnham stone, and the labour of applying it. No heat is required in any part of the process, and the work is therefore very simple."

THE CLARENDON PRINTING HOUSE, AND THE ASHMOLEAN MUSEUM, OXFORD.

RECENT historians of Oxford, beginning with Chalmers in 1810, assert that Sir John Vanbrugh was the architect of that noble edifice in Broad-street, Oxford, long known as the Clarendon Printing House, which was built in the years 1712 and 1713. Ayliffe, a contemporary writer in his "Antient and Present State of the University of Oxford," published in 1714, ascribes the design to "that ingenious artist of a mason, Mr. Townsend, of Oxford." Townsend, however, was only the builder; the architect was Nicholas Hawksmoor, one of Wren's pupils, who was also employed for the south quadrangle of Queen's College, and for the north quadrangle of All Souls' College. The *Minute Book* of the Delegates of the Press contains the following entry, under date of October 3rd, 1715:—"Mr. Vice-Chancellor proposed to gratify Mr. Hawksmoor for his care in drawing and supervising the whole works of the new Printing House. Agreed to give him 100*l*." This entry deserves notice for the use of the verb *gratify* in the sense of giving a *gratuity*, and as showing that architects had not at that time established a claim to any stated payment as "commission" for their services.

Another building in Broad-street, the Ashmoolean Museum, which was finished in 1683, is ascribed by the same recent historians to Sir Christopher Wren himself. Yet in the "Parentalia," compiled by his son, and published in 1750 by his grandson, although one chapter of the book is given to "a Catalogue and Account of Designs of Buildings [by Wren] in the Universities of Oxford and Cambridge," no mention is made of the Ashmoolean Museum. The account books of the University contain no entry of any payment made for the building of the Museum except to a "Mr. Wood;" and positive evidence that he was the architect, as well as the builder, is furnished by a view of the east end of the Museum, "drawn, engraven, and sold by M. Burghers, in St. Peter's-the-East, at Oxford," in 1685 or 1686, which has "T. Wood, archit."

at the foot. Thomas Wood was employed by the University as a worker in marble, and as a sculptor on two or three occasions, and might be described as "that ingenious artist of a mason," quite as justly as the Mr. Townsend who built the Printing House twenty years afterwards; but I am not able to point out any other building erected by him. A DELEGATE OF THE PRESS.

THE METROPOLITAN WATER SUPPLY.

At the last meeting of the Metropolitan Board of Works, the debate on the motion of Mr. Freeman—

"That the Chairman be requested to seek an interview with the Home Secretary, for the purpose of inquiring whether it is the intention of the Government to bring in a measure founded upon the report of the Royal Commission on Water Supply; and also to place before him the Board's general approval of the report,"—

was resumed by Mr. Richardson, who moved as an amendment,—

"That the Chairman be requested to inform her Majesty's Government that the Board, having considered the report of the Royal Commission on the water supply of the metropolis, are of opinion that there should be a constant supply of pure and wholesome water; that the existing supply is not satisfactory; that the Board are not prepared to express any opinion as to the desirability of the water supply being transferred from the companies to the municipal authority; but that, if Parliament should determine that it would be expedient that the water supply of the metropolis should be in the hands of the municipal authority, the Board would be prepared to undertake the duty."

After some discussion, the amendment was put and negatived, only one hand being held up in its favour, and the original motion was then put, and on a division was carried by 21 to 10.

REGISTRATION OF DISEASE.

ONE of the most important obstacles in the way of satisfactory sanitary legislation has always been, and still remains, the difficulty which thinkers and writers upon the subject experience in deciding what to ask for. Whether the result of the labours of the present Sanitary Commission will be conclusive to define these desiderata, remains to be seen. In the mean time, and pending the deliberations of this Commission, public opinion has, as if by common consent, fixed upon one or two requirements as necessary to strengthen the hands and increase the usefulness of health-officers, and other authorities having more or less directly the charge of our local sanitary administration. Not the least of these is the registration of disease.

It requires but a very superficial consideration of the subject to be convinced, that however useful the registration of the causes of death may be to afford the means of judging of the past sanitary condition of a community; the registration of disease would be far more likely to afford the means of arresting an epidemic, as the first cases of attack would thus be made known to the authorities, probably some days before a single death would be registered. As the medical profession, the large proportion of health-officers, and a considerable number of the most able writers on sanitary matters are almost unanimously in favour of registration of disease, the subject acquires just now additional importance.

We have before us a short pamphlet on "National Returns of Sickneses," which concisely, and in a practical manner, shows how such returns might be obtained, and rendered available for the public use. This cannot fail to be useful at the present time, as the most dangerous opponents of the registration of disease have been those who seek to surround the proposition with a host of imaginary practical difficulties.

The author of the pamphlet is careful to state in his preliminary remarks that "the proposals in this paper are entirely confined to cases of sickness occurring within the practice of Poor-law medical officers, and of the medical officers of charitable institutions." The difficulties in the way of attempting to deal with cases of sickness arising in private practice would be, certainly for the present, insurmountable; and, moreover, the origin of epidemics of zymotic disease can almost invariably be traced to the very classes whose sickness under the present proposition would be registered.

The gist of the proposal is that Poor-law

* These Hyatt lights, we may usefully mention, consist of lenses fixed in a skeleton frame of iron, the whole strong enough to form a footway, landing, or staircase. The patentee is Mr. B. F. Stevens, of Henrietta-street, Covent-garden. In many cases where light is of consequence they might be usefully introduced.

* "Suggestions for National Returns of Sickneses," by James Lewis, of the Registrar-General's Office, Somerset House. Published by C. P. Alvey, 31, Museum-street.

medical officers, and medical officers of charitable institutions, should furnish on a uniform system returns to a central office in London, where they would be tabulated, and presented to the public with the least possible delay.

The pamphlet gives some valuable and interesting particulars as to the extent of the information which would thus be made available. It appears that there are in England and Wales somewhat more than 3,000 Poor-law medical officers, who, according to an estimate made by Dr. Rogers, the president of the Poor-law Medical Officers' Association, treat on an average 3,500,000 cases of sickness per annum. An estimate of the number of in and out patients treated annually by the "numerous medical charities undertaking the gratuitous, or semi-gratuitous treatment of disease," adds another million and a half, making in round numbers an aggregate of about "five million cases of sickness per annum as occurring in the public medical practice of England and Wales." Nearly the whole of these five million cases occur among the very class which contributes most largely to the excess of death-rates, and in which for the most part are originated all epidemics of zymotic disease. There can be no two opinions as to the value, from a sanitary point of view, of a register of the sickness occurring among so large a portion of the population of England and Wales.

It is wisely, and very strongly recommended, that the forms to be used for transmission to the central office should, in the first instance, be of a very simple character, in order that the labour of both of filling them up, and preparing them for publication, should be as much as possible kept within moderate limits. This is the more necessary as it appears very desirable that the medical officers should themselves fill up and transmit these returns. To ask those gentlemen to furnish a variety of particulars, many of which would probably never be fully given, which would thus render the returns incomplete, would be to defeat the object in view.

There can be little doubt that the value of such published returns of sickness as are here proposed would to a great extent depend upon the promptness with which the returns could be made available to the public. The recent deputation to the President of the Poor Law Board on the subject appears to have proposed weekly returns to the Central Office, but only an annual publication. The Medical Officer of the Privy Council is in favour of a quarterly return. We quite agree with the author of the pamphlet under notice, when he says that "if a return of new cases of sickness is to be of any use to the Central Sanitary Authority, it should be made as frequently as possible; not more seldom than once a month certainly, and preferentially once a week." We are decidedly of opinion that nothing less than a weekly return would answer the purpose in view. A less frequent return would result in this anomaly, that as regards all large town centres of population, the Registrar-General would publish the deaths arising out of the cases of sickness, of which we should not receive information until the end of the month, quarter, or year, as the case might be, and long after the return could be of any possible sanitary use, except as a contribution to the history of disease.

A perusal of the pamphlet in question will satisfy most readers as to the thorough practicability of such a national return of sickness, and we must wait for the report of the Sanitary Commission in the expectation and hope that it will contain a strong recommendation for the publication of some such returns of sickness as are suggested in the paper before us. In the meantime we are convinced that in urging the support of all those interested in sanitary science for some well-organised system of registration of sickness, we are helping on a cause which has been so long and so often advocated in these columns.

DEATH BY SUFFOCATION, AND ITS RESPONSIBILITIES.

WITHIN the short space of four weeks no fewer than thirty-three persons have had the breath of life literally squeezed out of them, or, as the juries termed it, have died from suffocation. This is a very unpleasant subject to dwell upon, but at times it becomes our duty to ventilate these unpleasant subjects; the more so, as in this instance there is a most uncomfortable deduction to be made from these lamentable occurrences. The profession we represent is ever ready, and justly so, to take a fair amount of credit to itself

for the benefits it undoubtedly has bestowed upon mankind: and shall it not, then, take equal blame when it has left undone the good it might and ought to have done? We think it should and will; and, thinking so, we can make no apology for plainly speaking the unvarnished truth,—that the profession as regards these horrid slaughters has been, in however remote and limited a degree, tainted with the crime of manslaughter. Before, however, throwing out any suggestions for the removal of this taint, it will, perhaps, be well briefly to consider the causes of these two catastrophes, the means by which they ought to have been prevented, and the lesson they teach us with regard to our huge assembly-rooms in the metropolis. The causes are easily explained after the results; truer wisdom it is to see and avert the causes before. The meeting of two crowds of people, or the division of one (both of which occurrences take place nightly in London on a much larger scale), have, coupled with the small or unequal sizes of the passages, led to these many deaths. Engineers tell us that in conveying water through pumps and pipes the great object to be attained is efficiency, and uniformity of size in the passage; if contraction or enlargement is made, the water becomes troublesome and unruly, and loss of power ensues. It is so with a stream of people, and we can only prevent these so-called "accidents" for the future by following out in our buildings this engineering axiom. Had this been carried out in the cases before us, how much heartrending sorrow would have been spared.

We must not lose sight of the fact that these calamities might have been far worse; if so many were killed at Bristol in trying to gain access to pleasure, how much greater the number would have been had they been seeking egress from fire and destruction.

The third point under consideration is a very serious one, and one of which it is difficult to over-estimate the importance.

To demonstrate our case more clearly, suppose we put it in the form of an ordinary rule-of-three sum. If in a small parochial assembly seventeen lives are lost during an unfounded panic, how many would be lost in one of our large metropolitan halls (Exeter or St. James's, for example), if a panic occurred for which there was good cause, or in case of actual fire?

We shudder at the bare idea of a correct answer to this question, and we imagine that even the most devoted worshippers of Bowness would likewise impiously (we had almost said piously) recoil from the wholesale slaughter which would certainly take place.

Let us look at the means of egress from Exeter Hall, though we do not wish it to be imagined for a moment that we are making an exclusive raid upon this hall; there are many in London as bad, and some far worse. The only practical door in case of fire, &c., is that on the south side leading direct into the Strand, which would afford a means of escape to a few in the body of the building; the gallery people would have but a slender chance of flight, while the chosen 700 in the orchestra would inevitably miserably perish; and yet, when the attention of the authorities was called to this prior to the re-decorating, they refused to take any steps for the safety of the public in their charge. There are many who never enter these London halls from a dread of the certain death which would be their lot in case of panic. We have spoken of the disease almost an epidemic which pervades our halls; let us now turn to the pleasing task of suggesting the remedy. There is no Act of Parliament which obliges architects so to construct buildings, that when crowded with people in a state of panic, they can be emptied in a given time. There should be, and no building ought to be licensed until the conditions which this Act should contain were complied with. Let a committee of the leading architects and builders be formed to consider what should be embodied in such a clause, and submit the result to the Board of Trade. In this way, and this way only, we think the profession could free itself from the slight stain of which we have spoken: humanity itself demands the step, and we trust the numerous members of our profession possess those higher, purer, and more disinterested motives which will make this duty a pleasure to all. In the meantime, and till this much-to-be-desired object is attained, we should wish to impress upon our readers two saving maxims to be strictly adhered to in case of panic or fire. Never move from your seat until you have arranged and resolved on your course of action,

both with yourself and those around you; and, if, being near the door, you think it well to go out do your utmost to clear a space in the street round the door.

W. F. C.

A VILLA OF CONCRETE.

FERNLANDS, CHERTSEY.

THE use of Portland cement concrete as a building material goes steadily on. We illustrate in our present number a villa residence of considerable size, the walls of which are entirely constructed of it. This building, known as Fernlands, is nearly completed; it stands on a rising ground, about a mile from Chertsey, Surrey, and forms a somewhat prominent feature in the landscape from the rail, as the town is approached from the London side. The concrete of which it is built is composed of gravel and sand, dug on the spot, and Portland cement, in the proportion of 7 of gravel and sand to 1 of cement. Some portions, such as the terrace walls, are composed of 9 of gravel to 1 of cement, and this latter proportion is found to make a good wall. Hoop iron is used in the walls as a tie.

The apparatus employed in the construction is that patented and manufactured by Messrs. Drake, Brothers, & Reid, of London: it is easily adjusted to any shape or height of wall. The walls were built by the proprietor of the estate, Mr. J. Madocks, who employed his own workmen. The contractor for all other portions was Mr. B. E. Nightingale, of Lambeth.

The building consists of basement, ground-floor, and first and second stories. The large central hall, shown in the plan, is continued up to the roof, with balcony round on first floor, and is lighted by a lantern, somewhat elaborately ornamented with carving, gilding, and stained glass.

There are in all twenty-two rooms, besides conservatory, pantries, and larders. The pilasters (2 ft. on face by 3 in. projection), at each angle of the main building, and of the tower, were built up together with, and form a part of, the walls; and the walls are decreased in thickness on each floor, being 14 in., 12 in., and 10 in. The chimney-breasts, being large on the ground-floor (kitchen fireplace especially so), were reduced in size on the chamber floor, the adjustability of the apparatus allowing variations of this kind to be carried out at will. The pilasters to front doorway and shafts of the windows above it are of stone.

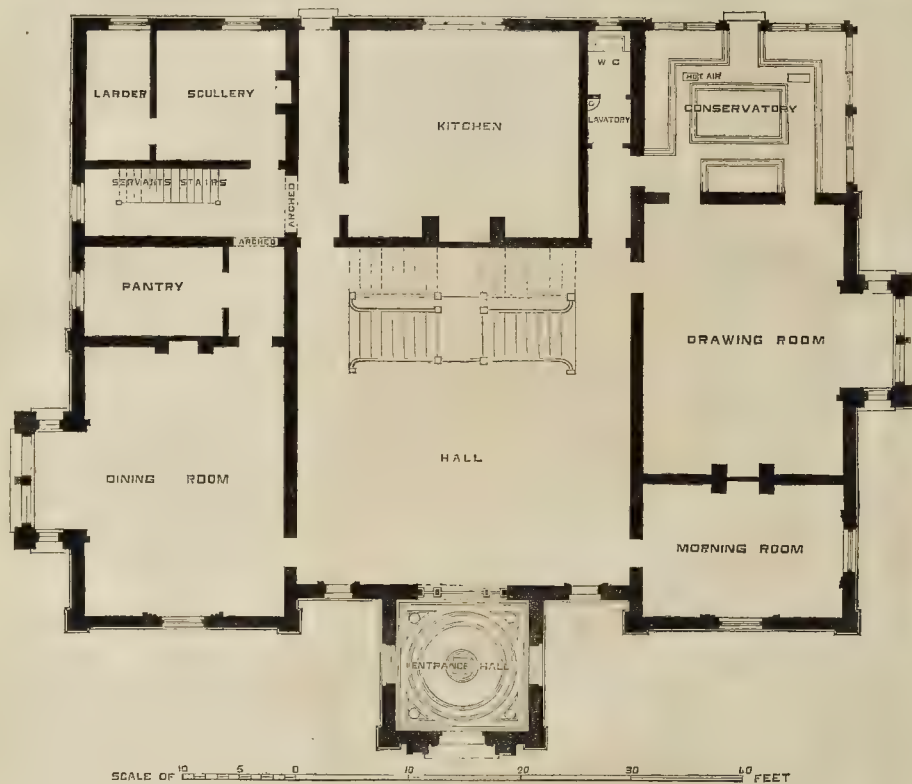
The building is heated by air, warmed by contact with earthenware, conducted mainly through flues formed in the body of the concrete walls, and admitted by sliding valvular gratings in the skirtings of the several rooms.

Ventilation is provided for in every room by distinct flues, formed in the concrete, and entered by apertures near the ceilings. The bells are Moseley's electric; and the closets are all of Moule's patent.

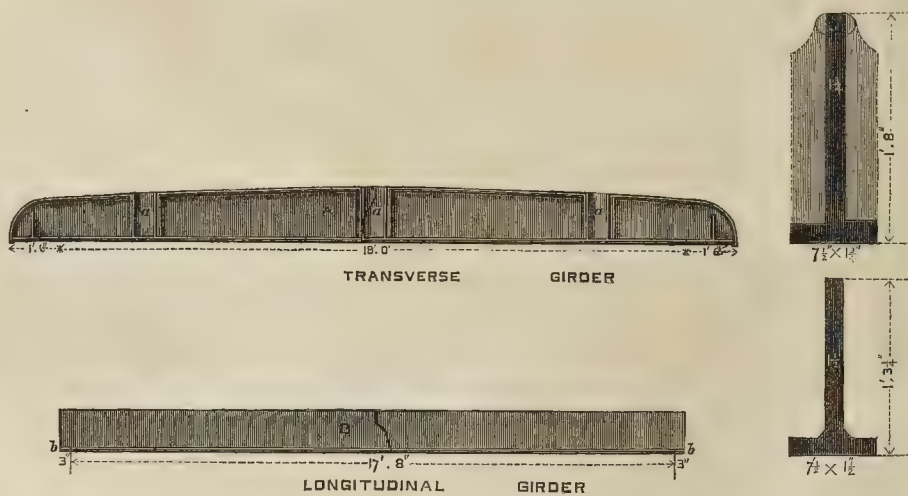
The architect considers the construction perfectly successful, and it may be taken as a proof that concrete is a suitable material for buildings of any class or size. With the apparatus used, battering as well as perpendicular walls have been constructed, and we have every reason to believe that with due care and intelligence, and with good cement, walls of any shape, height, or inclination, can be successfully carried up in this material. Bad concrete is utterly worthless: with good concrete properly applied, sound and economical buildings may be constructed.

The strength of the walls of this building was very satisfactorily demonstrated. During the construction it was determined to form a doorway in one of the inner walls. The concrete was cut away with a pickaxe to the required size, except in the middle, where a beam of concrete was left, 3 ft. 4 in. long, 9 in. deep, and 9 in. thick. This beam, a perfectly straight one, had along the middle of it one of the horizontal joints which necessarily occur between the layers of the concrete, but no bond of iron hooping. This beam was tested with a weight of 25 cwt., hung on its centre. After bearing the strain for twenty-four hours, the foreman jumped on it, but without effect, and it had after this to be demolished with a pickaxe.

The architect is Mr. T. Wonnacott, of Chertsey. The cost of the building, when completed, will be, we are told, about 4,000l., including stables and coachhouse. Mr. Patrick, of Dover-court, near Harwich, supplied the cement for the concrete walling; and Messrs. J. B. White, Brothers, of London, supplied the cement for the exterior work.



A CONCRETE RESIDENCE, CHERTSEY.

Plan of the Ground Floor.

CAST-IRON GIRDERS, KING'S COLLEGE, LONDON.



FERNLANDS VILLA, CHERTSEY.—BUILT OF CONCRETE.—MR. WYNNACOTT, ARCHITECT.

CAST-IRON GIRDERS, KING'S COLLEGE, LONDON.

We mentioned in our last that some of the girders from the dining-hall, King's College, similar to those which had failed there, had been broken by the hydraulic press, in the yard of Mr. George Dines, with the view of ascertaining their strength. Reference to the account we printed at the time of the catastrophe* will show that the flat was formed by three cross girders, with longitudinal girders resting on them, and on the end walls. Our illustrations represent one of each of these, A and B, elevation and section. A shows the cast pockets on the transverse girder, to which we referred at the time; into these the dovetailed ends of the longitudinal girders, B, dropped, the top flange being there omitted, as shown on section. The bearing of the transverse girder was 18 ft.; the height in centre, 1 ft. 8 in.; the web was 1½ in. thick; and the bottom flange, 7½ in. by 1½ in.

Pressure being applied, the girder broke through the pocket, as shown, with 40.9 tons pressure in centre. The girder B, broke as shown, with 27.5 tons in centre. The iron of these two particular girders must be considered good. Whether or not it was so in all is another question. At the time of the accident the girders A were loaded with about 25 tons each in the centre; the girders B with 7½ tons.

BEXLEY HEATH CHURCH COMPETITION.

With reference to this unfortunate and ill-managed affair, we have received from Mr. H. E. Marsh, late chairman of the committee, a statement of the reasons which led him and five other members of it to resign on the determination being come to to adopt the design marked No. 1, by the architect who was called in to assist in making a selection. The church required is to seat 900 persons, and to cost 4,500*l.* exclusive of tower; and if it be correct, as stated, that the design now determined on includes a chancel nearly sixty feet long, we can have no hesitation in applauding Mr. Marsh's opposition. It is an absurdity, or worse, and the sooner the subscribers outside interfere the better. The fact that the late chairman has subscribed 300*l.* towards the erection of the church, and was engaged in raising that amount to 1,000*l.* by application to friends, seems to show real interest in the undertaking.

LECTURES FOR WORKMEN.

The lectures on "Ornamental Ironwork," to be delivered by Mr. J. M. Capes, M.A., at the South Kensington Museum, and especially addressed to workmen, promise to be well attended and to be serviceable. The first, which was given on Monday evening last, was listened to by at least 350 persons, the great bulk of whom were practical workmen.

Mr. Capes began his introductory lecture by remarking the obvious, although extraordinary, fact that, in 1870, any very pressing invitation should be required to draw together a large audience of English workmen, in order that they might be told something about that which, above all other matters, they ought to be thoroughly well acquainted with,—namely, the use of iron in every possible way of employing it. Notwithstanding the general use of iron for the purposes of modern civilisation, and for almost all the needs of life, except food and clothing, the study and practice of ornamental ironwork were in a very unsatisfactory condition. The lecturer traced the causes of a lamentable decay in what was once a great national industry, to the debasement of public taste, rather than to the absolute want of highly-skilled artisans; and he dwelt forcibly on the baneful effects on art arising from the universal substitution of the low mechanical system of casting iron for the higher process of forging it. This substitution, he argued, had led to three specially injurious results. First, it had introduced unsound ideas of construction, inconsistent with the essential nature of all metal work. Secondly, it had banished the peculiar beauties in which iron stands pre-eminent over wood, stone, earthenware, and other non-metallic materials. Thirdly, it had fostered carelessness in workmanship, and reduced the workman to the level of a mere machine. All sound design, he contended, was based upon the rule that beauty is to be attained by the decoration of

structural forms designed for practical use in accordance with the special qualities of the particular material employed; and all natural beauty is attained by the observance of this rule. The lecture was illustrated by examples of ironwork borrowed from the collection in the Museum. In conclusion, Mr. Capes argued that the revived study of ornamental ironwork on sound principles could not but be of the highest importance to the English artisan, because it is through his personal skill that a material, in itself of a low market price, acquires a great and permanent value; and he drew a striking contrast between the life of the true artist-workman and that of the uncultivated artisan of the modern foundry.

The series will be continued weekly for five successive Mondays, each lecture commencing at eight o'clock; and we hope the opportunity here offered of learning something about principles, for a merely nominal fee, will be largely taken advantage of by those for whom the lectures have been expressly provided.

DERIVATION OF THE WORD "IRELAND."

CAPTAIN BUNTON ("Pilgrimage to El Medinah and Meccah," 1856. Vol. iii., p. 335, n.), writes: "May not the Phœnicians have supplied the word 'Ir,' which still survives in Erin and Ireland? Even so they gave to the world the name of Britain, Brettaniko, Barrat et Tanuki, the land of tin. And I should more readily believe that Eran is the land of fire, than accept its derivation from Eer (vir) a man."

Also, "Ur of the Chaldees (whence the Latin *uro*), becomes in Persian 'Hir,' in Arabic, 'Ir.' " What is the passage in Claudian mentioned by "A. H." in the *Builder* for January 22nd?

Has the word *Ir* been traced from the fifth century onwards?

How and when did the word as we now have it first appear in England? S. F. C.

NEW SCHOOL AT BIRMINGHAM WORKHOUSE.

The erection of a new school for boys at the Birmingham Workhouse is so far completed that it will be taken possession of in the course of a few days. The new building, as seen from the main road, is three stories in height. It is built of brick, and in a Gothic style, corresponding to the other portions of the workhouse. The new school and its belongings partly occupy two sides of a quadrangle, the remainder being play-ground. The cost, exclusive of land, is between 9,000*l.* and 10,000*l.*, and the land, we believe, was bought for something like 1,500*l.* The lower part of the conspicuous building seen from the road comprises the school-room and day-room, or room for the boys when not in school. The latter room is lighted up by a row of windows on each side. It is 102 ft. long by 30 ft. wide, and of ample height. Over it is a dormitory, of similar dimensions and appearance, and the top story is a dormitory of the same length and width, lighted by dormer windows, and relieved by circular ribs of stained deal, which support the roof. The school-room, occupying a corner, is irregular in shape, something like the letter F, without the second stroke. In the long direction it is 50 ft. long by 30 ft., and in the other or top piece it is 19 ft. by 58 ft. Adjoining the school-room are three class-rooms. Upstairs there are dormitories, rooms for the schoolmaster (one overlooking the lower dormitory), superintendents of labour, &c. In a room on the ground-floor, 22 ft. by 26 ft., there are rows of basons fitted, at which the boys wash after leaving their dormitories. At one end of the lavatory are baths, in which every boy receives his weekly wash. Then there is a swimming-bath, 26 ft. by 15 ft. 9 in. The other buildings form part of the second side of the quadrangle, and consist of a dining-room, a tailor's room, and a shoemakers' room. The dining-room is 60 ft. long, 30 ft. broad, and 22 ft. high.

The trades taught in the workhouse are tailoring and shoemaking, and for the practice of each of these handicrafts there is a room 35 ft. by 23 ft., besides store-rooms and rooms for the industrial teachers overlooking the workshops. The remainder of the quadrangle is to be used as a playground, and it is 280 ft. long by about 200 ft. wide. On the school-room side there is a covered shed, 50 ft. by 16 ft.

The architects are Messrs. Martin & Chamberlain, and the builders Messrs. Jeffries & Pritchard. The whole of the new buildings, like the

rest of the workhouse, are ventilated, and they are warmed by steam pipes. It is contemplated to appropriate the rooms about to be vacated by the boys to male epileptics.

The average number of boys in the workhouse is about 270, and the entire population of the pauper colony is considerably over 2,000.

CANTERBURY NEW WATERWORKS.

THE engine and boiler-house, coal-store, chimney, cooling pond, softening and lime water reservoirs, boundary walls, permanent pumping engines, pumps, and boilers, are all so far finished that the permanent pumping-engine, pumps, and boilers, have been in use for some weeks past to pump up the spring-water from one of the two bore-holes. The quantity of water raised from the bore-hole, by the new pumping-engine, has been at the rate of 1,000 gallons per minute, equal to about one million gallons and a half per twenty-four days.

The normal level of the water in the bore-holes is now 9 ft. above the level of the water in the river Stour, at the Silver Hole spring at Wincheap, and, when yielding a supply at the rate of 1,000 gallons per minute, this level in the bore-hole is only temporarily lowered about 22 ft., the water at once rising again to the normal level directly the pumping is stopped.

The object of the present pumping is to clear out the soft chalk, &c., from the subterranean fissures that yield the spring-water, in order that the water may come up clear and free from chalk in suspension.

On Tuesday, the 18th inst., this reservoir, which is 19 ft. 6 in. deep, and capable of holding 350,000 gallons, was quite filled with water to the overflow, and, on carefully testing, it was found that the reservoir was quite watertight. The water-tightness of the 12-in. main pipe is now being tested throughout its whole length.

AN APPEAL FOR THE BUILDING TRADE.

SIR,—No one connected with building concerns but must acknowledge the justice of the touching description by your correspondent "Builders' Foreman: a Mason" in your last number, of the sufferings which the trades are now undergoing, and the privations they now endure from the collapse in building operations. Surely this subject must be taken up by the Government, for the pressing necessities of the people ought to be the first care of our rulers; and it is in their power, without any excess of principle, to give work and occupation to the mechanics and business to the trades with which they have to do. The nation gave twenty millions for the manumission of the slaves without any return; they properly contributed many millions to relieve the starving Irish during the famine. I have to propose a scheme for the metropolis, by which they should have an equivalent for their outlay. There are many building operations in London which have received the sanction of the Legislature, but in which there appears to be a stand-still on the part of the Administration, who seem to think that the economy of a great nation consists in doing little or nothing,—in avoiding to spend money to meet urgent necessities. However, let me ask, when are the Law Courts to be commenced? What has justified the delay which has arisen under the present Administration? When is the National Gallery to be begun? There has been a competition of able men, the architect has been selected and appointed, and a sum voted by Parliament upon his plans. Is this to be delayed till the "Ides"?

There are the Public Offices to be completed. The site has been cleared, the rubbish carted away, and the foundations laid in. When is the superstructure to be carried up? For the Law Courts there is the suitors' fund in Chancery lying idle, and not a penny need come out of the imperial exchequer. If the National Gallery were carried out, we should by donations double the number of pictures,—individuals only awaiting the time when there is space to hang up their contributions to present valuable works to the nation. For want of Public Offices, a vast amount is yearly paid for accommodation in most inconvenient private premises. Should we not then have equivalents for these outlays? And in the mean time the artisans are left to starve, and the butchers, bakers, and other trades connected with them made to suffer with them.

There is also another side of the question. The mechanics must do something to induce the Government to spend their money. They must consent to lower the late extravagant wages,—to be satisfied with 6d. an hour instead of 7d.; to feel that they act nobly in economising their expenditure to 80s. a week instead of 36s., rather than to be paupers and idle and dependent on charity. Materials are lower already from depression of trade, and if wages be likewise diminished, the Administration may be disposed to undertake remunerative works when they can be carried out at moderate cost. The greatest economists in Parliament do not desire cessation of work; only that what is necessary should not be done extravagantly, and the ratepayer then would pay his taxes cheerfully. Oh, sir, that our Ministry would act nobly up to the occasion, and not wait to be driven thereto by a starving industrious population.

T. L. D.

DEPRESSED STATE OF THE BUILDING TRADES.

I HAVE read with attention the letter signed "Builder's Foreman: a Mason." I know that what he states is true; but he raises an inquiry into a very difficult question: What is the cause of this depression, and its remedy? I venture to give my opinion on both, founded on the experience of half a century of active manhood, with a full knowledge of the particular incidents of the trades, to one of which he belongs. The active prosperity of the "Building Trade," for some years causing a very considerable rise in "building labour" generally, was, like the prosperity which brought on the climax, on "black Friday in 1866," artificially brought about by a reckless employment of a super-abundant supply of actual and spurious capital: the result was a collapse, reducing the price of every description of material, building materials especially, except "labour." Those who take on themselves to organise the labour market say that they can by combination protect labour from the adverse influence of this general fall in price; but every present experience testifies me they cannot accomplish this. If labour were now "permitted" to take the best price it could get, employment would be largely increased, and the time would come when, from the increased demand for labour, the price would rise. Would your correspondent, who probably, as a good hand, has been receiving 7d. per hour for eight or ten hours a day, consent to work for 6d. per hour, or less, if he could not get that? Would many others do the same? If so, the low price of materials and the low price of labour would tempt capital back to the building trades; and, after experiencing the disagreeable, though wholesome truth, for a short time that "half a loaf is better than no bread," the whole loaf would return. This is what every other active industry is obliged to do, and, notwithstanding all the emigration schemes of sending out the brave and energetic, and keeping the pauper at home, what the "labour power" must come to,—viz., submit to the practical effects of causes which it cannot control.

SENEX.

THE QUADRANGLE OF THE ROYAL EXCHANGE.

SIR,—The propriety of the observations made by your correspondent, "A. P.," in your number of the 5th inst., with reference to the covering over the central court of the Royal Exchange with a glass roof, cannot be denied. The effect which would be produced by such a covering, would not, in my opinion, in any way destroy the beauty of the building. The amount of accommodation provided by it in wet and muggy weather to our great merchants and City traders would unquestionably be a wonderful gain, and the convenience of such a covering to the public in general could not fail to be valued and appreciated as it would deserve.

The advertising mania alluded to by your correspondent cannot be too much deprecated. Advertisements, advertisements and advertisements, are the order of the day; and that a public building like a Royal Exchange should be allowed to be "distorted and vulgarised, as it is, with boards of a thousand colours," appears to me certainly most disgraceful to those who are in authority, and able to put it down; especially when there are great capabilities at hand by means of a little money to decorate and give the proper character to the interior of the

building, which at present it stands so much in need of.

I am not a moneyed man, not even a small merchant, nor a City trader, but will gladly contribute my mite towards such a desirable work as that of covering over the central court of our "Royal Exchange" (though I may very seldom or never make use of it), if it be only for the sake of protecting her Majesty.

J. H. G.

COAL-CELLAR PLATES.

A FEW days since I observed an unclean trading a piece of leather on the iron plate over a coal-cellar; by pulling a string attached to his sucker he lifted the unsecured plate. I pressed my walking-stick on the edge of another plate, and it instantly turned over like a thing of life. I replaced it, and passed on my way wondering that these are not looked after; it is temptation to entry, and dangerous to pedestrians; many are worn smooth, and when covered with snow, are very slippery indeed. District inspectors might inspect them. If one of them performed the letter V on the pave, or dropped through on to the coals, it would probably lead to a public duty being performed promptly and energetically. The Board of Works ought to supply them with suckers; the police might be furnished with the same; they would then have the pull against many negligent householders, and call them over the coals for not looking after their plate.

R. T.

THE HEARTH IN OUR HOME.

A CORRESPONDENT WRITES:—

"Allow me a few words on the construction of the fire-hearth in the speculating-fields, or rather in the hundreds of small houses that have sprung up around the metropolis. I have made a point to notice this important fact, that the trimmer of flat brick, or no trimmer at all, is the rule, and the brick-on-edge trimmer is the exception; then comes plastering with layer of mortar; and then, to fill up, gravel and thinned mortar; finished with 1-inch of Portland cement. With the plastered ceiling all looks secure."

I have heard of two serious accidents from the failure of such hearths in these last few months. In the one case, at Peckham, a little child was nearly killed underneath, and a young woman nearly came through with the falling debris. In the other case, at Bow, an old gentleman, sitting by the fire, was severely lacerated. In both cases the affair seems to have been hushed up, or quietly settled.

It is almost time the public were protected from this penurious atrocity. I leave the case in your hands, to treat it as you may think fit in your journal."

The warning comes not a day too soon. The Building Act says,— "The hearth or slab of every chimney shall be bedded wholly on brick, stone, or other incombustible substance, and shall be solid for a thickness of seven inches at the least beneath the upper surface of such hearth." In some cases the joists are of such insufficient depth that carrying out the requirement of the Act would bring the underside of the hearth below the ceiling; and district surveyors are sometimes unwisely led, out of mercy to the builders, to allow the insufficiently-formed trimmer to pass. More often, however, they are imposed on by false statements. A builder who has put in a hearth not in accordance with the instructions of the Building Act would find himself in an awkward position should a fatal accident occur in consequence.

SEMPRINGHAM ABBEY CHURCH.

THIS interesting old church has been restored from its sadly dilapidated state, and re-opened for divine service. The old roof is replaced by a new one. Uniform seats with benches and carved in accordance with the existing originals, have been substituted for the heterogeneous and unsightly pews. Tiles laid in patterns now occupy the places of the broken slabs and stable pitching. The north wall has been rebuilt from its foundations, and extended so as to occupy the site of the old north transept. The walls and piers and arches have been denuded of their various coloured washes, and the mural decorations have once more been brought to light. Three out of the four tower arches are now opened, and that on the south has had a new window inserted, which has been filled with stained glass, containing the sacred monogram

and medallions with Alpha and Omega, the gift of Mrs. Saunders, the wife of the vicar. There is another window of stained glass on the south side of the nave, the gift of the Rev. J. C. K. Saunders and Mrs. Saunders, in memory of two daughters. The subject is *Our Lord's Ascension*, executed by Mr. W. H. Constable, of Cambridge. A third window represents the Saviour inviting the weary and the heavy laden to come to Him. The chancel has been re-built by the Crown (her Majesty being the proprietor and owner of half the parish), at the cost of 400l. It is in the Early English style, with an apsidal termination, having three lancet windows at the east end, between which are pillars of red Mansfield stone, resting on carved corbels, and surmounted with sculptured capitals. The floor is laid with Minton's tiles. The pulpit is of carved oak, on a stone base.

OXFORD.

Proposed Enlargement of the City Court.—At a recent meeting of the town council, the City Buildings Committee reported that the following builders had been invited to send in tenders for the enlargement of the City Court, namely, Geo. Wyatt, Chas. Selby, Messrs. Honour & Castle, T. Jones, George Jones, James Baker, Henry Cowley, and J. R. Symm. When the tenders (five in number) were opened, Messrs. Honour & Castle's, amounting to the sum of 292l., being the lowest, was recommended to be accepted, and the town clerk to be instructed to draw up a contract and submit it for the approval of the committee. The mayor in reply to a question, said five tenders were sent in as follows:—Mr. G. Jones, 352l.; Messrs. Honour & Castle, 292l.; Mr. J. Baker, 315l.; Mr. C. Selby, 358l.; Mr. T. Jones, 325l. Mr. Wyatt & Mr. Symm declined to tender. After a good deal of discussion the recommendation of the committee was finally adopted.

The City Gaol.—The City Gaol Committee recommended that Mr. John Castle complete the specifications in detail; also that he prepare the bills of quantities preparatory to obtaining tenders from builders, and that the estimate be divided in the following manner, namely,—1. A separate one for the new wing; 2. A sum for the alteration of the old building; and 3. An estimate from Messrs. Haden & Co. for the whole of the heating and ventilating. Mr. Galpin said there was a serious objection to one part of the report—that which recommended that the city surveyor should prepare quantities. There would be much dissatisfaction among the profession if such a course were adopted. Another reason for not adopting the recommendation was that if any errors occurred in estimates of this description, prepared by the city surveyor, the authorities would be responsible. He agreed to the report with this exception, and he moved that the clause be expunged, and that the report be then approved. Mr. Bruton said he was bound, as an architect, to support Mr. Galpin's motion. There was no doubt he had stated what was the actual practice amongst the profession—that it was not polio for an architect or surveyor to take out quantities, or to be responsible for that part of the work. If that were done, the result would be, either that the builders would do just as much work as the quantities and ignore the specifications, or do the work in the specifications and not in the quantities, and that the city would be responsible for the difference. Mr. Tolit was ultimately appointed; and the report was approved, with this exception.

The Sewage and Drainage.—The town clerk has issued a pamphlet bearing on these important questions. It is entitled "A Letter from the Town Clerk to the Mayor of Oxford on the Drainage Question and the Bill promoted by the Thames Conservancy." In his introductory observations he explains that he has received from the Thames Conservancy the duplicate of a letter addressed to the Board, repeating the previous injunction of the former body as to the discontinuance of the passage of sewage into the river, and stating that "The Conservators feel that immediate steps should now be taken to insure the purity of the waters of the Thames." The town clerk next sets forth the gist of the statutes prohibiting the pollution of that stream and its tributaries, and then goes at once into the subject of the sewage and drainage. In the outset he says,—

"If we are forced to some action, the general opinion seems to be that we must continue the present sewers,

now emptying themselves into the Thames and Cherwell, under the rivers and carry them to the land, at such distance from inhabited houses, to be utilised on such land."

He proposes the utilisation of the sewage on successive meadows in the neighbourhood—

"And this," he continues, "brings us to the principal point in this paper, which is, that by the time the sewage water from Oxford found its way to the Thames, say at Culham Bridge, it would cease to be sewage, and it would be impossible for a chemist to detect the difference between the water in the river and that at the end of the sewage stream."

"The foregoing," the author adds, "was written several months ago, since which two important resolutions have been made: first, the Oxford Local Board, after several careful, deliberate, and temperate discussions, have determined not to purchase land, and in this I entirely agree; and secondly, a formidable meeting of landowners, convened by the Duke of Marlborough, have formed a committee to oppose a Bill promoted by the Thames Conservancy, and I submit that the gentlemen who have taken this view of the Bill have done so on erroneous grounds."

THE POETRY OF BUILDERS' BILLS.

In a poem by Mr. F. B. Kito, called the "Setting Sun," containing a large amount of autobiographical matter, the author gives the following oddly expressed musings on his builder's bills:—

"Midsummer day, is over past and gone,
And now the little bills come dropping in
In blank astonishment we view the totals:
O vanity of workmen's estimates
O danger of departing from our plans.
Alas these alterations and improvements
Have upset all our little calculations."

I may be angry and may make a splash
I cannot get away from these demands
Painters and glaziers, bricklayers, carpenters
Gravely maintain that every charge is right
With solemn faces they declare to me
The regular price is charged for everything.
No doubt they may be right in their opinion
But they are quite irregular to them
Can I by County Court appeal oppose them
And shane these tradesmen into fairer charges?
I can appeal, but what then shall I do?
I fear in that case I should fare still worse.
And have as well a lawyer's bill to pay.
The remedy is worse than the disease.
There are the bills: no doubt they must be paid
I'll pay the bills! and so have done with them."

PUBLIC-HOUSE BUILDERS.

SIR,—It appears to be settled that the Government intend to introduce the Bill, in this session of Parliament, for the purpose of making considerable alterations in the system of licensing public-houses; and as the new Beer Act of last session may be taken as an indication of the character of the proposed enactment, I think it is time that the builders on new estates in the suburban districts of London should be up and doing, and endeavor to get introduced into the new measure some special provision for the protection of their interests, otherwise the hardship inflicted last autumn licensing season, by the licensing justices refusing to grant any new beer licences whatever, and thereby rendering much expensive and valuable property completely unproductive and useless until they choose to grant spirit licences, may be perpetuated.

Builders should embrace the present opportunity, and use the powerful interest they undoubtedly possess, to endeavour to get their public-house property placed in a satisfactory position.

R. G. G.

GLAZING WALLS.

Your article in the *Builder* of February 5th, on "The Materials for Economic Dwelling-houses," contains some valuable suggestions. At the same time, allow me to say, that the plan you propose for glazing the surface of a wall with the aid of a salamander, or ironplate, is not very practicable, according to my opinion, for the following reasons:—First, because it would be a very difficult matter to lay the glaze on the wall with a brush, without disturbing the colours which would previously have been laid on the surface. And, secondly, because an iron plate would collapse before sufficient heat could be applied to fuse the glaze, that is to say, supposing your glaze was sufficiently hard to resist the weather. It would be all very well to cover the surface of a wall (externally) with a glaze such as is used on potteryware, and which would undoubtedly look brilliant at the time, but when the first severe frost came, it would assuredly fall off in thousands of small pieces. If you place a piece of potteryware, of any kind, out in the open air on a frosty night, you will find the next morning the glaze lifted in various places. Having said thus much in objection to your plan of glazing by means of a salamander, allow me to say that I think your suggestion of glazing external and internal surfaces to be highly valuable, if practicable. I would propose the following as being a feasible system of accomplishing the object in view. Build a wall of loose half-burnt bricks, in a shed at a brick-works, and then paint any pattern

which may suggest itself, after which take down the wall, brick by brick, and dip them in a glaze sufficiently hard to resist any weather, and burn them in a muffled kiln; that is to say, a kiln with an inner case of very thin fire-clay, so that the heat could penetrate to melt the glaze without the flame and dust arising from the fires coming in contact with the bricks. My reason for mentioning half-burnt bricks here is that they would absorb the colours and glaze better than if well burnt, and they would become quite hard in the process of glazing. My opinion is (from some years' experience of glazing white enamelled bricks, &c.) that there could by this means be produced a thoroughly impervious wall, at a moderate cost, which would be highly decorative in its character, and which would beautify our street architecture to an extent at present undreamt of.

ALPHA.

SIR,—I have read with much interest the article on "The Materials for Economic Dwelling-houses," and I quite agree in thinking you that the walls of cottages ought to be non-absorbent. I am at the present time manufacturing considerable quantities of glazed fire-bricks, which in my opinion answer the purpose. They are used largely for kitchens and outbuildings, so as to do away with papering or whitewashing. The cost is but trifling, and only the sides and edges are glazed; so that the tops and beds may adhere readily to the mortar, and there be nothing to interfere with its setting.

THOMAS H. SEACOMBE.

DRURY-LANE THEATRE.

At the general meeting of proprietors held on Monday, a report from the architect of the theatre, Mr. M. Nelson, was read. It pointed out that covenants as to repairs remained unfulfilled, complained that the work, so far as it had been done, was unsatisfactory, and estimated the cost of the work remaining to be done at 2,250*l*. The chairman, in moving the adoption of the report, referred to the unusually crowded state of the room, and said it was probably owing to a difference which had arisen between the lessee and the architect. On two occasions Mr. Chatterton complained that the architect had been wanting in courtesy towards him, while, on the other hand, the architect complained that he had not been treated courteously by the lessee. Dr. Clarke said, considering how well and successfully the lessee had laboured for the good of the theatre, he thought he was entitled to every consideration at the hands of the committee, and that it should not be left to one person alone to say whether the repairs were properly done or not. The chairman said the lessee when he signed the lease, undertook to execute the covenants to the satisfaction of Mr. Nelson. Mr. Grunstein complained of the censure implied in the architect's report upon the lessee, who, he contended, had been illiberally treated by the committee in refusing the extension of time he had applied for, and unfairly and arbitrarily by the architect, who sought to compel him to spend 4,735*l*. upon work which he could get as well done for 1,000*l*. less. The architect's specification was frivolous and vexatious, and it would be impossible to carry it out. He added that the dispute between the two gentlemen had been made the subject of legal proceedings. No action was taken by the meeting as to this matter. Mr. Chatterton has acted under the advice of Mr. A. Baker and others, and considers that he has properly repaired the theatre. We have received some curious statements on the subject, but do not think it necessary to publish them.

SOCIETY OF ENGINEERS.

At a meeting of the Society of Engineers, held in the society's hall, Westminster Palace Hotel, on February 7, 1870, the report of the council and a statement of accounts and balance-sheet were submitted. The retiring president, Mr. F. W. Bryant, then presented the following premiums for papers read during the past year:—To Mr. E. G. Bartholomew, for his paper on electric telegraphy; to Mr. F. W. Hartley, for his paper upon the various methods employed in determining the commercial value and purity of coal gas; to Mr. Perry F. Nursey, for his paper upon English and Continental intercommunication; and to Mr. Vaughan Pendered, for his paper upon apparatus for measuring the speed of ships. The president for 1870, Mr. William Adams, then took the chair, and delivered an inaugural address, in which he reviewed at some length the various papers read during the past year. In concluding he said,—

"With reference to the position of our pro-

fession generally during the past twelve months it must be admitted that it has felt the effects of the commercial depression which has, more or less, for the past five years, influenced every department. But affairs appear to be changing in this respect, and the new year has opened with signs of returning animation. I hear on all sides of improving prospects, and of the development of practical schemes, which lead to the conclusion that better times are dawning upon us. In looking at the sources from whence we may expect work, Russia appears to be one of the most promising countries. A vast field is there open for enterprise, both with regard to mechanical and civil engineering, so that we may anticipate a considerable amount of work from that quarter. There are other directions in which we may likewise look for employment for our profession, but Russia, if I mistake not, will prove a great field for engineering operations. At any rate, be that field where it may, the future prospects of the profession are very much more encouraging than they were a year ago, so that we commence the present year with renewed hope."

THE COSTS OF ST. ANDREW'S CHURCH, HERTFORD.

A MEETING of the committee appointed for the erection of the new Church of St. Andrew, Hertford, has been held for the settlement of the costs of the edifice. Earl Cowper presided.

Mr. M. S. Longmore read a statement of sums received and paid by the treasurer, of which we give a summary. Received at the London and County Bank, 1,503*l*. 4*s*. 7*d*., at Messrs. Sharples & Co.'s Bank, 1,577*l*. 12*s*.—Total, 3,080*l*. 16*s*. 7*d*. Payments—To Messrs. Dove & Brothers (the contractors), 2,350*l*. Other payments (including 189*l*. 8*s*. to the architect; 75*l*. 12*s*. to the Clerk of the Works; and 94*l*. 8*s*. for taking out quantities), 481*l*. 8*s*. 7*d*. Balance in hand, 249*l*. 8*s*. The amount of promised subscriptions remaining unpaid was 253*l*. 11*s*. 6*d*.

Mr. Johnson, the architect, presented a statement of the expenses incurred, from which it appeared that the charges on contract and for extra work, "ordered from time to time," were 3,734*l*. 15*s*. 6*d*.; Mr. Kiddill's (for heating apparatus), 80*l*.; and Mr. Schrivell's (for gasfittings), 60*l*., making 3,874*l*. 15*s*. 6*d*. To this must be added—architect's commission at 5 per cent., 193*l*. 14*s*. 9*d*.; for additional services rendered, 71*l*. 8*s*.; and for travelling expenses, 20*l*., making 285*l*. 12*s*. 9*d*. for the architect, and bringing up the total to 4,159*l*. 18*s*. 2*d*. Adding to this the sum of 75*l*. 12*s*. paid to the Clerk of Works, the gross total was brought to 4,235*l*. 10*s*. 2*d*. Of this sum, 2,531*l*. 8*s*. 7*d*. had been paid (as shown by treasurer's statement), leaving 1,404*l*. 1*s*. 7*d*. unpaid.

In answer to a question, Mr. Johnson stated that the amount of the builder's contract was 3,275*l*. There was an extra of 14*l*. 12*s*. for the foundation-stone, 182*l*. 5*s*. 8*d*. for additional foundations, and an extra sum for gas-piping and gas standards.

The extra items were gone over and mostly agreed to, and at the close of the meeting Earl Cowper complimented the architect on the way he had done his work.

THE PREVENTION OF ADULTERATION.

SIR,—I noted with some degree of consternation the paragraphs in your several issues relating to adulterated malt liquor, and also the theory of the effects of insanity attributable thereto. The question I would raise from these premises is, firstly, can we confine it to malt liquor, or are we not justified in laying the scourge of England—"brain disease"—to the alarming adulteration of the whole food of the country? Scarcely an article comes to our table representing the commodity by which it is called, but is in some way or other severely adulterated, and must, I am confident, have an important influence on our physical career, and tend in some way to engender insanity, among other ailments. To this axiom I would therefore, secondly, ask, what is the remedy, and how to abate it? I am obliged to "W. T. S." for his suggestion of "withdrawing the licence" of licensed victuallers who are found transgressing their privilege, and think, were it enforced, every other public-house would be happy for the community, closed.

But why, sir, could not licences be granted to every vendor of food in a similar manner, and part of the proceeds of the licence system be paid to medical officers of health in every town, borough, and county in the kingdom, who should be called upon to analyse any article a purchaser may reasonably suspect to be tampered with, and the penalty be commensurate with the fraud and injury inflicted by the ingredient used in adulteration. We see officers appointed to test our gas, and fine the company who poisons us with sulphuretted hydrogen and carbonic acid; we have the waters of the metropolis examined in a similar manner and reported on if free from organic matter; we have our sanitary arrangements attended to;

thus caring for our purity of air, fire, and water: then, why, I repeat, cannot such a scheme as I mention be promoted to prevent us being slowly poisoned by 99 per cent. of our articles of consumption? I am fully persuaded, if the legislature adopted such a plan we should hear of no more "booth" for butter, no more diseased meat chemically rendered usable in sausages, no more mahogany sawdust in coffee, no more of the thousand things we innocently consume daily, to our physical dangerment, and at this expense, perhaps, of our mental capacity.

W. L. G.

ARBITRATION AS TO GROUND AT CROYDON.

MR. URBAN-SHERIFF ARNOTT has held a court at the Greyhound Hotel, Croydon, before a special jury, to assess the amount of compensation to be paid by the London, Brighton, and South-Coast Railway Company, for lands required to be taken from the trustees of Miss's estate, for the construction of the Surrey and Sussex Junction Line. Mr. Lloyd, for the claimants, having given a history of the Sussex and Surrey Junction Railway (now proposed to be abandoned), called Mr. Robert William Fuller, who deposed that he was an auctioneer and valuer, having considerable experience with regard to the value of 100 acres in and about Croydon, and that the quantity of land altogether taken by the company was 3a. 0r. 3lp.; of this 2a. 2r. 15p. was building land, which he estimated to be worth 60s. an acre; detached residence, with garden and grounds (2r. 15p.), together with the reversion of 77.7 per annum on the expiration of a lease in 1873, he had estimated to be worth, together, 1,350s.; add 10 per cent. for compulsory sale, 201.5s.; and 60s. for consequential damage and depreciation in value. The figures, as worked out, would be as follows:—Freehold land, at 60s. per acre £1,556 5 0 Detached residence, with garden, at 53 per annum to end of lease, with subsequent reversion of 75s. per annum, including 5 per cent. interest 1,358 0 0

Add 10 per cent. for compulsory sale 251 8 0 Consequential damage 500 0 0

£3,705 13 0

Mr. W. J. Blake, an auctioneer and valuer of thirty-five years' standing in Croydon, gave evidence as to the value of property in the neighbourhood, and the estimate he had made thereupon of the value of the plot in question, the total of which amounted to 5,574. For the railway company, Mr. H. Jones, Mr. G. F. Adams, and Mr. E. Vigers, surveyors, estimated the value of the land at 2,453l. The jury awarded 3,100l. to the claimants.

COMPETITIONS.

Alexander's Fountain Competition, Glasgow.—In this competition, which is for a testimonial fountain to be erected in honour of Mr. Alexander Smollett, of Bonhill, a design by Messrs. Adamson & McLeod, architects, under motto "Seven," has been selected by the committee from thirty-six sent in. The erection of the fountain is to be proceeded with at once. The style is French Gothic, to be carried out in durable freestone and red and gray granite.

Kennington Workhouse.—The Board of Guardians met on Wednesday, the 9th inst., when they selected the design submitted in competition by Mr. Williams.

CHURCH ARCHITECTURE OF THE NINETEENTH CENTURY.

STR.—No century since the Reformation has seen so many churches built as the present, but as we are living in practical, businesslike, and, we may hope, useful times, why should not the plan of our new churches be in accordance with our present form of worship, instead of being built after the pre-Reformation type of parish church? We meet for worship as one congregation, but generally under four separate roofs, viz., nave, two aisles, and chancel; sometimes, perhaps, only one aisle, and in very small churches with perhaps only nave and chancel; but what would be thought of our architects if they were to build any other kind of building that was intended for one assembly, "say a music-hall," with even one row of pillars down the length of it? Now, perhaps, my argument may be met by the difficulty of the wide span of roof in Gothic architecture, but this is not an insuperable difficulty. Take Westminster Hall and King's College Chapel for instance; besides, the later Gothic has wider and less pointed roofs than the Early Pointed, which our architects are so fond of copying. Moreover, Gothic is not absolutely necessary at all, though usual, and perhaps desirable.

Since our railway stations have become common, we have many specimens of wide-spanning wooden and iron roofs of light and somewhat elegant appearance; and looking at it as a matter of expense, though the roof would probably be more, the stone or brick work and foundations would probably be less. Now, perhaps, some of our Churchmen may think it unorthodox not to have a chancel, but this may be obviated by

having it all chancel, having the seats each side, and facing one another, like our cathedral choir and college chapels, or there might be some artificial division if desirable; but if we must have a chancel under a separate roof, let it be of the same width as the church, that the whole congregation may see and hear the clergyman when at the communion-table; for under the present system those in the aisles, "which form nearly half the entire congregation," have often some difficulty in doing this. As a matter of usefulness, we might take example from Dissenting chapels, however incongruous some of their Gothic-Grecian fronts may appear.

I am aware that some of our modern churches have aisles to the chancel, and perhaps some may consider these our models; but this is only dividing them into six compartments instead of four, and increasing the number of pillars, and still a great number in the aisles are unable to see the clergyman at the communion-table or pulpit, or when he is in any other position.

J. H. G.

CHURCH-BUILDING NEWS.

Carlisle.—The new parish church of St. Mary Within has been opened. The site is in the Abbey, near the cathedral. The new edifice has been built of red freestone in the Gothic style of architecture, the great object of the designer having evidently been to make it as simple as possible, but at the same time to make it harmonise with the cathedral. The interior differs from that of the other churches which have recently been built in Carlisle, inasmuch as it has no chancel arch to divide the chancel from the nave. The entire length of the church from the west end to the chancel step is 69 ft., and thence to the extremity of the apse it is 36 ft. more. The width of the nave between the pillars is 33 ft., and that is also the height of the side walls, while the height to the ridge is 54 ft. There are two aisles, each 12 ft. wide, divided from the nave by three arches on each side, turned with red and white stone alternately, and resting upon pillars of Kilkenny marble. The clearstory is lighted with sixteen lights, each about 7 ft. in height, arranged in mullioned windows in doublets, relieved by shafts of Irish green marble supporting the arches. At the west end there is a four-light window, 13 ft. wide by 24 ft. high, filled with tracery in geometric Gothic design. There is a small tracery window at the end of each aisle, and the aisles are further lighted by small plain windows. The apse is semicircular in form, and in it are seven windows with tracery heads, the finishing of the interior being shafts of Irish green marble. The reredos is done with Minton's encaustic tiles, chocolate and red tiles being placed alternately, and relieved by bands of green glazed tiles. The chief feature of the east end, however,—which, by the way, is, strictly speaking, the south-east, as the church, like the cathedral, does not stand directly east or west,—is the stained glass presented by Mr. Losh. The central lancet window contains the Ascension, and each of the six other lights contains two subjects, those on the left of the centre representing incidents from the Old Testament, chiefly illustrative of the life of Moses; while those on the right have for their subjects incidents in the life of Christ. The roof of the apse is hipped and ornamented with monograms and floral decorations. A noteworthy feature of the interior is its inner roof. Several feet underneath the timbers of the roof an inner ceiling of elliptic shape has been constructed, supported by Gothic ribs, and this is said to improve the acoustics of the church. The whole of the wood fittings are of Memel varnished. They are designed after the style of those in the Temple Church in London. Sittings are provided altogether for 693 persons. The chancel has encaustic tiles on the floor. Behind the pulpit, and adjoining the vestry, the organ, built by Messrs. Gray & Davidson, has been placed, at the cost of Mr. Losh; whilst in the opposite corner, seats are placed for the accommodation of Sunday-school children. The church is heated by Hayden's patent hot-air apparatus. There are ninety-four gas jets placed round the top of the reredos, and a row of twenty-four jets runs round the capital of each of the pillars of the nave. The total cost will be about 6,000l.

The contractor for the whole work, at 4,823l., was Mr. George Black, of Carlisle, joiner, who sublet the stonework to Messrs. C. & J. Armstrong, builders; the plumber was Mr. Richard Johnstone, of Carlisle; the slater, Mr. Norman;

Messrs. Slee & Morgan were the glaziers for the contract work; and Mr. Thomas Corbett supplied the Angleses and Irish green marble columns. Mr. Christian was the architect.

Books Received.

The Second Course of Orthographic Projection: being a Continuation of the New Method of Teaching the Science of Mechanical and Engineering Drawing; with some Practical Remarks on the Teeth of Wheels, the Projection of Shadows, Principles of Shading, and Drawing from Machinery. With numerous Illustrations. By WILLIAM BINNS, Assoc. Inst. C.E. London: E. & F. N. Spon, Charing-cross, 1869.

AT AN interval of some years, Mr. Binns has supplemented his Elementary Treatise on Orthographic Projection with a second volume, in which he has compressed the pith of the lectures delivered by him at the late College for Civil Engineers, Putney, and at the Department of Science and Art, Kensington. In this second course of Orthographic Projection, he has propounded the importance of establishing a uniform system for the formation of the teeth of wheels, and having compared the various methods now in use, and slightly altered that which is considered the best among them, he hopes his improvement will be recognised and universally adopted, so that for the future there may be but one form. As matters now stand in this department of mechanical engineering, two wheels of any given pitch obtained from different makers will not work together, because every maker has a formula of his own for the shape of the teeth, which he believes to be the best, but which, as we have remarked, prevents his wheels from working with those obtained from any other firm. After describing the methods pursued by various engineers, including that obtained by the use of the odontograph, he lays down a plan, by the adoption of which the inconveniences attending the present diversity of rules might be done away with. He proposes,—

1. That there shall be a generating circle for every pitch, and that the pitch be stamped or otherwise marked on each scriber, or generating circle.
2. That the diameter of each generating circle be equal to the radius of the least wheel of the set.
3. That the number of teeth assigned to the least wheel be fourteen for all sets of wheels for mill gearing.

The proposal of a universal epicycloidal system has been made before now, but from the fact of a want of sufficiently definite terms it fell to the ground. The diameter of the scriber, for instance, was left to the judgment of each maker. Mr. Binns's more precisely stated proposal is likely to be useful. French and American engineering has been laid under tribute by the author, and he incidentally mentions facts that may be serviceable. In describing bearings for shafts, we may note, he says, an alloy of copper and tin is the composition most in use, though compounds of tin and zinc, with a little copper, have been employed, as well as pure tin; but this last has the disadvantage of flattening out under pressure, unless confined by a flange or ledge of harder metal, in a manner patented in 1843, from an American plan, communicated by Mr. Babbitt, of New York. Again, he records that Mr. Penn has employed ligum-vitre for the bearings of screw propellers, with a plentiful lubrication of cold water, with very satisfactory results; and similar scraps of information are frequently dropped by the way. The chief contents of this second course, however, consist of instruction in such matters as toothed wheels and their pitch, spur wheels and their delineation, mortise and other wheels; the cycloid, epicycloid, hypocycloid, and involute; spur, bevel, skew, and other gearing; eccentrics, weigh shafts, cams, heart-wheels, wipers, tappets, and ratchet-wheels; couplings, plummer-blocks, pulleys; and similar details, without a knowledge of which all the art of the engineer would be as nothing. When these are fully explained and described, the projections of shadows are treated at length and with luminosity; and then the work concludes with two chapters, with which it might as well have been commenced; the first being on shading and colours, and the second containing directions how to draw from the machine and copy drawings. To those in want of plain instructions on orthographic projection, we commend the work, generally. The author, we perceive, particularly recommends to pattern-makers the section of it we first mentioned.

First Teachings about the Earth; its Lands and Waters; its Countries and States: a Beginning for Children. By M. OGLE. London: Simpkin, Marshall, & Co. Dorking: Clark.

THE useful lady who is the author of this volume says, with much truth, in her brief preface:—

"The child to whom that wry collection of names and sounds in ordinary political geography is distasteful and meaningless, becomes at once interested and pleased when taught about the earth as a whole; as a planet spinning on its axis, with its bulging tide-waves, its fire-spitting craters, its blue atmosphere, its cloud vapours, its mountain chains, and its coral islands."

Then it is that the child becomes interested in the earth and its people, its nations, its capitals, and towns, and its political histories; and so prepared for that dry political geography with which children are usually forced to begin, whether they like it or are interested in it or not.

It is well such a volume as this should not only be simple and clear, and it is so; but there should be no obscurity such as this, for example:—"Tulip trees—trees which produce the red dye, 'cochineal.'" As most people know, cochineal is an insect, and not an exudation, or an extract, from a tree, as this quotation might lead children to suppose.

In general, however, the matter is both accurate and simple. It is divided into lessons, and to each lesson is appended a list of questions, with the answers briefly stated.

VARIORUM.

MR. TIMES'S Year Book of Facts in Science and Art, which we always look through with special interest, has been issued for the past year. The portrait on this occasion is one of Mr. Reed, C.B., the chief constructor of the navy, and, as usual, there is a memoir along with the portrait. The volume contains the usual amount of varied information as a yearly record of progress in discovery and of improvements in science and art.

Miscellaneous.

Complaints of Scarcity of Employment come from the Northern United States, where there is "a glut in the labour market." It is said there are at least 50,000 workmen in New York out of employment; and the *Chicago Tribune* calculates that there are at any rate from 15,000 to 20,000 in the same condition in that great hive of the West. The same thing is said to be true of all the towns and many of the rural districts all along the Northern States. A correspondent of the *New York Tribune* represents that there are in the rural districts of New York State alone at least 100,000 persons unemployed. That journal advises that they should go to the far West; but the *Chicago Tribune* points to the South as the great outlet for surplus labour. The *Toronto Globe*, recommending the North, says that the present condition of the farming population, even of the Western (United) States, is far from being what could be desired, but that there never was in Ontario a better prospect of ample employment than in the coming spring and summer, though the supply of work is comparatively limited at the present time; and the *Star*, speaking of the workmen, give painful instances of the hardships caused by scarcity of employment, or inadequate wages, amongst workmen.

The Cost of the Leavesden and Caterham Asylums.—At a recent meeting of the Metropolitan Asylum District Board, a letter was read from the Poor Law Board, which, referring to a previous letter of the manager, said the Board could not "share the satisfaction" of the managers with regard to the near completion of the Leavesden and Caterham Asylums, inasmuch as the original estimates had been exceeded by nearly 6 per cent. A resolution was passed reminding the Poor Law Board that the original estimates were only approximate, and that there was cause for satisfaction to the managers when they found that their rough estimate of 257,000*l.* for the two asylums, and all connected with them, would only be exceeded by 15,000*l.*, the actual cost being 272,000*l.*; and they held that there were very few, if any, instances of buildings of a similar magnitude being completed for a sum so closely approaching the original estimates.

The Hornsey Drainage.—At a special meeting convened to consider the schemes submitted for draining the Hornsey and Crouch End district, Col. Jeakes, the chairman, stated that three engineers of eminence had been consulted, each of whom was capable of carrying out the plan he submitted. The plans were almost identical, the difference being, that Mr. Latham would allow storm-water to flow with the sewage, whilst the others would provide a separate set of drains. He thought they should judge each plan irrespective of land for irrigation, as it was possible that some chemical process might be devised for the purification of the sewage, whereby they would be relieved from the expense of purchasing land. Mr. Latham's estimate was 28,350*l.*, irrespective of compensation; Mr. Meason's, 43,427*l.*; and Mr. Shield's, including compensation (17,000*l.*), 44,236*l.* Their surveyor had taken out the quantities, and calculated Mr. Latham's at 47,044*l.*; Mr. Meason's, at 46,056*l.*; and Mr. Shield's, at 38,833*l.* In Mr. Latham's plan it was proposed to drain Stroud Green by a sewer, 42 ft. deep, for two miles; and in Mr. Meason's there was to be an embankment to carry the sewer through the Campbourne estate. A discussion ensued, and it was finally agreed, that from the knowledge their surveyor had of the district, he should draw up a report for the guidance of the Board.

The British Archaeological Society of Rome.—This society has begun the season with vigour. The weekly meetings are well attended. Last week the excursion was to the tombs on the Latin Way and the remains of the Church of St. Stephen. The frescoes and stucco ornaments of the first century in the tombs were much admired, and the remains of the early church were considered interesting; but great surprise was expressed that a society of gentlemen or ladies should be obliged to creep through a hole to see them, merely because the authorities have walled up the doorway in the modern walls built by the Pope to preserve the ruins. On the 22nd of January, the excursion was to the Thermæ of Caracalla, where Mr. Wood, the secretary, repeated on the spot Visconti's lecture, which he had read the night before at the meeting. The society then went to see the subterranean chambers, to which the entrance is from an adjoining vineyard behind the Thermæ—the proprietor of which was very obliging, and ready to show anything. There is no plan to be had of these interesting sub-structures. One corridor runs the whole length of the Thermæ, and is probably 10 or 12 yards high, but it is so much filled up with earth that the bottom has not yet been reached.

Improved Industrial Dwellings Company.—A meeting of the shareholders of this company was held at the Mansion House on Monday. The report, which recommended a dividend at the rate of 5 per cent., leaving 2,284*l.* to be carried forward, was taken as read. The chairman, Sir S. Waterlow, in moving that it be received and adopted, said that the amount received from the tenants in the shape of rent was very satisfactory, considering the great depression of trade. He had no doubt still more satisfactory results would be shown if trade revived. The shareholders had not gone into the matter with the view of making large profits; their object, rather, was to ascertain whether the dwellings of the working-classes in the metropolis could be reconstructed on a plan which would yield a fair and reasonable return on the capital invested. The working of this company showed that that could be done, and Mr. Allan, who had erected most of their dwellings, was so satisfied of their progress that he had undertaken a similar work on his own account as a building speculation. He had already erected one block of buildings, and had commenced the erection of other four blocks. The report was unanimously adopted.

The Brighton Sanitary Association.—The annual meeting of this Association has been held in the Committee-room at the Royal Pavilion. The committee's tenth annual report stated that much useful work had been effected during the year. The agents of the society had diligently exerted themselves in the discharge of their respective duties; and it was evident that, through their influence, a great improvement was manifested in the general cleanliness of the houses, as well as in the occupiers of them, in the districts which have come under their inspection.

The South Staffordshire Industrial and Fine Arts Exhibition.—At the concluding meeting of the committee who successfully carried out this exhibition held in Wolverhampton last summer, the statement of accounts was presented, the surplus appropriated, and the committee dissolved upon the termination of their labours. The net profit is 873*l.* The exhibition was visited by nearly a quarter of a million of people, and of these at least 75,000 were working men. A scheme was laid before the meeting for spending the balance, and securing 1,000*l.* of Government money to establish a central art and science school for Wolverhampton and the district. The exhibition was projected for the equal benefit of the Wolverhampton School of Art and the South Staffordshire Educational Association; and at the meeting Mr. Rupert Kettle explained the outline of a plan in which the two institutions propose to co-operate for the accomplishment of this object. It is essential for the success of the proposal that about 700*l.* should be subscribed by the public, and an appeal is to be made, under the sanction of the Exhibition Committee, to the guarantors of the exhibition, and the manufacturers, merchants, and others, for this sum, which is considered sufficient to found a self-supporting school to diffuse a knowledge of art and of science in two important branches, in this populous locality.

Lecture on Puttenham.—The Rev. Charles Kerry, curate of the parish, has read an interesting paper, in the school-room, on "The History and Antiquities of Puttenham." The rector, the Rev. W. A. Duckworth, took the chair. The room was densely crowded, and the audience were much interested and gratified with the essay, which was illustrated throughout with humorous stories of the sayings and doings of the old folks of Puttenham. The lecturer exhibited the British and Roman relics discovered in the parish within the last few months, whilst other interesting objects less portable were illustrated by large ink drawings, which added to the general interest. The address contained much of value and importance in connexion with Surrey archaeology. The lecturer thus spoke of the name Puttenham. The word is Anglo-Saxon, and signifies the "Home of Pits," "Patten," or "pitten," is descriptive of the home, and refers to some kind of home which appeared at least remarkable to the Saxons. It is well known that the Britons usually scooped pits in the grounds for their habitations, roofing them with a conical erection of branches or reeds.

Reduced Postage for Printed Matter.—Printed matter abroad is carried at much lower rates than in this country, to the great benefit of the community. Circulars, newspapers, and books, and even small parcels, are transmitted by the post in foreign countries at rates which should put Englishmen to shame. The Government, last Session, expressed itself favourable to a reduction of the rates, and the Post-office officials, it is well known, are quite ready to undertake the service. In the multitude of other pressing duties it may be overlooked, and the council of the Society of Arts of London have therefore appointed a committee to take steps for urging upon the Cabinet the great importance to all classes of reducing the postage on printed matter to one halfpenny instead of a penny, as at present, for every four ounces weight. All classes should give their support and influence on behalf of this committee.

Music.—On Wednesday, at the hospitable residence of Mr. Henry Hill, F.S.A., a cantata, called "The Silver Wedding," the words selected and the music composed by Mr. William Lusher, was performed for the first time by a number of zealous and well-trained amateurs. It is a bright and sparkling work, and should obtain for the composer more attention from the music publishers than he, although by no means unknown, has yet received. The opening chorus, "Hail, happy day, with three-fold blessing crowned," the ballad, "The Sun in his glory and splendour," and the part-song, "May guardian saints your path attend," especially pleased the audience. The last-named is worth the attention of Mr. Henry Leslie for his choir. Pope, Goldsmith, Mathew Bishop, and others, supply charming words.

Buckingham Palace.—A number of workmen are engaged at Buckingham Palace in painting and decorating the interior. The decorations and improvements will cost about 6,000*l.*

Sale of the Demidoff Art Gallery.—The most magnificent private gallery of works of art in Europe is about to come to the hammer, and is expected to realise more than half a million of money. The Demidoff Gallery, in the Villa of San Donato, at Florence, has been stripped of its treasures, which are to be sold in Paris during the present month and the next. The walls left vacant, however, are again covered with pictures, which had been hidden away in the lumber-rooms of the palace. This splendid collection is rich in modern as well as in ancient masterpieces, of the Italian, Spanish, Flemish, and German schools. There are also marbles, porcelain, enamels, ivories, bronzes, jewelry, arms, tapestry, and indeed works of art of every description. The first day of the sale is the 21st of the present month.

The Sanitary Movement in Turkey.—A sanitary reform of great importance to every town in the Turkish empire has just been decreed. A Hygienic Council, attached to the Turkish Ministry of the Interior, has been created, with the function of improving the drainage, enforcing proper street scavenging, and generally applying measures for the advancement of public cleanliness both in the capital and throughout the provinces. Its further duty will be to improve existing civilian hospitals and establish new ones where needed. The president, vice-president, and secretary of the new board will be regularly salaried, but its members will only receive an attendance fee of a lira each sitting.

Another New Dye.—The aniline dyes, it seems, have now a rival which not only vies with them in brilliancy and variety, but is of a less fleeting or more fixing character. The new colouring matter, according to the *Mechanics' Magazine*, is a purely vegetable extract, the plant from which it is obtained being imported from the western parts of Africa, and also from the West Indies. The colouring matter is variously treated, according to the colours required and the dyes to be prepared from it. The process of production is carried on with machinery of a special character, which has been designed by the patentees, Messrs. Walker & Co., for this manufacture.

Gateshead New Town-hall.—At the last meeting of the Town-hall Committee Mr. Muschamp moved, "That the best thanks of the council be given to Mr. Johnstone, the architect, and to Mr. Bulman, the contractor, for the highly satisfactory way in which they have carried out their contracts." Ald. Bigger seconded the motion. The Mayor said there could only be one opinion about the resolution, for it was somewhat strange to hear tell of a building costing 12,000*l.* completed without one shilling for extras. The motion was carried, and Mr. Johnstone, the architect, being present, the Mayor tendered him the thanks of the council for the ability he had displayed.

Music in Cathedrals.—At the last meeting of the Worcester Cathedral Restoration Committee, the remarkable offer was made by the Earl Dudley to give 10,000*l.* for completing the restoration of the choir of Worcester Cathedral, at present suspended for want of funds, upon condition that the cathedral should be used exclusively for the celebration of religious worship, and that it should not be used for the musical festivals of the "three choirs." Of course the matter rests in the hands of the Dean and Chapter. The answer is to be given in April.

Waterworks, &c., for Baden.—In order to provide Baden, in Suabia, with a sufficient fund to carry out improvements when it has been deprived of one of the chief sources of its revenue, the gaming tables, which are to be suppressed in 1872, the rent paid by the proprietor of the tables has been raised, for 1871 and 1872, from 300,000 florins a year to 500,000 florins. Besides this, he has undertaken to expend 200,000 florins in the two years on improvements, such as water-works and the construction of hothouses.

The Oxford Slade Professor of Fine Arts. Mr. Ruskin delivered his inaugural lecture in the Sheldonian Theatre on the 8th, when the edifice was filled with a large audience. The special subjects of the several lectures of the professor will be:—(1) February 15th, "The Relation of Art to Religion;" (2) February 22nd, "The Relation of Art to Morals;" (3) March 1st, "The Relation of Art to Use;" (4) March 8th, "Line;" (5) March 15th, "Light;" (6) March 22nd, "Colour."

Brentwood.—The chapel in High-street, which will shortly, we understand, be pulled down, appears to have formerly received a considerable amount of attention in respect to its internal embellishment. Several gentlemen were viewing the interior of the building, when one of them accidentally discovered a painting. It is situated on the wall close to one of the windows, and upon further removing the plaster by which it was covered, the nearly complete figure of an archbishop, wearing his mitre, was brought to light. Looking at the period at which the chapel was built, and the fact of its being dedicated to Sir Thomas à Becket, it is thought probable that this is a representation of him, and that it was executed several hundred years ago. Further, but less interesting, paintings have been discovered contiguous to this.

Northern Architectural Students' Society.—The usual fortnightly meeting was held on Wednesday, the 2nd inst., in the Literary and Philosophical Society's committee-room, Newcastle, the use of which for the purpose of meeting has been granted to the students. The hon. sec. (Mr. Joseph Oswald) read the minutes of the preceding meeting, from which it appeared that a motion to amalgamate with the Northern Architectural Association had been rejected. Mr. W. Badlington then read a paper upon "Landscape Gardening," which formed the theme of a discussion, in which many of the members took part.

Ele from British America.—We have received from Mr. A. E. Roberts, of Rood-lane, some specimens of stained and polished fir, imported from the north-west coast of America. The wood has a very fine vein, is suitable for cabinet-work, is of unusually large dimensions, and free from knots. The usual weight of the wood is about 37½ lb. per cubic foot, and when artificially dried by the desiccating process, about 34½ lb. The unstained specimens are particularly beautiful.

Request to a Town.—The Chevalier de Strassburg, who recently died at Baden, in Austria, has left to that town his fortune, which consists of a sum of 210,000 florins (2 fr. 50 c. each), and a splendid residence surrounded with an immense park. The only condition he imposes is that the capital of the money shall remain intact, and that the interest shall be employed for ever in the embellishments of the locality.

Timber Measure.—At a meeting of persons connected with the timber trade of Liverpool, held on Monday—Mr. E. Chaloner in the chair—it was resolved to resist to the utmost the substitution of calliper or any foreign or invoice measure, or of any other measure, in lieu of that known as the "sale measure of the port." There was a large attendance; and only one gentleman dissented from the resolution.

Bristol Cathedral.—The present Mayor of Bristol has offered to build (at his own cost) the north porch designed for the new nave by Mr. Street. This donation (equivalent, it is thought, to 1,200*l.*) is made to depend on the condition that 600*l.* be at once raised in special donations (without trespassing on the general fund) to carry on the north wall of the nave to meet the porch.

Temperature of the Earth.—In a paper read before the Royal Society Mr. Hull records the temperature of the strata through which the shaft of a coal-mine was sunk near Wigan. It is nearly half a mile deep, and penetrates the globe farther than any other mine. The temperature of the coal at the bottom of the mine, as stated in Mr. Hull's paper, is ninety-three degrees and a half!

Schools at Middlesbrough.—The new British schools erected at Middlesbrough, at the sole cost of Mr. Joseph Pease, of Darlington, were formally presented to the trustees, on behalf of the town, by Mrs. J. W. Pease, last week. The new buildings, which have cost 4,500*l.*, will accommodate 700 scholars.

London and Middlesex Archaeological Society.—The ordinary evening meeting will be held on Monday next, at University College, Gower-street, when a paper will be read by Mr. J. G. Nichols, entitled, "Sir William Harper, Mayor, 1561."

Progress of Steam in Agriculture.—A steam plough company is to be started for the county of Northumberland. Upwards of 1,500*l.* have already been subscribed.

On Local Taxation.—The Local Taxation Committee, of which Sir Massey Lopes, bart., M.P., is chairman, have awarded the prize of 50*l.*, which they offered for the best essay on the present system of local taxation, to Mr. C. F. Gardner, B.A., of Devonport.

Fall of a Chapel Wall.—A portion of the front wall of the new chapel in course of erection on the site of the old Mount Tabor New Connexion Chapel at Fenton has fallen. Fortunately, no one was near enough at the time to be injured by the bricks which fell. The damage is said to have been about 50*l.*

The Law Courts.—Workmen have commenced the demolition of several houses in Fleet-street, the ground on which they are built being required, we may suppose, for the new law courts.

Wem Church.—Wem Parish Church has just been heated with a hot-water apparatus by Messrs. Evans & Morris, of Shrewsbury, at a cost of 125*l.* The length of the church is 72 ft., width 45 ft., and height 26 ft.

TENDERS.

For two houses, with stable, &c., Sherwood-street, Nottingham, for Mr. J. S. Butler. Mr. John Collier, architect. Quantities supplied:—

Nickers	2,997 0 0
Johnson	2,997 0 0
Chim	881 0 0
Rown	870 0 0
Sedgwick	830 0 0
Bell & Sons	829 0 0
Messon	828 0 0
Wool & Slight	818 0 0
Atkinson	804 0 0
Watercroft	799 0 0
Andrews	785 0 0
Rushworth	784 0 0
Shepperson (accepted)	730 0 0

For the erection of dormitories, &c., at Leytonstone, for the Guardians of St. Matthew, Bethnal-green. Mr. W. Mundy, architect. Quantities supplied:—

Whitford & Co.	23,930 0 0
Mart	2,823 0 0
Crockett	2,800 0 0
King & Sons	2,789 0 0
Homes	2,783 0 0
Lee & Co.	2,750 0 0
Brady & Co.	2,647 0 0
Morewood	2,605 0 0
Capps & Rizzo	2,562 0 0
Kent	1,866 0 0

For rebuilding two houses, Church-street, Greenwich, for Mr. Samuel Shove:—

Hunt & Son	2,830 0 0
Nail	7-7 16 0
Beckett	697 0 0
Baldwin	684 0 0
Baughan	620 0 0
Blake	595 0 0
Jackson	585 0 0
Harrison & Edwards	587 0 0
Warr	575 0 0
Steuteford	565 0 0
Lambey & Co.	555 0 0
George	550 0 0
Barks	475 0 0
Shirley & Horn	468 0 0
Mundy	460 0 0
Davis	446 0 0

For paving and fencing pathways of Waltham Holy Cross Parish Churchyard. Mr. Charles Chapman, architect:—

Cole	2,152 10 0
L. Lee	383 10 0
Smart	345 12 0
Heachret	345 5 0
Gardner	344 10 0
Bird	329 0 0
W. Lee	326 0 0
Ruffy	290 0 0
Turner	290 0 0
Farman	273 0 0
Bentley (accepted)	272 10 0

For taking down old buildings and building four houses at Leatherhead. Mr. Dibble, architect:—

Walker	21,905 9 0
Putney	1,589 2 0
Hamblin	1,420 0 0

House and Shop. Warehouse.		
Putney	408 0 0	...
Johnson	485 15 0	...
Thames	570 0 0	...
Lynn & Dudley	465 0 0	...
Hamblin	430 0 0	...

For new infirmary and casual wards, to be erected at the union workhouse, Richmond, Surrey. Messrs. Brewer & Son, architects:—

Long	23,687 0 0
Osborne	3,587 0 0
Sims	3,250 0 0
Sale	3,237 0 0
Sweet	3,200 0 0
Quayson	3,190 0 0
Atis	3,145 0 0
Adamson & Sons	3,045 0 0
.....	3,075 0 0
Carless	3,061 0 0
Mansley & Co.	2,966 0 0
Wignmore (accepted)	2,750 0 0

The Builder.

VOL. XXVIII.—No. 1411.

Incomplete Decorations at the Palace of Westminster.

ORACE never was in London. That fact may be stated without fear of contradiction. The sparkle of his inimitable verse was never dulled by the fogs of the Thames. Its glow was never checked by the vigour of an English writer. Coracles lay on the banks now covered by palace and by hospital, when the Roman satirist was polishing his epistle *ad Pisones*, or leisurely pursuing that famous journey to Brundisium over a route to be taken

eighteen centuries later by the Indian Mail. But though Horace had not the advantage of being able to express his opinion as to English taste and English manners, no words could more happily express the verdict of the small knot of people who, some few days ago, met in the octagonal hall of the Westminster Palace, to enjoy a private view of the Venetian enamel mosaic decorations, than those of the Roman satirist. The large panel, representing St. George, was veiled until the arrival of the First Commissioner, so that time was given to compare, or rather to contrast, the gorgeous colouring of the vaulted and groined roof, rich in armorial bearings, and bright with gold, with the poverty-stricken baldness of the lower part of the hall.

"Turpiter atrum
Desinat in pisces mulier formosa supererit;
Spectatum admissi risum teneatis, amici?"

In fact, the Central Hall, in its present state, is entirely beyond the range of criticism. It is only by chance that the subject is properly presented to the mind. So ridiculous is the contrast between walls and roof that no spectator would imagine that the hall was supposed to be finished. The bare, light-coloured stone below and the glowing colours above, lead to the natural conclusion that the apartment is in the possession of the workmen; and the activity of several of those functionaries, who were engaged in operating on the floor and in washing the frescoes of the adjoining corridors, strengthened the illusion. We may as well observe in passing that the latter process is, so far as our experience goes, quite novel, as applied to this description of work. Our climate has had enough blame thrown upon it for rendering fresco impossible, and many of the grimy and rueful faces that glare on us from the walls of Westminster give evidence that—be it the fault of climate, of artist, or of material employed—it is a gross misnomer to call those handiworks fresco paintings. Still, the scrubbing-brush—or, we believe, it was only a scrubbing flannel—was busily employed on that particular evening over the surface of these historic pieces; so that we were not surprised to see that a large piece of paint (plaster and all) had peeled off the nose of Charles, Prince of Wales, while his royal father, whom the prince is hugging on the occasion, is raising

his hand to order his standard to be erected at Nottingham.

The decoration of the roof of the Central Hall, though betraying an inequality of surface, which the light of 104 gas-burners brought out in unnatural relief, is rich, picturesque, and quite appropriate to a state apartment. It has, besides, the important quality of durability, and, unlike fresco, it may be washed with impunity. Whether it be the best mode of decoration may admit of a question; but that it is good, and even excellent, there can be no denial. But such a roof, over an apartment walled with simple white stone, is a simple absurdity. Any but the most uneducated eye is shocked.

The intention of the original design, which was interfered with, as our readers may remember, by an unexpected vote of the House of Commons, was to produce a rich unity of decoration. The central shafts, at each angle, were to be gilded down to their bases. The parallel shafts on either side of these golden columns were to be of white marble. The intermediate mouldings were to be banded with red and light-coloured stone, and enriched with gilded roses. All this work is now in plain white stone. The gilding of the ribs of the roof is out off at the capitals of the shafts, and the head of gold is placed on feet, and legs, and body of clay.

The windows in the Octagon bear marks of the constant warfare which the architect of the Palace has waged with light, or rather with darkness. The difficulty has been felt in this Central Hall (where it might have been thought almost impossible to occur) not less than in other parts of the building. To diminish it, the unfortunate expedient has been adopted of inserting a large quantity of clear, transparent glass in the windows.

The four spaces, or panels, which intervene between these windows, each above a door of the hall, it has been intended to fill with four pictures in mosaic work. One is now complete. It represents St. George, between two female figures, intended for Fortitude and Purity. On the whole, the work is not undeserving of admiration, both as to design and as to execution. St. George is attired in gilded and fluted armour, of a very late date, and a German pattern. He holds a sword of disproportionate dimensions, and has a wooden shield on his arm, the carved edge of which is represented with great truth and felicity. The figure of Fortitude, on the right of the saint, bearing a lance with a pennon displaying the red cross, is graceful and effective. The least successful part of the composition is the head of "Purity," which is cropped, low, and square, and very much resembles that of Vitellius, or some other of the more ignoble Roman emperors. Beneath the design itself (which seems to require rather more relief from shadow than has been given) are two escutcheons, one containing the three lions of England, and the other the cross of St. George. Between the two is a plaque, or square space, of gilding, inscribed, "St. George for England," the lustre of which, when seen from the opposite doorway, rather kills the rest of the composition. Seen, however, diagonally, the glare disappears. On the whole, the new specimen of mosaic is splendid and stately, in good keeping with the roof, although, for that very reason, in strong and damnable contrast with the naked walls. The decorations were executed, we should add, from the designs of the architect, Mr. E. M. Barry.

Do not let our readers imagine that we have spoken with more emphasis than the case requires on the subject of the injury done to one of the most important apartments in the Palace of Westminster. The mode in which this great misfortune (for such it is) occurred must be fresh in the minds of those who take an interest in the subject. Mr. Layard was supposed—rightly or wrongly, it matters little—to have exceeded his authority in giving orders for the decoration

of this hall. As a sort of practical hint, the estimates for the purpose were cut down by the House of Commons. Unluckily it was a case of cutting off one's nose to be revenged on one's face. The ex-Minister, in the occupation afforded by Spanish politics, may easily have forgotten the snub. But the fact that a national building has been injured for the sake of an implied "lesson" to a Commissioner of Works is written in plain and very ugly letters on the Octagon Hall. We can very ill afford to have such public proof set up of the ignorance and contempt of the very elementary principles of art which prevail among our representatives. At a time when the very life of English manufacture depends upon the spread of a competent art education among the industrial classes, the fact that the designs of an architect for one of our most conspicuous public places should be messed because the House of Commons was angry with one of the Ministry, can only be considered a national misfortune;—no, not only,—for we regard it also as a national disgrace.

There is another question connected with the decoration of the Palace of Westminster in which a very large number of our readers will be apt to take even a more lively interest than in the æsthetic harmony of the Central Hall; and that is the kind of decoration which should be employed in a national palace. In the Prince's Chamber there are illustrations of the Royal House of Tudor to the sixteenth century. It is very remarkable that these twenty-eight portraits, which have been so long in their present position as to trace their history to the personal impulse of the late Prince Consort, have received but little attention. Authorities on decoration seem ignorant of their existence, or, at all events, of their nature and origin. The darkness of the chamber they adorn, which is such as considerably to obscure their force and beauty, is probably one cause of this neglect. There exists an ably-written series of biographical sketches of the characters, drawn up by Mr. George Wallis, and illustrated by photographs of the portraits, but we believe that it is out of print.

These portraits, which fill panels about half way up the sides of the lofty walls of the Prince's Chamber, are painted on stout millboard, which had previously been saturated with oil, so as to be practically impervious to damp, the uncompromising foe and destroyer of the ancient leather hangings of the Middle Ages. The details of the ornamentation are incised in the surface of the panel, and the whole is then painted and gilded, the effect being as rich as that of enamel, though with less glitter and irregularity of reflection.

King Henry VII., the first monarch of the House of Tudor, is represented from Remée's copy of Holbein's picture, which was destroyed by the fire at Whitehall. He is a majestic and thoughtful figure, dressed in a richly furred robe, which has the peculiarity of two openings in each sleeve, or at all events of a slashed and furled division in the upper part, which seems to be intended to allow the occasional unembarrassed use of the arm. His consort, Elizabeth of York, is taken from the same authority, and wears a hood that resembles an architectural canopy. The two sons and two daughters of this royal pair, Prince Arthur, Henry VIII., Margaret, and Mary, with the ten consorts of this much marrying race of princes, follow. Of these, two are kings. Louis XII. of France (taken from a miniature in a missal), the first husband of Princess Mary, and James IV. of Scotland, the first husband of Princess Margaret, eldest daughter of King Henry VII., and Queen Elizabeth of York, the ancestor of the reigning family.

The three children of King Henry VIII., Edward VI., Mary, and Elizabeth, head the third generation of the Royal House of Tudor: the first is taken from a portrait by Holbein; at

Windsor, and the other two from three portraits by Lucas de Heere. With them ranks the husband of Queen Mary, the infamous Philip II. of Spain, the most bloodthirsty tyrant that has ever boasted of the name of Christian. The first cousins of these princes follow; Lady Frances Brandon, Marchioness of Dorset, daughter of Princess Mary and of Charles Brandon, Duke of Suffolk; and King James V. of Scotland, son of Princess Margaret. Mary of Lorraine, Duchess Dowager of Longueville, and second wife of King James V., is painted from a portrait in the possession of the Duke of Devonshire.

In the fourth generation ranks the romantic name of Lady Jane Grey, eldest daughter of Lady Frances Brandon, and the great-granddaughter of King Henry VII., by his youngest daughter, Princess Mary, together with that of her second cousin, Mary Queen of Scots, daughter of King Henry VII., by his eldest daughter, Princess Margaret. King Francis II. of France, first husband of the Queen of Scots; Henry Stuart Lord Darnley, her second husband and first cousin (being the grandson of Princess Margaret, by her second husband, Archibald Douglas, Earl of Angus); and Lord Guildford Dudley, the unfortunate husband of Lady Jane Grey, complete this interesting series of portraits.

Now we venture to express the opinion that a series of well-authenticated portraits of some of the most illustrious personages of English history, executed by English artists, and completed in a method perfectly suitable for mural architectural decoration, has a claim on the admiration of any man of taste (to say nothing of the patriot) as a fitting decoration for the palace of the nation. Of the long series of English sovereigns, the representatives and the allies of successive and rival dynasties, the knights and nobles of the stormy periods during which our institutions struck, like our native oak, their roots deeper into the soil, we have many portraits, coats, tombs, statues, and other memorials scattered over the country. The collection of these, or of well-designed copies of them, into a grand set of historical illustrations for the Palace of Westminster, would be a task of which the nation might well be proud. It would be the compilation of an illustrated history of England that would sink deep into the hearts of our children and our children's children. It would increase tenfold the value of each separate memorial by the co-ordination and the display of the whole.

In the Convent of the Superga, near Turin (that votive church of which the soaring dome commands a view of the plains of the Po, and even, on two or three days in the year, of the marble *duomo* of Milan), is a series of portraits of the Popes—from St. Peter to Pius IX. inclusive. We are not about to vouch for the authenticity of the portraits; and we regret to add that Italian justice or zeal has scratched out the eyes of the present pontiff. Still, with every allowance, the series is interesting and instructive.

Why should we, who have a history on which we think we are entitled to look back with so much more pride than any Italian even professes to entertain in referring to the long career of treachery, falsehood, gripping avarice, and red-handed murder that attaches to the history of so many of the Popes,—we refer to no Protestant pleading, but to the pages of the Papal historians themselves,—why should we neglect the opportunity to form a national series of our own? Nothing sheds so much light on history as portraiture.

WESTMINSTER ABBEY.

The same fascination that compels people to revisit Westminster Abbey after they have once passed its hallowed precincts, appears to take firm hold of those who write about this deeply interesting edifice. If any one compiles a book about it, let him be a dignitary of the Church, an architect, a miscellaneous writer, or a collector of church notes, we may be sure of an appendix, or a supplement, or a second volume. Dean Stanley has shown that he has enjoyed no exception to this inevitability.* Scarcely have his *Memorials of the Abbey* been mastered by his public, than we find him in the grey aisles of the edifice taking account of things he missed in that work, or passed too slightly over;

or we see him standing by, as vault after vault is opened to verify or refute traditions of royal burials; or perusing documents pointed out to him, all too late, as yielding fresh facts. Knowing the working of the charm, we are not surprised, accordingly, to find he has now issued a supplement containing a few of his happiest after-thoughts, some elaborations of former statements, an account of the examinations of the royal vaults, some documents, a chronological table of events connected with the history of the Abbey, and twenty-three illustrations. The additions and corrections are made so that they may be read with interest and understanding, without constant reference to the volume they supplement.

We pick out first for mention a communication from Mr. Poole, one of the numerous volunteers who have assisted the dean throughout in his task. In the Clerk of the Work's Register there occurs the term "middle tread," in the indication of a place of interment in the cloisters. This expression, thus incidentally made, has furnished a clue to the kind of pavement that formerly existed in various parts of the Abbey. It applies, as will be guessed immediately, to the pathway of square stones laid down, the centre of a pavement composed of pieces perhaps placed diagonally. The cloisters were thus paved, with the addition of a course of square stones against the walls. The two ambulatories, and the two aisles of Henry VII.'s chapel, had likewise their middle treads, as may be still traced. It is known, from an old engraving, that the nave and its aisles were also paved in the same manner, though the numerous interments, with the necessary vaults, gravestones, and tombs, had so observed the design when the pavements were repaired about thirty years ago, that it either escaped notice, or was considered beneath it, and these portions of the fabric were laid with a wide field of squares placed diagonally, save a border of square stones against the walls, and a line from pillar to pillar. If the middle tread was of use chiefly for processional purposes, we can see how it came to be disregarded. But this Medieval arrangement was discernible in the north aisle of the choir and in the western aisle of the transept, when the pavements there were handed over to Mr. Scott for the restoration rendered necessary by decay, and for which the insertion of a heating apparatus offered an opportunity, and the middle tread was carefully perpetuated in both. Besides the recovery of a term that was familiar in the mouths of those who have gone before us, and the certainty of a feature of the fabric all traces of which were fast being obliterated, there is another interest in this subject. Ben Jonson's grave is described as "18 in. of square ground in the abbey, which we know to have been one of the square stones in the middle tread; for the account says of it that it was in the path of square stone (the rest is lozenge) . . . in a pavement-square of blue marble about 14 in. square."

Mr. Poole says,—
"This clearly refers to the small stone which Dean Buckland found lying about (it having been displaced for the new pavement), and which he caused to be placed in the rear of the stone now adjacent, and opposite to Ben Jonson's grave. This stone is exactly 17 in. wide, and has no doubt been 17 in. high, being the normal size of all the squares of 'middle treads,' and also the length of the diagonal of a 12-in. square, which latter is the normal size of all the lozenges. It has been reduced for some reason to 14 in. high, and is of Parbeck marble, which, when polished and undecayed, is of a blue colour."

The dean's account of the search for the grave of James I. is pleasantly told. If he has thought well to tone down a supercilious pungency that here and there flashed upon the page in his first volume, as in the reply of Bishop Grosseset to the anxious inquiries of Henry III. concerning the precise grace to be wrought by the unction, for instance, he will have no cause to retract his steps and, with graver emphasis, elaborate his freshest impressions of the discoveries made in the course of this quest. With bated breath and beating heart he seems to stand, bareheaded, by the various vaults and describe their contents to those unable to see into them for themselves. And lest our readers should wonder why the search was undertaken, we must explain that the dean considers "that the interest of a great national cemetery like Westminster Abbey depends, in great measure, on the knowledge of the exact spots where the illustrious dead repose;" and as this information was missing in the case of the monarch in question, or rather, as opposite statements were in existence concerning his place of burial, the joint sanction of the Lord Chamberlain and of the First Commis-

sioner of Works was obtained, and excavations made on the spots indicated by the aforesaid accounts. It was Mr. D. C. Bell, of the Privy War Office, who first pointed out the contradictions of Keepe, Crull, and Dart to the statement in the abbey register, that the monarch was buried in the tomb of Henry VII. Two of these authorities, the first-mentioned of whom wrote only fifty-six years after the death of James, placed the remains of the Scottish king in a vault on the north side of that tomb; and the third named a vault at the east end of the north aisle, where two of his daughters were buried, as the true spot, adding on another page a conflicting statement that the king and his queen rest together in a vault by the old Duke of Buckingham's tomb. Curiously the true statement in the abbey register was not credited till the other clues had been followed and proved valueless. The first excavation made was at the north-eastern angle of Henry VII.'s tomb, where it was concluded the king and queen would be found lying together. Four large coffins lay in the vault that was disclosed by the removal of the marble pavement. They proved to be those of the Duke and Duchess of Argyll and two of their daughters. The next spot opened, which was that between Henry VII.'s tomb and the Villiers Chapel, yielded no results; but west and south of the three vaults were found, which were examined. One coffin only lay in the first, which was the one nearest to the dais west of Henry's tomb. It was roughly shaped to the human form, and bore an inscription on a silver plate, which declared these lead-coated remains to be those of Cromwell's favourite daughter, Elizabeth Claypole. The other two were empty. The Sheffield Chapel was next opened; and here a wide brick vault was found of the dimensions given by Dart, and in it lay a long leaden coffin, shaped to the form of the human body, on which was a brass plate, recording the name and titles of James's queen, Anne of Denmark. But still no king. A thrilling impression began to take root among the investigators that some evil-doers must have been at work; and it was (erroneously) thought likely the Parliamentary soldiers, when in possession of the chapel, might have rifled the grave. Further excavations, however, were made. First, eastwards of the queen's resting-place, where a wall was soon found, which opened into the Sheffield vault, where lay the coffins of the first Duke and Duchess of Buckinghamshire, and three of their children, with that of the second and last duke. Next, it was resolved to open the vault of the king's mother, Mary Queen of Scots. Whom this was done a striking scene was disclosed. We quote the account:—

"A vast pile of leaden coffins rose from the floor; some of full stature, the larger number varying in form from that of the full-grown child to the merest infant, confusedly heaped upon the others; whilst several urns of various shapes were tossed about in irregular positions throughout the vault. * * * The first distinct object that arrested the attention was a coffin in the north-west corner, roughly moulded according to the human form and face. It could not be doubted to be that of Henry Frederick, Prince of Wales. The lead of the head was shaped into rude features; the legs and arms indicated, even to the form of the fingers and toes. On the breast was soldered a leaden case, as clearly containing the heart, and below were his initials, with the Prince of Wales's feathers, and the date of his death (1612)."

Close to this lamented young prince, along the north wall, were two full-sized coffins, flattened and distorted by the pressure of four or five smaller ones laid upon them. Though there was no plate upon either, it was easy, aided by Crull's account, to recognise the upper one as that of Arabella Stuart, and the one beneath it, which was saturated with pitch, as that of Mary Queen of Scots. Henry of Orléans, Mary of Orange, Prince Rupert, Anne Hyde, Elizabeth of Bohemia, ten children of James II., and the eighteen children of Queen Anne, lay in the crowd of coffins around; but still there was no King James. The Lennox vault was next opened; and then that of Queen Elizabeth. In the last lay two coffins, one resting on the other. The wooden case of the great queen's coffin was crumbling away, but enough remained to show it had been constructed with inch elm, with a carved and panelled oak lid laid upon the thickness of elm; and over all, lid included, was a covering of crimson velvet. An illustration is given of the Tudor rose, initials, and date, incised in the centre of the cover. After opening the space between the graves of Edward VI. and George II. and his queen, with no result, the vault of the first of these was explored. In it lay a solitary coffin, "rent and deformed, as well as wasted by long corrosion, and perhaps injured by having been examined before." Close by

* Supplement to the first and second editions of "Historical Memorials of Westminster Abbey." By Arthur Penrhyn Stanley, D.D., Dean of Westminster. With Illustrations. London: John Murray, 1859.

shrivelled up and unsoldered, was found the leaden inscription-plate, which must have been inscribed with the titles of the Protestant king, as the Dean observes, in the short interval of nine days when the body lay at Greenwich, and Lady Jane Grey upheld the hopes of the Protestant party. In the vault, too, lay another relic, a portion of the frieze of Torregiano's altar. An illustration of this work, taken from Sandford's "Genealogical History," gives a poor idea of it, for the perspective is bad, and the proportions out of all reason. The general effect of it, with its monstrously large coat of arms over the cornice, and slender pillars rising out of substantial bases, is more that of the great bed of Ware than that of Torregiano's "matchless altar," which, like that of other work of his period, would be sure to have been exquisite in its proportions as well as details. The frieze, however, it was decided, should be replaced, as nearly as possible in its original position; hence it can now be seen; and the leaden plate that was once upon the poor little prince's coffin was reaffixed to it, and its inscription copied on the pavement over his grave.

The quest was still carried on. An earthen grave in the Montpensier Chapel was next examined, in which was found a leaden coffin of an unknown person, whom the Dean takes great pains to identify as Cromwell's favourite, General Worsley; and at last that which should have been done at first was taken in hand. The excuse for looking in all the places not mentioned in the "Abbey Register" before examining the place indicated in it, was the impression that the entry in it only signified the chapel generally, and not the actual tomb of the royal builder of it, combined with a reluctance to disturb "the sacred resting-place of the august founder of the chapel" till every other place had been searched. The Dean shall tell his own tale:—

"It was with a feeling of breathless anxiety, amounting to solemn awe, which caused the humblest of the workmen employed to whisper with bated breath, as the small opening at the apex of the arch admitted the first glimpse into the mysterious secret which had hitherto cloided this long research. Deep within the arched vault were dimly seen three coffins, lying side by side; two of them dark and grey with age, the third somewhat brighter and newer, and of these, on the introduction of a light into the aperture, the two older appeared to be leaden, one bearing an inscription, and the third, surrounded by a case of wood, bearing also an inscription-plate. The mouth of the cavern was closed, as has been already intimated, by a huge stone, which, as in Jewish sepulchres, had been rolled against the entrance. . . . The third coffin lying on the northern side was immediately found to be that of King James I., as indicated beyond question in the long inscription engraved on a copper plate soldered to the lead coffin. . . . The two other coffins were as indisputably those of Henry VII. and his Queen."

An illustration by Mr. George Scharf shows this vault and its royal contents. On the breast of the coffin supposed to be that of the Queen is a large Maltese cross, but no inscription; and on her right hand and on her left lie the two kings. The Dean makes a great point of this selection of a last resting-place on the part of the Scottish king, deeming it a piece of policy on his part to engrave his ancient Celtic stock upon that of the Tudor family, through whom he had come into possession of the realm. In like manner, it will be remembered, Charles I. was buried in the vault that held the remains of Henry VIII. and Jane Seymour, at Windsor.

One of the documents inserted in this supplement gives a list of the paintings in the Abbey, which will be read with interest by archaeological artists; another tells of relics lent to the Duchess of Gloucester; an account-book refers to "comforting pills," "ointment for the loins," and "hippocras" for the use of the abbot; and to the tiling of the anchorite's house; and the warrant for the disinterment of the magnates of the Commonwealth, extracted from "Collectanea Topographica et Genealogica," appears among the additions. Note has been made, too, of the instances in which workmen or others have scratched their names in old times, in places not expected to be seen. Thus, on the Ormond vault, in which Oliver Cromwell was interred, were found, rudely executed, the names R. Donkey and Walter Mill Gerford, dated 1683, and others coming down to 1704. Again, in Henry VII.'s vault, occur the name John Ware, and initials E. O., both dated 1625, which specimen of calligraphical indiscretion has been the means of bringing them into posthumous disgrace, for the Dean concludes that they must have both been privy to the theft of the rich velvet pall that once covered the coffin of Henry VII., but which must have disappeared at that time, as no trace of it was to be seen when the vault was opened a few months ago.

No one will find fault with the Dean for yielding to the enchantment that makes every one anxious to return again and again to the alluring Abbey. And the majority of those who revisit it by the light of his guidance will see more in it than they would otherwise. The volume contains a number of illustrations, some of which might be better than they are.

THE ADAPTATION OF OUR ANCIENT CATHEDRALS TO THE USAGE AND SERVICE OF THE CHURCH OF ENGLAND.

At the last quarterly meeting of the Erexter Diocesan Architectural Society, Mr. P. B. Hayward read a paper on the subject at the head of this notice. We print the principal part of it:—

I feel bound to offer a few words of apology to the members of this society for venturing to bring to their notice a subject which has been already ably treated by Mr. G. E. Street in an exhaustive paper read by him at the Liverpool Church Congress last October, but which, perhaps, is not so generally known as it deserves to be. My excuse is, that the alterations that are contemplated in our own cathedral, naturally suggest some inquiry as to the principles which should form the basis of cathedral restoration, or rather adaptation to modern requirements; how far these principles have been kept in view in the restorations that have already taken place, or are now in progress in other cathedrals; and, as a natural sequence, whether the plans, which are now before the Dean and Chapter for consideration, are in keeping with these principles. I hope, on these grounds, that a few remarks on this subject may prove worthy of consideration by our Diocesan Architectural Society, which has for years past exercised an undoubted, although unobtrusive, influence for good in all matters relating to church building or church restoration, that have been brought within its cognisance. In this paper I intend to deal merely with the architectural part of the question, leaving to able and wiser pens the task of suggesting any alterations in the constitution of our cathedrals which may tend to bring them more into harmony with the increased activity and earnestness now felt by Churchmen, and so make them in the highest sense of the word the mother churches of their respective dioceses. The one great principle which, as it seems to me, lies at the very root of our public worship, and distinguishes it from all other, is that of unity or one-ness. We meet together in God's house, before His holy altar, as one family, clergy and laity alike, each with their appointed duties, to worship one God and Father of all; and the problem that has to be solved is to so plan the arrangements and fitting-up of the interiors of our cathedrals (built, as they originally were, for a use and worship differing materially from our own), that this principle may be recognised to the fullest possible extent. The plans of our cathedrals, with their strongly-marked division into nave, choir, transepts, and aisles, undoubtedly present difficulties to the task of adapting them to comprehensive congregational use, and it is only of late years that any attempt whatever has been made to utilise in any degree the naves of our cathedrals for public worship. The services, until quite recently, were invariably confined to the choir; and the nave, usually separated from the choir by a massive screen, merely formed a vast atrium, where people could stroll about at their leisure during the celebration of divine service in the choir, listening to the music, or admiring the architecture, but in no sense feeling that they were in God's house, or able to participate in the service that was going on. The choir, in order to accommodate the large congregations at the Sunday services were, in our own cathedral at least, crowded with seats to the very altar-steps, in utter defiance of any spirit of reverence, and disregard of the proper use of our choirs or chancels; the laity at the eastern end turning their backs deliberately on the altar, that they might the better see and hear what was going on. I crave the indulgence of my auditors, if I here remind them that the screens which invariably separated the naves from the choirs were not originally intended as a support for the organ, as an ignorant person would naturally suppose from the general practice of modern times. They were introduced in the thirteenth and fourteenth centuries (according to Dr. Hook, in his Church Dictionary), when the distinction

between clergy and laity was far more decided than in our Church, to mark as emphatically as possible the termination of the congregational part of the church, as opposed to that part devoted to the clergy, and to support the rood or crucifix as an object of adoration to the people. The fiery zeal of the Reformers swept that abomination of Popish idolatry, the rood, from its place; and in later times, perhaps in unconscious satire upon this same idolatry, the rood was replaced by the organ. There were musical enthusiasts in those times. When the Church began to shake off the lethargy in which she had been so long sunk, men began to inquire, amongst other things, whether the empty naves of our cathedrals might not be turned to some account after all; and so they were gradually thrown open for special services when it was wished to accommodate larger congregations than the choirs would hold, but still this was done without any general recognition of the great principle of retaining the proper and distinctive uses of the choir, or chancel, and nave. This principle is most clearly set forth in our Book of Common Prayer. In the rubric just before the order for Morning Prayer, it is enjoined that the "chancels shall remain as they have done in times past," and in the rubrics at the beginning of the Communion Office, we find it ordered that "the Table at the Communion time, having a fair linen cloth upon it, shall stand in the body of the church or in the chancel, where Morning and Evening Prayers are appointed to be said." The words "shall remain" in the former rubric, clearly refer, so it seems to me, to the practice of the early church, and not to those later times when the corruptions of the Church of Rome, by the introduction of subordinate altars to the saints in the different parts of the church, destroyed the purity of the earlier worship. The distinctive uses of nave and chancel, or choir, are very clearly described in the following literal translation of a passage in the decretals of Gregory IX., "That the laics shall not presume to stand or sit among the clerics near the altar, during the celebration of the sacred mysteries, but that that part which is divided by rails from the altar shall be open to the clerics who sing, but for the purposes of praying and communicating that the Holy of Holies shall be open to laics and women;" and, in an order made by the Council of Tours in 567, almost identical words are used. This principle is universally recognised in parish churches, where any attempt at correct ritualism is observed; and if so, should it not apply with still greater force in the case of our cathedrals, which are, or ought to be, patterns to their daughter churches? In the recent restorations of the cathedrals of Ely, Lichfield, Hereford, Worcester, Landaff; and if I mistake not, the Chichester and Durham also, the principle of comprehensive congregational worship, and consequent restoration of the naves and choirs to original uses, has been observed with the happiest results, both architecturally and morally; and Mr. Street, in his rebuilding of the nave of Bristol Cathedral will, of course, act in the spirit embodied in the paper already referred to as read by him at the Liverpool Church Congress. I take leave here to refer to a passage from this paper which, in the clearest manner explains his views of cathedral arrangement, and fully sustains the argument I have endeavoured to maintain. He speaks of three courses as open for adoption. 1st. The use of the nave without any altar or provision for a choir. For this he argues there can be no defence whatever, "unless the service is confined to a sermon and hymns, after the manner of University services." Too much stress, it seems to me, cannot be laid upon the importance of the presence of the altar in our public worship. It is as it were the holy of holies, the embodiment of that presence which gives force and efficacy to our prayers. 2nd. The provision in the eastern part of the nave of a second altar, and a second system of choir-seats. For this, he says, there is precedent in the facts that in several of our cathedrals more than one altar is still used; that in St. Alban's Abbey the people's altar is on the west side of the screen; and that in one of the earliest of our Christian churches, that of St. Apollinaire in Classe, at Ravenna, there is a choir altar in the apse, and the people's altar in the middle of the nave. I may also add that this is further confirmed by the rubric already quoted, which enjoins that the altar shall stand in the body of the church or in the chancel. The objection to this course lies in the reduplication of the choir-seats, and in the retention of the massive screen, which in our own cathedral, at

least in my opinion, goes far to deprive the interior of much of its dignity and proportion. With regard to the third course, I quote his words *verbatim*. "The third course is the removal of the close screen, and the adapting the choir for use by the clergy and choir only, whether the congregation be great or small. And here I would say, *in limine*, that though I should always regret having to remove any old screen, I am painfully conscious that by insisting on its retention, together with the present use of choirs, I should not be doing a really conservative work. For it cannot be denied that the choir suffer much more in effect by the introduction of additional seats, pews, and stalls for the congregation, than they could suffer by the removal of the choir screen, if this be accompanied by the removal of the additional seats. In place of the close screen, an open screen ought to be erected, which need be no bar to sight or sound, whilst it preserves the proper division between nave and choir. The choir will then, of course, be reserved only for choristers, and we should have to do our utmost to increase their number, to which end I think it might be possible to make use of guilds or fraternities, whose members might, at any rate on Sundays and festivals, take their place in the choir. There can be no question that the choristers would be better heard, and the music much more effective, if they were not hemmed in by a crowd of people; whilst the pulpit, placed outside the choir, would generally command the largest area which the plan of our cathedral admits, and would, like the choir, suit equally well a large congregation or a small one." I might quote much more to the same effect, but this will suffice to show the view that one of the most eminent, as well as conservative and thoughtful church architects of the day takes of this deeply important question. These general remarks on the principles I have endeavoured to advocate, as forming in many people's minds the basis of all cathedral and church restoration, bring me in the next place to consider their practical bearing in the case of our own cathedral. Do the plans which have been prepared by Mr. Scott for the re-arrangement of the interior, at the request of the Dean and Chapter, accord or not with these principles? With all due respect to that venerable body, and to the eminent architect they have called to their assistance, I venture to contend that in the plans that are now prepared, but I trust not yet finally approved, these principles have not been kept in view. Let me briefly describe the general arrangement proposed. The close rood-screen remains its present position, unaltered, I believe, in any respect, save by the addition of some canopy work at the top. The seats and stall-work of the choir are all new and of elaborate design, except that the ancient and very interesting miserere stalls are, of course, retained, and the arrangement of the seats and stalls as far eastwards as the bishop's throne is nearly the same as at present. Eastwards of the side gates the space nearly as far as the altar is filled with chairs, arranged facing north and south, a broad passage being left in the middle. The altar is backed with a reredos of sumptuous and elaborate design, and a rich pavement of marble and tiles is proposed to be laid. In order to accommodate a larger number of persons than can be seated in the present choir, it is proposed to seat the aisles with chairs, to remove the monuments between the choir and aisles, and to pierce the stone screen at the back of the stalls, for the purpose of enabling those who occupy these chairs to hear and see with greater facility than would be practicable at present. The position of the pulpit is shifted from the western to the eastern side of the entrance to the choir from the north aisle, but the position of the bishop's throne remains unaltered. With regard to the remainder of the building westwards of the screen, I believe no alteration whatever is contemplated. It will thus be seen that the proposed alterations consist merely in the renovation of the choir itself, and in the seating of the choir aisles; the present division of the cathedral into two virtually distinct churches by the massive screen being still adhered to. This, I think, is greatly to be regretted, not merely on architectural grounds (although few people will deny that the beauty of the interior would be greatly enhanced by the removal of the screen), but also on account of the negation of that principle of unity, the importance of which I have endeavoured to demonstrate; and lastly, on the ground of practical convenience, on which I shall have a few words to say presently. As regards the seating of the

choir aisles, I cannot help thinking that a serious objection to it lies in the fact of the difference of level between the choir and the aisles. The level of the floor of the choir stalls cannot be less than 3 ft., or possibly 3 ft. 6 in., above that of the aisles, and to this must be added at least 3 ft. more of solid work in the stone screen at the back of the stalls before the pierced work begins, so that the occupants of the aisles would have a solid barrier of 6 ft., if not 7 ft., shutting them off from sight and sound. Besides, it seems to me, that this piercing of the screens behind the stalls would be anything but conducive to the comfort of their occupants, who would be exposed to all the draught from the aisles. Permit me now to describe a plan suggesting an alternative arrangement which was sketched out by my father, at the request of the late bishop as long ago as 1859, and by him submitted to the Chapter, with his full approval. I think I am also correct in saying that the present Bishop of Ely, then Canon Browne, expressed himself strongly in favour of its being carried out. I have little doubt but that this plan, although it appeared to be shelved, eventually led to the fitting up of the nave for the Sunday afternoon services through the liberality of Chancellor Harrington, just twelve months afterwards. This latter arrangement, if I mistake not, was generally understood to be only a temporary and tentative one, and that on its success or otherwise depended whether a more comprehensive scheme should be carried out or not. The success has been undoubted, but unfortunately up to the present time no further steps have been taken in the matter. The great distinction between this plan and that of Mr. Scott, lies in the removal of the rood screen, and the organ placed on it, from their present position, and substituting a light open screen of such construction as to be little or no obstacle to sight or sound, and which shall, at the same time, distinctly mark the boundary between nave and choir. The present screen, minus the organ, is proposed to be re-erected between the westernmost of the columns in the nave, removing all the modern panel-work of the lower portion and the mass of masonry behind it, and substituting for it a glazed screen of tracery-work. In a line with this, across the aisles, corresponding screens would be thrown, the whole forming at the western end of the church a species of narthex, or inner porch, like those frequently met with in foreign cathedrals, and which would undoubtedly contribute materially to the comfort of the congregation. Eastward of this screen, the whole space of the nave, transepts, and aisles would be available for the congregation, the pulpit being placed against the pier forming the eastern angle of the north transept, so as to command, as far as it is possible, nave, choir, and transepts. The choir would be restored to its strictly legitimate use, that of containing the clergy, choristers, and communicants only, the present return stalls, facing east, being done away with, the stalls for the dean and precentor placed nearest to the screen, facing north and south, and the choir-seats also brought near the screen, so as to allow of the musical portion of the service being heard to the best advantage by the congregation. What to do with the organ is the next consideration. It is proposed to place it in the north aisle, immediately behind the choir-seats, a clear passage of about 6 ft. wide being left in the aisle, and the upper portion of the organ carried over this passage, supported by groining. The pipes would fill up the whole of one of the choir aisles, and might also be made to stand boldly out into the choir itself, so as to allow of the sound being as freely transmitted as possible into the body of the church. The lectern would be placed on the western side of the screen, so as to command nave and transepts. All the eastern part of the choir, above the bishop's throne, would be perfectly open and unencumbered with seats.

Oxford Architectural and Historical Society.—The honorary secretaries (the Rev. P. C. Medd, M.A., University College, and the Rev. E. G. Maxwell Lyte, Christ Church) have issued the following notice:—"It is proposed to commence a series of walks and excursions with the view of exploring the neighbourhood of Oxford, and visiting the chief objects of antiquarian interest. It is intended to visit all those remains which illustrate the history of the country during the British, Roman, Saxon, or Mediaeval times."

LAMBETH WORKHOUSE COMPETITION.

DESIGNS were received from fifteen of the invited architects whose names we printed a fortnight ago, and are now under consideration. Mr. H. Currey has accepted the invitation of the guardians to assist them in making the selection, and will shortly proceed to examine the drawings. With one exception, a set marked T, the designs bear the names of the respective authors. There is very little architectural art displayed in the designs, nor is it particularly needed; still there is no reason why, without any extra expenditure, good proportions and agreeable forms should not be adopted. Compliance with the instructions, the best means of classification, good arrangements to facilitate administration, healthful rooms, sound inexpensive construction, are points which must first be looked for; but the design which, besides exhibiting these, provides a structure suggesting care, order, harmoniousness, and regularity, should have the preference. The estimates given in the case of the few designs to which particulars are attached vary. Thus while Messrs. M'Murdie and Wagstaffe name 47,600*l.*, Mr. Francis H. Fowler, whose design has considerable merit, puts down 35,700*l.* as the cost. The design by Messrs. Foulsham and Giles & Biven—plan somewhat widely spread out—is estimated at 47,000*l.* Mr. F. Marable, who, like some of the other competitors, sends two designs, has evidently given good consideration to the subject. Messrs. A. & C. Harston's plans have considerable merit, and the same, in a greater or less degree, may be said of those by Messrs. Beeston, Son, & Beeston, Messrs. C. Gray, Searle & Son, and Mr. P. Farris. Careful weighing of relative merits will be needed in making the selection.

THE ARCHITECT AT THE HOUSES OF PARLIAMENT.

THE following correspondence involves questions of serious interest to the profession:—

Sir,—I have just seen with surprise the following paragraph in a London daily paper:—

"Mr. Ayrton, Chief Commissioner of Public Works, has come to an open rupture with Mr. Barry, the architect of the Houses of Parliament, and the report is widely circulated and believed that Mr. Barry, indignant at the treatment to which Mr. Layard's successor subjected him, no longer holds his appointment. The whole affair will be brought before the House of Commons."—*London Correspondent of the Irish Times.*

My official relations with Mr. Ayrton, as First Commissioner of Works, have always been of a satisfactory and friendly description, and, as far as they are concerned, there is no foundation for the above statement. As, however, I should be very glad of the support of the profession in the trying circumstances in which I am placed, I send you a copy of the letter I have received from Mr. Ayrton, to which, I presume, allusion is made:—

"Office of Works, &c., S.W.
January 22nd, 1870.

"Sir,—I am directed by the First Commissioner of Her Majesty's Works, &c., to inform you, that in consequence of various arrangements now being made for the conduct of works under this office, the new Palace of Westminster will, from the 31st day of March next, be placed entirely in the charge of the officers of that department; and that the estimates for that service for the ensuing year will therefore be prepared on their responsibility.

I am further to inform you that the First Commissioner will be obliged to you to have all the contract plans and drawings of the Houses of Parliament, and all other papers necessary for affording a complete knowledge of the building, and of the works carried on in connexion therewith, arranged together and deposited in the office of the clerk of the works, in order that they may, when required, be at once handed over to this department.—I am, &c.

GEORGE RUSSELL, Secretary.

E. M. Barry, esq."

Notwithstanding my experience, in the Law Courts' competition, of the unjust treatment which can with impunity be inflicted upon an architect, I could not but be surprised to receive this letter, coming as it did without previous explanation, without any intimation of dissatisfaction, and at a time when several works under my direction at the building are still unfinished. I have addressed a letter to the First Lord of the Treasury, and to Mr. Ayrton, pointing out, on public and private grounds, the objections to entrusting one of our chief architectural monu-

ments to the sole care of the officials of a department which is constituted, avowedly, without regard to artistic qualifications.

Feb. 14. EDWARD M. BARRY.

The step taken by Mr. Ayrton, although at present not widely known, has excited very considerable dissatisfaction, and has brought us indignant letters from some, who see in it more than is expressed. The motive of the act is certainly not obvious. Mr. Barry holds no salaried office which the Chief Commissioner might think could be dispensed with. He is simply paid his commission as an architect on such works as he is directed to superintend. We believe it is a fact that his estimates have never been exceeded in execution, and that what he has done has met with general approval. With reference to such a building as the Houses of Parliament works are constantly required, proposals for alterations and improvements are constantly arising. At the present moment his designs and estimates for various suggested matters are before the Chief Commissioner. Does Mr. Ayrton think that when future suggestions are made or other works required, the House of Commons will be willing to act on the report of a clerk in the Office of Works, or if the House were willing to do so, that the public would be satisfied? If Mr. Ayrton do think so, we venture to assert he is wrong. An architect of reputation must be called in; and who could be that architect but the man who knows every inch of the work, who was born and bred in it, so to speak, and who, so far as we know, has fully satisfied both the Government and the public? We hope to find that Mr. Ayrton has acted under some misconception.

THE THAMES SUBWAY.

This curious work may now be said to be practically completed. The passage under the Thames has been finished for some time past, as also the chambers at each end. During the present week the attention of Mr. Barlow, the engineer, and his assistants has been mainly directed to the application of engine-power to the working of the lift, by which the passengers are to be let down and taken up by the shafts at the ends of the subway.

From a visit to the works we have obtained a few particulars which may be interesting to our readers. The shafts by which the subway is reached are at each end rather under 60 ft. deep and 10 ft. diameter; they are partly lined with brickwork and partly with iron. At the bottom of each shaft, under the level of the subway, a small steam-engine, of about 4 horse-power, is placed for use in raising and lowering the lifts, and for haulage of the single omnibus by which the passengers will be conveyed. The lift is an iron chamber, with a floor of about 6 ft. by 5 ft., and a ceiling about 6 ft. 6 in. high. The entrance to the lift is by sliding iron doors; on its opposite sides it has pairs of roller wheels which work in guide-roads fastened to the sides of the shaft. The lift is raised and lowered by a chain of great strength, which moves over a pulley at the top of the shaft, and is attached to a balance-weight, which also works between guide-roads. The balance-weight is a slab of cast iron, with an opening in the centre by which it may be loaded according to the number of passengers in the lift. The lift, which weighs about 15 cwt., is further connected with the balance-weight by a wire rope attached to the bottoms of the weight and the lift respectively, and which passes round a pulley at the bottom of the shaft. A brake has been invented by Mr. Barlow, which is attached to the roof of the lift, and is applied by a screw worked from the roof on the inside. The desired effect of the application of the brake is to stop the lift in its descent, not instantaneously but gradually, and within a few feet. On arrival at the bottom of the shaft, the passengers emerge at each end to a waiting-room of about 24 ft. long by 10 ft. wide, with seats along the sides. From this they will pass into the iron omnibus, now completed and ready for its work, which will be run up close to the inner ends of the waiting-rooms. The first part of the journey from each end of the subway is down an incline of about 1 in 30 to the middle of the subway. The haulage up the last part of the ascent at each end will be by an endless wire rope, worked by the steam-engine on the Surrey side. The lift will be seated for seven or eight passengers; the omnibus is seated for fourteen persons. The first-class passengers will descend the shafts last,

and the omnibus will be despatched immediately on their arrival at the bottom of the shaft. The omnibus is 5 ft. wide inside, and has cushioned seats with stuffed backs; there is a space of 2 ft. 2 in. between the seats, which are placed lengthways along the sides of the vehicle. It is intended, we believe, to fit up a cross partition in the omnibus to divide the first- from the second-class passengers. A brake, which the conductor will work with his foot, is fitted at each end of the omnibus. The gauge of the rails is 2 ft. 6 in.

The subway and engine-rooms are wonderfully free from water, a hand-pump worked at occasional intervals being sufficient to clear away the accumulations.

It may be expected that this important work, executed at a comparatively small cost, and in a marvellously small space of time, will be opened to the public in a few days.

PROPOSED RESTORATION OF THE WEST FRONT OF WELLS CATHEDRAL.

The committee have determined to proceed with the restoration of the west front of Wells Cathedral, under the direction of Mr. Ferrey, with as little delay as possible. Mr. Scott's report, which strengthened their determination, may be usefully printed:—

"Having in compliance with your request made a careful examination of the state of the west front of your cathedral,—in the first instance alone, and subsequently in conjunction with your excellent architect, Mr. Ferrey,—I beg to offer a general statement of the opinions at which I arrived:—

Though the Douling stone, of which this front (as well as the cathedral generally) is constructed, is an excellent material, it happens, nevertheless, that the extreme rigidity of the design, and the high relief and partially detached form of its features, has, by exposing them in an unusual degree to the direct action of rain on the upper surfaces of their projecting parts, given rise to a very considerable amount of decay.

This decay varies in all possible degrees from a trifling loss of surface to the almost entire destruction of the stone; and the mode of its repairment must consequently vary according to the circumstances of each particular part.

Where, for instance, the decay has not injured the stability of the work, nor in any very serious degree obscured its architectural design, I would leave the work as it is, only endeavouring by some application to protect the surface against the admission of wet which would cause an increase of the decay.

Where—to go to the other extreme cases—the decay has proceeded so far as to endanger the stability of the parts affected, or of others dependent on them (as in many places the case), or where the architectural design has been lost or seriously obscured by its effects, I would recommend just such an amount of renovation as the particular case absolutely demands, but no more.

In intermediate cases the judgment of the architect and his representative must be exercised in determining the degree of reparation demanded, always leaning towards the minimum, which will give the security required, and always striving to preserve every fragment of stone which retains original workmanship, even though its retention may necessitate increased labour and difficulty. It requires no ability in an architect to condemn and to renew; his skill in works of restoration should be almost wholly directed to preservation, for which constant thought and contrivance are required.

I do not know how to suggest any rule for a work in which all the parts differ from one another in condition, excepting that the restoration should in each case be limited to the demands of stability and the permanence of the work and of its artistic design.

I have suggested that the distinction may often be advantageously drawn between parts of which the forms are purely mechanical, such as mouldings, &c., and those which involve higher art, as foliated carving and figure sculpture. The restorer, though he must always be scrupulous, may set more freely in dealing with the former than the latter, inasmuch as, not only can the more mechanical features be generally restored with certainty, while the restoration of more artistic portions must be by guess; but the latter are so precious, that the most correct restoration is almost valueless as compared with even a wreck of the original.

There is one class of work which differs in kind from any which I have mentioned. I refer to those parts which have been renewed some thirty or forty years back. Where these have been executed with a reasonable degree of correctness, they need not be disturbed; but in many instances they are such mere caricatures of the original details that it would be labelling the old architects and falsifying their work to allow them to remain.

The detached shafts and clusters of shafts, as well as the abaci of the capitals, have throughout been executed in a bad blue lias, which did duty as marble. Many of the shafts still remain, but the majority are either wanting, or their places supplied by ordinary freestone.

The variety of colour produced by these quasi marble shafts, &c., was as much a part of the intention of the original designer as the architecture itself; and no restoration can be considered worthy of that name which fails to express this intention. It is clear, therefore, that either the same material, or other of similar colour, must be introduced. The slaty lias which covers the walls on their horizontal projections have universally failed; I would, therefore, seek a more durable material for their restoration. It may be the case that for the shafts a variety of lias may be found which is trustworthy. That procured at Keinton, or some particular bed in the quarries there, is of a hard texture as to be used as a marble; and I think it not unlikely that this may be a suitable material. If not, the next county (Devon) contains abundance of marble which, both in colour and durability, is thoroughly suited to the object in question.

All ties, cramps, dowels, and other metal-work made use of must be of copper; and every open joint must be

stopped with the strongest cement. In selecting the stone great care will be required, as some of that now procured at Douling is of inferior quality.

As regards cost, it is far from easy to give a decided opinion, but from a comparison with the west front at Salisbury recently restored, I should suppose that it will come to from £6000 to £8,000.

The work should be superintended by a very experienced clerk of the works, and I fear that it would be hardly practicable to carry it out by a specific contract, though a schedule of prices for work of different kinds might advantageously be made the basis of a contract.

I think it will be best to work gradually downwards, stage by stage, from the top, clearing away the scaffolding as the work proceeds.

The ground along the west front and round the north-western angles has been raised above its natural level. This conceals a part of the basements and dwarfs the effect. It will be necessary to remedy this by lowering the levels of the ground.

I will only add that it gives me much pleasure to find that the view I had formed coincides with that entertained by your able architect, Mr. Ferrey, and expressed by him in his report.

Geo. GILBERT SCOTT.

CAMEOS.

The attention of the council of the Art Union of London having been called to some of the works in cameo by Mr. Bonca, recently mentioned in the *Builder*, and feeling the importance of encouraging this branch of art in England, they have commissioned him to produce Mr. Foley's Caractacus as a cameo in hard stone, onyx. This will form part of the prize list either this year or next, together with some cameos in shell. A few years ago the Art Union offered three premiums, for the 1st, 2nd, and 3rd best cameos, of a certain size and character, on which occasion Miss Pistrucchi produced a fine work, and obtained the first premium.

ART WORKMANSHIP: SOCIETY OF ARTS.

The premiums offered to art workmen by the Society of Arts were for subjects under three heads, viz.,—1. For works executed after prescribed designs; 2. Specimens of the application to ordinary industry of prescribed art processes; and 3. Works of a similar character to the prescribed subjects, though not exactly correspondent. Thirty-eight works were sent in under the first heading, twenty-two under the second, and eighty-two the third, being 142 in all. Although many of the works are very creditable, and deserve, and will doubtless obtain, recognition, we cannot consider that full advantage has been taken of the opportunity given. The premiums offered are liberal, the works remain the property of the producer, and the Government Department of Science and Art have always shown themselves ready to purchase the best of the works sent in. However, we do not wish to be understood as underrating what has been sent in, but rather to urge other workmen to enter the lists should premiums again be offered by the Society.

The prize of 15l., in Class 1 of the first division, for a carved frieze, including the human figure (whereof so few of our art workmen know anything) has evoked no competition. For the premium offered for a panel in carved oak, four competitors appear. We give the preference to the panel No. 4, by J. Osmond. The panel by Mark Rogers, jun. (2), is also meritorious. The panel signed W. T. K. (3) is good furniture-work, not likely to be damaged, but has less life and "go" than the preceding. No. 5, unfinished carving in wood, after an entablature of a chimney-piece in South Kensington Museum, is meritorious. For the premium offered for metal panel in low relief, after *Virgin and Child*, we should place No. 7, by A. Dufour, first; and No. 8, by A. Ostertag, second. No. 7, *tazza, repoussé* work in silver, is creditable. Of the three iron knockers, No. 11, by A. S., must be deemed superior; though the other examples, by John Wilkins and Thomas Bayley, have merits of their own. No. 15, metal missal cover, by H. J. Hatfield, is excellent, as good, indeed, as may be hoped for, and cannot fail to obtain the full premium offered. Some niello work, by Jas. S. Gill (16 and 17), after an arabesque by Lucas Van Leyden, and an engraving on copper after the same example, by John Gittins, are satisfactory. The paintings on porcelain are not particularly noteworthy. W. H. Slater and Miss E. Henwood send some of the best. Under the head of embroidery, the portion of an Italian altar frontal (17), executed by the Misses Pfänder, is admirable of its kind.

Passing to the Second Division, No. 42, frame for a miniature, engraved and enamelled on metal, by Alfred Gray, though somewhat tame, is very good. For the premium offered for the most beautiful tablet in moulded or modelled

earthenware, painted with enamel colours and fired, the response is not satisfactory. One competitor, J. B. Evans (44), merits a modified reward. The wrought-iron balcony (60), by William Robson and Henry Robson, deserves great praise, and little less should be said for the balcony (59) designed by G. Emms, and executed by J. Emms & Sons. We will take another opportunity to speak of the works exhibited in the Third Division.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the meeting of this society on the 9th ult., a resolution was passed with reference to a circular from the hon. secretaries of the Architectural Exhibition Society, stating that the exhibition must be discontinued after the present year unless better supported, to the effect that the Liverpool Architectural Society "would see with great regret the discontinuance of the Architectural Exhibition in London, and that it is hoped that members of this society will exert themselves to furnish an adequate contribution of works for exhibition this year."

Mr. G. A. Audsley read some observations upon the brickwork at the new buildings in connexion with the South Kensington Museum, illustrating practically the method there adopted of cutting and setting the bricks, as it had been explained and exhibited to him at the works. He was of opinion that the method there adopted of treating the bricks by a process more allied to that usually adopted with stone, and sawing and rubbing them to a precisely true face, &c., was calculated to insure a much more finished and artistic result in brickwork than could be obtained by casting the mouldings and ornaments, where ornamental brickwork was to be introduced. A long discussion on brickwork followed; most of the members expressing themselves very much opposed to any treatment of a brick which involved removing the "fire-skin" from it, as tending to reduce very greatly its weather-proof qualities; though the general opinion was that the treatment of brickwork illustrated by Mr. Audsley might be most suitable and effective for interiors, as in churches, entrance-halls, and such like, suggestions which Mr. Audsley further supplemented by expressing his conviction that it would do equally well for the interior of a dining-room, in place of plastering and paper.

METROPOLITAN IMPROVEMENTS.

The excellent map published annually by Mr. Stanford, of Charing-cross, showing the metropolitan railways, tramways, and miscellaneous improvements, for which plans and sections have been deposited in the private bill office, on the 30th of November preceding the opening of Parliament, is useful for many purposes. It is unfortunate that from the nature of the case such an admirable publication should be in some respects so ephemeral, and that even before Parliament meets so many of the coloured lines should require the application of the sponge, because of the schemes they indicate being already dead. So it is in this instance with several proposed metropolitan railways; the Fulham, Hammersmith, and City; the Islington Railway,—narrow gauge on viaduct from the neighbourhood of Finsbury to Islington, which has appeared in former editions of the map; and the East and West Metropolitan Junction and Mansion House; and the North-Western and Charing Cross, from Camden Town to Charing Cross. In the case of the East London Tramways Bill also, there was no appearance before the examiner on standing orders. There are, however, six other Metropolitan Tramway Bills left on foot, the promoters of which propose to lay an aggregate of about 145 miles of road, at a cost of about one million and a half sterling; the promoters of the London Street Tramway Company alone proposing to lay above forty-three miles, and other two companies twenty-seven and twenty-eight miles each. A proposed new market near the Charterhouse has also been dropped.

The most important Bill, as involving works, in the metropolitan district, is that of the Great Eastern Company (Metropolitan Railways, &c.), which is to a great extent a revival, with slight deviations and some additions, of the Bill passed several sessions past, which provides for the extension of the Great Eastern to Finsbury, and the erection of a new station at that new terminus. The new Bill also provides for company yards and works at Leyton and Stamford-

hill. The South-Eastern Company have a Bill for a direct line between Greenwich and Woolwich. A line has been already authorised, but from its heavy cost the company shrink from making it, convinced as they are that they could only do so at a permanent loss. The new line is for a deviation which would be more direct and much less costly. By the new project the line would be carried across the foot of Greenwich Park, much nearer the Observatory than the authorised line, and the Board of Trade will, it is believed, oppose the Bill,—an opposition likely to prove fatal. Mr. Brady, the engineer of the company, proposes by a system of cross trenches to make vibration that could reach the Observatory impossible, but his scheme will prove abortive if it fails to convince the astronomical authorities in charge of that important establishment. The Metropolitan District Company has an important Bill for carrying a spur of their system from a point between Southwark and Blackfriars bridges, along under Queen Victoria street to the Mansion House. The Metropolitan and St. John's Wood Company has a Bill for a short extension of their line westwards to the Edgware-road at Kilburn.

Among the miscellaneous Bills there is one for a subway from Arthur-street, Cannon-street, to pass under the Thames to a point at the south end of London Bridge, whence it will pass under High-street, Borough, to the south side of St. George's Church. Mr. Peter Barlow is its engineer, and it may be supposed that the work will be executed after the pattern of the Tower Subway just completed so successfully. In connexion with the Thames Navigation, certain works, not very important, are proposed at Fulham and Battersea bridges.

OPENING OF THE NEW BATHS IN BATH.

The Grand Pump-room Hotel and Baths, which a company, co-operating with the Corporation, have erected in Bath, are now completed. The hotel was opened last summer, but now the baths also have been opened to the public.

The building was designed to afford to the middle and upper classes the same facilities for the use of the Bath waters as are enjoyed by poor people at the Mineral Water Hospital. The baths occupy the lower part of the south wing of the block, the remainder of the building being appropriated to the purposes of the hotel. The style of the structure harmonises with the facade of the Grand Pump-room and the baths adjoining.

The baths, as described in the local *Chronicle*, are approached on the south wing of the Grand Pump-room Hotel, extending parallel with Bath-street, and are reached through the arched way under the wing, on each side. That on the left forms an entrance to several subways, one of which effects a communication with the king's and queen's bath and the Grand Pump-room. Another subway passes under the central passage between the baths, and terminates in the apartments attached to the ladies' swimming-baths. The various pipes connected with the baths are carried through the subways, which render them accessible in case of the necessity of repairs. The vestibule leads to an ante-room from which a corridor, 180 ft. long, 8 ft. wide, and 14 ft. high, runs, having the baths on either side, and connected at the entrance with the hotel adjoining by a short flight of stairs. At this spot a large hydraulic lift has been erected by Messrs. Stothert & Pitt, ascending the whole height of the hotel, so as to enable patients to be lowered from any story in the building to the baths below. The vestibule, ante-room, and corridor, are heated by a steam apparatus, and are paved with encaustic tiles laid out to pattern, the corridor having a glass roof with ornamentally painted iron framework. The shape of the principal baths is octagonal, and somewhat elongated. They are lined with buff glazed tiles, while the top edge is paved with white marble; seats of that material being provided in each bath. Stone staircases form the descents to the baths, having on either side copper rails fixed on brass standards with gun-metal tops. The valves for supplying or carrying off water are of the simplest construction, and are placed within immediate reach. The walls of the bath-rooms are inlaid for some distance from the floor with white glazed diamond tiles having intersecting buff bands, and small mauve squares at the points of intersection. The floors are laid with hexagonal tiles of a chocolate tint, the spaces between each

tile being filled in with black. The doors to the bath-rooms are locked from the outside by the attendant, thus preventing ingress, while the bather inside can open the door by simply turning the handle. One of the rooms has an entrance to the hydraulic lift, and is provided with a crane and other apparatus, by means of which the invalid bather can be easily lowered into the water. Besides the first-class baths, there are reclining, douche, shower, vapour, and injection baths, and these, like those of the first-class, are provided with well-furnished dressing-rooms and every similar convenience. The requisite ironmongery for these rooms has been supplied by Messrs. Tuck & Son.

The ladies' swimming-bath is of ample size and height, and is covered with a light iron and glass roof. The dimensions of the bath are 61 ft. long, by 27 ft. wide, and 33 ft. high. It is approached by a broad and gentle descent of stone steps, and the floor gradually slopes, so that, whilst at the end nearest the dressing-rooms the depth of water is 3 ft. 6 in., it increases to 4 ft. 6 in. at the other extremity. The bath contains 33,150 gallons of water, supplied by a syphon from the King's Bath spring, at a heat of 113° Fahrenheit. A piece of sculpture, by the late Mr. Joshua Wall, of Stroud, called the "Wood Nymph" (a water nymph it surely should have been), has been placed here, being presented by the architects and builders. A general waiting-room is attached to the ladies' swimming-bath, access to it being attained by a flight of stone stairs at the further end of the corridor, and a short passage at the bottom of the stairs, where are hot-air closets on the one side, and private dressing-rooms leading into the bath on the other. The premises will be lighted by gas, for which fittings of an ornamental character have been designed, manufactured, and fixed by Messrs. Tuck & Son. The buildings have been erected under the superintendence of Messrs. Wilson & Wilcox, by Mr. Bladwell, of Bath, for the mason's work; Mr. A. Ridout for the carpenter and joiner's work; Mr. Trewolla for the plumber's work; and Mr. R. Packer for the painter's work. Mr. R. Herridge was clerk of the works. The establishment has been luxuriously furnished.

THE LAW COURTS AND NATIONAL GALLERY.

SIR.—The reply of the Government official was vague and unsatisfactory. Are the Government prepared to accept the responsibility of the delay,—a delay of their own creating?

In the Queen's Speech, while matters of minor importance are paraded, no allusion is made to the deep prevailing distress of the building operatives and others. As a ratepayer, and a heavily taxed one, I object to maintain these operatives by an increased rate charge, while "deliberate parliamentary sanction" has been given to certain public works—the Law Courts and National Gallery. It is a mistake to stop these works for a mere caprice, and drive these men to the workhouse or to the "Emigration Mistake Committee." There is work in this country to take up all surplus labour for the next fifty years.

A RATEPAYER.

THE THAMES EMBANKMENT WORKS.

The Metropolitan District Railway works are being now pushed forward, and it is likely that, before the end of the spring, we shall have not only an agreeable promenade and a convenient carriage-way from the City to Westminster, where formerly we had foul and pestilential mud-banks, but that we shall have also the advantage of the railway.

The contractors have now 2,000 men, three locomotives, 250 horses, 280 trucks, and 20 steam-cranes at work. The soil, as it is loosened, is carried off by trains of wagons to the nearest crane station, where it is hoisted to the surface, transhipped to carts, and then conveyed to some convenient landing-stage, and tilted into a barge alongside the Embankment wall, in which it is carried off to the Millwall Docks, where there is a demand for it as ballast. These barges, of which there are 130 engaged in the work, carry back the bricks, the lime, and the sand which are employed in the construction of the retaining walls. These walls, 7½ ft. in thickness, rest upon a foundation of concrete from 2 ft. to 3 ft. in depth, and are carried to a depth of 21 ft. below the level of the rails, above which they rise to a height of 15 ft. 4 in. The width of the

way between them is 25 ft. The roof of the railway is for the most part girder work, the girders being lined with brickwork, but in some parts the vaulted roof has been adopted. The stations will be at Hungerford, Norfolk-street, and Blackfriars Bridge. As soon as the railway is covered in, the contractors employed by the Board of Works will take charge of the surface, and commence to lay down the new carriage and omnibus roadway.

STRENGTH OF BRICKS.

At a recent meeting of the Glasgow Architectural Society, Mr. John Macdonald, builder, read a paper on the nature and properties of bricks. In the course of it, he said,—Our clay is so pure that it requires to be adulterated. It is particularly so in the case of machine-made bricks. The operation through which the clay passes in the mill, and the pressure it sustains in being forced into the mould produce such an amalgamation, that were the bricks made thus of pure clay instead of good well-burned bricks coming out of the kiln, each brick would be likely to be sent into a thousand pieces. House machine-made bricks are all to a greater or less extent, in proportion to the panness of the clay, composed of ashes or other substances to keep the clay porous. In the process of burning, steam is produced, and if there be not a safety-valve through which the steam escapes, an explosion is inevitable—an explosion which completely destroys the brick. Ashes mixed with clay form numerous channels or outlets for the steam, and hence the bricks are preserved. That ashes or other extraneous substances deteriorate the clay, I think must be admitted, but that they do so to such an extent as to impair the usefulness of the brick, may well be doubted. Could bricks be made of pure unadulterated clay, they certainly would sustain a greater pressure; but, on the other hand, it can be shown that bricks made of clay, mixed with ashes, are capable of sustaining a much greater pressure than it is possible to put on them in ordinary erections.

Through the kindness of Messrs. H. More & Son, engineers, of this city, I have had some experiments made as to the pressure bricks are fitted to sustain. No. 1, a machine-made brick (the bricks were produced), made of clay mixed with ashes, stood a pressure of 15 tons, but at that stage wood (yellow pine planks), used to make up the press, gave way, by the brick being pressed through the wood, and in consequence the brick was removed, without sustaining any injury. No. 2, of the same quality and make as the foregoing, sustained a pressure of 50 tons, or 22 cwt. to the square inch; and the planks again gave way in this instance also, and the brick was removed from the press unimpaired. No. 3, a brick the same as No. 2, but with more ashes in it, gave way at a pressure of 50 tons. No. 4, of the same make as the foregoing, but so soft as would not stand exposure to weather, gave indications of yielding at a weight of 25 tons, and crushed at 37 tons 10 cwt. No. 5, made from clay taken from a mine, the clay to a slight extent impregnated with iron ore, sustained a pressure of 70 tons, and crushed at 82 tons. No. 6, a common fire-brick, gave way at a pressure of 42 tons. No. 7 is a brick made of common clay, without mixture or adulteration, but to secure burning is perforated with twenty-four holes, from bed to surface, each of $\frac{3}{4}$ -in. in diameter. This brick splintered at a pressure of 55 tons, and gave way crushed at 75 tons. No. 8 is a fire-brick largely used in Glasgow and elsewhere for facing or ornamenting buildings. It stood the least pressure of any tried; it splintered at 22 tons 10 cwt., and crushed at 30 tons. This, I think, is to be accounted for by the fact that it had a recess in both beds each $\frac{3}{4}$ -in. deep, and $6\frac{1}{2}$ in. by $2\frac{1}{2}$ in. Of course it was not possible to fill this recess with lime to that extent as to give the recessed part of the brick the same amount of pressure as was on the margin or outer edge of the brick; hence the outer edge gave way, was broken to pieces, when the centre, or recessed part, was none the worse,—quite entire. It is thus evident that a recess of this kind must, and does, impair the bearing power of the brick.

These tests, though very satisfactory in demonstrating the pressure good bricks will sustain in an isolated position, fall far short in showing how much weight they will sustain in a wall when well bedded and compactly built together with good lime. Mr. More, who is an authority in

such matters, gives it as his opinion, that "they would sustain 100 per cent. more pressure when thus built than when isolated in the press." My own opinion is that Mr. More is rather under than over the mark; but, even suppose his estimate too high, we can well afford to make large allowance, and still have strength enough left to sustain a much greater weight than it is possible to bring to bear on any wall. Suppose some of the gentlemen present were about to erect a mill, or other building, of five or six stories high, the wall of lower stories (say) three bricks—28 in. thick; and suppose Mr. More's opinion to be correct, every 6 ft. 2 in. of this wall would carry a weight of 60,000 tons. But suppose we take off 50 per cent. from Mr. More's statement, this would still leave strength enough to carry a weight of 30,000 tons,—a weight which could not by any possibility be brought to rest on a wall of these dimensions, 6 ft. 2 in. by 28 in. It will thus be seen that as far as strength and endurance are concerned, architects need not hesitate to employ bricks in any buildings they may have to erect.

A word or two as to the best manner of applying them. Good lime is an essential condition to good brickwork. Three parts of sand to one part of lime shells is the usual prescription. I fear the proportion of sand is rather high; I would reduce it to two and a half. The next point is close bedding. Good lime is only good when used in proper proportion. Light beds and close joints are essential to good brickwork; when these are neglected or disregarded the work cannot be good.

PARLIAMENTARY.

The New Courts of Justice.—Mr. Ayrton, in answer to Mr. Headlam, said that the architect of the new Courts of Justice was engaged, under his direction, in preparing plans for the construction of these courts within the limits of the Act of 1855, and the funds prescribed in it; but he could not inform the hon. gentleman whether those plans would include a communication between the northern and southern sides of the Strand. It was no part of the scheme at present, and there were no funds for it.

The Thames Embankment.—In reply to a question from Captain Grosvenor, the Chancellor of the Exchequer said that eleven acres of land belonging to the Crown below high-water mark were taken for the purposes of the Thames Embankment. Of these $5\frac{1}{2}$ were gone, for which the Crown had no consideration; the other $5\frac{1}{2}$ the Crown had retained, and he concurred with the Commissioner of Woods and Forests that $2\frac{1}{2}$ of the latter should be applied for building purposes, and not laid out in gardens for public recreation.

The Embankment Viaduct.—In reply to Lord Elcho, Mr. Ayrton said that, when the question of making a viaduct from Hungerford Bridge to Wellington-street was before the House, he strongly objected to it, believing the street would never be made. When he acceded to office he wrote a letter to the Metropolitan Board of Works, calling their attention to the recommendations of the committee, and stating that if in their judgment it was for the convenience of the inhabitants of the metropolis, and the interests of the ratepayers, that the construction of that street should be abandoned, he would take upon himself the responsibility of that. He believed they had introduced a Bill for the purpose of abandoning that work. He had also addressed a letter to the Metropolitan Board, calling their attention to the recommendation of the committee, and requesting that in their report they would take notice of any measure affecting any public building in the metropolis, so that he might see whether the building was one under his charge.

Sites of Places of Worship.—Mr. O. Morgan got leave to introduce a Bill to facilitate the purchase and taking of sites for places of worship and schools. The measure is an attempt to extend to the case of persons desirous of purchasing land for sites of places of worship and poor schools the powers which, under the Lands Clauses Consolidation Act, are vested in companies for commercial purposes.

The Serpentine.—In reply to Mr. Dyce Nicol, Mr. Ayrton said that the works at the Serpentine were, under the contract, to be completed by the 15th of April next, provided they were not interrupted by the severity of the weather, or any other unavoidable cause of delay, of which the Government engineer was to be the judge.

REREDOS IN ST. NEOT'S, NEAR LISKEARD

A REREDOS has just been placed in this church, composed principally of hand-painted encaustic tiles. Its length is 19 ft., and the height from the floor is 7 ft. 6 in. There is a panel on each side of the altar, crowned with a Perpendicular heading, and surrounded with a thorn leaf border on a purple ground. The panels contain Our Lord's Prayer, the Apostles' Creed, and the Commandments, all written on the tiles, and have diaper ornamentation in sage green and buff around them. The space above the altar is divided into three compartments, following the form of the larger panels. In the centre one is a cross on a blue diaper ground, and in the others the wheat and vine intertwine with scrolls on a red ground. The texts on the scrolls are, "My flesh is meat indeed," and "My blood is drink indeed;" and at the four corners there are evangelistic symbols. Running along the entire length of the reredos is the text "Come unto me, all ye that labour and are heavy laden." It was presented to the church by a parishioner, and is the work of Messrs. Cox & Son, of London.

THE PHYSICAL COMMOTIONS THROUGHOUT THE GLOBE.

EARTHQUAKES, hurricanes, and other notable phenomena are still taking place with unusual frequency. Reports are still received from Gros Geran, in Germany, of the continuance of the earthquakes, and lately the violence and number of the shocks seem again to be increasing. For some time they had been but few and slight. On the 3rd ult. three were observed, one between four and five o'clock in the morning, and two between four and twelve o'clock in the evening. No farther disturbance seems to have taken place till the 14th ult. On that day, however, three shocks were observed, one at half-past six, one at half-past seven, and one shortly after nine in the morning. Just before four o'clock on the morning of the 16th ult., a shock was distinctly felt, and two slight movements without noise were observed on the following night. It is curious how frequently it is in the night that earthquakes occur. Perhaps, however, shocks which would not be noted by day are felt in the stillness of night or early morning.

A sharp shock of earthquake occurred at San Bernardino, in California, on the 14th ult. There have been hurricanes of unusual force in America, and nearer home, in Scotland, recently, there was a violent hurricane, which, in a narrow line, levelled everything before it. A letter from Bhoosanal, in India, gives an account of a terrible catastrophe which occurred there on the 3rd ult. In the afternoon, at five o'clock, thick yellow clouds appeared on the north-west horizon, and foretold a severe thunderstorm. After half an hour's lightning the rain came down in torrents, and the blast increased to a hurricane. The noise and confusion were terrible, and a more awful scene has seldom been witnessed. All the corrugated iron roofs of dwellings and workshops, and of the new station building were torn off and blown about like feathers before the wind: sheets of half a ton weight were carried a distance of 300 yards. The entire roof of the new stores building was torn off, the bare walls only being left. Carriages were thrown off the rails, driven against each other, and smashed; one truck ran away for five miles, at the rate of 20 miles an hour. Large trees were broken off like straw. About 1 in. of rain fell during twenty minutes. The hurricane lasted only five minutes, and blew from west to east.

It is notable that a new description of lava is being thrown from the crater of Vesuvius since the last eruption, consisting of crystallised salt. This beautiful phenomenon is said to have hitherto been unknown, at least to this extent, in volcanic natural history. We may here note, by the way, that of late years the meteoric stones which fall differ in composition from those of older date.

A few years ago, we noted in the *Builder*, before any remark as to it, so far as we know, had elsewhere or before appeared in print, that a luminous arch had appeared by night spreading from the zenith, or nearly so, east and west, down to the horizon. The arch has since been occasionally seen, and in the *Suffolk Chronicle* its recurrence is again noted; and in connexion with a brilliant display of the aurora or northern lights, which is another phenomenon of more common occurrence within the last quarter of a century than it seems to have pre-

viciously been. Agitation of the magnetic needle was observed in connexion with this arch or halo. Other strange and new phenomena of a similar kind have been lately observed, especially a coloured halo pending from the zenith, of which Mr. G. Darwin writes in *Scientific Opinion*.

We may finish up these notes by remarking that we also see from *Scientific Opinion* that the bright white equatorial belt of Jupiter has changed colour, or rather has become coloured,—of a fine strong greenish yellow, like yellow lake, which change seems to be rather a portentous sign of the times. It was declared by astronomers some years since, we remember, that the rings of Saturn,—Jupiter's *vis-à-vis*, as we may say—were becoming still more unstable than heretofore, and that any day they might topple over and collapse. The tremendous rapidity of Jupiter's rotation (greater even than the ringed Saturn's), on the other hand, and his belt phenomena, seem to indicate that he, on the contrary, is on the eve of throwing off and establishing a system of rings, perhaps simultaneously with the collapse of Saturn's; and the change of colour of his equatorial belt is, therefore, we think, a portentous omen of coming changes, even in the state of our own planet.

THE CONDITION OF THE BUILDING TRADE.

SIR,—The best thanks of the unemployed operatives of the building trades are due to your correspondents, "T. L. D.," and "Senex," for the suggestions which they have made with the view of removing the depression of trade under which we are at present suffering. May we not hope that some member of the Legislature will speedily call the attention of the Government to the unnecessary delay in the undertaking of sanctioned public works, and that some of the many influential readers of the *Builder* will exert themselves in order to put an end to the present unsatisfactory state of affairs?

Both your correspondents, sir, call for a reduction, in what "T. L. D." terms the "extravagant wages" of the building operatives. And, strange to say, they both ignore the fact, that in the metropolis the standard rate of wages paid to skilled artisans is 8d. per hour. Your correspondent, "Senex," suggests that a "Builder's Foreman" has probably been receiving 7d. per hour, and proposes that he consent to a reduction of 1d. per hour. But is 7d. per hour an "extravagant" rate of wages for a competent "Builder's Foreman"? I should have supposed that two guineas per week would not have been considered an excessive remuneration for an individual satisfactorily performing the duties of responsibility and trust which devolve on a builder's foreman. I am a joiner, sir, at present out of employment. I have been receiving 8d. per hour since the last advance of wages in London, in the spring of 1866, and I am not yet prepared to submit to a reduction; but I will willingly comply with it if your correspondents can convince me that their theories are sound, and that my position would be improved by accepting a reduction of wages.

One hundred years ago, sir, Dr. Adam Smith was engaged in preparing for publication his "Inquiry into the Nature and Causes of the Wealth of Nations." At that time, he tells us, "a carpenter in London, and in some other places, is not supposed to last, in his utmost vigour, above eight years." Thank God, our position has somewhat advanced since that time, and I, for one, am unwilling to retrograde. I do not want "extravagant wages," but I want some one to prove that my present demands are unreasonable. I require, as a skilled artisan, a decent home,—not one of the dens where fever and disease reign, where decency is continually outraged, and where cleanliness is impossible. I desire good and sufficient food and clothing for myself and family; education for my little ones; some food for the mind, as well as the body; I want once in a while to get out of the smoke of London, to breathe the fresh country air, and to view the beauties of nature. I need something for my support while sick and out of work; and from sickness and want of employment we lose, on the average, taking one man with another, not less than eight weeks per annum. I must make good wear and tear of tools, replace them when lost, stolen, or burnt, and often purchase new tools to suit a particular job. I want to provide for my family should I die early, and to put by something to keep me from a dependence on the tender mercies of a Board of Poor-Law Guar-

dians in my old age; and I must confess I do not desire to take my last long rest in a pauper's grave. I want to get all this without occasionally "shooting the moon," and suddenly disappearing from the notice of the landlord, the baker, the butcher, the greengrocer, and other interested individuals. Are these "extravagant" desires? And if not, will "T. L. D." kindly show me the way to accomplish my wishes with my present income, and still to leave an "extravagant" surplus? Then I shall be content to cry *passover*, and to admit that my demands have been excessive.

But, sir, is the proposed reduction of wages absolutely certain to bring prosperity to the building trades? From undue speculation, the commercial panic, the increase in the railway fares, and other causes which may be allowed to be placed in the same category as "extravagant wages," we have miles of unoccupied house property in the suburban districts of the metropolis. The workman is asked to submit to a reduction of 12½ per cent. in his wages. Is the builder prepared to submit to a corresponding reduction in the prices of the houses he has already finished? If not, it is folly to believe that he will charge less for No. 6, Terrace, which he contemplates running up next year under reduced rates of wages, than he will for No. 5, which was completed last year at the old prices, and which still remains empty. We want a plain, straightforward answer to this question; for if the value of house property already completed remains unchanged, neither the operatives nor the public will be benefited by the proposed reduction of wages; but, by a quiet bid of *leger-demain*, the 12½ per cent. will be simply transferred from the wages fund to the profits of capital,—a result which, from the workman's point of view, can scarcely be regarded as "a consummation devoutly to be wished."

At a time when we hear so much of high wages driving trade out of the country, and when the ignorance of the principles of political economy on the part of the working classes is so universally deplored, I would beg respectfully to submit for the serious consideration of your readers the following quotation from the "Wealth of Nations," book i., chap. 10:—

"In countries which are fast advancing to riches, the low rate of profit may, in the price of many commodities, compensate the high wages of labour, and enable those countries to sell as cheap as their less thriving neighbours, among whom the wages of labour may be lower. In reality, high profits tend much more to raise the price of work than high wages. . . . In raising the price of commodities, the rise of wages operates in the same manner as simple interest does in the accumulation of debt. The rise of profit operates like compound interest. Our merchants and master manufacturers complain much of the bad effects of high wages in raising the price, and thereby lessening the sale of their goods, both at home and abroad. They say nothing concerning the bad effects of high profits; they are silent with regard to the pernicious effects of their own gains; they complain only of those of other people."

TRYING PLANE.

THE OXFORD SLADE PROFESSOR OF ART.

On the 8th inst. Mr. Ruskin delivered his inaugural lecture as Slade Professor of Art, in the Sheldonian Theatre at Oxford. In the course of it he said:—Art has of late years received from various sources a very considerable stimulus. Firstly, from the extension of commerce, of which the immediate result has been to increase our jealousy of other nations, and to make us eager to enlarge our wealth by selling our artistic skill. By these means art has been debased, and its true development has been hindered. Secondly, the accumulation of wealth in the hands of a few has created a demand for works of art. Here, too, the effect has been an injurious one, not so much from the fault of the buyer as of the seller, since artists have sought to attract by eccentricity, or by consulting the more popular taste, forgetting that experience teaches us that sooner or later it is the picture best in itself which is most eagerly sought after. Besides this, there is another form of demand for art which is wholly mischievous. It proceeds from the wealthy class, who merely seek by means of art to promote their pleasure or amuse their indolence. This has especially injured sculpture and work in jewelry. As the case is a moral one, so also must the remedy be. Nothing but moral influences can check this evil, which belongs to a luxurious people and a luxurious age. Lastly, the popular demand for art is much larger. There is a general development and improvement in the taste of the lower classes, which we hope may proceed still further, until our very ribands and crockery may exhibit the results of a highly-cultivated taste. He urged

that the end which we have to set before us is to establish a practical and critical school of English art, especially in those branches in which English schools show peculiar excellence. There are some directions where, owing to our national character, we are almost sure to fail. For example, he believed we shall never excel in decorative design, which needs surrounding influences inaccessible to us. Our great power was the portraiture of living persons. We all need to have a fixed, unselfish purpose for our country and for ourselves. Careless selfishness has too long been our curse. May we not hope that the youth of England will once more rise up to make their country in the noblest sense the leader of nations, flourishing like a tree planted by the waterside, which bringeth forth her fruit in due season? Mr. Ruskin's second lecture was given on the 16th of February, on "The Relation of Art to Religion."

CAUTION TO AUCTIONEERS.

SIR,—On Tuesday, the 25th ult., at the Mart, Tokenhouse-yard, I had eighteen lots of property to offer for sale, the last being the lease of a house in Queen-street, Cheap-side, which was to be sold without reserve. The property was knocked down for 375d., and I asked the purchaser to sign the contract. I was engaged for a few minutes, during which time the room was cleared, and he then refused to sign the contract, on the plea that he had given more than he intended. I said at first would not give his name; but after my pressing him to do so, I obtained this, and he proposed to go to his employer's office, and come on to mine; afterwards he did so, accompanied by the principal clerk in the establishment, and then only asked me if I would take 275d. for the lease, which, of course, I declined. My experience has not furnished me a similar case, but on speaking to two leading auctioneers in the City, their has; and although the property is depreciated by the course taken, my client has no legal remedy, as to go for damages would be throwing money away. But a stop ought to be put to such a practice.

STANLEY ROBINSON.

CAUTION TO BUILDERS AND OTHERS ERECTING IRREGULAR BUILDINGS.

The 38th section of the Metropolitan Building Act requires the builder engaged in building or in executing any work to give to the district surveyor notice in writing two days before such building or work is commenced, stating the situation, area, height, and intended use of the building so about to be commenced, &c.; and the 41st section sets forth that if any builder neglect to give notice in any such cases, or executes any works of which he is hereby required to give notice before giving the same, such builder shall, for every such offence, incur a penalty not exceeding 20s. to be recovered before a Justice of the Peace.

In consequence of several of such cases having occurred repeatedly after due warning had been given, the District Surveyor of Stratford-le-Bow and Poplar felt it incumbent on him, in discharge of his duty, to summon five offenders against the law to the Thames Police Court, Stepney, the builders complained of being George Crab, Ebenezer Alexander, Thomas Hodges, William Walker, and Charles Longley, the two latter being persons who had erected wooden structures. These cases were heard before Mr. Lushington on Wednesday, the 2nd inst., when each of the defendants was convicted in the penalty of 10s. and costs; the defendant, Longley, in two penalties of the same amount, for having caused the erection of two irregular buildings.

At the same time a builder of the name of Stevens was convicted, and ordered to amend an irregularity complained of by the District Surveyor; and three defendants, Allen, Shaw, and another, were also convicted, and ordered to pay outstanding fees, with costs in each case.

NEW WESLEYAN CHAPELS AND SCHOOLS.

The fifteenth annual report of the Wesleyan Chapel Committee, just now published, shows that the following works have been sanctioned by the committee since the Conference of 1868:—

127 Chapels, at an estimated cost of	£123,738
13 Ministers' Houses, ditto	11,294
29 Schools, ditto	14,969
45 Enlargements and Alterations, ditto	16,456
73 Modifications of cases previously sanctioned, at an estimated additional outlay of	24,349
19 Organs	3,387

302 cases Outlay £162,971
The number of chapels is the largest sanctioned in any one year, though the proposed outlay is somewhat less; the average accommodation being fourteen sittings per chapel fewer than in the chapel erections sanctioned last year. New schools, built in connexion with

new chapels and settled upon the same trustees and trusts, are not separately reckoned. The number of separate school erections is above the average, though fewer than the very large number reported last year.

Two hundred and sixty-four cases have been returned through the May District Meetings, this year, as completed. Of this number, 175 have no more debt than had been sanctioned. These include 88 chapels, 5 ministers' houses, 22 schoolrooms, 39 enlargements and alterations, and 21 organs. The total cost of these cases is reported as follows:—Chapels, 98,499l.; ministers' houses, 3,921l.; schoolrooms, 19,810l.; enlargements and alterations, 14,679l.; organs, 3,391l.:—Total, 140,300l., being 4,743l. more than the amount reported last year, but more than the sum reported in any year except the preceding two years.

The entire cost of all erections and enlargements, regular and irregular, reported this year as completed, has been 209,744l., being 39,184l. less than the sum reported last year, but more than the sum reported in any year except the preceding two years.

The report contains views of a number of the new chapels and schools, of which we reproduce four available examples:—

Ashby-de-la-Zouch Chapel and Schools.—The foundation-stone of the new schools was laid October 2nd, 1867, by Mr. John Hall Joyce, of Breedon. The foundation-stone of the new chapel was laid June 10th, 1868, by Sir F. Lyett. The buildings, erected from the designs, and under the superintendence, of Mr. Nicolas Joyce, architect, of Stafford, are in the Geometrical Pointed style of the fourteenth century. The chapel provides seats for 600 persons. It is 64 ft. by 41 ft. inside, and consists of a nave 25 ft. wide, with a span roof 50 ft. high, and two aisles, each 8 ft. wide, with lean-to roofs. An open porch of three arches, 24 ft. long, within which is an inclosed vestibule the same length, gives access to the lower part of the chapel, and the staircases leading to the galleries. At the other end of the chapel is a classroom, 24 ft. by 12 ft., over which is the organ-loft, the roof of which is carried up to the same height as that of the nave. Adjoining the classroom at one end is a vestry for the minister, and at the other a staircase leading to the organ-loft. Between the nave and the aisles are rows of cast-iron columns, the lower parts of which are octagonal, and the upper parts circular, with foliated capitals; these support arches which carry a clearstory and the nave roof. In the aisles are galleries, the floor timbers resting on brackets cast on the iron columns; there is also

a narrow gallery over the vestibule at the end of the nave. The timbers of the roofs and the sittings in the galleries are of red deal. The gallery fronts, the benches, and the pulpit are of carefully-selected pitch pine. The underside of the roof is boarded with pitch pine, and this, as well as the other woodwork throughout, is varnished. A large circular window over the organ-loft, at the back of the pulpit, is filled with stained glass, and the other windows have cathedral glass of amber and green tints. The chapel is lighted by three coronas suspended from the roof, each having twenty-four gas-jets, and by brackets with double lights under the galleries. It is warmed by hot water; the pipes are square in section, laid on the floor of the passages alongside of the raised cills on which the benches are fixed, and are effective without being unsightly. The walls of the chapel on the ground-floor are two bricks and a half and three bricks in thickness. The walls are faced with red pressed bricks, with bands and patterns of blue bricks, and dressings of Hollington stone: the roofs are covered with slates of varied shades of colour. The principal features, externally, are the clearstory, pierced with circular cusped windows; the entrance arcade, of stone, with carved capitals and parapet of open work; and a large four-light traceried window in the principal gable over the entrance. The cost of the school buildings has been about 6000l., and of the chapel nearly 2,000l. beyond the value of the materials of the old building. The contractors for the principal parts of the work have been Mr. Frondman, of Ashby; Messrs. Lowe & Sons, and Mr. Bassett, of Burton; and Mr. S. Fish, of Hartshorne.

Mostyn-road Chapel, Brixton-hill Circuit.—In that part of Brixton in which this chapel has been placed, not fewer than 4,000 houses were erected within six years. The chapel designs, including numerous class-rooms, with two large rooms for Sunday-school and other purposes, were prepared by Messrs. Tarring & Son, architects; but it was thought more prudent at first to erect only the chapel and minister's vestry. A contract for this portion of the works was undertaken by Messrs. Myers & Son, for 6,760l.

Memorial stones were laid on the 23rd of June, 1868, by Sir Francis Lyett, Mr. Thomas Hazlehurst, and Mr. A. McArthur; and on Tuesday, September 28th, 1869, the building was opened for Divine worship.

Yeovil Chapel.—The necessity for better Wesleyan Chapel accommodation in Yeovil has been long felt. Through the liberality of Sir Francis Lyett, of London, Messrs. Easor, of Milborne Port, friends in the Yeovil Circuit, and others,

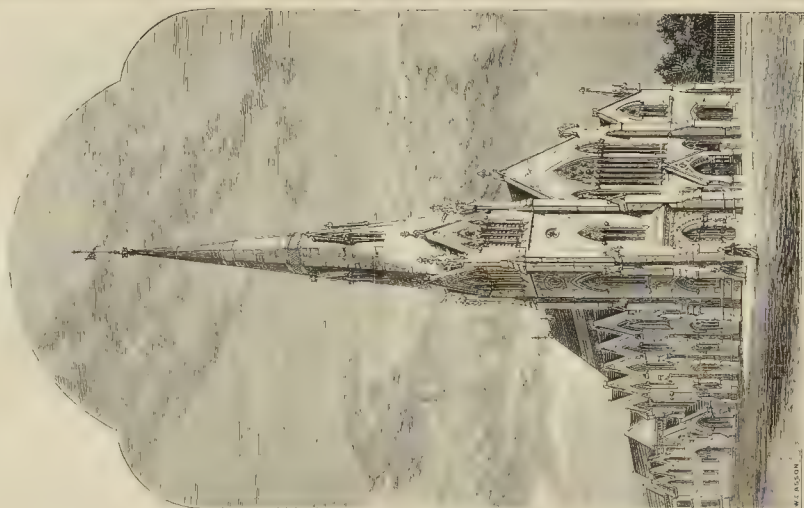
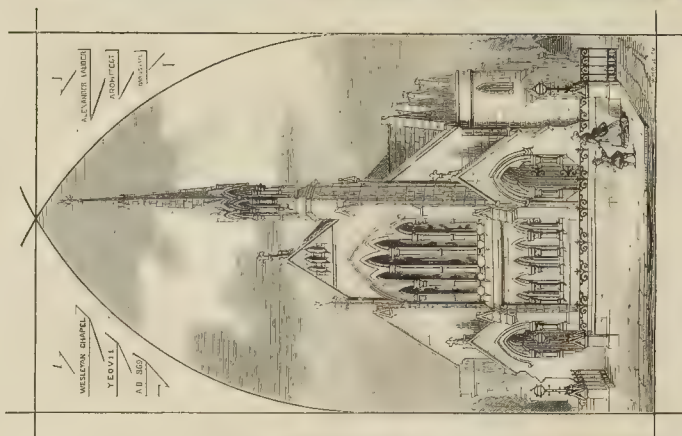
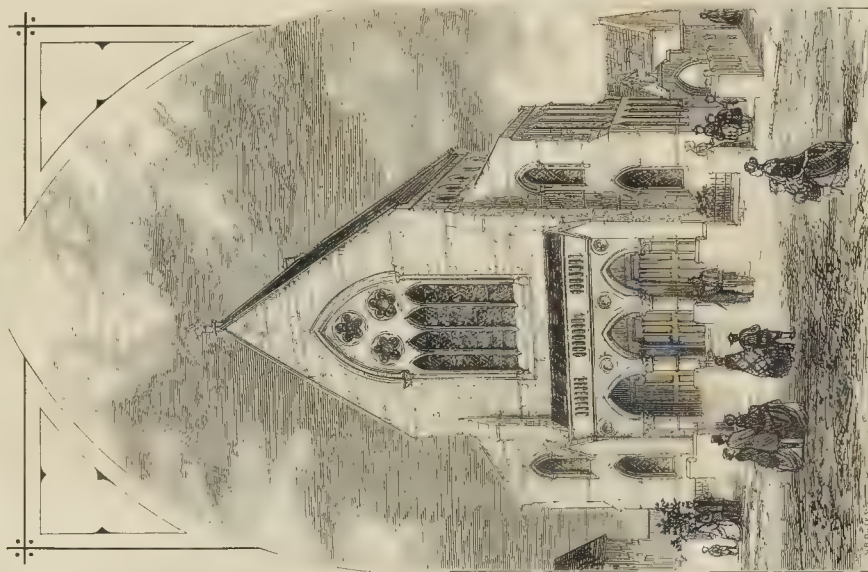
the way became open to commence a new chapel. The trustees were enabled to enter into a contract with Messrs. Bartlett & Harewood, of Yeovil, for the erection of a chapel from plans prepared by Mr. Alexander Lauder, of Barnstaple, under whose superintendence the works have been carried out. The foundation-stone was laid on the 22nd of February, 1869. The chapel is in the Early English style, entirely built of local Ham Hill stone by Mr. James Staple, of Stoke. It is calculated to accommodate 650 persons, having side galleries and choir-loft. The gallery pillars are carried up to a swept coiled roof, dividing the chapel constructively into nave and aisle; the nave having an apsidal termination in the choir-loft. There is a minister's vestry, with basement accommodation at the end of the chapel. The whole of the woodwork is in pitch pine and oak. The chapel is lighted with pendants from the longitudinal arading over the gallery pillars, and small corona lights under the galleries. It is to be heated with hot water by Messrs. Garton & King, of Exeter. The seats are open, with leaning backs, book-boards, and ha-ralls. The total outlay, including site, will be about 3,000l.

Newton Abbot Chapel and School, Torquay Circuit.—It is asserted that of late years Wesleyan Methodism has made considerable advancement in South Devon. New and commodious chapels have been opened at Ipplepen, Shaldon, Paignton, and Newton Abbot, all within the boundary of the Torquay Circuit before its division last Conference, involving an outlay of 7,000l. The foundation-stone of the latter was laid by Mr. John Bowden, of Ipplepen. A spacious school-room at the rear of the property had been previously erected and paid for at a cost of 410l. The new chapel was opened on Thursday, May 21st, 1868. The style of the building is Early English, with open roof ceiled at the hammer-beam. The walls are of native limestone, relieved with Bath stone windows, doorways, and pinnacles. The length is 85 ft.; width, 46 ft.; and height to wall plate, 32 ft. The seats are open benches with sloping backs, and lightly stained. The font has a marble pillar, with Bath stone pedestal and bowl; and it, and the service-books, communion-cloths, carpets, and cushions, are the special gifts of the society classes and friends. In a recess is a powerful organ. A gallery has been placed over the main entrance lobby for the accommodation of the Sunday scholars. The drawings were prepared at the Devon Office by Mr. J. W. Rowell, and the work has been executed by Mr. G. Hawkins, builder, Newton.



NEWTON ABBOT CHAPEL AND SCHOOL, TORQUAY CIRCUIT.

NEW WESLEYAN CHAPELS.





CHRIST CHURCH, FINCHLEY, MIDDLESEX.—MR. JOHN NORTON, ARCHITECT.

CHRIST CHURCH, FINCHLEY.

The plan of this church includes nave, north and south aisles, north and south transepts, chancel, organ-chamber, vestry, narthex, and tower.

The nave is 92 ft. long by 32 ft. wide, 34 ft. high to stone cornice, and 52 ft. 6 in. to the apex of boarded roof. There is an arcade of five bays to aisles. The columns are quatrefoil on plan, with detached shafts in angles, banded, with moulded bases and carved capitals. The arches are formed of a double order of stone, with a brick upper course of alternate black and red; the spandrels over are of brick, with panels of stone, carved with various emblems: shafts carry principals of the roof. The cornice is of stone, with rich foliage of Early character running the whole length of nave. The roof is formed with double principals, filled in with pierced tracery, and boarded on the under-side, forming a pointed vault. The western door is double, under a richly-moulded arch with foliage in hollow, the tympanum being carved with a representation of the Ascension, the doors themselves are square-headed. Above the west door is a circular rose-window of large proportions, with geometric tracery, the jambs being brought down square with marble columns in angles, and panels of marble of varied colour and design in spandrels, the whole inclosed in moulded arches with labels over. It is filled with stained glass, by Bell. The west gable is surmounted with crocketed copings, and with cross on apex and gurgoyles at angles, a parapet running round nave. The nave floor is tiled. This being the only portion of the design now completed, the arcades are filled in with temporary brickwork; the windows of the future aisles being fixed in it. The aisles are 13 ft. wide, each bay separately gabled with copings and angel finials, and buttresses terminating in canopies. The roofs are internally boarded to pointed vault.

The transepts are 23 ft. by 23 ft., opening from nave by lofty lancet arches, boarded in a similar manner to nave and aisles, and lighted by four-light windows to each, with geometric tracery, crocketed gables, with crosses and rectangular buttresses at angles, with gurgoyles and canopies. The aisle windows are couplets, with circles in head, under moulded arches. The chancel, which is 35 ft. long by 32 ft. wide, opens into the nave by a lofty moulded cusped arch, carried on shafts on foliated corbels. The east window is of elaborate geometric tracery of six lights, separated by shafted mullions, crocketed gable, canopied and crocketed buttresses. The chancel is 28 ft. high to the foliated cornice; vaulting shafts carry ribs of a similar character to nave. It is raised three steps above nave, and the sanctuary three additional steps, besides the altar dais; there are double rows of stalls. The floor is tiled in ornamental patterns. The organ-chamber is separated from the chancel by an archway filled with tracery, and with screens of metal-work.

The tower is situated on the south side of the south aisle. It is 12 ft. square on plan, and is of five stages, the two upper ones having open arcades, with pointed cinquefoil arches, and is terminated with a rich cornice and open parapet, and at angles four octagonal open turrets. The tower is finished with an octagonal spire of slate, the whole rising to a height of 150 ft., finished with a vane.

The narthex, or western porch, is 12 ft. wide, and is the whole width of the nave, arcaded with trefoil cusped arches, with a parapet of open early tracery. The stone used in the construction is Potter Newton, with Bath stone dressings; and the internal lining is of red and black brick, in bands, patterns, and ornamental designs. The roofs are all pointed and vaulted, and covered with Delabole slates and tile coverings. The pulpit has carved and sculptured panels, foliated caps and cornices, with moulded and marble shafts, and inlay of marble and jasper. The font is square on plan, with shafts and inlay of marble. The works at present executed have been carried out by Mr. Henry Wheeler, of Highgate, from the designs and under the superintendence of Mr. John Norton, architect.

PROGRESS OF HARROGATE.

THERE are evidences of progress on every hand. No new mills are being erected, or mammoth workshops, but the growing prosperity of the town—as an inland city—is shown by the fact that hotels are being enlarged, and mansions, villas, and houses of a superior character are springing up more rapidly than ever. More and more of those who formerly resided in the suburbs of Leeds, Bradford, and other towns, are taking advantage of the increased railway facilities and coming to reside at this healthful spot, and it seems as if Harrogate will double its resident population before many years have elapsed. Many first-class mansions, for example, have been lately erected in the Victoria Park. They are principally in the Gothic and Italian styles of architecture. The West End Park, situate opposite the Prince of Wales Hotel, now forms a formidable rival to the Victoria Park. The premium offered by the company, who bought sixty-nine acres here, for the best plan for laying out the estate with building sites and first-class villas, was awarded to Mr. Hirst, of Bristol, architect. Either a second premium was awarded to Mr. H. E. Bown, of this town, or an arrangement (was come to) whereby it was agreed that Mr. Hirst should take the premium and Mr. Bown carry out the design. However, Mr. Bown appears to have the principal management of the estate. There are above 300 sites, we believe, including a site for a church. Many of the mansions in Victoria Park have also been designed by Mr. Hirst and Mr. Bown. Land has been purchased for a new estate in Leeds-road, and a number of houses are to be erected, and operations on a large scale for manufacturing bricks, &c., are to be carried on somewhere in that locality. In fact, a building mania is raging in Harrogate at the present time.

Harrogate Public Rooms Competition.—For the works here Messrs. Shutt & Thompson and Mr. Dyson sent in a plan each, and Mr. H. Bown two. Both Mr. Bown's and also Messrs. Shutt & Thompson's plans provided for a colonnade, 24 ft. wide, extending the entire length of the present terrace, a pump-room, and a ladies' and gentlemen's cloak and retiring rooms, &c. Mr. Dyson's plans provided for a colonnade the same length as the others, but 12 ft. wide, and in addition an elegant covered lounge or conservatory, occupying the entire garden (east) front of the concert-room. Messrs. Shutt & Thompson's and Mr. Dyson's designs included a stone frontage to the pump-room, in a line with the front of the present building, the covered colonnade, &c., being of iron and glass. Mr. Bown's plans were all iron and glass, the pump-room, &c., to the principal front having the appearance of two octagonal conservatories, one with a tower 48 ft. in height. Ultimately the directors, after hearing explanations from the several architects, selected Mr. Bown's plan, No. 1 for the elevation, and No. 2 for the ground-plan. Mr. Bown was instructed to obtain tenders at once, so that the work may be completed by the opening of the season.

A NEW TOWN-HALL FOR POPLAR.

A MEETING of the trustees of the parish of All Saints, Poplar, was held on the evening of Thursday, the 10th inst., at the Board-room of Poplar Workhouse, to receive a report from a special committee who had been delegated to open tenders submitted for the erection of a new town-hall and parochial offices for the use of the parish.

The new buildings have been rendered necessary in consequence of the recent purchase of the old Poplar Workhouse by the guardians of the union; the room hitherto used as a town-hall, with the contiguous apartments occupied by the parish officials as parochial offices, being comprised in the purchase. The guardians paid the trustees the sum of 10,000l. for the workhouse and the freehold of the land on which it stands, and the sanction of the Charity Commissioners has recently been obtained for the appropriation of this sum towards the erection of a new town-hall and parochial offices.

The acquisition of a site on which to erect the proposed new buildings has been a task of many months, in consequence of the difficulty experienced in obtaining land which could be regarded as sufficiently central or easy of access. The difficulty was obviated, however, by the seasonable discontinuance of the use of the old parish watch-house by the Commissioners of Police, who have just completed the erection of a more com-

modious station in the East-India Dock-road. The parish authorities at once opened negotiations with the commissioners, which terminated in the purchase by the trustees of the watch-house and the land on which it stood, the building having since been demolished. Representations were also made to the authorities of Brazenose College, to whom belong a large garden-ground attached to the rectory-house, and adjoining the site of the watch-house; and arrangements were made by which the trustees have acquired a portion of this land. The site is in Newby-place, and immediately facing the principal entrance to the parish church.

Messrs. Harston & Harston, of East-India Dock-road, are the architects of the new buildings; and their estimate for the works was 7,550l. The report of the special committee intimated that sixteen tenders had been received, as follows:—

Mann, Kentish-town	49,300
Corrum, Lewisham	9,288
Garrod, Commercial-street	8,933
Ennor, Commercial-road	8,670
Watts, Bromley	8,693
Wicks, Bangs, & Co., Limehouse	8,390
Kilby, Limehouse	8,335
Till, Hampstead	8,301
Hearle, St. George's East	8,193
Higgs, Lambeth	8,175
Nyers & Son, Lambeth	8,037
Scrivener & White, Fitzroy-road	8,043
Blackmore & Morley, Haggerstone	8,025
Crabb & Vaughan, Kingsland	7,886
Perry & Co., Stratford	7,854
Sheffield, East-India-road	7,479

The committee submitted that, as Messrs. Crabb & Vaughan's, Messrs. Perry & Co.'s, and Mr. Sheffield's tender were the three lowest, the trustees confine their attention to the same, and select that which they thought the most substantial tender.

After some discussion, Mr. Sheffield's tender was accepted; and the committee were empowered—subject to the surties proposed by Mr. Sheffield being satisfactory—to commence operations at once.

A FIXATIVE FOR DRAWINGS.

CORRESPONDENTS ask us, from time to time, the way to set pencil and charcoal drawings. We have just had an opportunity of testing an invention by M. Rouget, one of the masters of the Government Schools in Paris, for 'permanently and instantaneously fixing every kind of fugitive design, such as those produced by chalk, crayons, pastels, lead pencils, or other similar materials.' It consists of a liquid which is blown through a little glass apparatus, in the shape of a minute shower that spreads itself over the paper, so that the drawing is not rubbed by a brush being passed over it. Through the fineness of the spray the paper is not cooked, neither does the liquid appear to leave any mark. Our test was severe, and upon rubbing the drawing operated upon, with india rubber, nothing moved, nor was any appearance of a smear produced. It seems a very valuable preparation. According to the London agents, Corbière & Son, it is equally efficacious with photographs.

CAST-IRON GIRDERS, KING'S COLLEGE, LONDON.

SIR,—Your notice in the *Builder* of the 12th inst., page 129, and the accompanying diagrams, shows clearly the cause of the falling in of these girders and ceiling.

It appears from the girders broken by Mr. George Dines to test their strength that the transverse girder A broke with 40.9 tons applied in the centre, and the longitudinal girder B with 27.5 tons applied also in the centre.

This experiment would give a constant of about 2.8 for this simple formula; viz., transverse girder A,—

$$2.8 \times 20' \times 7\frac{1}{2}' \times 1\frac{1}{2}' = 49.83 \text{ tons B.W. in centre.}$$

$$18 \text{ ft.}$$

$$\text{Longitudinal girder B,—}$$

$$2.8 \times 15\frac{1}{2}' \times 7\frac{1}{2}' \times 1\frac{1}{2}' = 27.2 \text{ tons B.W. in centre.}$$

$$17' 5''$$

Therefore the iron must have been very good, as ordinary cast iron is seldom calculated higher than for transverse girder A,—

$$2.5 \times 20' \times 7\frac{1}{2}' \times 1\frac{1}{2}' = 36.1583 \text{ tons B.W. in centre.}$$

$$18 \text{ ft.}$$

$$\text{And for Longitudinal Girder B,—}$$

$$2.5 \times 15\frac{1}{2}' \times 7\frac{1}{2}' \times 1\frac{1}{2}' = 24.27 \text{ tons B.W. in centre.}$$

$$17' 8''$$

And taking $\frac{1}{2}$ of B.W. as safe load, the trans-

Engineering in India.—The Viceroy of India has applied to the Home Government to send out a civil engineer, possessed of special experience, to be employed in examining the coast of India, with the view of discovering sites for ports.

verse girder A would safely support only about 9 tons, whereas the actual weight placed thereon was about 25 tons. And the longitudinal girder B would safely support about 6 tons, whilst it was loaded with about 7½ tons. Again, taking the area of the ceiling and pathway over, to be supported by one of the transverse girders, A, and the three longitudinal girders B (bearing on the former), as 18 ft. x 17 ft. 10 in. = 321 feet superficial. The safe load for the transverse girder A is about 18 tons equally distributed = about 1½ cwt. per foot superficial, and the safe load for the three longitudinal girders B collectively is about 36 tons equally distributed = about 21 cwt. per foot super., and as an ordinary floor should support about 1½ cwt. per foot super., safe load equally distributed, the longitudinal girders B = 2½ cwt. per foot super. might have been of sufficient strength to support the ceiling, earth, and stone paving of the pathway above, whilst the transverse girders A would be about half the strength required, and hence probably the accident.

CLIFFORD H. CONSTABLE.

* * We insert the above without necessarily agreeing in the deduction.

DERIVATION OF THE WORD "IRELAND."

THE passage in Claudian, inquired for by "S. F. C.," is a puzzle, if we take it literally:—

*"Manducant Saxones Feno
Oreolares: insculpti Pictorum sanguine Thule;
Scotiarum cumulis fient glacialis IANX."*

This was said of the Christian emperor Theodosius the Great; and he has been rendered:—"The Oracles flowed with Saxon gore; Thule became warm with the blood of the Picts; and joy Ierne wept her heaps of slaughtered Scots." It should be noted that the Scots reached Caledonia *via* Ireland, and that the inhabitants of Ireland were long called *Scotii* by classical writers.

To speak of the "Emerald Isle" as a "glacial Ireland," is to our present notions a great misnomer; for we cannot now understand that it ever resembled *Iceland* in its characteristics of perpetual snow; but yet it is certain that the whole of the British islands have had their *glacial* era, as is shown by the erosion of lofty rocks, *scratched* by the descent of glaciers, and the distant transport of heavy boulders, by the same agency. Ethnologists tell us that, probably, the *thermal* effect of the Gulf Stream did not reach us, from across the Atlantic, till about the twelfth century B.C.; so that, at the date of the fall of Troy, Ireland may have been placed in a very much colder climate. The native Irish word for "ice" is *carr*, a Celtic word; Welsh, *ia*. I cannot doubt that this etymon, whether or not climatically correct, has furnished the poet Claudians with his idea of "glacial Ierne."

I would rather not follow Captain Burton into Punic and Chaldeé just at present.

A. HALL.

GLAZING WALLS.

SIR,—In answer to "Alpha," in your impression of Saturday last, I can support by practice what he puts forward as a suggestion. I have very closely examined the pieces of old Assyrian and Babylonian bricks at the Museum of Practical Geology in Jermyn-street, and I have glazed several common bricks with various colours similar to the old specimens referred to, and also painted designs on some and burnt them in, and have been successful in making the bricks non-absorbent, and at the same time ornamental for external and internal work, and I have not the least hesitation in saying, that if the matter were thoroughly gone into, common bricks could be ornamented and made quite impervious to moisture or our London dirt, at moderate cost, and every shower of rain would clean our external walls and make the buildings look quite fresh again; and for inside work, we should get permanent ornamental walls, without the expense or use of plaster, paper, or paint. I may also state that I have been successful in glazing red bricks and preserving their colour. This, I believe, has not previously been done. I shall be happy to show any one my specimens, and also a specimen of terra cotta, on which I have burnt in a pattern very successfully.

In writing this, I can but thank my employers, Messrs. James Powell & Sons, who have kindly allowed me to make my experiments and burn in the same on their premises.

I must add that I have spent many hours studying the specimens of old work at the museum in Jermyn-street, and I received many valuable hints and much good information in attending the working men's lectures at that institution. I believe there are some fine specimens of old Assyrian and Babylonian bricks at the British Museum, but I have not seen them, as that building is not open at such hours that many people and art-workmen can go without inconvenience, or it may be, in some cases, loss of time. If it were open only one evening in each week it would be a great boon.

WILLIAM GOLDING.

P.S.—I have now some of my specimens exposed to this severe weather, having first dipped them in water, and up to the present they stand all right.

W. G.

GLAZED SURFACES FOR "WATER CORNERS."

SIR,—The inquiries of your correspondent on this subject in your number of the 8th ult. proclaim a difficulty which has troubled architects and others for many years; viz., to procure a material with a sufficiently hard impervious surface, and which can be made in such a form as to offer the least chance of injury.

I have, in the course of my practice, tried many schemes, but have found them all deficient in one or more particulars. To attain the desired improvement in this most important sanitary provision, I beg to state that in the construction of the "water corners" for the new London Orphan Asylum at Walsford, I have arranged to use the material manufactured by Messrs. Finch & Co. in their porcelain baths. Each will consist of four cut slabs built up against slate or brickwork, and jointed together with cement. I fully believe that this scheme, combined with a proper water service and separate outlet to drain, will fulfill all the requirements above mentioned, except as to the joints.

What is really wanted for perfection, and what I have asked for, but hitherto without success, is a material made in this same material in one piece, with three sides and a bottom to the proper bowls, and with rounded angles. There cannot be a doubt that it would amply repay some of our porcelain manufacturers to produce this much-needed sanitary article, and which, on account of the enormous demand, ought to be supplied at a reasonable price.

HENRY DAWSON.

WATER FIT TO DRINK.

FEVERS and plague are in our lanes,
There's sickness in each home,
And deadly gases from our drains,
Like dire mounitions come.
The rich man growing wild despair,
The poor unnoticed sink;
They die for lack of light and air,
And water fit to drink.

Oh! England, rich in worldly spoil!
In health how poor thou art,
Altho' thy sons still think and toll,
In worship, in me, and mart.
Artist and craftsman in their gear,
And authors o'er their ink,
Exhausted, yearn for light and air,
And water pure to drink.

We build to Heaven stately domes,
We circumnavigate the earth;
Yet death sits in each lowly home,
As on each lowly hearth.
We eat and drink, yet seldom care,
Till sickness makes us think,
Our life's support is light and air,
And water pure to drink.

What boots our power, and what our gain,
In science and in art,
If still unmindful we remain
Of life's important part?
"Man, know thyself,"—this maxim bear
In mind, nor from it shrink;
The God that gave us light and air,
Sent water pure to drink.

One strong appeal, an earnest one,
We still make for our poor,
In jail or workhouse, bond or free,
That health they may secure.
Come, kindly hearts and hands, and dare
In noble work to link;
Our people want but light and air,
And water fit to drink.

HOARDINGS.

At the Police-court, Guildhall, Mr. William Brass, builder, the contractor for erecting the new Post Office and Telegraph offices, at the corner of St. Martin's-le-Grand, appeared before Alder Mr. Gibbons in answer to four summonses taken out against him by the Commissioners of Sewers, for putting up a hoarding on the four sides of the plot of ground upon which the offices were to be built without having first obtained a licence from the Commissioners of Sewers for permission to do so, as provided by the Act of Parliament.

The defence was called by the counsel that the fee for each frontage of the site would be 10s. every two months. The Commissioners granted the licence only for eight weeks at a time, no matter how long the building might take in erecting. If in the present case the building took two years, the fees that would be charged would be about \$800. It was the practice of the Board to charge for two licences where the building was at the corner of a street, if the frontage in both streets together exceeded 50 ft., which was the limit allowed under a 10s. licence, unless the frontage was in one street, and then there was no limit. A copy of this licence was produced, and it contained a stipulation that no bills should be posted on the hoardings, but that they should be whitewashed and lighted.

It was contended for the defendant that the summonses

were untenable under the circumstances, and that the defendant could not be held liable; and also that the proceedings were irregularly taken by the Commissioners of Sewers very unnecessarily.

Alderman Gibbons said he was of opinion that the Act of Parliament intended that only one licence should be granted for a building, and that the fee should not exceed 10s., but he was also of opinion that the Commissioners of Sewers had the power of saying what should be put upon the hoarding. Brass had infringed the Act by not applying for a licence before the 24th of January, and for that he should fine him 40s., and 5s. for every day since.

This conviction was on one summons, and the other three were withdrawn.

THE FINSBURY PARK ACT.

In the Bill Court on Thursday in last week (after term) Sir John Lubbock, before Mr. Justice Blackburn and a special jury, the case of *Wing v. The Metropolitan Board of Works* came on. This was an action brought by the plaintiff against the defendants under the Finsbury Park Act, for having neglected to make proper and convenient means for preserving the communication between the lands belonging to the plaintiff on the west and north sides of Finsbury Park, so as to give the necessary thoroughfare from his lands to the Strand and the Grosvenor Gardens. Seven Sisters-road as required by the Act. Before the conclusion of the plaintiff's case it was arranged to take a verdict for the plaintiff, subject to a special case.

TREATMENT OF SEWAGE WITH CARBON.

MR. HYNES, in allusion to Mr. E. Johnson's last letter, sends a printed quotation from the paper by him read to the Corporation of Lancaster on 14th ult., when they were about initiating a water-supply and a tubular system of drainage throughout the town. In this quotation he says:

"It is for you, under the powers of your Act, immediately to interdict the contents of the water-closets being poured into the sewers unless desecrated. To do that, it is only necessary to order every one having a water-closet to bring the soil-pipe, as well as all the sewage-water of house to one point into a tubular sewer, that tube to empty into a large sewer, and above the sewer, at the level of the main sewer, and connected with it by a grating and tubular sewer, so as to prevent the escape of solid matter. At the bottom is laid a bed, 18 in. thick, of raw hair, dry velvet, and dry peat, or dry earth, on to which the sewage water falls, and is filtered into the main sewer; a fresh layer is added once a week until the tank is full, and when emptied a stock of valuable manure will be the reward for the labour, and to a great extent a removal of the foul nuisances we all complain of."

"The question," remarks Mr. Hinde, "of the sewage passing through three different tanks supplied with charcoal, as mentioned by Mr. Johnson, or through only one tank supplied from time to time with fresh layers of charcoal, as deserving of a patent, I must leave to wiser heads than mine to decide."

DOCTORS AND DISINFECTANTS.

SIR,—In a communication, entitled "Disinfectants and Doctors," which appeared in the *Builder* of 15th ult., Mr. Brierley, the author of it, expresses his surprise that medical officers of health should differ so greatly as they do in the estimate formed by them of the efficiency of various disinfectants. Divergence of opinion among doctors is, however, not so uncommon as to occasion much surprise to those at all familiar with medical literature. It was, perhaps, to be expected that a matter of so much importance, and one apparently so capable of being set at rest by direct experiment as the question of disinfectants, should have formed a subject of discussion at long and short among sanitary officials should have been in a position to agree as to the value of the results obtained from the most generally used disinfecting agents. But the truth is, that extremely few observers approach the subject without prejudice. Two classes of theoretical preconceptions are allowed to warp the judgment in connection with disinfectants, namely, first, predilection for the germicidal microscopical studies; secondly, the other on a bias in favour of chemical pursuits. The former leads to what is called the germ theory of infection, which finds in carbolic acid, as the best germ-destroyer, the most appropriate disinfecting substance; the latter to the transformation theory, which recognises in oxygen the great ester-at-rest of morbid metamorphoses, and consequently the most reliable of disinfectants.

This theoretical difference of opinion has been pointed out alluded to by the medical officer of the Privy Council, in a recently published memorandum, entitled "Precautions against Scapularia." Chemical disinfectants, it is therein remarked, "are of two great classes, and hitherto it is not certain which of the two acts best. The one class is well represented by chlorine and certain of its compounds [but better still by ozone]; the other is well represented by carbolic acid. . . . These two systems do not combine well with one another, and it will be convenient that the local authority should declare which of the two it adopts." It will thus be seen that, contrary to what Mr. Brierley imagines, the matter has had the attention of the Medical Department of the Privy Council. But it is to be regretted that instead of merely chronicling the existence of the two systems, the State Sanitary Office had not thought proper to determine which is most consonant with practical experience.

The two divergent authorities cited in Mr. Brierley's communication, namely, Dr. Trench, medical officer of health for Finsbury, and Dr. Brierley, medical officer of health for Finsbury, appear to be exponents of these two systems. In the absence of conclusive practical experiments calculated to set at rest the value of oxidising disinfectants such as ozone and chlorine, as compared with germ-destroying antiseptics like carbolic acid, theory, it would seem, must still be the only guide. There is, nevertheless, one thing in respect to which all are agreed, and that is that ventilation is the best natural means of disinfection. But ventilation is a process of oxidising, or, perhaps, rather of oxidising. In purification by fresh air Nature works by means of oxygen, and not by the action of its analogue. By the addition of carbolic acid to air, necessary vital element would appear to me to be vitiated instead of being rendered more wholesome. If the remark

made in the Privy Council memorandum above quoted, namely, that "these two systems do not combine well with one another," means anything, it is that oxygen and carbolic acid are antagonistic. But the former substance is the one which is operative in natural ventilation. Carbolic acid, which Dr. Trench patronises, would, therefore, appear to be in antagonism to the ventilating operations of nature. Cond's fluid, which Dr. Hardwicke recommends, on the contrary, having ozonic oxygen for its active principle, is in harmony with nature, and merely provides artificially a larger degree of the vitalising element by means of which all natural purification is accomplished.

It must not be thought that Dr. Hardwicke is singular in his preference for oxygen, or Cond's fluid. On the contrary, in almost every paper and directions for combating infection, issued by the metropolitan and other officers of health, Cond's fluid is mentioned with approbation. This preparation is, moreover, put at the head of disinfecting agents in most standard works on chemistry and medical science which have issued from the press during the last ten years. It is to be found so classed in the following and many other important works:—Knight's "English Cyclopædia" (1860), Chambers's "Cyclopædia," Ure's "Dictionary of Arts, Manufactures, and Mines" (1860), Watts's "Dictionary of Chemistry" (1866), Miller's "Elements of Chemistry" (1868), Holmes's "System of Surgery" (1860), Reynolds's "System of Medicine" (1866).

JOHN MITCHELL, Ph.D.

LIGHT AND AIR CASES.

THE DYERS' COMPANY v. KING.

This was a suit tried before Sir W. M. James, to determine the right of the Dyers' Company of the City of London to obtain an injunction restraining the defendant from interfering with the light and air enjoyed by the company's hall, in College-street, Dowgate-hill.

The defendant had taken a lease from the Mercers' Company of two buildings, which until recently stood opposite the Dyers' Hall, one being 35 ft. high and the other 23 ft. high. On the site of these two buildings the defendant began to erect a building 74 ft. high, the height of the plaintiffs' hall being 48 ft., and the width of College-street at this point only 19 ft. The present hall of the plaintiffs was erected in 1840, but in 1856 alterations were made in College-street and Dowgate-hill, which resulted in the widening of both streets at their junction, and subsequently the Charing-cross Railway Company bought some land near the then corner of College-street, and threw it into Dowgate-hill. The plaintiffs' evidence showed that the effect of the proposed buildings would be to intercept nearly all direct light, which formerly passed over the demolished buildings to the plaintiffs' hall, and large models and diagrams were submitted to the Court in substantiation of the fact. The defendant, however, contended that the effect of the alterations in the width of the streets, as above mentioned, and the setting the corner of College-street 7 ft. farther back (as the defendant proposed to do) would be that, though the plaintiffs might lose their direct light, they would acquire, and, in fact, had acquired, so much additional reflected or diffused light as would compensate them for the loss of the direct light. On this point the defendant's counsel contended that the right to light was a right to a certain quantity of light coming from any source, and not a right to receive that light over a particular piece of land or house.

His Honour, in giving judgment, said that he could not accede to the argument of the defendant's counsel. The very terms "dominant" and "servient" tenements as applied to rights of this kind, showed that one person had a right to receive light coming over the servient tenement of another, and could not be deprived of such light because by purchase or gift he had obtained other or additional light. It must be that if the additional light so acquired was greatly in excess of what the owner of the house reasonably wanted, some diminution of the light over the servient tenement might be permitted. But this view could not be applied to the present case, in which it could not be said that the defendant would give any compensation for the light abstracted. His Honour being clear the principle of law contended for by the defendant was untenable, it was unnecessary to go into the evidence which had been adduced. It would be a very difficult thing to convince them that any substantial compensation would be given for the loss of light. The plaintiffs must, therefore, have the injunction prayed for; and the defendant must pay the costs of the suit, including the costs of a motion to dissolve an interlocutory injunction.

LECTURES TO WORKMEN.

Mr. J. M. CAPES delivered his second lecture on "Forged Ironwork," at the South Kensington Museum, on Monday evening last. He pointed out that among the peculiar qualities of iron, in which it is distinguished from stone, wood, and other materials used in art workmanship, its chief characteristic is tenacity, or toughness. This quality allows of, and calls for the adoption of a special lightness and delicacy, both in design and detail, which are unattainable in any other material. Its influence was shown in calling into play the skill of the artisan in the various processes of his work. This peculiar quality of iron, together with the actual construction of every portion of any work, should be made evident to the observer, on the principle that every work should not only be substantial, and durable, but should appear to be so. The lecturer offered an exposition of the rule that all counterfeits should be avoided in art of every kind, and gave illustrations of the complete or defective observance of these rules. Illustrations were given of the beautiful effects to be produced by the simplest treatment of wrought iron when handled by a workman familiar with its processes, and working upon designs calcu-

lated to bring out its characteristic qualities. As an example of singular strength and propriety of construction, beauty of design and excellence of workmanship, the screen in the Church of Santa Croce at Florence was instanced. In this case the effect is produced chiefly by the grace of the structural lines themselves, with but little addition of purely ornamental details.

CONDITION OF DORKING.

We are glad to find the county press have received our observations in a proper spirit. The *Express*, after reprinting our observations, says:—

"The above description of our town and its inhabitants is taken from the *Builder* newspaper of Saturday, 5th inst. Though the strictures of the writer are in many respects truthful, we cannot for a moment endorse the gloomy opinions he has given expression to, and certainly must protest at the epithet he has bestowed upon it, viz., of being 'a die away place with a mildew upon it.' That much requires to be done in sanitary matters most Dorkingites will readily admit; still, the place is not quite so black as it has been painted, and will, we believe, bear a favourable comparison in point of health with neighbouring towns and other localities of equal population and similar conditions in different parts of the country. As, however, a perusal of the article may be interesting to our readers—both promoters and opponents of 'Local Government'—we give it *in extenso*, and trust its publication will have a salutary effect, and lead to the adoption of some efficient measure with the view of remedying the evils complained of."

So do we. We have no other motive.

Sir,—Your article upon Dorking is much more true than pleasant. Mr. Sanbergue has devoted a great deal of time, trouble, and expense in endeavours to improve the sanitary state of Dorking. It is, indeed, a serious question, for the town is never free from fever; but the opponents of sanitary reform say fever always was and fever always will be, and death always was and death always will be. B.

SCHOOLS OF ART.

The *Stourbridge School*.—The annual meeting of this school has been recently held. The Hon. and Rev. W. H. Lytton presided, and there was a considerable attendance. The report of the council stated that the results of the Government examinations had been highly satisfactory, a large number of students having distinguished themselves in the higher grades. It was a source of congratulation that the evening class had maintained its numbers as well as its efficiency; but the council regretted that, from a variety of circumstances, the ladies' class had greatly decreased in numbers, though the fees were only 10s. 6d. per quarter. The school had now been in existence for twenty years, and had done great service to the glass trade, enabling it to maintain its position in the markets of the world against what would otherwise have been formidable rivals. Masters and workmen had likewise benefited by it, and the council expressed a hope that the glass-blowers, as well as other branches of the trade, would avail themselves more of the advantages offered them by the school. The building was admirably adapted for a school of art. It was the property of the council, but it was encumbered with a debt of 600*l*. A lady had made a very handsome offer towards the payment of that debt; but the council had been prevented by badness of trade and other circumstances from appealing to the public for aid. The report of Mr. Bowen (master) stated that he had introduced the study of flowers and foliage as the best exercise for young designers, and had found the system to be attended with beneficial results. He had also introduced actual designs applicable to one of the staple manufactures of the district, and three of the students who had produced their works were awarded by the Government studentships on the school for one year. The report concluded with the expression of a regret that there was an indisposition in the schools of art in this country to study the human figure, and the master believed that to the neglect of this might be traced the superiority of the French designers in taste. The reports were adopted, and the chairman proceeded to distribute the prizes to the successful students for the last two years.

The *Darlington School*.—The annual exhibition and *conversations* in connexion with this institution have been held in the Mechanics' Hall. The attendance, though not numerous, was fashionable, and the hall was adorned by some of the best works of the students, and a large collection of engravings, etchings, and drawings, from the South Kensington Museum. Mr. J. Dinnsdale was one of the principal exhibitors; three studies of the human figure by him have been selected for national competition. The first of the set is a human skeleton, in pen and ink; the second represents the muscles of the human body, and is done in Indian ink; the third is a chalk drawing of the human figure. The subsequent meeting was presided over by Mr. J. W. Pease, M.P. The eleventh annual report of the school congratulated the friends of the institution and the subscribers, on its continued and increasing success. At the end of the year 1868, the average attendance had increased about 14 per cent. above that of the previous year, and the past year showed a further increase in the average of about 8 per cent., making a total of 22 per cent. in two years. The annual examination took place on the 9th and 10th of March, and out of ninety-six students who presented themselves fifty-seven were successful, and eight were awarded prizes for special proficiency. About 300 works, executed by sixty-seven of the students, were forwarded to London for the annual examination, and those of seventeen students were selected for an award, in the elementary section (the same number as in 1868). The chairman, in the course of his address, as reported in the *Local Times*, said:—

"It had been his lot that morning to look over a number of plans and designs of a proposed Convalescent Home at Saltburn, which had been received in answer to an advertisement issued by some of his relatives, and it gave him great gratification to find that those from Darlington were excelled by none, either in artistic beauty or in practical utility. If there was one art in England which had been neglected more than another, it was that of ornamental building. Perhaps this was in no small degree contributed to by the fact that the devices resorted to for the supply of provisions for disastrous wars caused heavy taxes to be laid upon all our buildings, and even upon the very light of Heaven, which was to enter them. When they recollected that on every window, on every brick in its rough state, and especially on every moulded brick, and on every piece of timber used in the erection of a house, there was a heavy charge for duty, they had no cause to wonder at the progress of architecture being slow, and now that these hindrances were removed they found that beautiful buildings of enormous dimensions were rising on every side to embellish our country for all time. During the last two or three months he had visited some of the finest galleries of art in Europe, and he had been astounded to find the degree of perfection arrived at by the artists and architects of 400 or 600 years ago. After running through those magnificent galleries of Venice, Munich, and Vienna, and realising the beauty of thought betrayed by the old masters, and the charming way in which they depicted it,—after witnessing the wonderful art with which they gave an expression to every feature of the face, and a story to every picture,—he was led to the conclusion, so often arrived at before, that there was yet a great field of discovery before the student of to-day, in ascertaining how these colours had been mixed, and an extensive field of labour in endeavouring to attain that delicacy of touch which they had secured."

PRIZE MEETING OF THE FEMALE SCHOOL OF ART.

The lecture theatre at the South Kensington Museum was quite filled with an audience of charming young ladies on the 9th inst., Sir Stafford Northcote, M.P., presiding. Mr. Valpy read the annual statement, from which it appeared that the students on the books at present number 122, as against 141 at the close of the summer. The school is free from all debt. Ninety-nine students sent up, on the 9th of April, a total of 1,332 elementary, and 319 advanced works, in competition for national prizes, and the Queen's Gold Medal. Eleven third-grade prizes were awarded in the elementary section, and twelve prizes in the advanced section, making a total of twenty-three prize drawings. The Queen's Gold Medal has been won by Miss Julia Pocock, and her Majesty has been graciously pleased to purchase one of her water-colour drawings, "A Head from the Life." The National Silver Medal has been awarded to Miss Mary Whitman Webb, for studies of flowers from nature. National Queen's Prizes, consisting of books, have also been awarded to Miss Julia Pocock, for life studies of the figure; to Miss Webb, for flowers from nature; to Miss Alice Blanche Ellis, for flowers from nature; to Miss Emily Slous, for a modelled hand from nature; and to Miss Aimée Messenger, for a botanical sheet. Miss Julia Pocock had taken the 5*l*. 5*s*. offered by Mr. Alexander Macarthur, for the best modelled hand from nature. Miss Ellen Maorae and Miss Sarah McGregor gained the two prizes

for designs for folding screens, given by Messrs. Turner & Sons. Miss Gann gained the third place for the thirty-nine bonuses offered by the Committee of Council on Education, to be competed for by 199 head masters and mistresses of schools of art throughout the kingdom.

The Chairman, aided by Professor Donaldson, having presented the various prizes, pointed out that in this school the prizes represented work done in common with schools of art all over the country, and indicated not only that the successful pupils had done well among themselves and in their own school, but that they had attained a certain standard in competition with all other art schools. The result of these competitions and examinations proved that the school was doing a good work. He had known something of this school for a long time, and he remembered it when it was in a very different position from what it was now in, for in its early history many difficulties were recorded. He contrasted the present excellent premises in Bloomsbury with those which the school had in its early career when turned out of Somerset House, the confined premises at that time occupied being known as the "Reap-shop." Now, he said, it had everything that was needful—good rooms and good teachers. He proceeded to point out that much more was in consequence now expected of teachers and students than could have been expected of their predecessors. If the students to whom these advantages were open pursued their work in a slovenly or desultory manner, they were committing a fraud, not only upon those who were immediately interested, but upon the public. Complaints were now heard louder than ever respecting the want of art-culture in our population, and of the necessity of its application to our manufactures and designs, and it had been found that where proper attention had been bestowed upon studies of designs and manufactures, the character of English art had been raised. Her Majesty took great interest in the school, and, if for no other reason than loyalty, the students should endeavour to use their best exertions in their studies. He had referred to the interest felt in the extension of art education for the benefit of English manufactures, a feeling which was expressed by many under what was known as "technical education." He most cordially desired to see technical instruction promoted, and he believed such instruction to be of high national importance. But he thought that those who were pressing for this kind of instruction should not forget that it was possible to improve, and to connect a development in that kind of instruction with the maintenance of another kind of instruction—viz., in literary education. In the report of a Commission appointed some years ago by the Emperor of the French to examine the condition of technical instruction in Germany and Switzerland, a story was told of a devoted friend and successful cultivator of the sciences. This gentleman, it was there stated, was originally persuaded that scientific study was calculated, as well as the culture of letters, to form the habit of clearly expressing thought in good language, at the same time that it was capable of giving a higher tone to the mind. But, being appointed professor in the Munich Polytechnic Institute, he had to deal with pupils from the trade school or scientific gymnasium, and also with those from the literary gymnasium. He then soon made the discovery that, though the pupils trained to scientific studies appeared at first most competent to follow out their applications, those who came from the literary gymnasium, after completing their studies there, were not long before they surpassed the others. He (Sir Stafford) had brought that quotation with him that he might impress upon the minds of those who heard him what he was desirous of expressing, for what was said in that report of literature preparing men for the study of science was equally true of literature preparing the mind for the study of art. Those who studied art should not only aim to attain the mechanical skill of art, but they should attain to the cultivation and development of their minds with a view of making a better use of that mechanical skill. It was to be remembered that art was not a matter of so much colour upon a bit of paper, but was the expression of ideas, and the mind must be cultivated in order to obtain those ideas. He declared that it was his intention to give a prize to encourage this literary teaching and cultivation in connexion with art studies. He believed the school would take a high place in the promotion of education generally in this country. It would

also be the means of raising the status of women. At present it was a most melancholy sight to see one-half of our population treated as if it was an *affaire de bas* to provide for female education. One of the results of education would be to open new fields of employment to female artists and art-teachers, and women would take a place more satisfactory to themselves and more beneficial to the country as a whole.

Sir Digby Wyatt also made an interesting address, in the course of which he expressed a hope that by means of these schools the females of England would acquire that degree of independence which it was desirable they should possess.

Mr. Godwin expressed his intention of offering a prize of 5l. 5s. for the best shell cameo cut in the school, the cameo remaining the property of the artist. He then moved a vote of thanks to the President and Commissioners of the Council on Education for the loan of the lecture theatre, and to Mr. Cole, the president, and other officers of the Museum.

This was seconded by Professor Donaldson, and carried.

Mr. H. Cole returned thanks, and proposed thanks to Sir Stafford Northcote, which brought the meeting to a close.

ELEVATED FOOTWAYS FOR OVERCROWDED THOROUGHFARES.

OBSERVING in your publication of the 1st ult. a paragraph on "The Proposal for Widening the Streets of London," and referring to an illustration of Mr. Taylor's suggestions, where that gentleman proposes to set back the shops, and to form a colonnade, arcade, &c.; and considering that London has put its veto against any such arrangements by sweeping away some years ago the colonnade in Regent-street, where it was not only found to be a nuisance in the congregating of loiterers, but inimical to the interest of tradesmen, as their goods were in perpetual obscurity by being in its frowning shade,—I beg to submit a sketch for your perusal, which proposes to construct in overcrowded thoroughfares elevated footways over the carriage-way, by placing a series of iron columns on the line of the kerbs of the present footpaths, ranging with the lamp-posts (the columns would answer for the latter), and throw light ornamental girders from each column over the carriage-way, and to form on each side footpaths of suitable widths, with crossings at convenient distances, leaving the intermediate space open, the footpaths to be of stout glass, or other suitable material. Access to the footpaths to be gained by staircases springing from the most convenient lateral streets, clear of the main footways. By such a method there would be little or no obstruction of light, not any obstruction of thoroughfare to either carriage or footway below; it would afford every facility to pedestrians in getting through our, at present, most densely crowded streets, and would be the means of giving a perfectly safe crossing, by keeping clear of the carriage-way. As our most crowded streets are all places of business, should there appear to be any objection in raising a footway to the level of the first-floor windows, let the tradesmen turn these windows into show-rooms. I apprehend there would be nothing lost by this.

C. TATE.

OPENING OF CORN EXCHANGE AND FREEMASONS' HALL, WIMBORNE.

THE new building, with conversion of an old, forming a corn exchange and Freemasons' hall, has been inaugurated. The site is that of the old Wesleyan chapel, near the corn-market, which was purchased at a cost of 500l., by a limited liability company, composed of Freemasons, with shares to the amount of 1,000l., and the remainder required is being raised by subscriptions. The old chapel was demolished, so far as it was found necessary to conform with the designs for the new pile, which had been made by Mr. Walter J. Fletcher, of Wimborne, architect. The space or yard at the entrance was all taken in, and the front of the exchange carried out to the full extent of the property. Then sufficient space was taken out of the building to provide a suitable lodge-room, with its necessary offices, &c., and the whole of the remainder of the space was thrown into the large hall. The building is erected in the Doric style, and consists of a large hall to be used for the purposes of a market-room, county court, and assembly-room for public

purposes, which is 60 ft. in length, with an average width of 35 ft. At the main entrance from the open space known as the corn-market, is a portico with three-quarter columns on either side, and capped with an entablature. Above this, on a garter on the pediment, is the motto, "Audi, Vide, Tace," with the square and compasses and the number of the lodge, 622. The hall is approached by a portico, in which are folding doors lighted with glass panels. At the west-end the room is considerably wider than at the entrance, and here is a raised platform which will be used for county-court business, while it can be extended when required for entertainments and other public purposes. The room is lighted by a soffit light in the shape of a Maltese cross, the outside parts being formed of panes of glass, 6 ft. square, embossed with Masonic devices; the central part forming the circle of the cross is formed by a dome, also filled with ornamental glass, and supplies the ventilation. Around the ceiling is a wide double cornice, which tends to take off the deformity of the room. There are two windows on the east and four on the north sides of the room, of figured glass, the circular headings being filled with symbols of Masonry. There are two fireplaces with marble mantel-shelves, and stalls have been provided for the dealers attending the exchange. Underneath is a large cellar, and behind are lavatories, retiring-rooms, and other conveniences. The lodge-room is reached by a flight of stone steps, and the entrance will be from the north side of the building, where there is a porch of similar design to that at the entrance of the corn exchange. This apartment is 28 ft. in length by 18 ft. wide. Both the large hall and the lodge-room are lighted by sun-burners from the ceiling, and bracket lights are also affixed to the walls of each apartment. The floor is of pitch pine, 1½ in. in thickness, in narrow widths, and connected with galvanised iron dowels. The building was erected by Mr. Richard Froud, of Longham, and Mr. Edsall, of Wimborne and Poole, carried out the decorative arrangements, Messrs. Hopkins & Pike supplying the gas fixtures.

FROM AMERICA.

THE colossal bronze statue of Abraham Lincoln, to be erected in Union-square, New York, has just been completed at the works of Robert Wood & Co., in Philadelphia. It was cast from a model by H. K. Brown, is 11 ft. high, and is said to be a faithful likeness of the original.

Mr. James Lenox, of New York, has asked the Legislature of that State, now in session at Albany, for an act of incorporation for the Lenox Library, an institution which he proposes to found. He offers a site of two acres of ground, with 300,000 dollars, for the erection of suitable buildings, declaring that if this amount should be insufficient for the purpose he will give as much more. He intends handing over to the trustees, as a nucleus for the library, his entire collection of paintings, statuary, and precious volumes, adding that no amount of money shall be withheld that may be needed for making the Lenox Library the largest and most excellent institution of the kind in the United States.

A dollar subscription is in progress at Dubuque, Iowa, for a monument to the memory of the Legislator of that city. The inscription on the old cedar cross over his grave was:—"Julian Dubuque, Miner of the Mines of Spain, died March 24th, 1810, aged 45½ years."

A second tunnel is to be built under the Chicago River at Chicago, for the purpose of connecting the two divisions of the city. The work has already begun. Under the river, which is 300 ft. wide, it is to consist of three passageways. The east one for foot passengers, and the other two for horses and vehicles drawn by horses. The east passageway is to be 12 ft. high between the bottom of the upper arch and the top of the invert. The width of this passageway is to be 10 ft. The other passageways are to be 11 ft. wide. The opening approaches to the tunnel on each side, and the passageway for horses, are to be paved with wooden block pavement (the whole distance being 1,890 lineal feet), resting on lake shore sand. The contract requires that the river shall be entirely free and unobstructed, as also North and South Water streets, by the 1st day of April, 1871, and the tunnel to be completed and ready for public use by the 1st day of July, 1871. This is about the same length of time employed in the construction

of the Washington-street tunnel. The total cost of La Salle-street tunnel is expected to be upwards of 475,000 dollars.

Under the heading, or "caption," as the *Call* calls it, of "How to Succeed," that paper urges that mechanics should establish business for themselves as soon as they possibly can. No man, as a mere *employee*, gains the position which he ought to hold in the community. The mechanic, after having served an apprenticeship, may find it best to labour for those who are established in business, until he has gained experience and a certain amount of means; but as soon as these points are secured, it is his duty to become a master of his profession, and to place himself in communication with those who seek the services of his craft. The man who works for himself is his own master, which is one important consideration with the mechanic who places a proper estimate upon himself. And then, in times of depression, the man who carries on business need not necessarily be thrown out of employment.

DISSENTING CHURCH-BUILDING NEWS.

Hull.—Fish-street Congregational Church has recently been re-opened, after undergoing a renovation and reseating. The old front, which stood some 8 ft. from the street line, has been taken down, and the church brought out to the street, whereby additional accommodation has been obtained in the gallery. The new front is erected in an adaptation of the Italian style. The building is re-seated throughout in red fir and pine, slightly stained and varnished. A new communion-rail, table, and pulpit have also been fixed, these being in oak. The vestibule is paved with Maw's plain tiles, laid to a pattern. The building is lighted at night by means of two large sun-lights, with the brackets beneath the galleries. Mr. Samuel Musgrave, of Hull, was the architect.

Liverpool.—At the corner of St. Domingo-vaie, Breckfield-road North, a piece of land has been purchased for the erection of a Methodist New Connexion Chapel and Schools. The expenditure, exclusive of the cost of the site, will be about 4,000*l.* Towards this sum there is in hand, or promised, 1,025*l.* It is intended to have the schools ready for occupation by the beginning of April next, when divine service will be temporarily conducted in them till the completion of the chapel, which will be proceeded with without delay. The chapel will be built in the style of the thirteenth century, and the school-buildings will comprise two large school-rooms, with class-rooms underneath. There will be accommodation in the chapel for 800, and the edifice will contain two side and one end gallery, besides an organ gallery. There will also be a small tower and spire, about 120 ft. high, and the whole structure will be built of red sandstone, with Stourton stone dressings. The architects are Messrs. Hill & Swann, of Leeds and Sheffield. Mr. Thomas Cheatham is chief contractor, and Messrs. Grindrod & Hargreaves are sub-contractors. The chief stone of the schools has been laid.

Croft (near Darlington).—The foundation-stone of a Wesleyan Methodist Chapel has been laid at Croft. It is intended that this new place of worship, the first which the denomination has erected in the village, shall accommodate 180 persons, and its cost is estimated at 550*l.* The contractor for the brickwork and plastering is Mr. Joseph Simpson, and the joiner work is in the hands of Mr. Martin, of Darlington.

Stratford.—The memorial stone of a new Presbyterian church has been laid at the corner of Forest-lane, Maryland-point, Stratford. The builder is Mr. Ennor, and the clerk of works, Mr. Gilon. The church will hold between 800 and 900 persons. The spire is 120 ft. high; the cost of building upwards of 2,000*l.*

Ilkeston.—The Wesleyans of Ilkeston have determined upon building a new chapel in New-street, at a cost of 1,000*l.* Their present chapel, which was built some years since, at a cost of 600*l.*, is in Market-street, an inconvenient place; but the proposed new one will be central. The ground has already been purchased, the price paid being 200*l.*

Staindrop.—A new Wesleyan Methodist chapel was opened in Staindrop, on Tuesday last. The building is of stone; the style Romanesque. The interior has a wagon-headed panelled ceiling, and is fitted up with open benches, to accommodate 200 people. The architect was Mr. John Ross, of Darlington.

Watford.—The new Wesleyan chapel which has been erected in the Queen's-road, at a cost of 1,837*l.* has been opened. The chapel is in the Early English style. The building is ultimately designed for a schoolhouse, as it is proposed to erect a chapel on a piece of land adjoining, but the present building will probably be used for some years to come as a chapel. It contains sittings for about 300 persons. The architect was Mr. Pearson, of Rickmansworth, and the contractors were Messrs. G. & J. Waterman, of Watford.

Shrewsbury.—The memorial stone of St. Nicholas Presbyterian Church has been laid. The plans of the church and school-room were prepared by Mr. R. C. Bennet, of Weymouth, architect. The tender of Mr. Farmer, builder, Ironbridge, was accepted. The total cost of building and site will be about 3,500*l.*

ENGRAVERS OF ORNAMENT.*

A USEFUL little manual of the engravers of ornament, which might well bear elaboration on some future occasion, has been compiled by Mr. Marshall. It contains an alphabetical list of 177 engravers who have occasionally turned their attention to ornament, and gives a few particulars of each of them, briefly told, with intimation of the absence or presence, the abundance or scarcity, of specimens of their works in the South Kensington establishment and in the British Museum. The author says he compiled it for the use of schools of art and public instruction generally. Doubtless it will be useful for both purposes; but it would have been more so if it had been less of a skeleton. The facts selected for mention in the account of each engraver are given in a style which we must be forgiven for calling as dry as old bones. It can scarcely be considered encouraging to students in schools of art to see the birth, the life, the works, and death of an eminent engraver dismissed in six lines. Yet Mr. Marshall has, in several instances, disposed of a gifted and industrious lifetime in still less of his space. This is how he sums up the labours of Rooker:—

"Rooker, Edward, born at London, *c.* 1712. This designer and engraver possessed an admirable talent for engraving architectural views, of which he has given an extraordinary example in his large plate of the section of St. Paul's Cathedral, from a drawing by Wale. There are by him also six views in London, after P. Sandby; twelve views in England, after the same; and others."

And then Edward Rooker is laid aside; and Jean le Royer brought before us. Another English engraver, whose name calls up departed coteries, is treated with similar brevity:—

"Besire, James, born at London, 1740. Little is known of the circumstances of his life. He engraved some of the plates which illustrate the publications of the Society of Antiquaries."

And then Antoine Francois Baudouin, Fleming, is introduced to us. Some of the most known foreign engravers are, however, treated at greater length. We would that Mr. Marshall had made a few inquiries whereby he might have put us into possession of new particulars respecting English engravers. His selection of these has been somewhat arbitrary. Hogarth is not mentioned, although his first efforts were exclusively heraldic, and many of his pieces may be as strictly deemed ornamental, by virtue of their details, as those of Albert Dürer, who is included in the catalogue.

Students consulting Mr. Marshall's book to settle the disputed point respecting the discovery of the origin of engraving, will find that he attributes it to Finiguerra, in the stereotyped manner, although this is now denied. It would have been better to have warned them of this last fact than to have closed their eyes to it.

A point in the little work that must be mentioned with praise is the insertion, in nearly every case, of the monogram or initials affixed by each engraver to his works. These signs are given in facsimile, which will render the identification of a print easy to those to whom familiarity with the subject has not rendered the information needless. Taken collectively, the signatures are exceedingly interesting. Prefixed to the biographical notices is a chronological table of the engravers of ornament, of the Italian, German, Dutch, French, and English schools. A little more amplification will render the work of more serious service. It is a nucleus worthy of the additional labour.

* Handbook of Engravers of Ornament. By Julian Marshall. Printed for her Majesty's Stationery Office, 1869.

Books Received.

"ATCHLEY'S Builders' Price Book for 1870" includes some valuable additional matter, such as prices for the West Riding of Yorkshire; a long list of the principal marks or brands which are to be found on the ends of most deals, planks, &c.; and an elaborate paper by Mr. F. Campin, C.E., on the Application of Iron to Building Purposes. Touching the marks, we cannot go so far as the writer of the Introduction, who says,—"With these tables of reference it is possible for any one quite ignorant of the trade to decide on the description of a parcel of deals, &c., before him, so far as to being certain from whence they came, and the quality which he is buying." Some additional information would be first needed; nevertheless, the list is a beginning, and may lead to what will be a valuable contribution.—"The Body and its Health,"—a Book for Primary Schools. By E. D. Mapother, M.D. Dublin: Falconer. London: Simpkin, Marshall, & Co.—A tiny book on physiology, by a Professor of Physiology, of the Royal College of Surgeons, however well adapted for children—and this one is so—may well be read with advantage by many a parent and other grown person. It is illustrated by twenty-one engravings, but there is room for more.—"A Twelfth Scheme for the Prevention of the Damage by the Flooding of the River Irwell," which flows past Manchester, has been proposed in a printed form by Mr. S. C. Trapp, late borough surveyor of Salford. Mr. Trapp proposes a row of sluices at each of the weirs, such as Mr. Bateman has proposed at Throstle Nest. The cost, he says, would not exceed 15,000*l.* for each weir through the borough, or 60,000*l.* for the four, viz., Douglas, Adelphi, Throstle Nest, and Mode Wheel; including telegraphic communication from one to another of the weirs and sluices.

Miscellaneous.

Columbia Market.—The wholesale fish-market, which is to be held here, will open, without any formalities, on Monday morning next. After the wholesale market is over, many persons who have secured standings intend to carry on a retail market there in fish on Thursday, Friday, and Saturday next. Owing to the completion of the railway system over England, packages of the rougher sort of fish (which it will be of great advantage to the poor to be enabled to buy at a cheap rate) can now be brought to London at a low cost. The loan of 27,000*l.* made by the Public Works Commissioners to improve Great Yarmouth harbour (15,000*l.* of which are already expended), is expected largely to benefit the fishing interests. We shall be very glad indeed to find the market successful, but must confess that we do not expect it will be so immediately. The central area has been covered in, and the floorings are formed with Seyssel Asphalt, by Messrs. Armani & Stodart, under contract with Messrs. W. Cubitt & Co., the builders.

Edinburgh Architectural Association.—The usual fortnightly meeting of this Association was held last week, in the Rooms, 5, St. Andrew-square, Mr. William Beattie, architect, in the chair. After the election of several new members, a paper was read by Mr. W. Campbell, entitled "Plaster Work, Ancient and Modern." Mr. Campbell gave a brief historical *resumé* of the origin and development of plaster work in ancient times, proving its extreme antiquity by a number of quotations from the Old Testament and various Greek and Roman authors. Among existing specimens of old plaster work, few remain anterior to the Gothic period of architecture. Mr. Campbell called attention to a number of fine examples of old work to be found in Edinburgh and its neighbourhood. In concluding, he pointed out the chief deficiencies of modern plaster work, and gave some valuable practical hints as to how these might be remedied. A discussion followed the reading of the paper, and the thanks of the meeting were awarded to Mr. Campbell.

St. James's, Taunton.—The tower of St. James's Church, Taunton, is to be pulled down, and a *fac simile* of it is to be built, at a cost of between 3,000*l.* and 4,000*l.* The tower, which is a well-known specimen of the Perpendicular style, has long been in a dilapidated state.

Society for the Encouragement of the Fine Arts.—Mr. Hyde Clarke gave a lecture to the members of this society on Thursday, on "The Culture of the Fine Arts in its Influence on Industrial Purity."—Mr. Henry Cole, G.B., in the chair. The lecturer, after noticing the various aspects under which the subject might be treated, remarked that in nature the beautiful being as widely distributed as the useful, he could not consider the various bodies of artists as mere ministers to wealth and luxury; but, on the contrary, he thought it would be found now, as in former prominent periods of the world's history, that art and commerce always flourished together, and that were it even possible to suppress the fine arts in England it would be necessary to restore them on account of the rivalry of other nations. Next, passing in review the progress of art in England during the present century, and the various events favouring national and foreign industry, he observed that it was not until 1830 foreign rivalry was seriously felt, and then commenting on the great services rendered to art by the chairman in 1835, he ascribed the further improvement of the public taste to the influence of women, whose preference for the more artistic foreign productions, especially in the article of dress, had forced our manufacturers to pay more attention to beauty of form and colour. He concluded with some remarks on the more intelligent administration of the fine arts in France, Prussia, and Switzerland, compared to that of England, insisting that wherever the public taste was neglected the public purse suffered. Dr. Heineemann addressed the meeting with reference to Continental and Prussian art, and was followed by Captain Britten, Mr. Tidey, and Mr. Dutton on the different points raised by the lecturer, and by Mr. Cole, the chairman, who, not agreeing that we were so backward with respect to foreign nations, characterised French art as epicurean, or most excellent when connected with the cultivation of the senses.

The Watford Sewage Question.—At a recent meeting of the Local Board, the chairman read a report of the surveyor (Mr. Lovejoy), which was accompanied with plans and estimates of the proposed deodorising and irrigating works. He proposed to alter the tanks, which were built for the liming process, by raising the bottom and the side and the under walls, and to construct a carrier, filters, &c., as shown in the plans and sections. With regard to the irrigation works, for the quantity of land proposed to be taken, the engine and pumps at the outfall works would be amply sufficient. The report then proceeded to describe the arrangements and process. The cost of these works was estimated as follows:—Alterations to tanks, with filters, sluices, carrier, concrete, brickwork, &c., 235l. 8s.; sewers, 507l. 14s.; irrigation works, 264l. 9s.; total, 1,007l. 11s. Mr. Humbert said Lord Essex had offered to let land to the Board for 2l. 10s. an acre, and to sell the engine and pumps, &c., for 125l., to be released from all obligations to the Board. Mr. Austin, C.E., explained his process, and exhibited a model of his portable cesspool and filters. Mr. Trestrail recommended his A B C process, and offered to work the system at Watford for 300l. a year, or take the manufactured sewage alone as his remuneration, the Board paying the cost of working. Mr. Humbert said that when the tanks were altered, they might adopt either the Stroud or the Leamington system, or use McDougal's powder. Nothing could be more economical than the use of sulphuric acid and clay, if it were not for the royalty of 50l. a year. Ultimately, the further consideration of the subject was adjourned.

Fall of a Warehouse at Stroud.—The warehouse of Messrs. Ford, Brothers, adjoining Ryeford Mills, Stonehouse, has suddenly fallen in, burying beneath the debris a siding running from the Midland Railway into the mills. The warehouses, at the time of the accident, contained 5,000 sacks of grain, and the whole of this, together with two counting-houses and their contents, were precipitated on the siding and into the canal, which was entirely blocked up. The warehouses were six stories high, and built principally of stone; but there is not a single wall left standing; all is a mass of ruins covering an area of about 100 ft. and upwards of 30 ft. high. Fortunately at the time of the accident there was no one on the premises. The general opinion is, that the warehouse was overloaded with grain. The damage is estimated at between 1,000l. and 1,500l.

Sanitary Condition of Exeter.—The death-rate in October, November, and December, 1869, was unusually high in Exeter. The deaths were at the rate of 30 in the 1,000 per annum, while the rate for the whole of the United Kingdom was only 23½. The average death-rate in all the great towns put together was 25½ to the 1,000, while in the fourteen monster towns and cities in the kingdom the average was 27½. Exeter was therefore considerably worse than any sort of fair average that could be struck. There are very large towns worse than Exeter, viz., Sheffield, 30½ to the 1,000; and Manchester, 30½ to the 1,000; but all the other great towns and cities showed less mortality in the quarter. Of the second-class towns, to which class Exeter belongs, there are forty-six, of which only three are worse than Exeter, viz., Blackburn, 38 to the 1,000; Swansea, 31½; and Gateshead, 30½. Of the 974 deaths in Exeter, in 1869, 578 took place in St. Sidwell's district (containing the parishes of St. Sidwell, Holy Trinity, St. Mary Major, St. Martin, and the Close), and the remaining 396 in St. David's district, comprising the rest of the city within the municipal boundaries. During the latter months of last summer the nuisance of the mill-loom had become more intolerable than ever, as were the foul odours that pollute the valley of Holloway-street. The people who live in that neighbourhood smell the odour in their sitting-rooms and bedrooms, even now, when doors and shutters are closed.

New Baths for Southport.—The new baths about to be erected on the site of the late Victoria Baths, Promenade, will be on a more extensive scale than these were. The accommodation will be as follows:—*Gentlemen's Department*.—First-class tepid swimming-bath, 70 ft. by 30 ft.; second-class ditto, 61 ft. by 27 ft.; first-class cold plunge-bath, 46 ft. by 26 ft. Five first-class private baths, each with two dressing-rooms, and shower and douche baths, and water-closet attached; two first-class private medicated bath-rooms; twelve second-class private baths. *Ladies' Department*.—First-class tepid swimming-bath, 66 ft. by 28 ft.; second-class ditto, 50 ft. by 26 ft.; first-class cold plunge bath, 27 ft. by 14 ft. Seven first-class private baths, double, as for gentlemen; two first-class private medicated bath-rooms; eight second-class private baths. The whole of the baths will be on the ground-floor, and will be lighted by top lights and ventilated. The entrance, or principal front, will be towards the Promenade, the centre being two-storied. The style of architecture is Palladio-Italian, and the material externally red brick and stone. The directors have arranged to provide Turkish baths. The architects are Messrs. Horton & Bridgford, of Manchester; and the engineer is Mr. Charles H. Beloe, of Liverpool.

The East London Water Supply.—The water of the East London Water Company is declared by Professor Frankland, in a report on the subject, to be "very turbid, owing to the presence of much suspended organic matter full of living organisms. Among the latter vibrios are found." It further appears that in 100,000 tons of water the East London Water Company present their customers with 35 tons of foreign solid matter, including sewage. As the *Tower Hamlets Independent* remarks, "a law which punishes a little grocer for selling dirt as 'tea-dust' ought to be made to reach a body of monopolists which sells sewage under the title of 'pure water.'" The Whitechapel and Limehouse Boards of Works are moving in the matter. The Limehouse Board, at the suggestion of Mr. Arthur Harston and Mr. Blundell, have referred it to a committee for inquiry and report; and the Whitechapel Board have written to the Board of Trade on the subject.

Sewage Self-cleansing Process.—Mr. Latham, the engineer of the Croydon Board of Health, has had one of his patented solid sewage extractors put up at the town-sewage tanks at Brimstone Barn; and the editor of the local *Advertiser* says it is working efficiently. He compares it to a huge tambourine on edge, with six shelves crossing it. The solids are separated, and hence the sewage cleansed, by lifting these solids into barrels, to be emptied by Archimedean screws into tanks, where the soil is mixed with house refuse, to be sold as manure. The water passes through a turbine, and turns the separator. The town sewage is thus filtered by help of one man. New charcoal ventilators for the sewers, patented by Mr. Latham, are being made at an iron-foundry in Croydon.

Railway Matters.—Through tickets round the world by rail and steamer, are being arranged for by one of the leading eastern railways of the United States. The tickets are to be good until expired, giving travellers opportunities to make excursions in Japan, China, the Holy Land, or wherever tourists may be disposed to leave the main line of travel. The prices are fixed from New York as far east as Alexandria, in Egypt, and west to Yokohama and Shanghai. An agent has gone out to arrange with the English steamship lines between China and the head of the Red Sea and the railway to Alexandria. The whole trip can be made within ninety days, and the entire cost will be at the utmost 1,200 dollars in coin.—The traffic receipts of the railways in the United Kingdom for the week, ending 11th February, 1870, upon a mileage of 12,544½, amount to 736,314½, being equal to 58l. 14s. per mile. For the corresponding week of last year the receipts were 701,107l., the number of miles open 12,335, or 56l. 17s. per mile. A comparison of the two weeks shows an increase in the aggregate receipts of 35,204½, and in the number of miles open of 209.

Artisans' Dwellings and the Co-operative Movement.—The annual *soirée* in connexion with the Artisans' and General Dwellings Company was held on the 9th inst. at Radley's Hotel, Blackfriars. The chair was occupied by the Earl of Lichfield, who said that by means of the co-operative movement, under which the society was established, it encouraged habits of providence, and enabled its members to obtain better houses and at a lower rate than they otherwise could. The Earl of Shaftesbury said the co-operative movement had taken hold of the people of England and the whole of the Continent of Europe, as well as of America, and Englishmen had the honour that the movement originated in this country. All classes of society were dependent on each other, and what was wanted in the present day was a grand union of the classes, with mutual respect, kindness, and succour. Lord Elcho thought nothing was better calculated to bring about a union of the different classes of society than the establishment of such societies as this.

The Accident at Abbey Mills Pumping Station.—In reply to Mr. Knight, at the Court of Common Council, Mr. Deputy Lowman Taylor, one of the representatives of the City at the Metropolitan Board of Works, said he had communicated with the engineer as to the cause of the accident at the pumping station, and had been informed that the air chamber, which was placed in the centre, was of cast-iron, and from some unexplained cause the air in it must have been exhausted, so that it received a shock direct from the pumps. The damage was in the course of being repaired, and steps were being taken to prevent any stoppage of the works should any accident occur in the future.

Proposed Public Building for Free Library at Nottingham.—At a preliminary meeting, convened by circular, held in the Museum, Wheeler-gate, it has been resolved to form a Public Free Lending Library, a Reference Library, Reading-rooms, Museum, Lecture-rooms, &c., for the town. An attempt will be made to obtain funds towards the building such an institution, to be vested in the town council for ever, and to be managed in accordance with the Free Library and Museum Act already adopted by the town. Donations are solicited, in quarterly or other instalments within one year, so that 1,000l. or upwards may be raised. A provisional committee was appointed.

Stained Glass and Symbolism.—The Bury Town Council is troubled about what has been termed a "Pope's window," which has been inserted in St. James's Church, without, it is said, the sanction of the Council. The dispute has been carried on between two Catholics, one of whom thinks the church ought not to be disgraced with nonsensical Papistical symbols, the other that his brother captain and friends are unnecessarily punctilious.

Opening of a New Market Hall at Silverdale.—The opening of the new Market-hall at Silverdale has been inaugurated by a public dinner. The hall is a spacious brick building, standing in High-street, and the inhabitants are indebted to the private enterprise of Mr. William Steele, of Madeley, at whose expense it has been provided. It is intended to be opened two days a week, Mondays and Saturdays, for market purposes.

Discovery of a Monument of a Biblical King of Moab.—A correspondent of the *Journal Officiel*, writing from Jerusalem, says,—"An archaeological monument of the greatest importance has just been discovered by M. Clermont-Ganneau, interpreter to the French consulate here. It is a large basalt pillar, found to the east of the Dead Sea, on the territory of the ancient Moabites. On it is engraved an inscription of more than thirty lines, in Phœnician characters, commencing by these words:—'I, Mesha, son of Chamos.' Now, Chamos was a King of Moab, mentioned in the Bible, and contemporary of the Prophet Elisha and Jehoshaphat, King of Judah, and with Ahab, Ahaziah, and Johoram, Kings of Israel. . . . The monolith relates the struggle of Mesha against the King of Israel, and enumerates the towns constructed and the temples raised by Mesha, and consecrated by him to the god of his nation at Chamos. The age of this monument is fixed by its synchronism with Jewish history: it dates from nine centuries before the Christian era, and from about 100 years after Solomon. It is nearly two centuries older than the celebrated sarcophagus of Echmounazar, King of Sidon. The Phœnician characters in which it is written, present an Archaic aspect, not hitherto found to a similar extent in any of the Phœnician remains discovered. . . . This precious text has just been sent to the Academy of Inscriptions by M. Ch. Clermont-Ganneau, with a memoir, which will be immediately published."

New Carving Machine.—In the machine invented by Mr. Gear, of Newhaven, U.S., the wood to be carved is fastened firmly to the bed by moveable clamps adjustable to suit any required size of wood, and the cutters are fastened to a spindle moved by a universal joint in any direction upon the bed of the machine. The cutter is guided by hand, the guide resting against the pattern. The carving can be gauged to any required depth, and made to conform to any required pattern. A fan blows away chips as fast as they are produced, leaving the work constantly in view of the operator. The same tool that cuts the mortise also cuts the tenon, the two pieces of work to be dovetailed being clamped together to the end of the table.

Sheerness.—The Victoria Hall and Public Rooms have been inaugurated. The style of the building is the pseudo-Italian Gothic of the day. The chief features of the plan include hall and restaurant, with refreshment, reading, smoking, conversation, library, retiring, and waiting rooms. There is a large concert-hall, 100 ft. by 53 ft., 35 ft. in height, with gallery, stage, lobby, corridors, and waiting and cloak rooms. The Victoria Hall will be one of the best rooms in the county for bazaars, concerts, promenades, entertainments, and assemblies of all kinds. The building includes a smaller hall, to be used as a Masonic lodge-room, to which preparation and ante rooms are attached.

The Open Spaces at the Mansion-house.—At the last Court of Common Council, Mr. Deputy Fry presented a petition from the inhabitants of the ward of Walbrook in favour of the preservation as an open space of the piece of ground on the western side of the Mansion-house; also a similar petition from the president, council, and members of the Royal Institute of British Architects, who expressed a hope that the corporation would contribute a reasonable share of the expense of effecting this improvement. The value of the land was estimated at 180,000*l.* The petitions were finally referred to the Improvements Committee.

Panic in a Theatre.—During the performance at the Exeter Theatre last week, two men commenced to fight in the pit, and in the confusion which prevailed a cry of fire was raised. The building was densely crowded at the time. The audience in the pit jumped on to the stage, and a regular panic ensued. The officials and the more orderly portion of the audience, however, by strenuous exertion, ultimately succeeded in restoring order.

Royal Scottish Academy.—On the 10th inst., at a general meeting of the Royal Scottish Academy, Mr. W. M. Taggart and Mr. J. Dick Peddie were elected Royal Scottish Academicians.

Strike in the Building Trades.—On a proposal by Messrs. Aldin, building contractors, of South Kensington, to reduce their wages from 8*d.* to 7*d.* per hour, the plasterers struck work, and declared the firm closed to the trade.

Newspaper Press Fund.—The half-yearly meeting of members of this fund was held at the offices, Cecil-street, Strand, on Saturday, the 12th inst., Mr. Godwin in the chair. The report of the committee for the half-year ending 31st December last stated that the institution is progressing satisfactorily, although it is necessary to reiterate the expression of regret, contained in the last report, that the number of members remains stationary. The roll-book of the society shows an aggregate of 238 members, of whom 167 are resident in London and its suburbs, and 71 in the provinces. Four members have died within the year, two of whom resided in London, and two in the country. To the widows of the latter liberal grants have been made. The grants, by way of relief, for the past half-year, amount to 77*l.*, and for the whole year just elapsed to 147*l.*; the cases relieved being six in number. During the half-year the sum of 600*l.* has been invested in the purchase of 677*l.* 8*s.* 5*d.* in the New Three per Cents. The ordinary income of the fund for the year may be thus stated:—Dividend on 600*l.* Eastern Bengal Railway stock, 29*l.* 6*s.* 3*d.*; dividend on 700*l.* Great Indian Peninsula debentures, 34*l.* 3*s.* 9*d.*; interest on 3,800*l.* New Three per Cents, 121*l.* 9*s.* 7*d.*; from members' annual subscriptions, 162*l.* 18*s.*; from annual donations, 46*l.* 3*s.*; total, 374*l.* 8*s.* 7*d.* The total amount of receipts from all sources in the same period was 1,152*l.*, and the expenses of administration, including salary, rent, office expenses, stationery and printing, postage, advertising, and cost of getting up the annual dinner, amounted to about 800*l.* Mr. Monid moved, and Mr. Charley, M.P., seconded, the adoption of the report. The chairman inquired what steps had been taken with reference to the plate recently engraved by Mr. T. Vernon from Murillo's picture of "The Pool of Bethesda," in the possession of Colonel Tomline, M.P., and which that gentleman had presented to the fund. The secretary, Mr. Taunton, stated that measures were being taken for the legal acquisition of the copyright by the trustees with the view of issuing the engraving to the public for the benefit of the fund.

The Burying-place of Abraham.—At a late sitting of the Berlin Archaeological Society, Captain de Jasmund, the personal adjutant of the Crown Prince, gave an interesting account of a visit paid by his royal highness to the sepulchre of the Patriarchs, at Hebron, during his late journey to the East. The Crown Prince offered 100 napoleons for the necessary permission to enter the accredited tomb of Abraham, which no one had heretofore been allowed to enter. The Turks promised to admit the travellers on the following night, but it was unfortunately impossible for his royal highness to delay his journey so long. In the meantime, the Crown Prince and Captain de Jasmund gazed for a long time into the interior of the cave, through an opening 10 in. in diameter, until their eyes became accustomed to the flickering of the lamps, with which it is lighted, and they were able to distinguish the form of the cavity. It is about 40 square feet in extent. The floor, which was strewn with written prayers cast in from above, had evidently been artificially smoothed. The whole space was empty, but at the further end an opening, closed by a latticed door, seemed to lead to the inner cave. No masonry was visible on the walls, and there was no sign of the fifteen steps and the pulpit which, according both to Rabbinical and Arabian accounts, are to be found in the sepulchre.

The Holborn Valley Improvements: Presentation to Deputy Fry.—A service of plate, worth 500 guineas, has been presented to Deputy Fry by the Court of Common Council as a mark of its high appreciation of his services as deputy chairman of the Improvement Committee throughout the erection of the Holborn Valley Improvement Works.

Royal Gold Medal of Architecture.—The Council of the Institute of Architects have nominated Mr. Benjamin Ferrey, F.S.A., Fellow, for the award of the Royal Gold Medal of 1869-70, subject to the approval of a special general meeting and to her Majesty's gracious sanction.

Somersetshire Archaeological Society.—Subscriptions are being sought to place a memorial of the late Rev. F. Warre, a much valued officer of the society, in the parish church of Bishop's Lydeard. A monumental brass is proposed.

Training Ship for Poor Boys.—The Admiralty have consented to place at the disposal of the Board of management of the Forest Gate District Schools, the *Gothal*, one of the vessels now laid up at Sheerness, as a training ship for pauper boys. The Admiralty will fit up the vessel for 600 boys on the managers agreeing to pay 5,497*l.* The training-ship will be moored off Northfleet.

Architecture at the Royal Academy.—A special general meeting of the Institute of Architects will be held on Monday, the 21st of February, to consider the subject of a recent letter from Mr. S. Smirke, R.A., concerning the accommodation provided for architectural designs and drawings at the Royal Academy Exhibition.

Deptford Dockyard.—It is stated that Mr. Anstin, an American millionaire, and the representative of an eminent shipbuilding firm, has agreed to purchase Deptford Dockyard for 140,000*l.*

TENDERS.

For the erection of County Court and offices at Gainsborough. Mr. T. C. Sorby, architect. Quantities supplied by Mr. John Scott:—

Ridall	£4,187 0 0
Nicholson & Son	3,997 0 0
Closs & Co.	3,735 0 0
Dennett & Co.	3,674 0 0
Sherrin	3,459 0 0
Johnson	3,280 10 0

For semi-detached residence at Roshampton, Surrey, for the Right Hon. Earl Spencer. Messrs. Beeston, Son, & Brereton, architects. Quantities supplied by Mr. James Burnett:—

Parsons & Townsend	£1,153 0 0
Bracher & Son	1,125 0 0
Easton, Bros.	1,074 0 0
Adamson & Son	967 0 0
Wigmore	980 0 0
Avis & Co.	989 10 0

For two detached residences, for Mr. R. Overton, Victoria Park, Leicester. Mr. J. Goddard, architect. Quantities supplied:—

Duxbury	£2,780 10 0
Fish & Son	2,786 0 0
Neale & Sons	2,739 15 0
Osborne, Bros.	2,640 0 0
Herberts (accepted)	2,600 0 0
Perkins	2,600 0 0

For finishing houses on the Pill-hill Estate, Bristol. Mr. W. Cloutman, architect:—

No. 1.	
Millett	£474 0 0
Pady	340 0 0
Cleave	312 0 0
Lloyd	310 0 0
Harving	310 0 0
Hill	302 5 0
Stephens	298 0 0
Hook	289 0 0
Leat	285 0 0
Perkins & White	281 19 0
Hobbs (accepted)	269 5 0

No. 2.	
Millett	£203 0 0
Perkins & White	184 17 0
Leat	175 0 0
Hill	172 3 0
Sammons	170 0 0
Lloyd	160 0 0
Stephens	157 8 0
Hobbs (accepted)	149 10 0
Hook	149 0 0
Howell	146 10 0
Harding	100 5 6

For seven houses in Hare-street, Messrs. Reddall & Cumber, architects:—

Myers & Sons	£4,174 0 0
Currie & Son	3,695 0 0
Pritchard	3,694 0 0
Kiddle	3,478 0 0
Heuslow	3,468 0 0
Langford	3,390 0 0
Asby & Sons	3,339 0 0
Browne & Robinson	3,161 0 0
Higgs	3,151 0 0
Estes & Chapman	3,123 0 0

For rebuilding four houses, Bell-street, Marylebone, for Mr. Barr, Curran-road, Finsbury. Messrs. J. & E. A. Bull, architects. Quantities supplied:—

Ebb & Sons	£1,027 0 0
Wilson	1,922 0 0
Goodman	1,901 0 0
Merrin	1,800 0 0
Blackmore & Morley	1,864 0 0
Hockley	1,842 0 0
M. Laohian	1,830 0 0
Wignour	1,775 0 0
Brown & Sons	1,750 0 0
Kelly, Bros.	1,737 0 0
Scriveners & White	1,684 0 0

For repairs and building an additional kitchen to the Bath-street Temporary Infirmary. Mr. H. Baxon Snell, architect:—

Rist & Brown	£468 10 0
Patman & Potheringham	464 0 0
Bridgman & Nutball	437 0 0
Sabey & Son	430 0 0
Ennor	428 0 0
Perry, Bros.	427 0 0
Patch	398 10 0

The Builder.

VOL. XXVIII.—No. 1412.

A Recent Peep at the Great Pyramid.



IF the seven antique wonders of the world one only is still extant. The Pharos of Alexandria no longer sheds its light over the waters of the Mediterranean; Apollo Colossus has long since gone to the melting-pot; the crys-elephantine Olympian Zeus of Phidias has been turned into amulets and squared into dice; jackals labour the ground where once stood the terraced gardens of Babylon—the paradise of Nebuchadnezzar. The Temple of the Ephesian Artemis is sunk for ever in the marshes of the Cayster; the de-throned monarch Mausolus has taken refuge

in England, and from his pedestal in the British Museum placidly looks down upon the remains of his celebrated sepulchre,—a monument of departed greatness. But the Pyramid of the Cheops still stands erect on the western bank of the Nile. The storms of forty or more centuries have but chafed its surface; and though the palaces of Cairo have been partly built out of the stones of its *vestibule*, yet it remains apparently uninjured, and is likely to remain to the end of time. Climate, no doubt, has had much to do with its wonderful state of preservation. Had it been built in a country with cold and damp atmosphere, the moisture would have penetrated between the joints, and the frosts and thaws uplifted and riven its enormous courses of stone, as in northern climes they rive the granite mountains; but in Egypt, where literally there is no rain, no damp, no frost, Time has not these slaves to help him in his work of destruction.

Such an ancient monument as this, which existed before Abraham went down into Egypt, has been necessarily described by many writers. We have in our possession a book, called "Les Plantz des Villes," published in 1573, which contains a medley of good things. Poitiers, "the city of Peru," and the Pyramids are all therein described and illustrated, and we borrow from it a list of the writers of antiquity who have touched upon the pyramid, viz :—Herodotus, Durius of Samos, Aristagoras, Dionysius, Artemidorus, Alexander Polyhistor, Batorides, Antisthenes, Demetrius, Demoteles, and Apiori; and we are also informed that Thalio, of Miletus, obtained its height by measuring its shadow at the proper moment. Herodotus, perhaps, gives the most com-

plete account. He tells us that the Pyramid of Cheops was built in twenty years by 100,000 men; that they commenced by constructing a road from the Nile, of polished slabs of stone, ornamented with figures, for the transport of the stones. He mentions a canal formed by Cheops, in the midst of which was an island and a chamber, and he describes also the manner in which the outer covering (which was smooth) was laid. He says that upon the steps (those formed by the courses) were raised machines of timber,—evidently including inclined planes,—by means of which the huge stones of the casing, 30 ft. in size (they were triangular), were raised stage by stage to the summit, which was completed first, and the work continued downwards to the basement, this being evidently the only manner in which the work could be accomplished. In addition to these ancient writers, we have had in more modern times dissertations by Le Brun, Grobert, Jomard, Meister, Hirt, De Sacy, Langlois, Belzoni, Lepsius, Howard Vyse, and, though last not least, Piazzi Smith, who has compassed and spanned every stone, so to speak, of the Great Pyramid, and written an exhaustive book upon the subject, to which we beg to refer every one who wishes to study it in a serious manner.

Our object is simply to describe the impression made upon ourselves during a day's visit to it, in the belief that however frequently it has been spoken of, and however often it has been visited, a vast structure somewhat about the size of Lincoln's-In-Fields at its base, and somewhat higher than the cross of St. Paul's, which existed when the world was in its cradle, and will in all probability accompany it to its tomb, can never be considered commonplace, hackneyed, and uninteresting.

We left our hotel in the Esbekiah, Cairo, in a carriage before daybreak, accompanied by two Americans, who had joined us at Jaffa,—a fat doctor and small minister. Half an hour's drive brought us to the banks of the swollen Nile at Old Cairo. Here the donkeys and their drivers, who had been convoked by our dragoman, joined us, and we embarked in a caique at a spot which some have called Charon's Ferry, possibly because, in the time of old Egypt, bodies were here embarked on their way to the necropolis. Our Charon did not, however, bid us "trim the boat and keep quiet," but he himself was trimmed and kept quiet by our dragoman, for, as he demanded more than his obolus, our man felled him like an ox. He then arose, shook himself, and became a wiser if not a better man. In this we obtained a striking confirmation of the sad truth which we had learnt in our previous dealings with Orientals, which was, that if you wish to gain your point with either pasha or peasant, you must prostrate him, morally first, and then demand the favour of his compliance with your request that he will do his duty or perform his contract. On board the caique, in close companionship with us, were our favourites, Ginger Pop and Yankee Doodle; the former was a white donkey, of sturdy build, very like the one that figures in a picture by Gerome which will occur to the recollection of some of our readers. He derived his name from the fact that as he had made the pilgrimage to Mecca he had received the distinctive badge of a hadji, by having his mane and tail dyed with saffron, till they were the colour of ginger. He fell to our lot, and we mounted him on reaching the opposite bank with a certain degree of pleasure, for we knew by experience that he was a trustworthy steed. Yankee Doodle fell to the lot of the fat doctor, who to revenge himself upon those who had named his beast, beguiled the way by persuading his driver that his donkey would never be in want of a rider if he changed its name to Lord Dundreary; and by the time he reached the Pyramids, by dint of constant repetition, the boy had got the name pat.

Our ride was a pleasant one, not in a straight

line to the Pyramids, which we saw always before us, but, as the waters were out, by various turnings and windings on dykes and causeways, which, in the time of the inundation, served as the roads of communication between the various villages that crowned the summits of mounds rising out of the water on both sides of us. Each mound had its grove of date-palms; its group of white flat-topped houses; its crowd of fellahs, of fellah women in blue smocks and black nose-bags, called veils; and its naked children—like animated bronze figures, with the delicately-moulded forms peculiar to the dark-skinned races—sporting in and out of the shallow water, evidences of the exuberant life with which the Delta and that part of Egypt swarm.

After passing many of these picturesque oases, by about noon we began to ascend to the rocky platform on which the Pyramids are situated. Before we had reached it, a swarm of swarthy Arabs swooped down upon us, yelling and gesticulating, and seized our bridles. After recovering from our first surprise, we were reassured by finding that, though their manners were rude, their language was refined. To be accosted in our mother-tongue, spoken with a perfect accent, by a troop of dirty savages, was something novel for the lower class of Levantines, who, when they do speak a little English, generally interlard their discourse with expressions which they have picked up from sailors,—not exactly pleasing to ears polite. These men, on the contrary, had gathered their vocabulary from the hundreds of educated men who had visited the Pyramids on their way to or from India. Hence the amusing contrast. Still, however satisfactory their accent, it was not agreeable to be unseated by half a dozen pairs of unwashed hands. So there were loud calls for the Sobek, who, after preliminary conversation, by dint of loud persuasion, combined with force, prevailed upon his followers to leave us unmolested to choose our own guides.

We have mentioned hitherto but one pyramid, that of Cheops, as it is the largest and best-preserved of all; but pyramids of all sizes are to be found at intervals on the borders of the Nile, between the Delta and Jayoum, and always on the western bank only. Lepsius visited sixty-seven within a distance of thirty-six miles. At Ghizeh there are three large ones, and the remains of six diminutive ones at their feet. It has been affirmed, to account for these different sizes, that each monarch began to build his tomb as soon as he ascended the throne, and that he added a course or two to the exterior every year of his reign, and that in this manner the size of the pyramid is an evidence of the length of the reign of the monarch who built it; but this could hardly have been the case, for Cheops reigned sixty-three years, while Herodotus, who must have gained his information from the traditions of the priests, asserts that his pyramid was built in twenty years.

Besides those of Ghizeh, there are groups of pyramids at Sakkara, Abousir, Abousir, Dashour, Matanyeh, and Meidoun. All are on the same plan, with an internal chamber for sepulture, the entrance to which has been concealed by the external masonry, and all are in a more ruinous state than those which we saw at Ghizeh.

During our approach to the Pyramids from the Nile they grew so gradually upon our sight that we could hardly realise their vast dimensions until we got near enough to see some individuals belonging to a party which had preceded us descending at one of the angles, in proportion to the mass like mites to a Cheshire cheese. Leaving our donkeys in the shade, we hurried to one of the angles, where the ascent is easier than elsewhere, and commenced our pilgrimage to the summit. Two Arab guides are allotted to a man, and three to a lady; they keep hold of your hands, and by dint of hauling and

pulling (for the courses forming the steps are, in some places, 8 ft. or 4 ft. high), contrive to land you, puffing, panting, at the summit, if you do not give in by the way. Our fat doctor gave in at a third of the height, the lady who was with us at three-fourths, and the short minister and ourselves reached the summit—a platform of about 30 ft. square—in safety. Here we sat down to recruit and enjoy the glorious prospect of Cairo and the Nile on one side, and on the other the reddish waves of sand, stretching as far as we could see towards the desert of Jupiter Ammon. Near us were the two other pyramids, those of Cephrenes and Mycerinus; beneath us was the rocky necropolis, full of indentations and irregular cuttings, marking the site of excavated tombs, and a little beyond, on a lower level, appeared the head of the Great Sphinx.

While we rested, the conventional Arab performed the conventional feat of running down one pyramid and up another, for the gratification of a slight *baksheesh*. The ascent of the second pyramid must be difficult, as the outer smooth casing in part remains; but he accomplished the feat in less than ten minutes. We then prepared to go down. This was an arduous and somewhat dangerous undertaking, as the stairs are generally very narrow, and are half-covered with rubbish. You are completely at the mercy of your guides, who hold you by each hand, and take a delight in compelling you to scold of agility, which, when you are middle-aged, slightly inclined to *embontat*, and have not the sure footing of a goat, are in a slight degree distressing, particularly when you know that one false footstep would be sufficient to roll you to the bottom and convert you into a modern mummy. Our fat friend was so fully impressed with the idea of this risk, that he had actually promised his guides the unheard-of largesse of five shillings if they would deposit him safely on the sand below; consequently, on gaining the ground, we found him a general favourite, attended by a crowd of Arabs, who evidently thought him "soft" as well as fat. He had suddenly become the hero of our party, and we who were not so liberally inclined were constantly reminded of his indiscretion by such speeches as this: "It is customary to give poor Arab more than the ordinary *baksheesh* given to Scheik. Fat man very good man; he give poor Arab five shillings." In fact, he had created a complete revolution, and had spoilt the market for future visitors, as we subsequently learnt from one of them at the *table d'hôte* of our hotel. There are upwards of 200 courses, varying from 4 ft. 4 in. to 20 in. in depth in the Great Pyramid. Herodotus states that the outer casing was ornamented with carved figures, probably hieroglyphics.

After a hearty luncheon, we prepared for the second act—a visit to the interior. We found the entrance a little above the level of the sand, and in the middle of one side. Here we each took a lighted candle or torch, and entered, stooping and crawling as we found best, a passage, 4 ft. square, which descended gradually at an angle of 25 degrees. We could not stop to examine the construction of this gallery, as we were preceded and followed by Arabs, who urged us on; and as the suffocating closeness of the atmosphere, joined to our uncomfortable position, made us anxious to get into some more commodious portion of the building. After descending for a few minutes we commenced to ascend at the same angle, and at last reached a deep well in our path, which served as an approach to the lowest chamber, which is seldom visited. Beyond the wall we entered a higher gallery, where we had more breathing room. It was about 24 ft. high to the top, and was covered by a horizontal arch, *i.e.*, one composed of stones corbelled out on both sides till they meet, the ends being cut away so as to present internally two sloping sides. This gallery ascended at so sharp an angle, that it would have been difficult to walk up if holes had not been cut out here and there in the polished floor for one's footsteps. It was about the same width as the first passage. At the top we entered by a vestibule into the King's Chamber, containing the sarcophagus of Cheops, the founder of that stupendous structure. This chamber is about 34 ft. by 18 ft. in dimensions, and is roofed over by flat slabs placed side by side. The sarcophagus is of porphyry, and is covered with hieroglyphics; as the pyramid has been built round it, fortunately, it cannot be removed entire, and so possibly it may be allowed to remain, to rejoice the eyes of generations of travellers. As soon as we reached

the chamber, the Arabs began to howl and dance, for the gratification of their fat benefactor, what appeared, from their dusky figures, grinning faces, wild shouts, and whirling torches, a regular *ronde infernale*. The heat and closeness were suffocating, as may be imagined would be the case in an upper chamber in the centre of the pyramid, to which there was no opening except by a considerable descent, so that the air cannot have been renewed except by chemical change since the time of the Pharaohs. We were, therefore, not sorry to emerge into the open air, for we knew that there was nothing about the construction of the pyramid that we could not learn from books, as it has been so frequently measured and illustrated.

Our last visit was that made to the Great Sphinx, whose head and shoulders only are now visible above the ever-enroaching sand. She is no beauty, as her face was remorselessly ruined by a fanatical scheik in the fourteenth century. Her nose has disappeared, but the firm projecting under-jaw remains; and this, together with her retreating forehead, combines to offer a type of that deformity which was so attractive to certain Pre-Raffaellites, who copied vulgarly the early eccentricities of their now-reformed leader. If the sphinx were uncovered, she would be a marvel hardly second in interest to the Great Pyramid, as she measures 150 ft. from the extremity of her extended paws to the root of her tail; and, moreover, she holds between her fore-paws a temple, in which divine honours were paid her. The entire figure is cut out of the rock on which the pyramid stands, all deficiencies being made good with masonry. Among the conflicting theories about Egyptian chronology, it is difficult to fix the exact date of the erection of the Pyramid of Cheops, but we know that the Sphinx was completed in the time of Thothmes IV., who reigned in the year 1561 B.C., so that in all probability it was constructed many centuries after the Pyramid.

The point chiefly to be noticed in the Great Pyramid, besides the wonderful harmony observable in its dimensions,—for a correct understanding of which the before-mentioned book of Piazzi Smith should be carefully perused,—is the occurrence of the first example of the horizontal arch, which was borrowed from the Egyptians by the Greeks, and employed by them in the Treasury of Mycenæ; the gates of Assor; at a later period in the Fountain of Hippocrates, in the Island of Cos; and in the Mausoleum. It is also to be remarked that its external form was adopted by other nations as the distinguishing mark of a sepulchre. We find that not only was the magnificent tomb of Mausolus surrounded by a pyramid, but that also smaller sepulchres, such as that of Theron, at Agrigento, and the Lion tomb of Cnidus, the monuments in the Valley of Jehoshaphat, and many of the Roman tombs in Africa, had also pyramidal roofs. And may we not trace the steeple of St. George's, Bloomsbury, and all magnificent spires, even that of the Prince's Monument in Hyde Park, to the same remote source, however indirectly they may have been derived from it?

THE ARCHITECTURAL EXHIBITION.

THE honorary secretaries of the Architectural Exhibition Society have sent out a circular to the leading members of the profession, and to the societies representing the profession, of architecture, in town and country, calling upon them for more efficient aid and contribution to the Exhibition, both in the form of drawings to be exhibited, and in the more solid and perhaps less attainable shape of money subscriptions. Unless this desired assistance be more liberally given than heretofore, and a greater general interest shown in the success of the Exhibition by those most concerned in its success, namely, the architects of this country, it appears probable, according to the circular referred to, that it cannot be continued after the present year. Whatever difference of opinion may have existed as to the real importance of the Architectural Exhibition hitherto as an exponent of the state of architectural art in the country, and a means of extending the knowledge and appreciation of architecture among the general public, there will probably be few of our readers who will not concur with us in thinking that the discontinuance of this Exhibition for want of the support asked for would be a sign of a very undesirable move in a direction in which none of us individually wish to travel,—backwards.

It may be said that as the Royal Academy

have announced their decided intention of keeping one room in their new building for architectural drawings, provided a sufficient number of good drawings be sent to fill it; or, at all events, to give in that room the preference in position to architectural drawings over others, that a special exhibition for them becomes superfluous; and that it is far better for the profession, those of them who have anything worth exhibiting, to concentrate their forces in one place, more particularly when that place is one to which, at certain seasons numbers of people congregate, and where indeed it is not quite the right thing not to go. And, no doubt, to hang architectural drawings in one of the Royal Academy's rooms in the full fever of the season does insure a greater number of people seeing them and passing them than perhaps any other means; and it may be as well that the Academy, who number architects among their body, should openly give their recognition of architecture as an important art, and that there should be a chance that some of the large majority of visitors to the Academy, who know and care absolutely nothing about architecture, should have their interest awakened by some cunningly-prepared drawing, and that those who come to scoff should remain to praise. But to this possible advantage there are important drawbacks. In the first place, architectural designs exhibited in the form of drawings do not stand on the same ground as the rest of the works in an exhibition like that of the Royal Academy. The paintings, water-colour drawings, sculptures, there ranged are works complete in themselves, and which have attained their purpose and end; but an architectural drawing is merely a representation, in a very imperfect way, of what the architect (or his draughtsman or colourist) thinks will be the effect of the work if executed, unless we except the cases in which the drawing represents what the architect knows will not and cannot be the effect of the actual building. Here, then, is the architecture at a double disadvantage. If the exhibitor makes his drawing really an architectural drawing, such as an architect might find it worth his while to study with the view of arriving at a key to the structural and æsthetic design of the building represented, it is evident that this drawing must be looked at from quite a different point of view from the drawings and paintings which form the bulk of the collection; that its merits, if any, will be of a perfectly different kind; and that it will have to be considered as a means, not as an end. But it is idle to expect that the public who throng the picture-salons of the Academy in May and June will draw this distinction when they enter the Architectural Gallery. Not one person in a hundred, probably, goes to that suite of rooms with a view of taking a thoughtful and critical pleasure in works of art; they go to see pictures, some of which interest, some amuse, and some puzzle them; and the architectural gallery, filled (according to our present supposition) with what look to them more like diagrams than paintings, will merely be passed over as a blank break in their chain of sight-seeing, suggesting nothing to them. If, on the other hand, we keep to the practice which caused so much comment among the French architectural critics at the time of the Paris Exposition, of making our architectural drawings only a series of picturesque views, we have then to put them in competition, as pictures, against the other attractions of the Exhibition-rooms, with what kind of result may be easily foreseen. An architect can rarely afford to employ a really first-rate artist to make his design into a picture for him (even if the first-rate artist would undertake the job); besides which, the necessity for showing clearly the details of the building, and making it predominant, and everything else in the drawing only accessory, of course militates against artistic effect. So that we have no choice at the Academy, save either to be passed over by the mass of spectators as unintelligible, or to be made light of as inferior to the other works of art in the same building. Add to this the comparatively small scale and minute detail of most architectural drawings, which must of course give them an insignificant effect alongside of large and powerful oil-paintings or water-colour drawings, and it will be seen at once how impossible it is that the ordinary run of visitors to the Academy will give any intelligent attention, or any attention worth having, to the architectural drawings occupying a corner gallery of the building to which they have come for pleasure or study of a totally different kind.

Such considerations are, we imagine, sufficient to show the eligibility, even the necessity, for a separate exhibition of architectural drawings, where these initiatory representations of architectural design can be viewed and studied upon their own proper basis, apart from the distracting influence of works of art of a wholly different nature. And there is probably scarcely any architect of talent or eminence, in town or country, who, if the question were directly put to him, "Do you consider an architectural exhibition necessary or desirable?" would not immediately answer in the affirmative. One provincial society, that of Liverpool, has already, as our readers will have seen in our last number, expressed its opinion decisively on this head, in a resolution passed at a general meeting of the members; and assuming, as we think we may do, the existence of this general approval of the scheme, it is somewhat surprising that the Exhibition Society should be suffered to be now, after a career of some years, in a position to feel compelled to solicit the support which it might have been thought the architectural profession at large would before now have thought it their interest to give to them. That this is so is, perhaps, partly traceable to a certain laziness and "save-trouble" feeling among individuals of the profession. A would be glad enough to hear that there was a good exhibition, but he cannot be troubled to pack up and send off drawings for it, still less to make a drawing on paper to exhibit: he thinks B, who got that town-hall competition, ought to send up something; but he has not time himself to think about it. We have heard exactly this said more than once; and if the object were to fill the walls with designs for very large and grand works, this would be a valid objection; for few architects have the luck to get a really grand commission to carry out.

But we want to know how small things are getting built, and how they should be built, as well as large ones; and a design for an ordinary-sized dwelling-house, which shows originality and refinement in plan and conception, is more valuable than the most astoundingly impossible perspective view of a town-hall where these qualities are absent. It is the bane of the system of architectural competitions that architects get, through them, into a habit of only wishing to astonish spectators by dint of mere bigness and splashiness of drawing. An exhibition where the chief critics would be professional men, who can see into the real worth of a design, and are not to be taken in by draughtsman's dodges, ought to be a great corrective against this evil. It is to be feared, however, that the reason why many who might contribute to the architectural exhibition do not, is, that it does not "pay;" that the drawings are not sufficiently known and seen by the public; and that, in fact, the exhibitors cannot trace many commissions as having arisen from the display of their works in the room in Conduit-street. This, if a somewhat narrow, is still not an unnatural feeling; and it is certainly to be regretted that the architectural exhibition has attracted so little public notice generally, on the part of those not directly connected with the profession. The very great ignorance of even educated people as to what constitutes architecture as an art, and their consequent want of interest in and comprehension of the drawings which illustrate it, is, of course, mainly the cause of this indifference; and it will take a long time, and a much better system of art education in our schools, to do away with this stumbling-block.

However this may be, we do not think that in the meantime the architectural profession of England ought to allow the exhibition to drop, because the general public do not show so much interest as they might (and, we may add, ought) to show in it. Taking a serious view of the profession of architecture, involving the solution of many difficult problems, artistic and practical, which concern the beauty and well-being of our towns and villages, so great is the advantage and instruction to be gained by architects from a knowledge and study of the works of their contemporaries, at home and abroad, and from knowing in general what is going down and what is coming up in their profession, that it is worth while to make a stand for an exhibition which will give us these advantages; and this the Architectural Exhibition may certainly be if it is generally supported and contributed to as it should be. In the present state of public non-interest in architecture, it is, indeed, next to impossible that such an exhibition should be

self-supporting, and, perhaps, this is the most difficult part of the matter; "the penny-fee will be a hard chapter, we doubt." But if even one-fourth of the architects in this country would make up their minds to subscribe something towards the necessary expense of keeping up the Exhibition, the amount requisite from each for this purpose would, probably, be something quite trifling, and of scarcely any account at all in comparison with the importance of the object. One word may be added as to what ought to be the nature of the drawings to be exhibited. It is not entirely without cause that we have been twitted by some French critics with caring for nothing in our architectural drawings but the making of pretty pictures. It may be said that this is the only form in which non-professional people care to look at an architectural drawing at all. The sooner they are taught differently, then, the better. But the exhibition will not, at all events for the present, be for non-professional visitors, but mainly for architects. Let it then be made such an exhibition as architects can really visit with advantage, and derive some instruction from with regard to each other's mode of working. Small perspective sketches are all very well, if honestly done, to show the architect's ideas of what his building should look like in execution. But the magnificent views and vistas which confound the minds of competitive committees are out of place in a professional exhibition. We know they are all humbug, and it may be necessary to indulge in a little of this sometimes to please clients; but there is no reason why we should flourish it in each other's faces. What we want are drawings and plans which will enable us to trace out the whole working of a design; and especially large-sized and careful drawings of portions of a building, wherever anything special, either constructive or artistic, has been attempted, would often be very valuable for study, especially by young students. Let us be assured of an exhibition, in short, that will be of real value to professional visitors, and we trust there will be found among the architectural profession of this country sufficient *esprit du corps* and love of their art to induce them to give it a cordial and substantial support.

CLAUSES IN THE IRISH LAND BILL OF INTEREST TO THE BUILDER.

It does not fall within the scope of our columns to enter into any general discussion of that extensive and complex measure, the main features of which were laid before the House of Commons on the 15th inst. Dealing, as it purports to do, with the main question of the tenure of land in Ireland, its probable advantages or disadvantages involve many considerations that are foreign to our pages. But there is one point on which our readers may naturally expect that we shall not be altogether silent, and that is the probable and purposed effect of the Act, should it become law, on the operations of the builder.

The proposed provisions of the measure, in this respect, are capable of ready and distinct definition. It is a common practice in Ireland—and Mr. Gladstone expressed the surprise that he felt on becoming aware of the fact—although not in England, to value the buildings on a farm apart from the farm itself. That practice increases the facility with which any improvements made by a tenant in the form of permanent buildings, can be estimated. It is the intent of the measure to increase the security of the occupier of the land, and to render difficult and costly eviction on the part of the landlord, except in case of non-payment of rent. Certain rules of compensation for such evictions are laid down; but, in any case, it is proposed to recognise the right of an outgoing tenant to payment for permanent buildings erected by him, if they are applicable to agricultural purposes, and if they are such as to improve the letting value of the property. It is necessary that such additions to the holding should be available for the purposes of agriculture, as, otherwise, they would not come within the scope of the tenancy. Thus a case was cited in which the tenant of a farm abutting on the sea-shore built a bathing-house, and claimed to be paid for it as an improvement. Such an outlay would not come within the provisions of the present Bill. It is quite clear that it would be unjust to saddle the landlord with a payment for any building which was altogether apart from the terms of the contract for occupancy, and which,

although serviceable to one occupier, might prove useless to another.

The onus of proof as to the authorship of such structural improvements—to which the Bill proposes to assimilate the case of the reclamation of land—is thrown upon the landlord. That is to say, if the tenant claim to have erected a certain building, it is for the landlord, if he dispute the claim, to show that it has not been erected by the tenant. On the one hand, of course, the building will be to the fore to prove its own existence. On the other hand, it is presumed that the landlord will have, or ought to have, proper plans and surveys of his estate, which he can produce with all necessary books and records, so as to show that the improvements which the tenant claims to have effected were in existence at a date prior to his claim.

It is further provided that respect must be had to any advantages already derived by the tenant from improvements which he has effected on his holding. It is not easy to see how this provision applies to the case of permanent buildings erected by the tenant at his own cost. If his rent has been raised in consequence of such improvements effected by him, he will have paid twice for them, once in the interest of the money laid out, and once in the increased rent. The opposite case, of an abatement being made in rent, in consideration of permanent buildings being erected by the tenant, is not likely frequently to occur. In that case, no doubt, he would, altogether or in part, have recouped his outlay. It can hardly be urged that the general principle of such compensation is unjust.

A further provision which touches the subject of domestic building is that which allows of the sub-division and sub-letting of land by a tenant for the purposes of cottages and gardens. It is proposed to allow of such sub-division for the use of servants employed upon the farm, or for agricultural purposes. Into the general question of the policy of the case we cannot enter. It is, undoubtedly, proposed to limit, or rather to confiscate, certain rights which the owners of land have hitherto considered to attach to proprietorship. It is not, however, certain that such a limitation would be a positive grievance to the proprietors. In a merely financial point of view it is possible that it may be to their advantage.

But it is clear that the tendency of this portion of the measure would be to encourage domestic building in Ireland. A tenant would often be disposed to make substantial improvements in his holding, if once he had the assurance that the money he thus laid out, so far from giving the landlord a firmer hold on his rental, would not, in any case, be absolutely lost to the family of the improver. The tendency would be good in two ways. It would lead to the erection of convenient buildings, which otherwise would be deferred or avoided, and it would lead to the more workmanlike and permanent finish of the buildings so erected. In a country for the most part rich in excellent building materials, the hope of compensation would favour the transformation of the straw-thatched, clay-built hut, into the neat stone-built cottage or outhouse. The transformation which the last twenty-five years have effected in many English country villages is marvellous. Neat cottages, often with architectural pretensions of no mean order, are to be found replacing the old huts, partly timber-built, partly plaster, partly rubbish of any description, with windows the size of pigeon-holes, thatched roofs, and no means of ventilation, and which look so picturesque in pencil sketches. Those who are familiar with Ireland will know how much room exists for improvement in this respect. Our own experience is not such as to make us sanguine as to the rapid effect of legislation, even supposing it to be guided by as much wisdom as is competent to parliamentary legislators, in changing the long-formed habits of a race. Still, it is one thing to strive to enlist human nature on the side of progress, and another thing to ignore its well-known motives. In proposing to give the builder compensation for the work of his hands we trace at least a possible rudiment of increasing civilisation.

The rental of Ireland, it is well here to place on record, was estimated in 1779 at 6,000,000*l.*; in 1869 it is returned at 12,000,000*l.* The rental of England in 1771 was estimated at 16,000,000*l.*; in 1869 it is returned at 48,000,000*l.* The rental of Scotland in 1770 was stated at 1,200,000*l.*; in 1869 it was 7,200,000*l.* Thus, during the same period of time, speaking in round numbers, rents have doubled in Ireland, trebled in England, and sextupled in Scotland, the term selected being that

of ninety years. It will be a matter of interest to compare the increase of population, and the augmentation in the size of the capitals and great cities of manufacturing and commercial industry, with this increase in rent. The rate of increase of London, for instance, is known: it doubles in a little less than forty years. On the other hand, the constant decrease in the value of money, which has been so much accelerated since the discovery of the Californian and Australian gold-fields, has to be set off against the nominal increase in rental. The subject is one on which the materials for exact comparison have yet, to some extent, to be collected. It is closely connected with the question of the improvement of the habitable nature of the country, the sanitary, civilising, and æsthetic progress of domestic architecture.

We have confined ourselves to an examination of that portion of the Bill now before Parliament which distinctly interests the architect and the builder. But a lesson is involved in the statement incidentally made by the First Lord of the Treasury in introducing this important measure, of which we ought not to lose sight. We have, not infrequently, had occasion to warn our readers against the exaggerated and pedantic application of rules which, while sound up to a certain point, prove altogether fallacious when they are relied on as main and normal laws of social conduct. Human nature is more complex, as well as more noble, than either the pence or the multiplication table; and no error can be more lamentable than that which leads to the attempt to weigh all human nature in the partial and restricted balance of finance. The correlation of supply and demand is an important truth, and one which can not be neglected without producing certain and appreciable evils. We are even now smarting from the neglect of this law in the premature construction of railways, which were supplied, for the benefit of the individuals interested in their construction, in the absence of any such real demand on the part of the public as might justify the outlay.

But to attempt to apply this rule as adequate to meet all the exigencies of a complex state of civilisation is a miserable and mischievous pedantry. It is this fact which is so distinctly illustrated by the Irish returns quoted by Mr. Gladstone. It is undeniable that one main cause of the Irish trouble is the fact that cultivation of the land is almost the sole national industry, if, indeed, it be allowable to use the word. With the exception of parts of Ulster, almost the whole support of the Irish people is derived from agriculture or pasture. The mining, metallurgic, textile, commercial, and other occupations which are carried on by so large a proportion of the population of Great Britain, are, in Ireland, chiefly conspicuous by their absence. The oat-field or the potato-ground,—such is almost the sole resource of the great majority of five millions and a half of Irishmen. It results from this fact that the competition for land is keen. Independently of the strong passion for the native soil, which forms a predominant feature of the Irish character, land has a value in the eyes of the ordinary Irishman far greater than is the case with the Englishman on the same social level. In fact, the occupancy of land is, for the most part, the sole means by which the former exists.

Demand for land, therefore, is at a maximum in Ireland, as compared with England. Supply, on the other hand, is limited and fixed. On the principles of political economy, therefore, the price of land,—that is, to say, rent,—ought to increase in Ireland in a ratio far more rapid than is the case in Great Britain. And with this increasing rental every inducement to the economical, industrious, remunerative use and culture of land must, theoretically, concave. In some parts of the world we know such to be the case. We may cite China as an instance. There the ratio of population to land is very large, and there the utmost ingenuity and industry are exercised to obtain the largest returns from the coveted soil.

The facts quoted by Mr. Gladstone, however, are at total variance with a theory which must be true if the rules of political economy were those which regulated human action. The case of Ireland is absolutely the reverse of that which ought to prevail, did the correlation of supply and demand settle all social questions by a self-operating influence. During the period which has witnessed the tripling of the rental of England, and the six-fold multiplication of that of Scotland, that of Ireland has only doubled. The rich stream of productive industry which

has been turned into so many channels among ourselves has indirectly increased the value of landed property. The mere fact that land was in demand has altogether failed either to enhance its price or to improve its culture, to an extent at all comparable with the result of what may be called the contagion of industry.

The actual ratio of land under corn crops per head of population does not differ very sensibly in the three kingdoms. In Scotland the proportion is 2.31 mouths per acre, in England 2.61 mouths per acre, and in Ireland 2.56 mouths per acre. But the proportion of sustenance derived from the potato is far larger in the latter country, where a million of acres are devoted to the culture of this root. The actual facts are highly instructive.

England contains 32,590,397 statute acres, of which 22,261,853 were under cultivation in the year 1866, about a third being under corn crops. The population in that year was 11,461,217.

Scotland contains 19,639,377 statute acres, of which 4,158,360 were under cultivation in the year 1866, about a third being under corn crops. The population in that year was 3,153,413.

Ireland contains 20,322,641 statute acres, of which 15,549,796 were under cultivation in the year 1866, less than one-seventh of which were under corn crops, two-thirds being permanent pasture. The population in that year was 5,571,971.

In England, therefore, there existed 2.8 acres of land, of which 2.00 acres were cultivated for every soul of the population. In Scotland there existed more than 6 acres for every individual, although only about $\frac{1}{2}$ acre per head was under cultivation. In Ireland there were 3.6 acres, of which nearly 2.8 were cultivated per head. It must be stated, however, that in the case of Ireland, the hill pastures are included in the returns, which is not the case in the English statement. Half of the land cultivated in England is devoted either to grass crops or to permanent pasture. In Ireland 11½ millions of acres out of 15½ millions are pasture and grass crops. Thus, while the English population cultivates about an acre per head for corn, green crops, and fallow, the Irish population cultivates only about two-thirds of an acre per head for these purposes, while about one-fourth of the area of the island lies permanently waste.

The above figures are ample to show that those who endeavour to account for human action on the simple principles which regulate purchase and sale, or supply and demand, take a view of a large subject so inadequate as to be properly designated as puerile. While the Irishman, who depends solely on land, has a third less land, for every mouth, to cultivate than has the Englishman, who leans on so many other industries for support, the return which he wins from his culture, measured by the secular increase in the rental, is as two to three when compared to the English rental return. The comparison with Scotland is even more striking. The climate of that kingdom is more severe than that of Ireland. With the exception of the valley of the Clyde, the aid to be derived from her agricultural industry is not to be compared with that afforded by the great mineral wealth of England. But the high moral character of the Scotsman, his patient forethought and untiring industry, are made evident by proof stronger than any words that we can employ. While cultivating less than a fourth part of the area of his mountainous country, a breadth of land which is, as in the case of England, about equally divided between pasture, whether permanent or annual, and crops chiefly useful for human sustenance, he tills for human support about the same area per head as does the Irishman. Yet the results of his industrial toil, in the course of nine-tenths of a century, as measured by the increased value of the rental, is just threefold that which has been attained in the more favourable climate from the more fertile soil of the Emerald Isle.

It is undeniable that moral causes must have no small influence in producing such various results of national activity. To neglect or ignore the genius of a people, or of a race, is as unphilosophical as to neglect the conditions of soil or of climate. And the error is not one of theory alone. Were it so, we should find little disposition to discuss it. It enters into the very life of a people. It influences the course of legislation, no less than that of administration. Mr. Gladstone prefaced his motion by the discouraging doubt whether the main features of legislation for Ireland since 1793 had not tended rather to injure than to improve the condition of the Irish people. He admitted the existence,

under identical laws, of a state of custom and habit so different in the two kingdoms as to amount to disparity of law. The gist and upshot of the whole matter is, that it is not legislation to which we must look for the sole, or even the main, sources of improvement. Laws, in their operation, if not in their origin, are the reflection of national character. Let law be amended, if reason demand it; but let us not expect, from any alteration in the statute-book, that national progress with reference to which law bears little more than a negative relation. We may remove injustice; we may remove obstacles to agriculture, to industry, to commerce; but such removal is only a part, and a small part, of that which we have to do. The formation of truthful, honest, industrious, habits; the inculcation of mutual respect and forbearance between class and class, as well as between individual and individual; the encouragement of a large and catholic tolerance for all honest opinion; the spread of that knowledge, social and technical in the first instance, although rising to higher branches of culture by its own innate force and truth—these are the matters for which it behoves us to labour, and these alone are the means to make the desert blossom as the rose.

On comparing the amount of rental stated by Mr. Gladstone with the details of agricultural statistics from which we have ourselves made the foregoing extracts, it appears that the average rent of cultivated land in England is about 21.3s. per acre; in Scotland, 11.14s. per acre; and in Ireland, 16s. per acre. This comparison fully bears out the tendency of our foregoing remarks.

PROFESSOR SCOTT ON ARCHITECTURE AT THE ROYAL ACADEMY.

LECTURE I.

WHEN I delivered my last lectures in this Academy, it was my intention to give a practical sketch of the history and development of architecture in this country from the earliest rise of civilisation among the races of which our nation is composed, down, perhaps, to the period of the revival of Classic architecture. As, however, such continuous history has been disturbed by the omission of my lectures last season, and as few now present heard, and fewer, probably, now remember those lectures, it is not my intention to continue my former course, but, adopting as my stand-point the stage at which I had then arrived, to digress into an inquiry into some of the practical and artistic principles of the class of architecture of whose development I was then treating.

The chronological point which I had reached was the close of the eleventh century,—a point well fitted to be chosen as one for leaving the beaten track for the purpose of inquiring into principles. It was the very stage at which the great round-arched style, which had just developed itself into a strong and sturdy luxuriance, was in the condition best suited to receive the refinements of art.

It was, too, the very eve of that wonderful politico-religious movement which was to bring the nations of the West into contact with the East;—thus preparing the way for a vast influx of new ideas and of fresh artistic elements; and so far as our own country was concerned, it was just the moment when the simple and unambitious architecture of the Anglo-Saxon race had given place to the more colossal edifices and the more systematic style of the Norman invaders; and when the newly-imported architecture, having taken firm root in our soil, was ready to become naturalised as our own, and to be pressed forward in all zeal and earnestness by the united ranks of which—now neither Saxon nor Norman—were becoming, to all intents and purposes, English.

Nor let it be supposed that the architecture, thus made ready as the nucleus of subsequent developments, was in itself essentially rude, or mean, or barbaric. I admit that it was stern and severe, and lacking the refinements of advanced art; and that its sculpture, though a reflection from that of Byzantium, as that had been from ancient Greece,—was nevertheless grim, uncouth, and unrefined; yet in grandeur of conception and in vastness of scale its productions vied with those of almost any period or country; and I shall be able to show you that it contained principles the most profound and accurate, and capable of being carried forward to any degree of refinement.

A single half-century had in fact filled the

length and breadth of our land with structures of prodigious scale and impressive grandeur; founded on the most reasonable principles, and containing, in a rough and unrefined form, the most prolific and the most artistic elements. So many of these vast edifices have given place to others of more advanced style, or have been recklessly destroyed, that we can now with difficulty realise the architectural status of a country where they were rising or were just completed in every town and (on a reduced scale) in almost every village;—a period when vast fortresses, such as the Tower of London and the stupendous keeps of Rochester, of Norwich, and of Headingham were specimens of the vernacular architecture to be seen all over the land; when the now shattered ruins of Newark and the grim tower of Newcastle were as freshly erected as their names imply; when the awful names of Durham and Gloucester were but specimens of the "new manner of building" then recently introduced, and which pervaded the whole land; and when no city, or hardly a village, could be approached without the lofty scaffoldings heaving first into view which surrounded campaniles which could boast such as those at St. Alban's and Tewkesbury as their types.

We will, however, quit the track of mere history, to inquire into the intrinsic principles of the architecture thus far attained, and in course of development; and I must beg to be forgiven if, in doing so, I am compelled to repeat a good deal of what I had brought under your notice in former lectures; for, not then intending to go systematically into this inquiry, I had forestalled my subject by adverting to these principles from time to time as the course of my historical sketch chanced to suggest.

I shall, then, firstly consider the architecture in question,—this "*novum genus edificandi*,"—from a point of view bearing upon its great structural characteristic as a purely *arcuated* style, and one whose strivings all took the direction of rendering that structural fact the main source, as well as the main receptacle, of its artistic character and decoration.

Now what, I would ask, are the conditions necessary to an *arcuated*, as distinguished from a *trabeated*, style?

I would thus define them:—Generally, I would say that such a style should be capable of doing all, whether structural or artistic, by means of the *arch*, which other forms of architecture had done through the use of the horizontal *beam* or *lintel*.

And, to go more into particulars, I would add:—

1. That, as a rule, openings in walls and between pillars, whether taking the form of doorways, windows, gateways, or intercolumniations, should be bridged over by arches instead of by horizontal lintels or entablatures, though not descending into such purism as to reject the latter when circumstances clearly point to its adoption.

2. That areas inclosed by walls, or by ranges of piers or columns, and of any reasonable width, should be capable of being covered over,—and, in buildings of the highest grade, should as a rule be actually covered over,—by *vaulting*. This rule, however, not being pressed so far as to exclude level ceilings or timber roofs,—the one the most natural and economical covering for rooms, and the other for churches, halls, &c.,—where circumstances forbid the use of vaulting.

3. That the decorative system of the architecture should harmonise with, and result from, these prevailing structural conditions; the construction and the architectural treatment being, not only in harmony, but in the most intimate alliance the one with the other.

Now we all know that Grecian architecture almost ignored the arch, carrying the horizontal or trabeated system of covering openings to the highest artistic perfection; doing for that system just everything which the above-stated conditions would demand for an arch style. *Repose* was the great sentiment which their architecture expressed; *vertical pressure*, the one physical condition it had to provide against; whereas *arched architecture* (as they say in India) "*never sleeps*." It is always exerting pressure in some other direction than the mere vertical line, and the physical conditions it has to meet are the resistance of these, as well as the support of mere weight.

We know, too, that Roman architecture admitted nearly all the constructive conditions we have demanded, and carried them on to a

very considerable degree of practical perfection. We believe, moreover, that had not circumstances checked its progress, it would have carried out these conditions to a much greater extent. As it happened, however, it did not go so far as to make these structural conditions a leading artistic element, and the groundwork of a distinctive decorative system; but, being broken up through political convulsion before such an end was attained, it bequeathed the task to the descendants of its despoilers, and long centuries of darkness had to pass by before the work could be accomplished.

In Roman works, the arched construction was in many cases studiously overlaid and concealed by the decorative features of trabeated architecture; and, where an arch was architecturally treated, it was for the most part by bending round it the mouldings of an architrave or *beam*; and, where a vault was rendered ornamental, it was often by repeating on its coved surface the coffered panels which had originated in a horizontal ceiling; while, in purely arcuated works, such as the stupendous aqueducts, architectural decoration was usually ignored, and structural grandeur alone trusted to for beauty. Still, however, enough was done to convince us that these great builders were on the high road to a noble solution of the problem, and were only, by external accidents, stopped short of its attainment.

I am not about to indulge in abstract imaginings as to what an arcuated style of architecture might be if originated without the aid of previous associations or traditions; but I would ask you to follow out, with some reference to the previous Classic styles, and aided by our knowledge of subsequent developments, the *rationale* of such a style as that whose leading conditions I have stated.

We must begin with the simplest elements of the style.

Firstly, then, let us take a mere opening in a wall, whether intended for a window or for any other use. As in the trabeated system, apart from architecture, such an opening would be covered by a single block of stone, so in an arched system would it be bridged over by an arch; and, just in the same manner, if a continuous series of openings were required, equivalent to a colonnade, the same simple idea would be repeated,—in the one system horizontal stones lying upon upright ones (as at Stone House) or upon piers, and in the other the openings being covered by a series of arches; the *colonnade* being the ultimate result in the one case, the *arcade* in the other.

To architecturalise the arched opening, or the continuous arcade, the simplest expedients seem to be the insertion between the pier and the arch of an impost moulding to mark the springing line; and, in the arch, either to individualise the arch-stones by chamfering their edges, as the Romans often did, or to relieve their plain surface by moulding, the latter being best suited where the stones made use of are of only moderate size. The mouldings of the arch may, however, be continued down the jambs without an impost, and in either case a projecting rim or hood-mould may be introduced over the main arch to emphasize the line which separates the arch from the superincumbent wall.

These simple changes bring our plain arched opening into something like an architectural feature; and, if we apply them to a continuous arcade, the architecturalising process becomes yet more apparent, and it may readily be carried a step farther by adding pilaster capitals to the piers. Another and yet more important step, inasmuch as it is really the basis of a very marked feature in our arch styles, is the substitution of columns for the piers of an arcade; which columns, having square abaci, are really as well fitted to support the arch as the square pier itself, and at once give a highly decorative character to our arcade; and the more so if the jambs are converted into pilasters.

The abaci, however, of such bearing-shafts ought to be very different from the delicate finish of the Corinthian capital; for the arch is not the same inert load which the columns in a trabeated style are destined to carry. It exerts diagonal as well as mere vertical pressure, and so demands a firmer base. This led the architects of the early arched styles, while adopting the Corinthian capital, and perhaps reusing those of older buildings, to add to it a strong flat stone as an impost upon which they could safely give the springers of their arches a basis larger in diameter than the sustaining column. This form,—that is to say, the Corinthian capital with

an added impost,—became traditional, and we find the imitations of it down to the end of the twelfth century.

We have hitherto supposed our arches to be of moderate depth from extrados, or outer line, to intrados, or inner line, and our walls, perhaps, of moderate thickness. Let us, however, assume it to be necessary to increase the depth of the arch, and that the materials at hand are not of large size. In some of the Byzantine remains in central Syria, where the stone is of great size, we find that they have architecturalised by mouldings and enrichments only just so much of the arch-stones as was needful for beauty, and left the rest to go as mere wall-face; and where such large stones are not made use of, it is common enough to build the arch in two rims, and only to deal architecturally with the lower one, or perhaps to leave both plain.

Now, the first may be unobjectionable where the wall is of moderate thickness and the load great, and the second is well suited to large and massive engineering works; but for ordinary architecture, it is apt to give too bulky and cumbersome an effect. This naturally suggests the idea,—while allowing the upper range of arch-stones to occupy the full thickness of the wall,—of reducing the lower range to a smaller width, thus breaking the arch section into resalient angles, and thereby both lightening its effect and rendering the piers or jambs which support it lighter and less obstructive to the view.

Simple as this step may appear, it is one whose importance can scarcely be over-stated; for it is the starting-point of the entire system of Romanesque and Gothic arch-moulding; it is the origin of the clustered columns, and the deeply-recessed and richly-decorated doorways which mark those styles; and to it we owe in great measure even the traceried windows which are such leading characteristics of Gothic architecture. For, as regards arches, we had before but one angle to mould, whereas we may now have as many as the thickness of our walls will permit, thus generating at once the great Medieval system of receding orders, whether of arches or their jambs; and you will presently see that this gives us also our clustered columns, which are, in fact, the mere decoration of the receding orders of the piers.

Let us, however, take another step; and, instead of substituting a column for the group of arch-orders, let us substitute either a smaller column for each of the four orders, thus supporting the arches by a group of four columns; or else let these be united into one complex pillar formed of portions of four columns; or, thirdly, let us place a colonnette under each order, grouping them either in the solid or as detached shafts, round a central square pier. In any of these methods we at once obtain the clustered column.

To the jambs we may apply the same process, either substituting a colonnette for the inner order, and pilasters for the outer ones, or *vice versa*, or substituting colonnettes or pilasters for all. I do not know how early this system of using colonnettes to do merely decorative duty was introduced. We have a specimen of it in the remains of the church built by Benedict Biscop, at Monk Wearmouth, in the seventh century, where, as I have stated in a previous lecture two baluster shafts are placed in either jamb of a doorway to support the impost. To go to the far East, we find the system in use in the Mosque of Touloun, at Cairo, built, I believe, in the ninth century. In one of the doorways of the cathedral at Mayence, built about the end of the tenth century, columns and pilasters, with Corinthian capitals, and crowned by a thick impost moulding, are alternately employed to carry the four receding orders of the arch. The whole has semi-Classical details. In the western portals of St. Mark's, at Venice (close upon the same period), we find a profusion of detached columns similarly used. They are of marble and other rich materials, and were probably brought to Venice from ancient buildings in the East.

It may be that the possession of such antique relics, and the long-established practice of re-using them, may have suggested the use of small columns for such purposes; indeed, it is curious that in the case of the Mosque of Touloun, just alluded to, as a very early instance of the use of colonnettes, there is a tradition that the architect, who was a Christian, was imprisoned for refusing to use the columns torn from desecrated churches, which had been a condition prescribed to him, and only consented to proceed with the work on the withdrawal of this order. Whether

or not this custom originated the feature under consideration, I think that it is one which belongs essentially to a derivative style, and would hardly have come into existence in a style of architecture not aided by traditions of the past. The Romans themselves, as is proved by their mural paintings, seem to have indulged in the use of their columns (possibly of metal), for buildings not demanding massive dignity; and it is just possible that in their domestic architecture, some suggestions of this use of such pillars might have existed; and certainly among Mediæval works, in none are they more charmingly introduced than in the cloisters of St. Paul and St. John, at Rome, whose details are much more Classic than Gothic.*

EXHIBITION OF THE ROYAL SCOTTISH ACADEMY.

We cannot say that any of the works exhibited by the local artists this year can be considered as displaying super-excellent qualities, yet it is gratifying to observe that there is a levelling-up process going on, and that there are fewer works that can be classed as beneath mediocrity. The average of excellence, therefore, is greater, and more especially is this the case in the department of landscape painting; and considering the fact that we are so constituted that there is a certain connexion between our external surroundings and our inward thoughts, we may reasonably look to Scotland for a school of landscape painters displaying characteristics of its own; and as it may now be safely asserted that the Northern artists have achieved a marked degree of success in this department, it will meet with our first attention.

The landscapes of Sir George Harvey have a distinct individuality. He does not aim at striking effects, nor does he elaborate detail, nor allow any one part of the subject to predominate in a manner to destroy the general effect sought for. He depicts the cool, breezy upland moor or the peaceful pastoral valley, when Nature is in one of her calm, self-sustained moods; and, when seen from the proper point of view, the scene is full of air, and recedes far away into the distance in which each object is distinctly defined. No. 456, "A Mountain Tarn"—the only landscape he exhibits—is a characteristic example.

A many-sided man is Mr. Sam Bough. He shows us nature in every phase. He is equally at home on sea or land; amongst the mountains or on the plain. No. 386, "On the Sulway" is one of the best paintings he has ever produced. The scene must be familiar to those of our readers who have, in their journeys to Scotland, gone by way of Carlisle. At low tide the river is seen as a broad, shallow sheet of water, bordered by flat expanses of sand, with tufts of green on their margin. Mr. Bough has introduced a herd of cattle being driven through the water, whilst another drove is seen coming up in the distance; sea-fowl are sporting and feeding in the immediate foreground, and the eye is lost in the far distance of the ocean. In No. 446, "Skye," we have the landscape of that island as we know it, and as no other painter, so far as we are aware, has presented it to us. It is a land of rain, with a "brief, bright summer," according to Alexander Smith; but its brightness, in our experience, is very evanescent indeed: the thin film of mist enveloping the hill-sides, as shown in the picture before us, would not prevent a Skye man from calling it very fine weather.

Mr. James Cassie's pictures are always pleasing, and his work is thorough, but not overdone. He luxuriates in calm sunshine, "when nature seems asleep;" and he is not afraid to look "the god of day" in the face, as may be seen in his "Early Morning on the Tay" (339).

Mr. John Smart has the right spirit in him, if we are not mistaken; for the last few years he has been going on improving in the grasp and mastery of the subjects to which he sets himself. No. 478, "Head of Glen Cloy, Arran," has many of the same qualities as the works of the President; and No. 869, "Beallaich-na-Spreidh—Pass of the Cattle," would have attracted greater attention were it not for its resemblance to the fine cattle-piece of Mr. Peter Graham (which hangs in another room)—the same that was so much admired in the Royal Academy last year.

Mr. Colin Hunter is another young artist of promise. No. 718, "Fern Gatherers returning

Home," is a striking picture, the effectiveness of which is produced in a very simple manner by the contrast of three horizontal bars of colour; the principal figure, however—that of a girl—is feeble and doll-like. Not so striking, but better as a whole, is No. 832, "Mending the Net," in which a broad daylight effect is happily rendered.

Mr. Joseph Farquharson has chosen a hackneyed subject for his principal picture (401), "Evening,"—a pine wood, with a road running through it, and a rich sunset filling up the vista; it is, however, well rendered, and we look to him for something much better in the future.

Mr. Walter Paton gives us sunset effects year by year. They are pretty and popular, especially with ladies: it is their very prettiness, however, that we object to; but we must take them as we find them. Purple is his favourite tint, and this prevails in No. 731, King's Cross Point, Arran." In No. 500, "Falls of Glen Ashdale, Arran," a fine subject is spoilt by a sickly straw-colour being given to every tree and blade of grass.

We should have noticed sooner the exhibits of Mr. M. Whittier, No. 592, "Harvest by the Sea," No. 723, "Moor of Bannock," and No. 785, which all display that careful, effective manipulation and mastery of materials which have gained for him a high position.

There are several young men doing their endeavour to produce good landscapes, and we would like to have given them a word of encouragement, but our space is limited, and we must now pass on to the figure-subjects, taking no notice of those which have already been exhibited elsewhere.

Sir Noel Paton (limner to Queen Mab as well as to Queen Victoria) gives us one of those subjects which he has made a speciality, and in which he has no rival. No. 574, "Caliban," shows us the monster listening "to sounds and sweet airs" produced by aerial figures which float around him. The contrast between the heavy, animal matter of Caliban, and the airy, intangible, semi-transparency of Ariel and the accompanying phantoms, is finely rendered, and the scenery of the enchanted island is a beautifully suggestive piece of landscape, seeming as if it would dissolve into air like a dream. No. 738, "The Village Conciliators," of Mr. MacTaggart, is a large and happy group of children following a vendor of plaster casts. The juveniles are beautifully painted and natural, if we except their eyes, which are rather too bright, and startle one at first sight by their gem-like effect,—an effect which is heightened by the subordination of the accessories. It is, withal, a fine picture, and would be finer still were a few weeks' more labour bestowed upon it. No. 394, by G. Paul Chalmers, is a life-size study of an old woman reading the Bible, and is remarkable both for vigour of handling and delicacy of colour. The old lady is a type of a class once common in Scotland, but now fast disappearing. She is evidently a firm believer in the Calvinistic interpretation of the Book. No. 505, "A Love Song," being a Spanish lady with her guitar, is brilliant, rich, and warm in effect. Were Mr. Chalmers to concentrate his energies upon a large and important painting, and prove as successful in composition as he has done in manipulation, colour, and character, he would place himself in the foremost ranks of this Academy. No. 408, "Prince Charlie's Parliament," is not one of Mr. Macdonald's happiest efforts. "The young cavalier" is a great favourite of his, but we have never before seen him so unjust to his hero; neither is the colour good: the treakyness of the walls of the hut in which the council of war is held, is especially harsh. No. 474, "Maternal Care," and 629, "Play," by Mr. Hugh Cameron, display his usual delicate sense of colour and unaffected manner. The expression of the mother in the former and the merry gambols of the children and kitten in the latter show that he can be both pathetic and merry in the proper place and circumstances.

No. 901, "After Marston Moor," by W. E. Lockhart, shows us a cavalier bidding a lingering farewell to his wife and child ere he goes into exile. The male figure is well placed on the canvas, and is truthful in expression; and so, too, is the sturdy babe whom he caresses, but the grief of the lady is only surface deep. There is considerable quaintness in the scene from Longfellow's "Courtship of Miles Standish" (667). No. 511, by Mr. James Drummond, represents Queen Mary led captive to Edinburgh, after the Battle of Carberry Hill, when she was subjected to the reviling of the populace, on account of

her supposed complicity with the assassination of Darnley. The queen is dignified, tearless, and dauntless; one would fain hope she were guiltless. The picturesque timber facade of the high-street forms an admirable setting for the figures, but the subordinate groups want completeness. No. 544, "Travellers' Tales," by W. Douglas, is painted with that minuteness of detail and carelessness of finish usual in the works of this artist; in this picture the figures of the two men have met with more attention than he generally gives to them; but still the wine-forgiveness, &c., are what most attract the notice of the spectator. In No. 538, "The Laird's Pew," Mr. Peter Graham introduces us to a precise old squire of the time of the Georges, who is bent upon being decorous and setting a good example to the parish, but there is little true devotion in him; his daughter, again, is desirous of displaying her charms and fine attire to the best advantage.

No. 304, "Roba de Roma," is the fruit of Mr. Keeley Halswell's recent visit to the Eternal City. Two remarkably fat, jolly-looking priests are intent in the examination of certain ecclesiastical curiosities, which a Jewish vendor is pressing upon their notice, whilst a younger priest is more attracted by the pretty face of a peasant girl, who is taking her goods to market. It is a work displaying great vigour of execution and discrimination of character. Mr. George Hay is fond of Mediæval subjects, which he renders in a quaint and suitable fashion. No. 361, "The Sorvener's Booth," is a characteristic example; and in No. 628, "La Bonne Bouche," we have a subject of later times set before us with equal facility. No. 443, "A Quiet Pipe," and No. 710, "Alone in his Study," by E. P. Bell, are cabinet pictures, crisp in execution and subdued and harmonious in colour.

The architectural drawings will meet with due attention in a future notice.

ART-WORKMANSHIP: SOCIETY OF ARTS.

We must add to the list of creditable specimens under Division II. (application of ordinary industry, to prescribed art processes) mentioned in our last, the champagne glasses (118—120), made by Joseph Leicester, in which difficulties, including the introduction of filigree, are well overcome, and a very successful result is produced. Some glasses with filigree, sent by T. C. E. Barnes (45—49), are also meritorious, but are unnecessarily thick and heavy. Some of the book-covers by Charles Ffander are tastefully executed. The only set of fire-irons exhibited (55) are woefully ugly and spikely unsuitable. For the prize offered for an envelope-case, enriched with carving in low relief and marqueterie, two competitors appear. The case sent by Edward T. Grove is a very charming work.

Coming now to the third Division, articles sent in addition to those of prescribed designs and processes, we find an excellent mask, *repoussé* in copper, of one of the Laocoon group (61), by G. Deere; "Solitude," embossed in copper, by J. C. Day (70); and a circular ornament very cleverly printed in metal (74), by A. Millward. The purpose to which the latter can be applied is not very obvious, but the regularity of the forms and the precision of the cutting are praiseworthy. Under the head of wood-carving there are figures of Moses and Elias formed with inlays of various woods; they are somewhat hard and gauche, — Elias especially, but should not be passed by. Such work might be found useful in mura, decoration. 84, oak bracket by R. A. Brangan, and 85, panel in birch wood, by W. Matthew, deserve mention. The works modelled in plaster call for little mention. 101, North America; Indian, by A. Dufour, is spirited and vigorous and a wreath of flowers, by T. Godfrey (100), has some elegance. Among the carvings in marble, 109, a bracket, by S. Moutrie, deserves mention. A stone bracket, by T. E. Jago, shows good intentions. A human head is introduced, and lessens the value of the rest of the work. 116, study in Tisbury stone, "May," J. R. Heath, is a remarkable piece of cutting, though not defensible in principle: few would guess that the work was in stone. The tea service (125), designed and executed by Isaac Wild, should certainly obtain for him some recognition; the ornament, though not well selected, is well

* To be continued.

* See p. 141, ante.

executed, and the gilding shows more than common skill. The "Burning Heart," a porcelain slab, by Miss L. L. Hawkins (181), is a quaint conceit, or "Emblem," better intended than executed. And with mention of a porcelain tray, painted with "David, the Psalmist;" and a very good cameo portrait of Dr. Billing, executed from the life, artist not named, we may bring our notice to a close.

Beyond the premiums offered by the Society of Arts, the North London Exhibition Prize, consisting of the interest of 167l. 7s. 3d. Consols, is to be awarded for the best specimen of skilful workmanship in the exhibition of works sent in for prizes. We have reason to believe that this will go to Messrs. W. & H. Robson, for their wrought-iron work for a balcony, a decision in which we should fully accord.

PARIS STUDIOS AND THE "GRAND PRIX DE ROME."

We have mentioned in a former paper the architectural subjects taught at the Zurich Polytechnicum, and at the École des Beaux Arts, Paris. How are they taught? Such is the question we shall try to answer, by sketching the artistic life of a Parisian atelier, and the laurels that life leads to.

Plato, Aristotle, and most Greek thinkers were of opinion that learning should be the result of debate, and that a dogma only became a truth after winning many victories, and never encountering defeat. Frenchmen adopt that view with respect to artistic education. They hold that genius can reach perfection only when helped by experience and copious criticism. An aspiring artist, they think, should have hourly intercourse with other artists bent on aiding him in his artistic efforts. The Paris world of art-students and the Paris ateliers are the nephews of that belief.

An architect's atelier in Paris is, so to say, a private club of students of architecture. The master of the atelier is an architect of fair standing, perhaps a *Grand Prix de Rome*. The elect of the students, it is his mission to direct and counsel them in their architectural pursuits, and to work them up for the *Grand Prix de Rome*. Nothing can exceed the fatherly anxiety of the "patron" (the master's title) for his pupils, who are, indeed, his intellectual children, and the trustees of his artistic past. A Parisian atelier is a republic of young artists ever anxious to rival the bygone triumphs of their predecessors, and to break new ground. The students are grown men, but as disinterested as poets. They love ideas for their sakes; the artistic muse for her sake: they are not practical. For them an art is an art—not a trade. Many a poor student has found poverty sweet in the fancied halls of his imagination. Many a poor student does the night-draggery of some flourishing Paris builder, in order to have the day to improve his taste and learning with his comrades of the atelier.

The teaching is mutual: the fresh men are instructed by the old staggers in exchange for their handiwork. Thus, a fresh man gets practice over the plans of an older man, and the boon of his advice; while the advanced student can strike out the most ambitious designs, backed as he is by a staff of half a dozen juniors. So, by mutual co-operation, both tiros and veterans are equally benefited.

The students mix on terms of familiar equality. A constant exchange of opinions fills the pupils' minds with ready and varied knowledge. As a consequence of this commonwealth life, the atelier has a commonwealth spirit. "*Unus pro omnibus, omnes pro uno*," such is the watchword to which few students ever play false. And yet the rivalry of Paris artists is fierce, though self-giving. Every man tries his utmost to win, but is bound by the rules of the atelier to help others on to victory.

Every atelier rejoices in triumphs and memories of its own. One artistic generation after another is drafted into active life; "patron follows patron," but the old spirit is ever brooding its old devices within the old walls of the atelier. Thus, conservative and progressive, each atelier strives to hold its own under the banner of its past. Hence the keen competition between ateliers for the *Grand Prix de Rome*, the greatest prize that France can offer her artistic sons.

And now a few words about that studentship. The man who is proclaimed *Grand Prix* by the examiners (see *Builder*, Jan. 22), may go and spend four years in Rome or Athens, at the

expense of the French Government. If in Rome, he takes up his abode at the Palazzo dei Medici, which now belongs to France.

But wherefore these Roman pilgrims? What comes of their musings in the interest of art and France? We shall answer those questions by quoting from M. Garnier's* book, "*À Travers les Arts*." The astute critic, speaking of contemporary French art, says:—"The present period is the architectural period of truth, not that of original shams. The inside of a building is what its outside tells as it should be. If we look at the ornaments, which are to an edifice what expression is to the human face, we can trace back their genealogy to Greek art, though they often smack of something which betrays the individuality of a nineteenth-century man. They are not copies of a justly-admired style, but new modes of rendering it. The Grecian muse has breathed into us her vital spark, and harmonised our conceptions;—but the conceptions are ours, French art ours. Greece finds perfection, but France fashions it to her genius and her needs, and by that expansion of Grecian originality, claims an originality of her own, none the less meritorious for its Grecian lineage. Our forefathers worked a Renaissance out of Roman art. We think that modern France is destined to generate a yet more comprehensive revival, which will be the fruit of our minds rather than that of our traditions. All sound reformers must be sound historians. So we see that the men who have done most for French art, have been most learned in ancient art. At Rome it was that Duban, Labrousse, Duc, Vandyver, Baltard, and others grasped the past with one hand and pointed to the future with the other. At Rome the *Grand-Prix* men gather, at the hands of the great masters of old, materials for judicious innovations. One might almost say that old Rome has built modern Paris."

At a dinner given last year by the *Atelier Lebas* to the *Prix de Rome* of former years, the bills of fare were ornamented with the following suggestive design. In the foreground, the *Atelier Lebas*, and in the distant background, Rome. That design typifies art-education in France. It means years of labour, and, in some cases, years of privation, in order to secure the highest art-training the old masters can give. It means enthusiasm for the beautiful and the ideal, and a determination to prefer them to all material interests. It means the far-sightedness of a people who are aware that, next to religion and philosophy, art is the greatest civiliser that ever came from God to man.

LAWRENCE HARVEY.

École des Beaux Arts, Paris.

THE SEWAGE QUESTION.

A LECTURE on this question has been delivered in the Philosophical Hall, Leeds, by Mr. Filitter, C.E., resident waterworks engineer to the Leeds town council. The attendance included the mayor and several members of the corporation. In illustration of his lecture, Mr. Filitter had prepared an extensive series of diagrams, and to these he made constant reference.

In the course of his lecture he said, a belief had of late years been gaining ground that separate sewers would have to be made for rain-water and sewage, and in an official report, lately presented to the Home Secretary by Col. Ewart, on the drainage of Oxford, Eton, Windsor, and Abingdon, he had recommended this course to be adopted. This point was likely, ultimately, to prove the key to one part of the sewage difficulty. As, however, Leeds and its sister towns were sewered on the joint system, and as a change to the separate system would be costly, and not likely, therefore, to be readily made, Mr. Filitter proceeded to describe the known methods of dealing with sewage as it actually exists. These he divided into two principal groups,—first, those which endeavoured by mechanical or chemical means to remove the offensive matter, in order to convert it into solid manure, which might be classed together as "*Sewage Manure Methods*;" second, those which took the sewage direct to land, and attempted at once to purify the sewage, and abstract its manual elements by placing it in contact with earth, which might be denominated the "*Sewage Irrigation Methods*." There were other methods of dealing with refuse matter, amongst which he mentioned the Eureka system, as formerly

* *Grand Prix de Rome*, Architect of the New Opera House, Paris.

tried at Hyde; Dr. Bishop's plan, once in use in Leeds; and the Moule's earth-closet system. He scarcely considered these as being within the scope of his paper, but he believed this part of the subject to be well worthy of grave consideration; for upon further investigation it might, after all, prove simpler and better not to allow house refuse to become sewage at all, rather than to attempt to purify and utilise it when so made. In illustration of the simplest method of purifying sewage,—namely, by deposition,—the lecturer stated that the sewage of Leeds would fill a reservoir eight acres in extent and 5 ft. deep every day, so that a week's storage would require at least sixty acres of land, or a tract about the size of Woodhouse Moor.

Having mentioned the methods commonly adopted for obtaining a solid manure out of sewage, Mr. Filitter proceeded to describe the various systems of irrigation. It was found, he continued, that the sewage of about 100 persons might be utilised on an acre of sewage meadow, and that the effluent water was tolerably pure and free from offensive odour. Having spoken of this plan, as practised at Harrogate, Croydon, Warwick, Edinburgh, South Norwood, Birmingham, Barking, and other places, he said that, supposing Leeds had to irrigate, he found that they would have to carry a conduit past Knottingley, where there was almost any quantity of sandy land. If the farmers there objected to use the sewage, we might go to Thorne Waste, where, on a tract of 5,000 acres, practically worthless, we might demonstrate its value. The great drawback to this scheme was that Thorne Waste was twenty-seven miles away, and as it would involve a conduit twenty-seven miles in length, it was a grave question. How far irrigation had succeeded in a pecuniary point of view he could not confidently say. Its advocates adduced remarkable examples of heavy produce and large receipts, but it could not be forgotten that these were produced upon land which had cost much to put into shape, and required much to keep it in working order. Without in any way ignoring the success and apparent superiority of the irrigation system, it seemed to him that purification by deposition presented in some cases actual advantages, combined generally with prospects hopeful enough to warrant further experiment, by the engineer and analytical chemist working together. It was still open to grave question whether sewage, as we know it, ought to be allowed to be formed at all, and this view of the subject ought not to be lost sight of. In conclusion, he remarked that no single system could be held applicable to all towns and all localities. The several circumstances of each place, as to situation, as to level, as to temperatures, as to rainfall, as to markets, and many other matters, must be duly weighed and carefully regarded in devising any proper sewage scheme for that place.

Mr. Edward Smith, F.C.S., &c. (of Torquay), in a paper on "*The Chemistry of Sewage*," recently read before the Torquay Natural History Society, reviewed the question of the profitable application of sewage to the land. He referred to the immense national loss of the present wasteful system, and after declaring the inadequacy of irrigation, urged the necessity of preserving the excreta of towns, and mixing them with deodorising material, and points out a method by which this important object, he thinks, may be carried into effect:—

"We now come to the consideration of the application of the excreta in a solid or non-fluid state to the land, popularly known as the 'Dry Earth System.' I am not aware that a single objection can be made to the principle of direct application of excreta to the soil. As I have previously stated, the great difficulty hitherto has been the want of a suitable absorbing material. Dry earth is not sufficiently absorbent to enable us to apply it economically on a large scale, although at Wimbledon during the very hot weather, it was the only system that succeeded."

Mr. C. Stanford, F.C.S., an able chemist, has suggested that sea-weed char may be used as an economical and efficient substitute for dry earth. He has made some experiments in this direction, and finds that while perfectly dry earth absorbs 45 per cent. of water, sea-weed char absorbs 147 per cent.; the former becoming a sludgy mud, whilst the latter can be easily removed.

The mixture of sea-weed char and excreta, when removed and placed under cover, soon dries without producing the least nuisance. It can be stored for any length of time, and used again several times."

At a meeting of the Committee of the British Association on the Treatment and Utilisation of Sewage, at which there were present Mr. Grantham, C.E. (in the chair), and others, the honorary secretary presented the list of subscriptions from the various towns contributing towards the expense of a practical and comprehensive inquiry into the

treatment and utilisation of sewage. He reported that he had addressed the circular to 683 corporations and boards of health, and received replies from 245. The subscriptions amount to 756*l.*, exclusive of the 50*l.* given by the British Association. Of these towns and districts which replied to the circular and did not contribute, 25 deferred their decision for consideration, and 23 merely acknowledged the receipt of the application without any intimation as to their intentions; while the remainder, amounting to 116, refused on various grounds, some because they thought the inquiry ought to be conducted at the expense of the country generally, and some because, though they approved of the inquiry, they were too poor to contribute. The committee, after a careful consideration of the matter, was of opinion that the amount already subscribed was sufficient to justify the commencement of the inquiry, but that unless a larger number of places joined in contributing, the inquiry would not be sufficiently extended.

THE SOUTH KENSINGTON SCHOOLS OF ART.

THE prizes to the students of the South Kensington Schools of Art have been distributed by the Prince of Teck. Mr. Cole, C.B., who conducted the party into the new lecture theatre, said that Earl de Grey had found it impossible to be present. The Art School of South Kensington was one of 110 art schools in the kingdom, but these were partly supported by subscriptions, while the students' fees at South Kensington, paid the expenses of the school. He regretted that the students did not make more use of the museum, which was an advantage such as none of the other schools possessed. About 150,000 students now attended these various schools, which cost about 1*l.* per student, a very small sum in the aggregate when compared with the commerce of this great country.

The medals and other prizes distributed were won in the national competition of 1869, and the works to which they were awarded were executed in the twelve months preceding the April of that year. The medals and books distributed represented only the highest grade of distinctions obtainable by students, male and female, and consisted of three gold medals, and the Princess of Wales's Scholarship of 25*l.*, six silver medals, 12 bronze medals, and 21 Queen's prizes of books, all won in the national competition, besides 29 prizes of books, and 22 free studentships, won in the elementary or local prize section. This included the whole of the prizes gained at the great annual competition. At the second grade examination in March, and which consisted of examination by written papers in geometry and perspective, and exercises in freehand and model drawing, 120 students "passed," 36 won "prizes," and six obtained "certificates." At the third or highest grade examination, 13 students obtained the teacher's certificate. Besides the above regular prizes and distinctions, occasional prizes have been offered by the Department and by manufacturers during the year, some for general competition, and some only for this school. The Worshipful Company of Plasterers offered prizes of 25*l.* for designs for a "Truss," and an "over-door ornament," limiting, however, this school to one subject: two students obtained the prizes of 5*l.* 8*s.* and 5*l.* 5*s.* respectively. Messrs. Corbise offered during the year prizes of 5*l.* and 10*l.* for designs for silk fabrics and for paper-hangings for manufacture in France. Besides the works obtaining these prizes others were purchased to the amount of 18*l.* 5*s.*, and most of these works have been produced in France for the French market. Since the last distribution of prizes, 16 male and 6 female students had been admitted to the schools of the Royal Academy. One student (W. R. Bromley) from the school here had this year obtained the Royal Academy silver medal for the "figure from the antique." In the half-year ending February 29, 1870, the number of students was 382; the amount of fees, 878*l.* 11*s.* For the half-year to end February 28, 1870, the number of students is, at the present time, 766, and the amount of fees, 1,363*l.* 11*s.* Of the number of students, 470 are males, and 296 females: 199 are free students. Of the 103 schools competing, these schools took 3 gold medals out of 10, 6 silver out of 20, 12 bronze out of 61, and 21 Queen's prizes out of 102.

Mr. Redgrave addressed the students, and

said that one of the principal objects of the school was to elevate the general taste, and to make, not art-students, so much as students useful to manufacturers. They ought to study the works which others had done, not to copy them, but to stimulate their own invention and to enable them to conceive others in the same spirit.

Of the prizes distributed the following were the most important in the female school.—Gold medal and Princess of Wales's scholarship of 25*l.*—Marianne Mansell, design for porcelain. Silver medals—Edith Edenborough, monochrome, in oil from antique; Kate Greenaway, head from life, water colour. Mr. Cole specially mentioned a bronze medal for a "time sketch" by Edith Edenborough as an example of rapid execution only to be gained by hard and patient study. In the 'male school.—Gold medals—William Walter Oliver, drawing from antique; Harry S. Palmer, group, water colour. Silver medals—Charles Edward Black, head from antique; Joseph Harris, design for lace; Edward Charles Slocombe, design, hangings and jewelry; Thomas W. Wilson, design for tiles. A number of bronze medals and of books were also given. At the close of the distribution,

The Prince of Teck congratulated the successful students on what were their rewards for past work and their encouragement for the future. He was glad to perceive that the study of art was placed within the reach of all classes in the kingdom, and he thought we ought to feel deeply indebted to those who facilitated this teaching, which was of value not only to the country but to the whole world. It was also pleasant to observe that some of the designs of the students had been purchased by French manufacturers. He rejoiced to see that a convention had been made for the interchange of reproductions with foreign museums. It was impossible to visit the museum of South Kensington without being reminded of one who had been a great promoter of art and science in the country—the Prince Consort. It must be a satisfaction to Mr. Cole, who had worked to aid the prince, to know how fully these schools realised the prince's wishes.

FARMING COVENANTS.

At the ordinary general meeting of the Institution of Surveyors, on February 21st, Mr. John Oakley, in the chair, a paper on this subject, by Mr. Elias Pitts Squarey, member, was read.

The principle which ought to govern farming covenants would seem to be, that the tenant should have the freest and most unrestricted use of the lands and premises, consistent with the maintenance and yielding up of the freehold at the end of his tenancy in an unimpaired and uninjured condition; and the object of the paper was to indicate the relaxations and modifications, in whatever direction, which appear likely to conduce to increased production without injuriously affecting the interests of the landlord, and to deal with the separate questions of rent, covenants as to cropping, repairs, and entries between outgoing and incoming tenants.

We give his observations under the head of Repairs:—

"Repairs are a large and important feature in farm agreements, and probably lead to more questions, troublesome of solution, between the landlord and tenant, than any other condition of tenure. The ordinary arrangements are,—

- 1st. Where all repairs are borne by the landlord.
- 2nd. Where all are borne by the tenant.
- 3rd. Where the landlord provides the materials and the tenant pays the labour.
- 4th. Where the landlord finds the materials and shares with the tenant the cost of labour.

It is obvious that these varied conditions proportionally affect the rent which is payable, and theoretically it would seem to be of little importance by whom the necessary repairs are made; practically, however, it is far otherwise. Left to themselves, and without any liability to make good the wear and tear which inevitably happens to farm buildings, the tenant is too frequently careless of the cost of these repairs, and permits waste and injury to his premises, which, had he an interest in their economical maintenance, would never arise. On the other hand, where the entire outlay of repair is thrown on the tenant, he is too much disposed to evade, as far as possible, his liability: hence things go undone, which, trifling in themselves at the outset, by the end of a long occupation, assume very serious proportions. Arbitrations or legal

proceedings are frequently necessary for their settlement, and it is exceptional if, in such cases, the tenant is not relieved of a portion of the liability which, directly or indirectly, should properly fall upon him. For myself, I am inclined to the belief, that the fourth adjustment of the liability, i.e., the division of the cost of labour by the landlord and tenant, most fairly meets the difficulties of the case.

The tenant's proportion of expenditure is limited to an amount which is more than balanced by the comfort and advantage of the maintenance in proper condition, of his premises; and to avoid the large liability which is certain to result from neglect of prompt repairs, he will certainly be continually pressing on his landlord or agent the necessity for keeping things in good order.

Let me suggest, as exceptions to the materials to be provided by the landlord, straw for thatching, and glass and leadwork; further, the tenant should be bound to do the carriage of materials for repairs within reasonable distance. As with land, so with buildings, dilapidations at the termination of a tenancy should be more strictly enforced than is now the usual custom; but it is clear that the tenant should be only liable for a legitimate and necessary repair, and not for restoration or reinstatement."

A discussion, in which several members took part, followed the reading of the paper, and was adjourned to Monday, March 7th.

LORD BACON AND THE ENCLOSURE OF COMMONS.

At the present time the following scrap from the pen of the "wisest of mankind" may possibly have some interest. Francis Bacon desired to acknowledge his obligation to the Earl of Essex; but also desired to decline being mixed up with any folly or extravagance in which that headstrong young nobleman might desire to involve him; and concludes a letter to him thus:—"For your lordship I do think myself more beholding to you than to any man. And I say I reckon myself as a commoner." And as much as is lawful to be enclosed of a common, so much your lordship shall be sure to have."

This is an extract from "Spedding's Letters and Life of Lord Bacon."* The author infers the following paraphrase:—"You can have for your own share only 'so much as is lawful to be enclosed;' that is, I can only offer you such services as can be lawfully rendered by one whose chief service is due to the State." G. M.

THE LABORATORY, ETON COLLEGE.

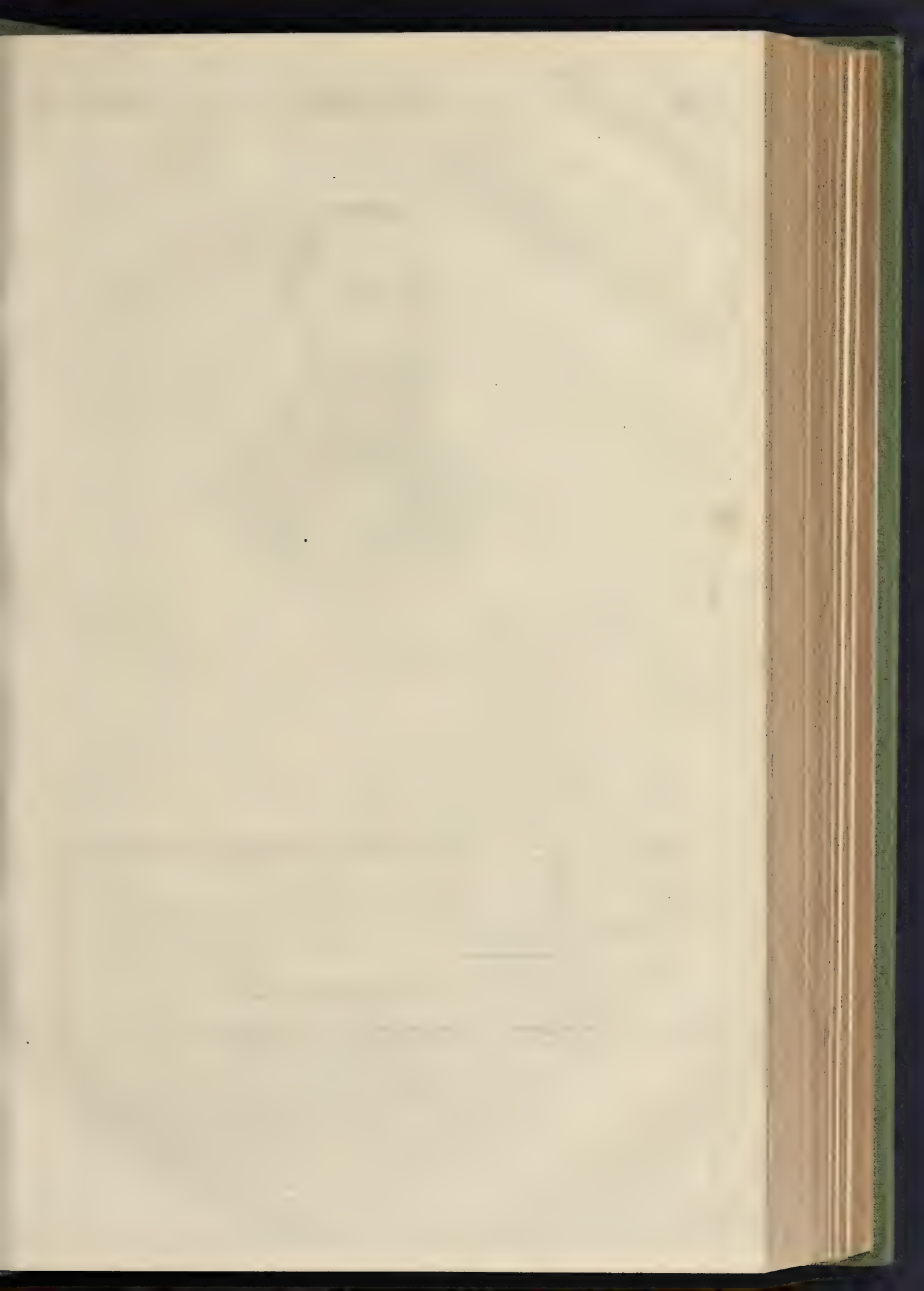
THIS is a building necessitated by the increased importance wisely given to science at Eton since the appointment of Dr. Hornby to the head-mastership of the school.

The arrangement is shown on the accompanying ground plan; besides which, there is a heating-vault arranged under the end of the lecture-room gallery, vaulted over with brick, and two additional rooms on the upper floor for purposes in connexion with the laboratory, which are approached by the passage staircase, and by a door at the gallery end of the lecture-room opening on to the staircase landing.

The walls of the building are of local red brick, with Bath stone dressings; the roofs are covered with brindle-coloured Staffordshire tiles, those of the laboratory and lecture-room being open-timbered. Special attention has been paid to the arrangement and general detail of the fittings, in order to make them as suitable and convenient as possible for their intended purposes; and in the matter considerable thought has been given by Mr. Madan, Fellow of Queen's College, Oxford, and head of the science department at the school.

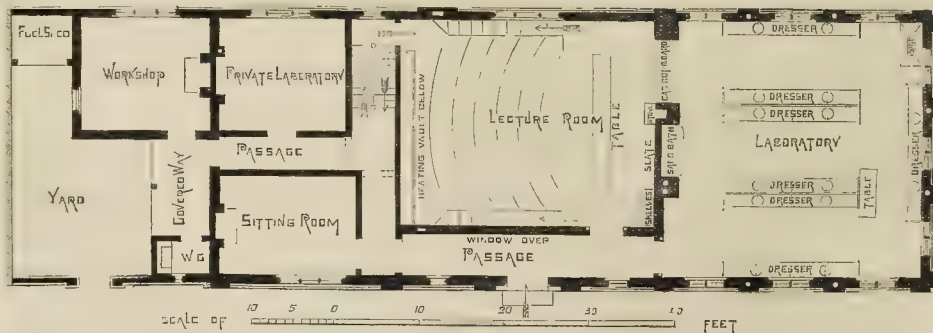
The building is heated by a boiler apparatus in the vault, and hot-water pipes in connexion therewith running throughout the building; the ventilation of both laboratory and lecture-room has been well provided for; and provision is also made by means of pipes acted upon by gas jets for the purpose of more effectually carrying off the gases occasioned by the chemicals.

The architect is Mr. William Wilkinson, of Oxford; and the builders are Messrs. Fänsnidge & Son, of Uxbridge, who are also supplying the heating apparatus. The cost of the building, exclusive of the fittings, will be about 2,000*l.*





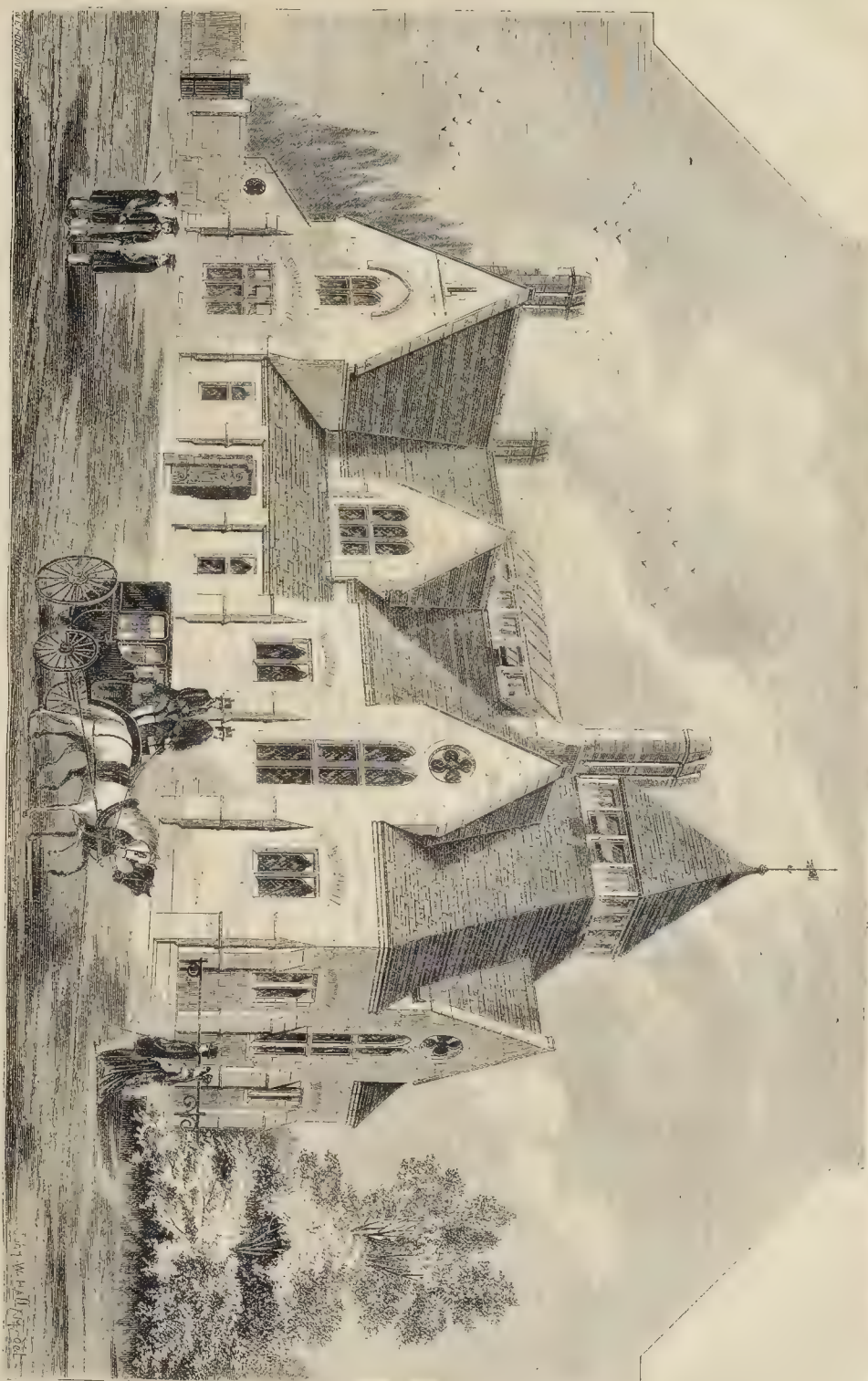
MR. WILLIAM HAYWOOD,
Engineer of the Holborn Viaduct.



THE LABORATORY, ETON COLLEGE.

Plan.

THE LABORATORY, ETON COLLEGE.—MR. W. WILKINSON, ARCHITECT.



THE HEALTH STATISTICS OF
LIVERPOOL.

At a recent meeting of the local health committee, Dr. Trench, the medical officer of health, presented his annual report, which set forth that during the 52 weeks of the year 1869, terminating on the 1st January, 1870, the returns of the local registrars recorded 18,668 births and 14,744 deaths within the borough of Liverpool. Of the births 9,467 were males and 9,200 females, making the total birth-rate for the borough equal to 36.6 per thousand. Of the 14,744 deaths, 7,588 were males and 7,156 females. The death-rate of the borough was equal to 28.9 per thousand, or 3 per thousand less than the average rate which had prevailed during the previous ten years. The death-rate of the parish was equal to 31.6, and that of the out-townships to 25.8 per thousand of the estimated population. There were at the last census, in 1861, 60,760 children under five years of age within the borough of Liverpool; the number might now be estimated at 69,672; and therefore their mortality in 1869 was equal to 10.5 per cent. of the whole; 4,461 infants, or every fourth child born within the borough of Liverpool died before attaining the age of twelve months. Zymotic diseases occasioned 4,298 deaths during 1869, and this accounted for 28.7 per cent. of the total mortality within the borough. This was nearly 1 per cent. less than the proportional rate of zymotic deaths to deaths from all causes during the preceding decennial period. Typhus and remittent fever accounted for 783 deaths, or 5.42 in the parish and 2.41 in the out-townships—a rate equal to 1.5 per thousand per annum of the estimated population. Under the head of "sanitary work" reference is made to the conversion of privies into water-closets. It appears that to the end of 1868 there were 13,391 privies so converted, and, during 1869, 1,857; so that the work was nearly done. As to registered lodging-houses, the number in the borough at the end of 1869 was 1,149. In addition to over-crowding—for which 549 persons were brought before the magistrates, and fined in sums varying from 1s. to 10s. and costs—the offence of permitting adult males and females not married to occupy the same room came under notice, and was entered in the books of the inspector. There were 365 rooms found to be thus occupied by 649 males and 691 females; and there were also in these rooms 139 children between the ages of five and thirteen years. The medical officer expresses an opinion that the Workshops Regulation Act, however beneficial in intention, is not only impracticable in its machinery, but inequitable in its effects.

CASES UNDER THE BUILDING ACT.

We have received the following letter:—
Sir,—We are instructed by Mr. George Willmer, of Vinegar-road, Leyton, Essex, to call your attention to the paragraph in your paper of the 5th inst., entitled "Cases under Metropolitan Building Act," and purporting to be the report of a case before Mr. Ellison, at Woodgate-street. There is a sentence therein as follows:—"A fresh notice was given in October following by Willmer, of Old Ford-road, for proceeding with the works, and the houses were covered in the same month." The report then runs:—"The houses remained unfinished for some time, and the builder Willmer could not be found."

The last sentence which we have quoted was not in evidence before the Court, and is untrue. Mr. Willmer complains that it is to be inferred from the report that he has gone out of the way, whereas, upon inquiry made at his late place of residence, he could easily have been found.

The report has injured Mr. Willmer's credit with persons from whom he has been in the habit of buying goods, and on his behalf we have to request that an apology for the insertion of the paragraph complained of be sent to us, and that a contradiction of the statement be made in two successive issues of your journal, such contradiction to be approved by us. We may add that a similar case to the one reported was heard at the same Court a few weeks after the one reported by you, and upon the magistrate deciding in favour of the surveyor, a case was granted for the opinion of the Court of Queen's Bench upon the legal point involved in the decision.

We have only to add that, in the event of Mr. Willmer's reasonable request not being complied with, he will take such steps, with a view to clear himself from the prejudicial inference from the report, as he may be advised.

Yours faithfully,

APPLEBY, WRIGHT, & CROWTHER.

We have every reason to believe that the brief report we gave of what took place is correct. The district surveyor informs us, in reply to an inquiry, that he said in court he had endeavoured to find out where Mr. Willmer had gone, but could not succeed, and authorises us to refer Messrs. Appleby, Wright, & Crowther to him. Our report is a dry statement of what we believe took place, without a tinge of animus of any kind. We know nothing whatever of Mr.

Willmer, and have not the remotest desire to do him any injury. We are quite willing to believe the statement that he would have been found if he had been properly looked for.

DECISIONS UNDER THE METROPOLITAN
BUILDING ACT.

Messrs. Enns & Son, builders, of 6, Northwicke-terrace, were summoned before Mr. Mansfield, by Mr. Alexander Feebles, district surveyor of North St. Mary's bone, to show cause why they refused to pay the sum of 4l. 15s., the fee for surveying an alteration to the external wall at the nave end of the English Presbyterian Church, at Marlboro'-place, Abbey-road, executed after the church had been roofed in.

Mr. Joseph E. Turner, solicitor, appeared for the district surveyor; Mr. Ebbs appeared in person.

The facts of the case, as proved by the evidence, are as follow:—

The notice for the erection of the church was given on the 30th of April, 1869, and about the end of the third week in October the roof was slated over, with the exception of a space of about 5 ft. at the tower end, which was left unslated for the passage of the scaffolding for the tower, then in course of erection. The wall in question was originally intended to be, and was built up as, a blank wall, some time before the roof was covered in. After the roof was covered in, four windows were cut away for in the blank wall in order to improve the effect of the church. The windows consisted of three single-light openings, surmounted by a large wheel or rose window.

Mr. Turner contended that the roof having been covered in previously to the commencement of the alteration, and the alteration affecting the construction of an external wall, the Special Rules of the 13th section of the Act came into operation, and the district surveyor was entitled to the further fee provided by the first part of the 2nd schedule to the Act. With reference to the part which remained unslated, he contended that this portion of the roof was immaterial, that the roof, as a whole, had been covered in within the meaning of the 9th section of the Act, and that the small opening left for the scaffolding could not be said to prevent the building from being covered in within the meaning of the section. An offer of compromise had been made by Mr. Feebles, but refused by Messrs. Ebbs.

Mr. Ebbs, on the other hand, contended that inasmuch as the space of 5 ft. had been left unslated, therefore the church had not been covered in within the meaning of the section, and the district surveyor was not, therefore, entitled to a further fee.

The Magistrate took the latter view, and said that although the church might otherwise have been completed and used for religious services, yet, if a part of the roof had remained uncovered, he should not consider the building to have been roofed in within the meaning of the Act.

CONDITION OF THE BUILDING TRADE.

Sir,—I have read in your paper, and I know myself, that thousands of building artisans are out of employ. I believe I may say there never were so many out of work at any one time before; and yet I have just now seen the following statement in a newspaper:—

"The joiners of Glasgow have resolved that on and after the 1st of March they will have a half-penny an hour more than at present, and that they will only work nine hours a day."

How are the two statements to be reconciled? I am a dealer in corn, and always find that when there are more sellers than buyers I have to reduce my price, and wait for better times before I raise it. ECONOMIST.

Your correspondent, "Trying Plane," if he reads my letter carefully, will see that it applies to working men, and not foremen, and that 8d. per hour is the mean, and not the extreme, price paid. He quotes Adam Smith; but there is nothing in Adam Smith more evident than the uncontrollable influence of supply and demand. Your correspondent's list of his requirements is amusing. Why not allow his wife a pair of dapple-grey ponies? It would be as reasonable as to expect what he enumerates, when the demand for labour is so depressed as to compel very many to leave the country, whom every sensible man would wish to retain. Adam Smith's observations as to overstrained profits are very true; equally so his observation that high-priced labour can be well supported when a nation is "growing rich." The present argument is, whether high-priced labour can be supported when the country is not "growing rich," and when the supply of first-class labour very much exceeds the demand. No man who really studies the subject borghes the prospect of high wages in prosperous times: it benefits the man that receives them, and the country generally by the increased money the workman has to spend. But there comes a time when every trading interest is depressed; when a man cannot sell a house for any amount approaching the money which it cost to build, and in a large proportion of second-rate property. Then crops up the question at issue, viz., whether a combination of working men can protect themselves from the inevitable effects of "supply and demand." This subject is worthy of ventilation by an able pen than mine, but your correspondent would do good service if they could satisfy the simple inquiry, "Whether a man requiring the highest rate of wage in prosperous times and depressed times, accepting the natural consequence of being out of work under the latter state of circumstances, would in a twelvemonth receive more money than the man who accepted work at the best price the state of trade would afford." If, taking this inquiry over a large body of men, the first proviso to be the case, there may be some justification for a uniform rate of high wages; if the other, 8d. per hour uniform rate is not so high in point of advantage as submitting to the natural influences of "supply and demand." S.M.E.X.

Sir,—I have followed with much interest the correspondence on the above subject, and your impression of the 19th shows some of the reasons why the trade is in the state it is. On page 144, there is a letter signed "Trying

Plane," which appears to be from a joiner who prefers to be idle rather than work for less than 8d. per hour.

On page 155, we see that the plasterers in Mr. Aldin's employ have struck rather than work for 74d. per hour. These instances show that the working classes do not yet perceive that they must accommodate themselves to the times, although their employers are forced to do so. The competition to obtain contracts is far too great for much profit to be made; and I should like to know how many master builders have done more than pay their expenses during the last two years, while we know that many have not been able to do that.

There are many clerks and others,—men who have received good education,—who would thankfully accept situations, if they could get them, at salaries far below what they feel they are worth; and our working-classes must look for employment in the same spirit.

The building trade is now in a deplorable condition, and in my opinion will be worse, so far as the operatives are concerned, before it gets any better. It will have to go through the same process that the cotton, and steel, and other trades have had to submit to, and the skilled workmen must be prepared to see mechanical appliances introduced into the building of the future to a much larger extent than heretofore.

Architects and builders must turn their attention to labour-saving apparatus in every branch of the trade, so as to bring the cost of building down to a rate that will induce the public again to invest in this class of property. The efforts recently made to introduce concrete houses seem steps in the right direction. IRON.

*** We have received a dozen other letters on this subject, so some of which we may give further consideration.

THE TRAMWAY BILLS.

Not only is the metropolis to be interlaced with tramways, if the numerous projects in hand be carried out; but in probably every large town in the country, tramways are the talk. That a revolution in town transit is on the eve of taking place, is evident; and it will be for Parliament to see that the inevitable change is discreetly and properly carried out.

The property or desirability of handing over portions of our great thoroughfares to private companies, as proposed, has been questioned; and although we are altogether in favour of tramways, this, we think, is a question well worthy of careful consideration. But if private companies are not to be allowed, under any circumstances or conditions, to interlace our thoroughfares with tramways, public authorities ought to be compelled to do so on some consistent and continuous plan. In the metropolis, especially, where there are so many different, and not interdependent, authorities, supervision and a gentle compulsion would especially be requisite.

Mr. William Booth Scott, C.E., the chief surveyor to the St. Pancras Vestry, reported on the subject to his constituents so far back as February, 1869, and again in the present year. The conclusions of his elaborate report just printed, are of public importance, and we may here give them in a more or less condensed form. Admitting the expediency of tramways, he is of opinion—

That they cannot be laid and worked upon railways of great traffic, "so as not to impede or injure the ordinary traffic of the streets."

That it would be inexpedient to permit companies of private individuals to lay tramways upon public thoroughfares, as by so doing they would usurp a right to control the use of the thoroughfares by the community at large, and would virtually establish a gigantic monopoly of the passenger traffic.

That it is possible to devise and carry out a comprehensive scheme of tramways for the metropolis, so that the community at large may reap all the advantages, while by proper and undivided management the inevitable inconveniences might be reduced to the minimum.

That the only satisfactory mode of thus dealing with the matter would be by the institution of a corporate body, to be called, say, the Metropolitan Tramway Board, upon whom would devolve the duty of devising, constructing, and managing such comprehensive scheme, and extending it from time to time.

That the privilege of running cars upon the tramways so constructed should be put up to competition and let by tender annually, or for terms of years, upon terms and conditions defined by the Metropolitan Tramway Board.

That the revenue derived would not, on the rapidity of the cost of constructing and maintaining the tramways, but would also produce so large an annual surplus as to reduce the general or paving rate at least one-half over the whole metropolis.

That companies of private individuals ought not to be permitted to establish a monopoly, and appropriate such an immense revenue by the use of the public thoroughfares, but that the revenue should be reserved to the community at large.

That the whole question should be thoroughly investigated by a Royal Commission.

Mr. Haywood, the engineer and surveyor to the City Sewers Commission, has also reported to his constituents on the subject. Mr. Haywood says:—

"Special consideration will be needed as to how far a company should be allowed to establish what will be, by many, considered a monopoly of portions of the public highways. The objections on this point have, however, been already raised before Parliamentary Committees, but have not been thought, in respect of the Metropolitan and Liverpool Acts already passed, to outweigh the advantages which the schemes possess; but, if very large benefits

are likely to accrue from tramways as well as large profits to the tramway companies, and there are objections to permitting private companies to construct them, it is a question whether Highway Boards should not themselves form such tramways out of the public rates; and this is a fundamental question at the threshold of the whole inquiry."

The subject has since been mooted in the Court of the City Sewers Commission, and after some discussion the principle of the schemes was approved, and the subject has been referred to the Bridge-house Committee.

A report has also been presented to the Metropolitan Board of Works by Mr. Bazalgette, their chief engineer, in which he says:—

"Amongst the most important of the Bills deposited with the Metropolitan Board of Works for the session 1869-70, are those for the formation of street tramways in various parts of the metropolis. They are seven in number, and are called the Metropolitan, North Metropolitan, London, North London, East London, and the Pimlico, Peckham, and Greenwich (two Bills). The aggregate length of these tramways is about 145 miles; the total capital is £17,400,000, and the borrowing powers £9,500,000. Most of the principal streets and roads of the metropolis would be, to a greater or less extent, traversed across by these tramways, and in many cases, the occupation of the same street is competed for by different companies—for instance, Tottenham-court-road, Hampstead-road, and Camden-Town-road, are included in these separate schemes, and the Edgware-road, King's-cross, Holloway, Islington, City, Camden, Blackfriars, and Westminster Bridge-roads, and White-chapel and Aldgate High streets, are each proposed to be invaded by two different companies. Four bridges are to be crossed, namely, Blackfriars, Westminster, Lambeth, and Vauxhall. I have on previous occasions expressed the conviction that, if tramways are to be adopted in London, it would seem desirable that some uniform system should be laid down under the direction of this Board, rather than it should be left to the discretion and management of private companies, whose interests would be likely to be those of the public and with each other. I am fortified in that opinion by experience of the excessive expenditure which has been incurred in this country by the formation of railways by rival and competing companies, instead of having a system of lines selected under some impartial jurisdiction to be executed by private companies; and I am still of opinion that it is undesirable in haste to multiply the tramways of London without having obtained experience as to their efficiency and advantage to the public."

It is to be hoped that Parliament will give the whole question, how best to establish tramways in the metropolis and other large towns, all due consideration before a single Bill is allowed to pass. The subject, we understand, is under the consideration of the Board of Trade. In the House of Lords, Earl Grey questioned the propriety of leaving the proposed tramways in the hands of private companies.

THE OXFORD SLADE PROFESSOR OF ART.

In Mr. Ruskin's second lecture in the Sheldonian Theatre, Oxford, he said art has a three-fold relation to religion. We must consider how far, first, it is literally inspired by religion; secondly, how far exalted by it; and, thirdly, how far it has advanced the creed it advocates. If we analyse imagination, we shall find that divine light, of which we all have a share, has affected the creations of all great artists; but the achievements of art have never been the result of inspiration, but of labour and of those feelings which influence all humanity. There are three essentials to all good work of art. 1. An instinct of construction, which is not enjoyed alone by man, but is shared by animals; 2. A faculty of imagination and vision; 3. A power of accurate design. If the second predominate it is usually the result of mental degradation. An example of this we may see in Albert Dürer's life and death. Some of his visions are unprofitable, unintelligible, and even frightful. A morbid influence spoils his work. This great artist has left us but two works of real didactic value. On the other hand, the best results have been gained by those whose vision was moderated and restrained by accuracy of design. Our best artists are those who are conscious of no divine influence. One of the greatest of them has asserted that all things are possible to well directed labour. Formative art exercises a two-fold influence upon religion. First, in the realisation of conceptions of spiritual persons; 2ndly, the localisation of the supernatural presence. Assume, for instance, in the first case the Madonna present to answer prayer; a truly religious mind would desire only so much of her presence as she deigned to give, whereas the superstitious will see before them the actual Virgin. This will affect them in two ways,—first, it will make them believe what they would not otherwise have believed; secondly, it will bring them more frequently under religious influences. The first is evidently mischievous. When art causes us to realise fancy, to believe what is not true, it

makes religion degenerate into superstition. If, however, we never lose sight of the fact that it is our imagination which is appealed to, then art is ennobling. The symbolical and realistic are so closely united that in ancient art it is almost impossible to distinguish between them. Now it is easier. It is hard, however, still to say how far symbolical art is improving to mankind. Pictures confessedly imaginary when painted by good men have an elevating tendency, and it is not with these we should find fault, but with the gilded virgins and crucifixes which render superstition a prominent part of the national character. These are pernicious, and to the honour of England their realistic tendencies have been and are discouraged. Lastly, the most notable and lamentable kinds of this injurious tendency is that which encourages people to lament over the sufferings of Christ, instead of being wasted during the last 800 years. How is it that, instead of picturing the misery of our Lord, these artists did not remember some of his last words, "Daughters of Jerusalem, weep not for me, but for yourselves and your children." How many women have been led to isolate themselves from the world—to employ themselves in devotions useless to mankind. How much misery might they have alleviated had superstition not perverted their intelligence. One chief reason of the misery of mankind is this division of sympathy with imaginary saints and bad men whose lives ought to have been kept in the background. What might history have been if, instead of living in a cloud of superstition, contention, and revenge, mankind had elevated the good and helped the weak who live among us.

GOVERNMENT WORKS.

SIR,—The more such excellent and practical advice as "T. L. D.'s" is urged on the Government at the present time, so much more will the public at large be indebted to such correspondents. There is no country on the face of the globe that takes so little interest in its public buildings as England. How few public buildings have we worthy of note? How much longer, as your correspondent justly observes, are the public generally to be kept in suspense as regards the New Law Courts, National Gallery, &c.? The sites are provided, and the money paid for them. Here there would be ample means to provide for the necessities of many deserving artificers.

I would not advocate unnecessary extravagance in design for our public buildings, but let them be effective and grand in composition. Who is there that would find fault with Somerset House as a public building? You have fine masses without being overcharged with ornament,—not all adapted to the climate of this country, and which after a few years you find mouldering away, from the effects of soot, and no means of preserving it.

Now, let the Government bear in mind the excellent advice of your correspondent, and at once carry out the designs for the New Law Courts, National Gallery, &c., and provide, or make provision, for so many starving and industrious workmen, and they would secure the goodwill of one and all. AN OLD SUBSCRIBER.

SPON'S DICTIONARY OF ENGINEERING.

This work, which has attained to the completion of the Second Division, extending as far as, but not yet completely embracing, the section upon bridges and their construction, is now issued by the publishers in the shape of two separate and uniformly bound volumes. From these the design and general character of the undertaking may be well conceived. The present volumes embody the serial numbers of the work in its current and first-projected form of publication, with brief explanatory statements on the part of the editor, Mr. Oliver Byrne, as to the present progress and ultimate scope over which his labours may extend.

The "Dictionary of Engineering" is not ostensibly projected as a work intended to afford new information upon every subject of which it may treat, as its title in a measure could be said to imply. Reference is freely made to works of well-known authority in special branches of engineering practice; but an impress of originality is conferred upon the present work from the manner in which such references are

applied, and the criticism to which, in some cases, they have been subjected. From the contents of the present volumes it might more fairly be apprehended that the Dictionary, when completed, will be likely to form a notable, if not the first, attempt towards the classification of the heterogeneous and widely-spread branches of practical science, upon the treatment of which the work is mainly founded, an effort which, upon its own merits, may in the view of many appear commendable, and has long been expressly called for.

As an instance of the general design and character of the subjects which may be successively commented upon, the treatise on agricultural implements, which occurs in the first volume, may be noted. The mechanical details which are here given as to the construction of the various apparatus of novel introduction and usage in farming, well illustrated and described by numerous engravings and diagrams, are followed up by a comparative inquiry as to the advantages and economy arising in the application of steam-motors and machinery in agriculture. Such an investigation is made to enter fairly within range, and the practical exposition which is given in this the first division, although but one of many subjects enlarged upon, of the successful results which have attended the adaptation of science to farming purposes, could not fail to interest a wide circle of readers, and, in certain directions, to be profitably considered.

When the present work was first submitted to notice, the publishers stated that from careful observation, and from classifying the demands made by professional engineers and the scientific public generally for information in relation to numerous subjects that could not be supplied in any convenient form, they were led to entertain the idea that such a work as the one now issued would prove likely to be useful, not only to the experienced engineer, but to all who are in any way interested in the rapid progress which has been made during the past few years in the successful application of the sciences to the arts.

In the list of subjects proposed to be comprehended in the general undertaking are included those of Railway Engineering, Labour-saving Machinery employed in the different industrial pursuits, Practical Mechanics, Naval Architecture, Mining, Telegraphy, and further researches upon the Strength and Properties of the Materials of Construction.

The treatise on Bridge Construction, which forms no inconsiderable portion of the second volume, and which might probably engage more general attention than intermediate subjects, bids fair to constitute one of the leading features of the entire work.

This section will comprise some portion of the volume next to be issued, and, as proving likely to interest some amongst our readers, we have made reference to it, to the exclusion of more specific branches of art of which the work up to its present point of issue already treats.

In the part to which we refer, a masterly investigation is entered upon, comprising incidentally observations upon the general theory of constructive science, but mainly and speedily resolving into an examination of the structural application of iron and steel.

The rival claims of various systems of suspension bridges which of late years have attracted notice might well suggest an important element of inquiry in such a work as that which is now projected, and we are glad to observe—that we do not remember to have before met with in any work of similar character within general reach—that structures of this class, of surpassing magnitude and scientific interest, which have been erected in America, have received something of that prominence to which they are entitled. It would in no way have detracted from the valuable diagrams given in this portion of the book had fuller references accompanied them. They are, however, clearly and well drawn; and to the professional reader, who may be fairly presumed to already possess acquaintance with some of the works described, less chance of incoherence may arise, if they do not prove more acceptable in their present form.

Although it is asserted that much of the materials required to complete this entire work, so that it may present in a concise and concatenated form the latest improvements of professional skill and ingenuity, are scattered through the printed transactions of Mechanical and Engineering Societies, or are to be found in journals devoted to engineering and mechanical pursuits, this portion of the work bears un-

doubted marks of originality, and in a measure which may fairly entitle it to the attention of those who may be interested in that particular branch of the science of which it treats.

The details and general principles of some designs by English engineers are given with illustrations in this portion of the work, including the Charing-cross and Cannon-street railway bridges, designed by Mr. Hawkshaw.

Reference is, however, as yet omitted to more recent works, which may probably be hereafter given, including the important designs which have received the countenance of Mr. Fowler, Sir Charles Fox, Mr. P. and Mr. W. Barlow, and others. The Chelsea suspension-bridge, as well as the elliptical-arched iron bridge at Westminster, both of which were designed by Page, and to which we have had occasion to refer in these columns, have been fairly instanced.

In other portions of the work, no doubt, further references may be appended in relation to recent discoveries in the structural application of iron. The Francis Joseph Bridge, lately erected over the river Moldau, in Prague, by an engineer of reputation in this country, and to which allusion has been made in various scientific journals, might be well incorporated with the examples already quoted.

After crossing that structure, and walking a little along the bank or rising slopes at the Carolinenthal side of the river, where a view may be obtained uninterrupted by habitations of any kind, it acquires a singular appearance. From the circumstance of the supporting system of chains being composed of steel, the first application, we believe, of that material in so large a capacity, the superstructure seems exceedingly attenuated. The effect is heightened by the novel arrangement of the main-chains, which are disposed in right lines of deflection from the towers to the roadway, intersecting each other towards the centre of the middle span, and designed to be sustained in that position by a curved chain of smaller dimensions, running above their own direction and throughout their entire extent. To this inferior chain the chains supporting the bridge are attached by vertical connexions, of lengths varying with the interval between the curved and oblique chains.

It is considered that the reciprocal action of the main-chains, from end to end of the structure acquired by this arrangement, possesses advantages over bridges supported by continuous chains, as in the Brunel, Barlow, Page, and other systems. Notwithstanding the apparent lightness of the structure, it is stated to embody in the principle greater rigidity than has yet been attained in any like class of erection. While public attention is attracted to the possible application of iron in the erection of railway and other bridges of far greater span than any which have yet been erected in this country,—say, for instance, over the Severn, Mersey, and below bridge on the Thames,—undertakings any of which may be shortly determined upon, and of which it may be said that all are necessary, inquiry upon the merits of later discoveries in the structural use of iron and steel cannot fail to prove of scientific and public benefit.

In taking leave of the present volumes of the "Dictionary of Engineering," at what, though, from the necessity of the case, an interrupted treatise, may upon its conclusion in the succeeding volume prove one of the more attractive portions of the general work, we can fairly commend it as an undertaking of considerable promise.

It will assuredly fulfil the expectations upon which it was projected, in being useful not only to the experienced engineer, but to all who are in any way interested in the rapid progress which has been made during the past few years in the successful application of the sciences to the arts.

Architect to the Conservative Land Society.—The post of architect and surveyor to the United Land Society (Limited), and to the Conservative Benefit Building Society, which was open to public competition owing to the decease of the late Mr. James Wyllon, has been conferred by the two boards of directors on Mr. John Ashdown, formerly surveyor to the Orphan Working School and the Hammersmith Bridge Company, and connected with other public works. There were sixty-one candidates for the position.

KING CHARLES I'S WATCHES.

Sir,—In reply to the question raised concerning Charles I's watches in your number for January 1st, your correspondent and others may be interested in knowing that a watch given by King Charles to a member of the Worsley family, at the period of his removal from Carisbrook to Hurst Castle, is still preserved in that family in the Isle of Wight.

This watch is mentioned by Sir Richard Worsley in his history of the island, and by other writers, and is also described by "Vectis" in the *Illustrated London News* for February 7th, 1852.

Through the kindness of one of the family to whom the watch belongs, I am enabled to add the following extract from the will of the Rev. F. Worsley, who held the livings of Chale and St. Lawrence, in the Isle of Wight, from 1754 to 1805:—

"Chale, January, 21, 1806.
"I give my watch, which was given into our family by the great and good King Charles I. of glorious memory, to my son, the Rev. James Worsley, of Billingham, and do most solemnly and ardently request, desire, and enjoin him to do all in his power to cause it to be preserved in the name of Worsley, his own descendants, &c., to the latest generations.

May the gracious God confirm, prosper, and bless my petition and injunction.—F. WORSLEY."

L. H. B.

"THE HEARTHSTONES IN OUR HOME."

THERE is, unfortunately, too much cause for complaint of the manner in which trimmer-arches are constructed for the support of the hearth-stone. The very best brick trimmer-arch is but a clumsy way for supporting the "slab;" it also adds unnecessary weight to the already weakened trimmer-joist. It was to remove these defects that I lately introduced a trimmer-arch of boiler-plate, screwed to the joist, which has answered the purpose beyond my most sanguine expectation. W. J. G.

STATISTICS OF RAILWAYS.

THE INSTITUTION OF CIVIL ENGINEERS.

At a recent meeting, Mr. Vignoles, F.R.S., President, in the chair, the paper read was "On the Statistics of Railway Expenditure and Income, and their bearing on future Railway Policy and Management," by Mr. John Thornhill Harrison.

Diagrams were exhibited, giving a synopsis of this information for twenty of the principal railways in England and Scotland, which represented about 85 per cent. of the entire capital expended in the United Kingdom. The most striking feature of this traffic was the large numerical proportion of third-class passengers, and, with few exceptions, they yielded the largest amount of revenue. The circumstances which seemed to affect the number of persons travelling first, second, and third class were considered; and whilst it was admitted that each locality required a separate study, it was thought that there were probably some general principles which, with allowances for variable circumstances, might prove useful guides; and it was deduced that where low fares filled the trains, a moderate difference in them effectually sorted the passengers, and tended to increase the demand for first and second class tickets for long journeys.

On the question of the further extension of railways, it was urged that many lines might be constructed at a cost of from 3,000l. to 5,000l. per mile, provided the landowners would sell their land for the purpose at the ordinary market value, that the Board of Trade would allow level crossings, and that gradients as steep as 1 in 20 or 1 in 30 were adopted.

Attention was directed to the striking similarity on the different lines of the per centage of expenditure on the gross receipts, which averaged about 48·4 per cent., and the combined expenditure for maintenance, rolling stock, and locomotive power, which generally exceeded 50 per cent. of the total expenditure, the other heavy item being about 30 per cent. for traffic expenses. The total locomotive charges were generally from 8d. to 9d. per train mile. The repairs amounted to about 3d. per train mile, when the mineral traffic was heavy, and from 2d. to 3d. on the passenger lines south of London. Under the head of running expenses, the item of wages was strikingly similar on all the lines, being about 24d. per train mile. The cost of fuel per train mile varied greatly. On the

southern lines, where the consumption was small, the cost was 3d. or 4d. per train mile, whilst on the northern lines, where the consumption per train mile was large, but the price was small, it was only about 2d.

The per centage of net revenue on the total capital expended exceeded 5 per cent. per annum on eight lines; was between 4 and 5 per cent. on four; 3½ to 4 on other four; 3 to 3½ on two; and only in two cases was it under 3 per cent. This per centage was influenced by the cost of construction and the character of the traffic, and showed the importance of their consideration. The amount available for dividend was dependent on the per centage on the total capital. When this per centage fell below 4½ per cent. the stockholders' dividend was diminished to supply the deficiency, and *vice versa*; it depended most on the burdens to be borne; but where lines could *bond fide* pay all their engagements, and have a surplus to divide, the elasticity of the railway system seemed to promise at an early date a fair rate of dividend.

Two large funds for investment of capital were next considered: the national debt, which amounted to 750 millions sterling, and gave a return of 26½ millions per annum, or 3½ per cent., which was a burden on the industry and capital of the country; and the capital expended on railways, which amounted to 500 millions sterling, giving a return of 20 millions, or 4 per cent., per annum; whilst a sum nearly equal to the interest on the national debt was annually expended in labour and materials.

It appeared that 54 per cent. of the railway capital had been expended since 1849, in which year it amounted to 228,747,791l., whereas in 1867 it was 502,262,887l. The length of railways in operation had been more than doubled, being 6,032 miles in 1849, and 14,247 in 1867. The length of double line was increased from 5,034 to 7,844 miles, or 56 per cent.; whilst the single lines had been increased 542 per cent., or from 998 miles in 1849 to 6,403 miles in 1867. Notwithstanding this, the cost per mile was maintained at from 33,000l. to 38,000l. per mile. This was explained by the general traffic having increased 240 per cent., and the goods traffic 400 per cent.; whilst the capital expenditure was only 120 per cent. This augmented traffic demanded extensive increase of rolling-stock, sidings, and station accommodation, especially for goods. The traffic was still largely on the increase, and this would necessarily delay the closing of the capital accounts, which was desirable.

The burdens on railway property, as they affected the original shareholder, and the proposals for relieving these burdens to some extent, were next considered. One of these proposals was, that Government should take upon itself the responsibility of the loan capital at an equitable price; and it was argued, that as they could borrow money at a low rate of interest, they might benefit the railway companies and the public by an arrangement for gradually extinguishing the loans and reducing the fares and rates.

RUSSIAN MEMORIAL CHURCH AT SEBASTOPOL.

LETTERS from Sebastopol say that the Church of St. Nicholas, erected in memory of the Russian soldiers who fell in the Crimea, and dedicated to St. Nicholas the Wonder Worker, will be consecrated in May. The foundation stone was laid in 1856, close to the cemetery known as "The Cemetery of the Hundred Thousand," and the Church of St. Nicholas, already completed as a building, will, when it has been fully decorated, be the most magnificent religious edifice in the South of Russia. The contributions to the building fund from all parts of Russia have been immense, the largest offerings being those of the Princess Vassilichikoff, widow of the late President of the Council of the Empire, who is an annual subscriber to the amount of 15,000 rubles. The church is paved with granite taken from the ruins of Sebastopol docks. The walls are, for the most part, of grey marble from the Crimean quarries. The cross and windows are formed of a Crimean stone called *atonite*, while for other portions of the interior green, black, and fawn-coloured diorite is employed. Above the entrance is the face of our Saviour in mosaic, and sunk into the outer walls of the church are large slabs of marble bearing the names of all the officers who fell in the war. The left wall is dedicated to officers of marine artillery, of cavalry, and of infantry;

the right wall to officers of engineers, of the staff, of the navy, and of cavalry and infantry. Connected with the church is a memorial chapel, containing portraits of about two hundred of the principal actors in the war, including the Emperor Nicholas, the Emperor Alexander II., and the Grand Dukes Constantine and Michael. "Pilgrimages," says the *Gazette of New Russia*, "will be made to the Church of St. Nicholas, from all parts of the empire, and there will be an enormous gathering to witness the consecration of the building; for who did not lose a relation in the Crimean war, and who will not wish to visit the grave of his father or his brother?" It would seem, then, that the memory of the Crimean war is cherished by the vanquished.

HARROGATE.

SIR, With regard to the progress of Harrogate mentioned in the *Builder* of Saturday, the 19th, and especially with regard to the competition plans of the Public Works Company, I have, on behalf of Messrs. Shott & Thompson, and myself, to say that, although the directors knew we were waiting outside to explain our plans, we were never invited to do so. I enclose you two paragraphs from Harrogate papers, showing that this circumstance is being canvassed.

RICHARD DYSON.

WAGES IN MANCHESTER.

A JOINER'S CLAIM FOR WAGES.

A CASE that interested the joiners and carpenters of Manchester was decided by Mr. Headlam at the city police-court. John Johnson, builder, was summoned by a workman, named Edward Benson, for the sum of £s. 11d. as wages due.

Mr. Bent, in opening the case for the complainant, said that during the previous summer there was a considerable dispute in the building trade, with reference to the wages paid the workmen; but it was finally settled by Mr. Kettle as arbitrator. It was then decided by certain of the masters on behalf of the building trade, and certain parties on behalf of the workmen, that 74d. per hour should be paid from May, 1869, to May, 1870. That, of course, became a rule of the trade, and when a man was engaged it was understood he was hired on these terms except the contrary was stated. In this case the complainant, with twenty others, were engaged by Mr. Johnson on the 21st of January last, but no mention was made of wages. At the expiration of the first week's work, the complainant only received 30s. 4d. instead of 36s. 7d., and said to the cashier it was not at the rate of 74d. per hour, whereupon the cashier replied, "Oh, it is all right; we shall make it right next week." On the following Saturday the complainant again only received the 30s. 4d., which he took under protest, and he and fourteen others then left Mr. Johnson's employ.

For a defence it was contended that the complainant did not possess the "average skill"—a provision of the rule laid down by the arbitrator, and therefore was not entitled to the full wages of skilled artisans. After hearing some further evidence, Mr. Headlam gave an order for one half the amount claimed.

HOUSE AGENTS' RESPONSIBILITIES.

STINTON V. CURTIS.

THIS was an action (Court of Exchequer, February 19th, Second Court, before Baron Martin) brought by a widow lady against a house agent for alleged negligence in letting her house to a person who was unable to pay the rent. The defendant pleaded several pleas, which in substance denied that he had been guilty of any negligence.

Mr. Oppenheim appeared for the plaintiff, and Mr. McIntire for the defendant.

It appeared that the plaintiff is a widow lady residing at 3, Langham-street, Langham-place, and the defendant a house agent, carrying on business at Langham-place. In May, 1868, the plaintiff employed Mr. Lowe, the then partner of the defendant, but who has since died, to let her house for some months, on the condition that the first two months' rent, amounting to 35s., was to be paid in advance before the tenant was to be allowed to take possession. According to the plaintiff's case, the defendant negligently allowed a person to take possession of the plaintiff's house without paying the rent, which she had since been unable to recover. She now brought this action to recover the 35s. she had so lost, as well as certain expenses to which she had been put in the matter.

The defence was, that the person in question had improperly obtained possession of the plaintiff's house, and that therefore the defendant was not responsible.

The jury returned a verdict for the plaintiff.—*Damages, 30s.*

RESISTANCE TO FIRE.

SIR,—As a means of preventing the destructive ravages of fire, especially desirable in offices, libraries, art repositories, picture galleries, and other places, it is to be advised that the plating of roofs with sheet-iron plates, be adopted, as fires thereby would almost certainly be confined to the apartment they originate in, by reason of the obstacles to the progress of fire by the sheet-iron roofing. The plates could also be laid as shutters for libraries, and in picture galleries, and be made to fold or slide away, from place to place, as required. The complete adoption of iron plates being laid for the protection of roofs of domestic house lower apartments, would probably result in the saving of valuable lives and properties, and reduce insurance rates, to such an extent as to pay interest for the extra cost in building houses, offices, and warehouses, guarded with sheet-iron plates. The surface of the plates would allow plastering, painting, and paperhanging to be used as now, and if necessary punctures through the plates into the woodwork they are fastened to, could be made for any purpose. As a desirable measure for adoption, I beg to ask your consideration hereof.

For ships and steam-vessels, the light extra expense of the iron-plating, should be worth notice to adopt it, to prevent calamities: a little time gained by opposing the fire may end in saving life through aid arriving.

* Similar propositions have been made and carried out again and again,—plates, extra thick plastering put at the upper and underside of the laths, &c. We print the latter simply as a reminder, and to keep under attention the desirability of improved construction in the direction of incombustibility.

THE PIPE-LAYING CAT.

THE pretty tale is well known of a prisoner who made a spider's web serve to draw up a fine thread, the thread a string, and thence a rope strong enough for him to escape by. We have just now heard a little story of a cute young Yankee in Lisbon, O., which may go with this. He wanted to lay a water-pipe through a drain several feet below the surface without digging up the drain; so what did he but tie a string to a cat's leg, thrust her into one end of the drain, and gave a terrific "Scat!" The feline creature, thus made a cat-a-paw, and dreading a catastrophe or cataclysm, quickly rushed through the other end, as if from a catapult or catapult. The pipe was drawn through by means of the string, and 10 dollars were saved by the transaction;—a categorical result entitling this cat of the catacomb to be included in the next catalogue of labour-saving machines.

Books Received.

Our Domestic Fireplaces: a New Edition. By FREDERICK EDWARDS, Jun. London: Longmans, Green, & Co. 1870.

THIS is a much improved and enlarged edition of a work already noticed by us in past years. It has been entirely rewritten, the additions completing the author's contributions on the domestic use of fuel, and on ventilation.

In his first chapter the author gives an interesting sketch from various sources, of much relating to the history of the fireplace. In the second he details the progress made in this country during the present century. In the third, he enters into the details of various improvements which are possible at the present time, or may become practicable in the future. In the fourth he takes up the subject of stoves and other means for effectually warming the halls and other portions of dwellings, which are now in a great measure disregarded by builders, whom some ignorant critics, we may here observe, in charging them with ignorance and stupidity, speak of as "the lower classes of architects;" whereas architects of any class have too often nothing to do with the construction or arrangement of "our domestic fireplaces."

The volume is illustrated by numerous plates of grates, stoves, and other fireplaces, hot-water apparatus, &c. A portrait of Count Rumford forms the frontispiece.

The author thus states his views of what could be accomplished by hot-water circulation:—

"At one end of a line of houses boilers and furnaces could be fixed, and from the boilers hot-water circulating pipes, protected to prevent loss of heat, could pass in proximity to the houses. From such main circulating pipes, branch pipes, also protected, could enter each house, and ascend to any height required, with branches for drawing off water for baths and other purposes, and with other branches which would admit the water to circulate, when required, through hot-water coils for warming the house. That there would be any insuperable difficulty does not appear for a moment. The extent to which hot-water circulation has already been applied is a sufficient proof of its possibility. Competent persons could be as readily found to manage such a system as to make gas or to drive a railway train. The contingencies of a temporary failure of supply would be simply met by every house having the means of falling back upon something provided, just as we can substitute candles for gas. And, with respect to economy and efficiency, it is not possible to conceive how any system could be more economical, due care being taken in all matters of detail, or more efficient, inasmuch as the constant attention of a skilled person should attend the system, to the demands of the thermometer. Irrespective of this, the whole would be under facilities of regulation left in the hands of the occupier."

Marvels of Architecture, translated from the French of M. Lefebvre. To which is added a Chapter on English Architecture. By R. DONALD. London: Cassell, Petter, & Galpin.

THIS is a pretty little book, very readable, and likely to interest many in what architecture has done. It is not intended for the professional student. The chapter on English Architecture is the least satisfactory part of the volume, and further confirms what we recently said as to its being desirable that persons who write about buildings should know something of architecture.

Take an instance in proof. The author is speaking of "the Gothic style of architecture which sprang into ascendancy during the Middle Ages," and says,—

"The style is also widely known as the *Pointed style* of architecture, and is very largely to be found in the *Saxon* and *Norman* edifices of this country. What is known as the *Corinthian* order of *Pointed* architecture is, indeed, almost peculiar to England."

Very peculiar indeed, we should say. Again,— "Though the Gothic and Pointed styles are often confounded, there is considerable distinction between them. In Gothic, the general running lines are horizontal, as in entablatures and single corbices; in Pointed, the general running lines are vertical."

The author is evidently at sea. Nevertheless, it is an interesting little book: and it includes a considerable number of illustrative woodcuts.

VARIORUM.

"A GUIDE to the Churches of London and its Suburbs, for 1870." By Charles Mackeson, Parker, Strand. In this fifth issue of a very useful guide some improvements have been effected, as in the consecutive numbering of the alphabetical list of churches, so increasing the utility of the index. Another little improvement we would suggest. Although the guide is an alphabetical one, there is no alphabetical entry whatever of St. Paul's Cathedral, of Westminster Abbey, nor of the Royal Chapels, under any heading. This is certainly a defect. The reason of it is, that these churches and chapels are all placed at the head of the alphabetical list, which latter begins with "9. Alban, S. Holborn," without even a short rule to separate it from the last of the royal list, which is, "8. Chapel within Hampton Court Palace." Let the preferential list remain, by all means; but why not insert references to it in the proper alphabetical order?

Miscellanea.

Destruction of St. John's Church, Bethnal-green.

A fire has destroyed the district church of St. John, situated at the south-western corner of Bethnal-green. It was a capacious edifice, with sittings capable of affording accommodation for over 2,000 people. Workmen had been employed for some time in enlarging the illuminated clock in the steeple, and it is supposed that the fire arose through carelessness on their part; for, about seven o'clock p.m., a glare of light was visible in the steeple, and in a short time the flames burst forth through the clock-turret. Some seven or eight steam fire-engines soon arrived, but unfortunately no supply of water could be obtained for a considerable time. The firemen conveyed the hose into the interior of the church, but their efforts were frustrated from the cause referred to. The flames soon spread to the roof, and by half-past eight the whole of the building was in flames. It was not until that time that the engines could get a supply of water. Portions of the roof had fallen in, and as fire to the pews, in the galleries as well as in the body of the church. The fire continued to rage till ten o'clock, by which time the church was almost entirely destroyed. The parish church of Bethnal-green, in Church-street, was burnt down only a few years since.

Geographical Medal and Award to M. Lesseps.—At the general meeting of the French Geographical Society just held, M. Barbé de Boag, reporter of the committee to award the Empress's Grand Prize of 10,000 francs, given this year for the first time, announced that the award of that body had been in favour of M. Ferdinand de Lesseps, who, by cutting through the Isthmus of Suez, had accomplished the work most useful to the commercial relations of France. M. de Lesseps received from the president the medal which accompanies the prize, and announced that he would devote the sum of money to the expedition which the society is about to undertake into Central Africa.

The Drainage of Margate.—The articles that have from time to time appeared in our columns on the cesspool system at this very fashionable watering-place, have had effect, we learn, on some of the freeholders of the town, if not upon the local Board of Health, and an extensive system of tubular earthenware pipes is now being laid throughout the whole of the large block of houses known as the Royal Crescent Estate. The works are being carried out by Messrs. Docwra & Son, of Leighton, from plans prepared by Mr. W. Lane Sear, of Margate, architect.

Accidents.—A destructive fire has occurred in Newcastle, Atkinson's saw-mills having been burned to the ground, and 8,000*l.* worth of property thereby destroyed. There was a strong wind blowing, and no water was obtainable for a considerable time. This is the second saw-mill burned down in Newcastle within a month.—At midnight, on Friday week, the inhabitants of the Boulevard Jourdan, at Marseilles, were aroused by the noise of a terrific crash, which was discovered to have been caused by the falling in of two contiguous houses. After an hour and a half's work, eight men, all still living, but very seriously injured, were extricated, and exertions were being made to discover a young man and woman, who were known still to be beneath the debris.—The *North German Correspondence* reports that at about two o'clock in the morning recently, a rather alarming fire broke out in the upper part of the Palace of the Prussian Crown Prince, just above the apartments of the Princess Charlotte, the ceilings of which were partially consumed by the flames. The young Princess having been removed to another portion of the building, the fire was soon extinguished by the exertions of the fire brigade. The fire is believed to have been caused by a coal or spark from a chafing-dish with which some workmen, the day before, had been trying to thaw the frozen water-pipes.

House of Commons.—In answer to Mr. Locke King, Mr. Ayrton said that, owing to arrangements between the Government and the Metropolitan Railway, the subway projected some years ago from Parliament-street to Palace-yard could not be completed as originally proposed. He had, however, been in communication with the Metropolitan Board, and he had urged upon them the propriety of connecting the subway with the Embankment.—Mr. Cowper-Temple asked whether the Government are prepared to take measures for relieving the overcrowded condition of the objects placed for exhibition in the British Museum by means of the erection of a new building for the collections of natural history. Mr. Ayrton, in reply, said the Government had the subject still under consideration.—Mr. Samuda also has given notice to ask whether, before the Government approve of the site that may be selected by the Corporation for the waterside market for foreign animals, means will be taken to ascertain the views of those interested in the trade, and to insure a sufficient extent of accommodation being provided.

A Caution.—It ought to be pretty well known by this time that the copyright of Mr. Macleise's grand pictures, "Wellington" and "Nelson," in the Royal Gallery, at the Houses of Parliament, was purchased by the Art-Union of London, and that engravings are in course of active preparation for distribution. It takes a long time, however, to make such facts known, even in circles supposed to be well informed on such points. Thus Messrs. Ward & Lock had reproduced for publication, as a chromolithograph, the centre portion of the Wellington picture, and were about to publish it. On receiving notice, however, from the Hon. Solicitor of the Art-Union that the society would maintain its rights, those gentlemen at once expressed regret for having unwittingly done wrong, and forwarded all the impressions, some 3,500 in number, to be destroyed. Great credit is due to Messrs. Ward & Lock for their prompt acknowledgment of error. We mention the occurrence simply as a caution to other publishers.

The Railway for Japan.—A contract for the construction of a railway has been concluded by Mr. H. N. Lay, C.B. He represents capitalists who have entrusted him with money to be lent to the Japanese Government for the construction of reproductive public works, and he advances one million sterling to the Japanese Government for a line from Yedo to Osaka, some 300 miles, to be built by English engineers. The railway will be the property of the Government.

Ramsgate.—The New Cemetery.—The contracts for building the chapels, lodge, walls, &c., have been received by the board, and Mr. Wilson, builder, of Canterbury, is the accepted contractor for the erection of the chapels, for the sum of 1,882*l.* Mr. Duckett's tender for the lodge and wall, at a sum of 2,400*l.*, was accepted; but a letter was read from Mr. Duckett, to which the clerk was instructed to reply, and inform him that the board was not prepared to entertain the proposals contained therein.

The Alexandra Palace.—At Crouch-end Mr. Francis Fuller lately gave an address on the advantages and capabilities of the Alexandra Park and Palace, to a crowded meeting, desirous to hear what was to be done with the Palace. Mr. Fuller, according to the report in the *North Londoner*, said:—

"The British Museum was established by lottery, and he meant to have the Alexandra Palace established in a similar manner by the Art-Union system. He would not have it an exhibition of painting and sculpture solely, but of every article of use and ornament, that it might serve as an encouragement to trade as well as for instruction. The value of the palace and grounds was 650,000*l.*, which he proposed to deal with on the Art-Union and Tontine systems combined. He would collect in the palace 100,000*l.* worth of prizes, and have a distribution every three years. Mr. Webster, Q.C., proposed that a committee be formed in the locality to assist Mr. Fuller in his object, which was unanimously agreed to. In reply to a question, Mr. Fuller said he was working in union with the owners of the property, and they had fixed the price at which they were ready to dispose of it."

Mr. Fuller commended his project to the consideration of the residents.

The Water Supply of the City.—At a meeting of the Court of Common Council, to be held this day (Thursday), a motion is to be proposed by Mr. Deputy Stapleton, to the effect that having regard to the report of the Royal Commission, the question of the supply of water to the inhabitants of the City be referred to a committee, for them to inquire and report forthwith to the court as to whether it will be to the advantage of the public that the interests of the existing water companies should be purchased, and that the subsequent management should be vested in the corporation. At the same court Mr. Cookerell will bring up a report from the coal, corn, and finance committee, recommending that the sum of 1,200*l.* be expended in erecting a drinking-fountain in Smithfield, and that the corporation undertake to expend the sum of 50*l.* annually to supply it with water.

Finsbury Park.—Mr. Vulliamy, superintending architect to the Metropolitan Board of Works, estimates the expenses of this park during the year 1870 to be as follows:—General superintendent, 50*l.*; park superintendent, 104*l.*; gardeners, twelve, at 2*l.*s. each per week, 655*l.* 4*s.*; hire of horses for rolling and mowing machines, average 2*l.* 1*s.* per week, for twenty-six weeks, 70*l.* 4*s.*; repairs to machinery, lodge, &c., 25*l.*; repairs to fences, roads, walks, and gates, 100*l.*; manure, 100*l.*; trees, shrubs, grass-seeds, and lake, 100*l.*; water, at 7*d.* per 1,000 gallons (800,000 gallons), 25*l.*; gas, 4*l.*; land-tax, 2*l.* 1*s.* 4*d.*; poor-rates, 50*l.*; tithes, 1*l.* 1*s.* 4*d.*; total, 1,287*l.* 17*s.* 8*d.*

The Holborn Board of Guardians.—At a recent meeting a letter, dated the 8*th* inst., was read from Mr. F. Peck, architect, inclosing a communication which had been addressed to him by Messrs. Batstone & Hunt, as follows:—"Finsbury Schools. Dear sir: In May last we sent you a statement of our charges, amounting to 284*l.*, for preparing the quantities of the district schools, &c. Hoping you will soon obtain a cheque for us, we are, &c." Mr. Peck, the architect, also claimed 630*l.*, in regard to preparation of plans, and 3 per cent. upon work undone, for which, if carried out, he would have received the usual commission of 5 per cent. Consideration of the matter was deferred.

Manchester Ship Navigation.—Considerable interest has been excited, it is stated, respecting this subject, and it appears that the conclusion at which practical men who have fairly considered the matter have arrived is, that the proposed plan is quite practicable; and that Manchester and other capitalists are prepared, if the Mersey and Irwell Navigation proprietors are willing to give their earnest co-operation, to contribute funds in order to advance the undertaking. A survey is proceeding, it is said, under the direction of Mr. Fulton, engineer, and upon the result of his investigation will much depend the progress of the undertaking.

The Education Bill.—The Elementary Education Bill, introduced by Mr. Forster and Mr. Bruce, has been printed. It fills twenty-six pages, and contains eighty-eight clauses. It is divided into two parts; the first, which extends to the 81st clause, relates to "Local provision for schools," and the second to the "Parliamentary grant." There are four schedules attached to the Bill, one of which lays down rules respecting the election of school boards, and another directions for the conduct of its proceedings.

The Cambridge Slade Professor.—The Slade Professor of Fine Arts in the University of Cambridge (Sir Digby Wyatt) proposes to deliver a course of thirteen lectures, as follows:—1, Introductory, March 9*th*; 2, Architecture, History, March 14*th*; 3, ditto, Theory, March 15*th*; 4, ditto, Practice, March 16*th*; 5, Sculpture, History, March 28*th*; 6, ditto, Theory, March 29*th*; 7, ditto, Practice, March 30*th*; 8, Painting, History, May 2*nd*; 9, ditto, Theory, May 3*rd*; 10, ditto, Practice, May 4*th*; 11, Art applied to Industry, Ancient, May 20*th*; 12, ditto, Modern, May 21*st*; 13, Facilities at Cambridge for the Study of the Fine Arts, May 23*rd*. The lectures will be delivered in the Fitzwilliam Museum at 2.15 p.m., with the exception of the introductory lecture, which will be delivered in the Senate-house at 2.30 p.m.

London House Painters' Association.—The society that was formed, as we have before mentioned, some months ago, under the title of the London House Painters' and Decorators' Technical Instruction Association, and having its headquarters at the London Artisans' Club, 73, Newmarket-street, continues its classes at the Marylebone School of Art, in Bolsover-street; and, considering the very depressed state of the building trades, the association has been fairly supported. On Wednesday evening in last week the members adjourned to the large hall of the German Club, in Foley-street, to hear a lecture by Mr. John G. Crace, "On Art Training," Mr. Edward Hall in the chair. At the conclusion the meeting was addressed by Mr. Lampert, Mr. Shipton (the secretary), and others.

The Restoration of Chester Cathedral.—A meeting has been held in Liverpool for the promotion of the further restoration of Chester Cathedral. Of the 55,500*l.* stated by Mr. Scott to be requisite for the complete restoration, the Dean stated that works to the extent of 31,500*l.* had been secured by subscriptions and expended on works, with the exception of 7,000*l.*, now in the bank. The roofs and the interior groining of the nave were now under consideration. A special additional fund of 5,000*l.* for the groining, &c., while the scaffoldings were up, was now requisite. The whole work could not be completed within three years. The meeting was intended as a preliminary to one appealing to Lancashire in particular for aid.

The International Safes Contest.—Trade jealousies still keep up the excitement on this subject. The two American arbitrators and the French one having decided the contest in favour of Herring, the American, without the two English arbitrators, who had resigned in consequence of what they considered not very honourable conduct on the part of the Americans, an action in the Tribunal of First Instance, was commenced by Herring against Chataud, the English locksmith, and Tagnard, the stakeholder, and after three days' trial, has terminated by a judgment declaring the so-called award null and void, and condemning Herring in the costs.

St. Mary's Church, Torquay, South Devon.—A vestry meeting was held in this parish on the 16*th* inst., to consider the proposal to complete the church by building the tower in accordance with the plans prepared by Mr. Huggall, of Oxford, under whose direction the church has thus far been erected,—the first portion, the chancel and chancel aisles, by the late Mr. Thos. Darby, of Cheltenham; and the nave, north and south aisles, and porch, by Messrs. Wall & Hook, of Brimscombe. It was decided that it is desirable to complete the church at a cost of 2,700*l.*, and a committee was appointed to collect funds.

Easter Island.—At a meeting of the Society of Antiquaries of Scotland, held on Monday week, Lieut. M. Dundas read a communication on "Easter Island: its Inhabitants, Antiquities, and Colossal Statues." In the course of conversation with reference to Lieutenant Dundas's paper, Dr. Smith mentioned that a previous visitor of the island had found old graves almost exactly identical with those found in the Hebrides and in Shetland.

Value of Land, Derby.—The local papers say that the piece of land at the corner of St. James's-street, fronting the Corn Market, has been sold by the Derby Improvement and St. James's Hotel Company, to Mr. Randall, at 30*l.* a yard, subject to the approval of the directors who did not take part in the negotiation.

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Town-hall, Salford, 16th February, 1870.

ELECTION OF DISTRICT SURVEYORS
Under the Metropolitan Building Act, 1861.—The Metropolitan Board of Works hereby give notice that they will, on FRIDAY, the 4th day of MARCH next, at TWELVE o'clock at Noon, at their Office, 25, Abchurch-lane, London, receive and consider the applications of persons desiring to be elected to the following Districts:—
1. The District of Finsbury, containing the Northern portion of the Parish of Finsbury.
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Applications, in writing, with cert. of age and competency under the Building Act, addressed to the Clerk of the Board, will be received at the Office of the Clerk, until FOUR o'clock p.m. on TUESDAY, the 1st MARCH next. Each candidate must state the District he aspires for, and must be present at the Meeting of the Board on the 4th MARCH.
Spring gardens, 10th February, 1870.

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The Builder.

VOL. XXVIII.—No. 1413.

The Education of England.

THE earnestness with which the Right. Hon. W. E. Forster addressed himself to the great question of elementary education, in introducing the Government measure, seemed to sway the sympathy of the House of Commons by its rugged force, and to raise the tone of the debate, in at least the greater number of the speakers, far above the miserable bounds of party. The subject is one too intimately connected with the labours of the *Builder*, for a quarter of a century, to allow us to pass it over in silence. Our readers may naturally expect us to give, in a somewhat concise form, an explanation of the mode in which the Government

proposes to deal with this master-question of the day. But, before descending to detail and to objection, we cannot omit the occasion of echoing, with emphatic assent, some of the casual remarks of the president of the Committee of Council. The language, indeed, to which we refer, might almost have been copied from our own columns. "We cannot afford to wait," said the right hon. gentleman. Upon the speedy provision of elementary education depends our industrial prosperity. It is of no use giving technical instruction to our artisans without elementary education; and many of our labourers are highly uneducated, and for the most part unskilled. If we leave them any longer unskilled, notwithstanding their strong sinews and determined energy, they will become over-matched in the competition of the world. The communities throughout the civilised world are gathering themselves together in masses; and we know that in our small island we shall no longer hold our position among the nations of the world, if we do not make up for our lack of numbers by our intellectual force.

In the year 1869 an annual grant of about 415,000*l.* was required for primary schools in England and Wales, of which 11,000 were day schools and 2,000 were night schools. About 1,450,000 children were upon the registers; and the average attendance was about 1,000,000. Not more, however, than two-fifths of the children of the working classes between the ages of six and ten, and not more than one-third of those between the ages of ten and twelve, are on the registers; so that out of 1,700,000 children of the earlier age 1,000,000 are untaught; and out of 750,000 children of the later age 500,000 are untaught. The million of children attending the schools thus form the minority; outnumbered in such formidable proportions by those who are left to a self-acting preparation for the workhouse and the gaol.

To the 415,000*l.* provided by Parliament, the

parents of the children educated last year added the sum of 420,000*l.* paid by them in school fees. The sum of 835,000*l.* was thus expended on the education of between a million and a million and a half of children, or somewhere about the old English mark per head. Considering the low educational state of the country, it must be held satisfactory to learn that, in providing for the elementary education of the very poorest, the efforts of the parents have met those of the Government half-way. The indication thus afforded of the mode in which more comprehensive and vigorous efforts on the part of the educating class will be met by those whose children we seek to educate, is cheering. One-third of the cost of education from the Imperial revenue, one-third from the local rates, and one-third from the parents, is the proportion in which it is proposed that the funds required for the establishment of a comprehensive system of primary education shall be raised for the future.

In establishing this general principle, however, the Minister has not lost sight of the fact that certain modifications of detail may prove expedient. In the great centres of population, which are so often centres of educational destitution, powers will be taken for establishing free schools in case of proved necessity. And for parents who are *bonâ fide* unable to contribute to the education of their children, provision will be made for the issue of free tickets. With a sense of respect for the dignity of human nature, alike in rich and in poor, it was added that care should be taken that such free tickets should have no special stigma of pauperism attached to them. We wish we could believe that this system would provide what we insist on, the education of every child; but we cannot, and we look with anxiety to the result of efforts that will be made to modify this part of the Bill.

The Minister is not blind to the crying necessity that exists for revising the entire system of local rates. This question, however, is one demanding time for consideration and for discussion; and no reasonable man can wish to keep the children throughout all England untaught until it is solved. Thus the charge upon the rates may be considered as a temporary part of the measure, subject to revision on the occasion of any general review of the subject of local taxation. In the mean time it is not proposed by the Bill to pass any special education rate, but merely to institute a charge on the poor-rate. In the case, which is not considered probable, of this charge exceeding 3*d.* in the pound, there is a clause in the Bill which stipulates that there shall be a considerable extra grant out of the Parliamentary vote.

Having thus cleared the ground, by explaining the actual state of the primary education of the country, as far as the expense incurred is concerned, and the mode in which it is proposed to supplement the payment of school fees by the parents, we come to the principles of the Government measure. These are two. The first, to which it is proposed to give the force of legal enactment, is, that there shall be efficient schools everywhere throughout the kingdom. The second, if properly stated, is, that no child shall be suffered to grow up in a state of total educational destitution. This broad and wholesome principle, however, is not yet distinctly stated, or provided for. It underlies the idea of the measure; but, from the anxiety which has been felt by the framers of the Bill to secure as wide an acceptance of its provisions as possible, it is rather inferred than enounced. Thus what Mr. Forster spoke of as the second principle is virtually only a corollary of the first; namely, that there shall be a compulsory provision of these schools wherever they may be proved to be wanting, and only where this want may be proved. The measure, however, should go farther. Regarded as a matter of principle, no

maxim can be considered satisfactory short of this: "A SCHOOL FOR EVERY CHILD, AND EVERY CHILD TO GO TO SCHOOL."

In proceeding to the provisions of the Bill, we are reminded *in limine* of the manner in which the science and practice of the engineer form a basis for all sound legislation. The graphic representation of facts becomes daily more habitual and more important. Thus the first requisite for a School Bill is a school map. The country has to be properly mapped and divided, as a preliminary to any organisation of education; so that there shall be no spot in England or Wales that does not fall within a definite scholastic division. The limits which have been adopted for this purpose are those of existing boundaries. As regards the country proper, the "civil parish" is adopted as a school district. In towns, the borough boundary is taken as that of the educational division. In the metropolis, the districts of the workhouse schools, where such exist, are taken, and, in their absence, the boundaries of the vestries. Classes are introduced to allow of the grouping together of smaller districts, under the name of "United Parishes" or of "Contributing Parishes," but it is not proposed to take the "union" formed for the purposes of the Poor Law as the educational unit.

The outline of the educational survey of the country being thus arranged upon the map, the next step is to investigate the state of educational destitution by actual inspection. For this purpose powers are taken to call for returns showing the number of schools, of scholars, and of children in each educational district. Inspectors are also to be sent down; and any district in which it is found that the existing elementary education is at once sufficient, efficient, and suitable, will be let alone. By sufficient it is intended to express the fact that there are enough schools; by efficient, that these schools give a reasonable amount of secular education; and by suitable, that there shall be no religious or other restrictions to which parents can reasonably object.

Each school district is to elect a "school board." In the metropolitan districts such boards already exist, having been elected by the different boards of guardians within the unions. These boards will remain. In the towns, the town council is to form the electoral body; in the country, the select vestry, when there is one, and the ordinary vestry in other cases. Any person is eligible as a member of a school board; and the number constituting each board is not to be less than three, or more than twelve.

On these school boards is devolved, in the first instance, the duty of providing for the education of their respective districts. How far the information which the Government take power to collect is to be placed at the disposal of these boards, what steps are to be taken for securing the adoption of a general standard of sufficiency and of efficiency, and what is to be the normal central control exercised over these boards, does not appear.

The school boards are to have the power of borrowing money on the security of the rates, to be repaid in thirty years. They are to have the power of assisting existing schools, of providing new schools, or of doing both. But they are not to be allowed to assist certain schools, and to refuse assistance to others, on denominational grounds. The mode in which failure of the school boards satisfactorily to perform their functions is to be remedied was not stated by Mr. Forster.

The main regulations under which public elementary schools are to be conducted are these:—The first already exists, being to the effect that the school shall be kept up to that standard of secular efficiency which Parliament may from time to time determine. The second is, that they shall admit any inspector without any denominational provision. The third is

that no religious education shall be compulsory upon any scholar. If we rightly understand the provision, it is to the effect that the teachers of any school shall be at liberty to impart religious instruction to the scholars according to their own denominational or doctrinal views, subject to the permission of the district school board; but that any parent shall be at liberty to withdraw his child from being present at such religious instruction. The subject is one involving extreme difference of opinion, though our own opinion is quite clear on the matter, and the object of the framers of the measure appears to be, to remit its decision, in each instance, to the verdict of local public opinion, as delivered by the majority of the school board, or to limit the scene of the denominational contest to that arena. Such a mode of turning, rather than of vanquishing, the difficulty, is not what we can advocate.

Thus far we have considered the provisions which are designed to carry out the first principle enounced for the new measure, namely, that there shall be efficient schools everywhere throughout the kingdom. Such might be the result of the enactment if the new boards of education were likely to rise to the full height of their important duties; but this is not to be expected. As to the second portion, Mr. Forster's speech confirms the remark which we previously made on the second principle adopted by the Government. "The country expects us," said the right hon. gentleman, "to secure the attendance of the children. After much consideration the Government have allowed the question of direct compulsion to be brought before the House." The statement was received with cheers. The principle, it was argued, had already been admitted by the Legislature, in prohibiting the unrestrained labour of children.

Different measures are proposed in order to obviate, except in the last resort, the need of recourse to direct compulsion applied to parents. The first of these is an extension of the powers of the Act that bears the name of the present Speaker of the House of Commons; so that, instead of a Board of Guardians having the power of sending children receiving relief to school, their being sent to school might be made a condition. Then the short-time system might be extended to all trades, and also to agriculture. Thirdly, is given a plan for giving a certificate of education, and making it easier for children holding such a certificate to obtain employment than for others to do so. Then the industrial school system might be followed, involving the compulsory attendance of children under a certain age. The concurrent effect of these several methods may be looked forward to. The details of the Amendments of the Speaker's Act are remitted to the responsibility of the Poor-law Board, and those of the Acts relating to the short-time system to the Home Office. But it is evident that all these indirect methods of stimulating education fall short of the legislative declaration of the principle that it is the duty of every parent to send his child to school.

In the last resort, therefore, it is proposed to give power to the School Boards to form by-laws for the compulsory attendance at school of all children in their district from five to twelve years of age, inflicting penalties on those parents who fail to send their children to an elementary school without a sufficient excuse, such as the receipt of education elsewhere, sickness, or distance of residence from an elementary school exceeding a mile. The by-laws are to receive the sanction of the Government, and to remain for forty days on the table of the House, without receiving dissent, prior to being carried into operation. Power is also to be given to the School Boards to establish industrial schools. The small endowments which were not touched by the Endowed Schools Bill of last year are made over to the new governing bodies. Further power is given them to suggest amendments, which may come into operation if approved by the Government. Such are the main provisions of the Bill.

It is not our purpose to enter into any detailed criticism now with reference to this important measure. Of the two main principles of the Bill, the first is accepted by every educated Englishman. The second is hourly securing an increasing number of adherents, amongst whom the classes that form the main object of the solicitude of those who legislate on the subject are by no means the least numerous or the least hearty. The graphic delineation of the educational state of England—the map of the great moral disease of dark and depressing ignorance—

the life and death map of national promise—is a step of obvious necessity. Still the merit of having distinctly recognised that necessity is not small. The collection of reports, the mission of inspectors, and the removal of any denominational character from the visits of these inspectors, are all coherent parts of one general plan.

The remaining provisions of the Bill hang together on the cardinal assumption of another principle, as to the wisdom of trusting to which there will rightly arise a great conflict of opinion. Down to this step all has depended on the responsibility of the executive, under the ordinary Parliamentary check. For the remaining provisions the responsibility of the executive is reduced to a minimum. The Government is only to be called upon to give a sort of negative sanction. The initiative is entirely thrown upon the local bodies,—the vestries, the town councils, the various forms in which municipal organisation exists, so far as it does exist, among us. Not only the aid of schools, the erection of schools, the choice of teachers, the general disposition of the elementary education of the country, are made over to the new Educational Board; but the altogether unpropounded duty of originating penal by-legislation, subject alone to executive and Parliamentary interference, is thrown upon those untried bodies. It would seem to be thus rendered impossible that the educational tone of any district should rise above that of the men whom the popular voice of that district called to take sea's at the education board, or that the higher educational level of one portion of this country should exert any direct influence on the lower and less enlightened state of the darker districts. No provision seems as yet to be made for sending the fully oxygenated life-blood of national culture direct from the heart. Something more is absolutely required.

This devolution of the functions of that great officer, of whom the appointment has been often so strongly urged,—a Minister of Education,—on local, popularly chosen boards, is the more remarkable from the fact that the mover of the Bill expresses the most unequivocal condemnation of our existing municipal organisation. "We are behind almost every other civilised country," said Mr. Forster, "whether in America or on the continent of Europe, in respect to municipal organisation."

On this point the Minister admitted the existence of great difference of opinion. He argued that if use is to be made of municipal bodies at all, the wisest course is to treat them with fairness and confidence. He judges from the past that these bodies have risen to the height of the duties they had to perform. He referred to cases in which a rural vestry or a town council had been a scene of squabbles until it had important duties intrusted to it, and then it had risen to the level of those duties, the members exhibiting qualities which they were not known before to possess.

It is important that every one who has a voice in the matter should distinctly grasp the idea of the two-fold principle which we have endeavoured thus to trace to its source, and to follow out in its operation. But whether the Bill becomes law in its present form (which we should regret) or under any modification, whether the first results exceed our hopes, or call us, by the kindly teaching of disappointment, to fresh effort, Mr. Forster has entitled himself to recognition such as the memorable resolution of the Roman Senate awarded to the Consul Marcus Terentius Varro, when he took refuge in Cannus after the loss of the Battle of Cannæ. He has not feared to engage the enemy, and he has not despaired of the welfare of the State. Let him now go a little farther.

We must be pardoned for adding one word as to the education map. We trust that it will be something more than a mere index of districts and of schools. The skill of the engineer in the graphic representation of statistical facts can be nowhere more appropriately called into play. It is possible so to construct an education map as to make it indicate, at a glance, the population of the district, the number of children, the number of schools, the number of attendances, the amount of independent local support, and other important details.

Such a map, if annually re-edited, would give a view of the educational progress of the nation that would speak for itself, and would save the perusal of a whole volume of returns. If constructed as to be readily compared with other graphical charts,—such as the geological map;

maps indicating the cultivation and product of the soil, and its mineral products; maps indicating population and industry; maps indicating land and water communication, water supply, and sewage; maps indicating health and disease,—it will form a part of a statistico-graphical atlas that will not only prove of the highest utility to the Administration of the day, but also form a precious contribution towards the history of civilisation.

NEWHAVEN AND ITS POSSIBILITIES.

NEWHAVEN progresses but slowly, very slowly indeed. As a town upon the map, or as a sound in the ear of a railway traveller, sight-seer, or commercial man, it would betoken to the would-be-visitor a spot worth seeing and knowing; but look at it even without exploring it, and the illusion will be at once dispelled. Situated at the mouth of its harbour on the oozy Ouse, and inwardly flanked on each side with its bleak and undulating hills, and bulwarked seaward with its projecting chalk cliffs, it would at once strike a strategic mind that it offered great natural facilities for a coast defence against a foreign invader. Yet, century after century has been let pass, and the Government of this country seemed to be oblivious to the fact. An invading army could swoop down on the coast of Sussex here, sack, pillage, and burn all before it with rapine and spoliation in its rear, not ceasing in its onward march till it swept the chief town on each side onward through Lewes to Royal Brighton.

For the last five or six years, however, the attention of the authorities has been given to the construction of a fort at the mouth of the Ouse, and the upshot is that a very extensive basis of fortification is in course of completion. On Castle Hill, or the West Cliff, as we shall call it, this fort raises its crest some hundreds of feet above the sea-line, presenting seaward a chalk cliff, but within partly built up, and shaped to its required uses with excavated material. A very deep and wide moat surrounds the fort, running at right angles, the side walls of which are of solid concrete-battering some feet in their height. The seaward passage of the moat inclines in its base-line upwards several feet, the harbour avenue downwards to the river. The fort thus forms a bold and elevated intrenchment on the angle of the western cliff, commanding both the offing and the entrance to the harbour mouth. An arched entrance leads into the fort from the inland side, access to which will be by a drawbridge spanning the inner moat, or fosse. The landscape which took place recently of the earthworks here tore down like a little avalanche, and swept a portion of its retaining wall into the moat. The seawall of the fort will be guarded by several heavy pieces of ordnance, or, in other words, a battery of many guns, of very large calibre, which, when mounted on their carriages, will sweep a circle on their respective tables to any given point on the coast. A four-gun battery of ordnance, of about five tons in weight, or 68-pounder, will command the harbour. In the centre of the fort is situated the soldiers' and officers' quarters, magazine, gunners' rooms, stores, with the underground passages ramifying therefrom right and left. An inspection of the works convinces us that it is very well designed as a work of coast defence, and the inner buildings are well and solidly built. Some of the outer breastworks or embankments—that portion which faces the harbour, and inland—are very faulty. Greater care will have to be taken than has already been bestowed in the completion of the external finish, on the score of security, or, landslips will be afterwards inevitable. Already in two or three places we have noticed very serious landslips of the embanked earthwork, which no doubt were partly owing to the prevalence of stiff gales and heavy soaking rain. Some of these slips have, notwithstanding the great incline of the embanked work, torn away, sweeping their retaining walls and all else before them. Earthworks or embankments, no matter how much they may slope, or no matter how thick may be their retaining walls, require in a lasting work of fortification a binding or tie, which may be produced by an intersection of masonry in given places through the earthworks.

In noticing these landslips, an observer who was standing by remarked to us, that during the construction of the works they had already taken place three times, and the most noted of them precisely in the one spot. Here was a lesson for future guidance, which even at this moment does not seem to be improved upon. Where the body

of the earth has been displaced, a chalk shingle has been introduced, in hope that future mishaps may be prevented. We shall not anticipate with what result, standing as it will alone.

In one of the passages belonging to the barrack a very deep well is constructed, capable, we are informed, of supplying 95,000 gallons. The water is pure; and this reservoir is formed also to catch the clear soil and cliff drainage underneath and without the vicinity and circuit of the fortifications.

When finished, the fort is intended for the permanent location of about 200 men. At present there are only about half a dozen of artillerymen stationed there. The works will be hardly completed within two or three years. Mr. Kirk is the contractor, and there are about 150 men, including mechanics and labourers, employed.

Having said so much about defences, we may well begin with the offences. Well, Newhaven has hardly taken off her nightcap yet; and notwithstanding that it is a packet station *à la* Dieppe, she has not awoken to the important position she might occupy in the van of progress. At present she is a very laggard. True, the railway kisses the skirts of the town, and pours out a living nocturnal freight on her wharf; but, alas! they are only birds of passage that alight but for a moment, to again wing their flight across the Continent. Newhaven and its modest hotels, spasmodic inns, and dreary shops, are no better off in consequence. The Railway Hotel at the harbour crimps the money folk *en route*, and what is spent is spent while the boats are waited for. The town hotels and inns are mostly depending on the country and farming classes. Talking of hotels, Newhaven town contains but two bearing any approach to the appellation we give them. One is called the "Bridge Hotel," the other the "Commercial Hotel." The former lives on the still refulgent glory of posthumous patronage. It has a Royal memory. It had the honour of giving shelter, bed, and board to a fugitive king in 1848. Poor Louis Philippe, after his unfortunate flight, rested there; and perchance as we write we are sitting at the identical round table, and when we retire perhaps the worthy landlord deigns to accommodate us with the same cosy bed on which the dethroned monarch lay. See what it is to follow in the footsteps of the great, even in the far distance. The worthy landlord does not forget to inform the public of the honour that is his. Outside, on the front of the hotel, the painter has told in conspicuous letters that this hotel was patronised by Louis Philippe in the year 1848.

The streets of Newhaven, if we can call them streets, are small in number, and with the exception of one or two,—High-street, for instance,—might more appropriately be called roads or lanes. There is hardly the indication of a pathway, properly speaking, in any of them. The streets, and where the pathway should be, are one natural level. The rain, when it falls, runs down what channel it lists. The major portion of the town has been built on an incline. The drainage makes quick "tracks" down the nearest sinks, and finally kisses the muddy Ouse. In the town proper the population is but small, scarcely over 2,000, and the idea of a local Board for Newhaven is at present but a dream. When the town aspires to that position, her sanitary reformers will find no difficulty in perfecting a proper system of drainage and sewerage.

Formerly the river Ouse made a sort of horse-shoe circuit some distance above the town, passing into the harbour again in a straight line opposite the town. A useful bit of engineering, however, was accomplished two or three years since,—this ugly bend of the river was cut through, and the river made to continue a straight course. This improvement necessitated a new bridge, as it completely severed all connexion with both sides of the river. The old bridge, of course, crossing the bend, was left almost isolated in consequence. The circular part of the river now forms a sort of back-water, with two mouths, entering into the main channel. This portion is still in use as a sort of inner harbour, and the old wooden draw or lift bridge has but little service to do save to let an occasional small craft pass round to the back of the town. On this now almost neglected estuary of the Ouse shipbuilding once flourished for a short while; but all is now gone, and nothing but a dismantled shipbuilding shed, and shattered slips, sunken piles, desolation, and doom is now apparent.

The new iron bridge is one on the revolving

telescope principle. It presents a good roadway, but as a construction it is not over-strong. It is opened occasionally to let small vessels pass. It is, however, not troubled with much dead weight in the form of merchandise, as the railway relieves it of the trade and manufacture outward and inward bound.

On an elevated hill overlooking the town is the old parish church dedicated to St. Michael. Its tower and chancel are very ancient, but the body of the church is a restoration of some sixteen years since. The coping stones of the tower, over which a low shingled roof springs, are supported by a series of corbel images reaching all round. Several of them are very fantastic and *outré*, and the majority are much defaced by time. Two or three small double-arched windows perforate the tower. One of them is in a tolerable state of preservation—column and capital. The nave, north and south aisles, are of flint, with small windows in the Pointed style, with Caen stone dressings. The restoration is durably built, but it is destitute of ornament or beauty.

The old churchyard is carpeted over with a perfect mossy sward, and is in good order. It contains a few old monuments of interest, and in a churchyard of its size we never remember to have seen so many poetical epitaphs. Every third or fourth slab one meets with rhyme if not reason. Out of the number we were tempted to transcribe one, which we give as the best specimen we came across. It occurs on the monument of one Thomas Tipper, a brewer of local celebrity, who manufactured a famous Newhaven ale still called after him. The epitaph runs:—

"To the memory of Thomas Tipper, who departed this life May 14th, 1785, aged 54 years.
Reader, with kind regards this grave survey,
Nor heedless pass where Tipper's ashes lay:
Honest he was, ingenious, blunt, and kind,
And daret to do, what few daret, speak his mind.
Philosophy and History well he knew,
Was versed in Physic and Surgery too;
The best old Slingo he both brewed and sold,
Nor did one knavish act to get his gold.
He played through life a varied comic part,
And knew immortal Hudibras by heart;
Reader, in real truth, such was the man,
Be better, wiser, laugh more if you can."

Reader, so runs the immortal Tipper's epitaph! we fear there are very few even London brewers of the present day could lay claim to all the varied talents of the Newhaven brewer of old. There is a tombstone here also to the memory of a young Irish surgeon, of H.M.S. *Hyperion*, who died at an early age in 1880, much regretted by his messmates. He was a native of Newtown Mount Stewart, in the county of Down, and of the name of George Rogers. This slight notice of his grave on the wild coast of Sussex may awaken a memory of him in his native land. The most conspicuous monument in the churchyard is an obelisk erected to the memory of Captain Hanson and 104 officers and men of the *Brazen*, sloop of war, lost on Newhaven coast in January, 1800.

On the west of the harbour, on an elevation, a coast-guard station has been recently erected, of brick construction.

Before taking leave of our subject, we shall direct attention to the great natural facilities that exist for making Newhaven an important and progressive seaport. We have said at the beginning that the town was progressing but slowly. In saying this we spoke nothing but the truth. The small coasting inward trade of Newhaven consists at present of a little coal and corn. Some of this passes upward on the Ouse to Lewes in barges. The outward trade consists of flints for the Staffordshire Potteries, and some timber for ship-building. The goods traffic *via* Newhaven and Dieppe is, at times, considerable.

The harbour of Newhaven would be much frequented as a harbour of refuge if it were deepened and widened. The present entrance is under 200 ft. wide, and possibly at highest tide the depth of water does not exceed 22 ft. At an ordinary tide, it runs about 16 ft. or 17 ft. At low water, the steamers and other craft are lying some feet deep in mud, and the depth of water in the centre of the channel there averages about 6 ft. This is a bad state of improved harbour management for a shipping port.

One or two dredging steamers are wanted for Newhaven harbour, and there is sufficient to do all the year round for the larger number. One might be employed always in the harbour, the other outside deepening the approaches. A considerable distance must be gone out before 7 fathoms of water are obtainable. In a short period and with

no great amount of labour, men-of-war of large dimensions could ride in near the harbour. This would be a great advantage taken in connexion with the new fortifications. Between Newhaven Cliff and Seaford Cliff the beach is low, and the sea-line sweeps a circuit inland. This area could be utilised by the construction of breakwaters and deepening for an outer harbour, where a whole fleet might ride in security and safety. On Seaford Cliff a battery will also be required as well as at Newhaven. The present fort and martello tower would not tell for much in case of invasion.

A fine opportunity exists at this moment for utilising the sewage of the Ouse, and Newhaven offers every facility as to place, position, and the proper carrying out of a native guano company.

On that spot of ground which has become an island by straightening the river, the necessary works could be erected. Surrounded as it is on all sides by the river, loading and unloading barges could form a cordon round the island; and the River Ouse, which is navigable for boats as far as the prosperous town of Lewes, would be the means of transit for the supply of the sewage to farmers.

A careful consideration of the subject, and personal observation of the ways and means, convince us that we are risking no idle opinion. There are thousands on thousands of tons of sewage—rich mud—easily convertible into admirable manure, lying waste on the bottom of the River Ouse and in Newhaven harbour; and thousands of acres between Lewes and Newhaven are semi-sterile for want of manure.

We have pointed out a neglected resource in Sussex, and we trust that it will not be long until we hear of its development.

If a few men of capital and spirit would establish native guano works at Newhaven, they would soon conquer prejudice, and they would shortly find that the investment of their capital would yield a remunerative return.

Shipbuilding is a trade that could be easily revived in Newhaven, and could be carried on with advantage to the port and to the promoters. If the bend of the River Ouse were again resorted to for shipbuilding, dock gates would be necessary at both entrances to the main river.

We hope that whenever we retrace our steps towards Newhaven we shall find it more prosperous than it is at the commencement of this year, 1870, and that the few hints we have thrown out will not have been thrown away. Certain we are that Newhaven possesses great advantages, and that it only requires a little public spirit and some outlay to give the town a position commensurate with its port, and to make both port and town worthy of each other as places of commercial enterprise and national importance.

Another neglected resource which offers good facilities for its development in connexion with Newhaven, is the fisheries. A colony of fishermen could, with little expense, be located here, and with proper boats and gear, no danger would exist of not having a good market. With through communication to the London markets daily, any quantity of fish could be despatched and disposed of. Brighton and Lewes alone of the Sussex towns, in the visiting season, would consume large quantities. Newhaven, however, has always been wilfully neglected, harbour and town. From the year 1731, when an Act was passed for repairing the harbour, to about a decade ago, little or nothing was done. Upwards of a century and a quarter ago the same complaint existed; the piers were decayed, and the mouth of the Ouse was choked up with mud and sand, so much so that vessels over sixty tons would not venture into the harbour. A small ship-building trade was carried on in Newhaven even in the middle of the last century; but, as we have already remarked, this is now extinct.

Employment of Soldiers in Trades.—

In the Commons last week, Mr. Hanbury-Tracy asked whether it was the intention of the Government to promulgate regulations for the employment of soldiers in the trades which are connected with the supply of their clothing and subsistence, the stores required for their use, and the repair and construction of their dwellings. Mr. Cardwell said it had been decided to organise in each regiment a corps of artisans, and tools had been issued with that view to twenty-six regiments. A military committee had been appointed to consider the details of the arrangement.

ARCHITECTURAL OUTLINE.

THOSE who are accustomed to observe, or, better still, to study and sketch, the many varieties of natural scenery, know well how much of the character and expression of a landscape depend on the mere forms of the lines bounding its several gradations in foreground, middle, and extreme distance.

This applies not only to the broad distinctions of mountainous, undulating, or flat landscape, but in each and all such to their various parts; as, whether the transitions of form be abrupt or gradual, few or many within the ordinary angular scope of a picture. A mountainous landscape may fall of grandeur through roundness or monotony of form in its lofty features, and a flat scene may be redeemed from tameness by the boldness, variety, or piquancy of the vertical objects, natural or artificial, which break its line against the sky.

Any one who is familiar with landscapes of the Flemish school of painters will easily recall instances in which Jacques and Solomon Ruysdael, Abram Storck, Francis Decker, and others have proved on their canvas the capability of interest, from happy treatment in this respect, possessed by scenes on river, dyke, or plain, which might seem to an ordinary spectator incapable of picturesque effect.

In many of the paintings of these artists the relief from the monotony of a dead flat horizon is produced almost entirely by the projection against the sky of the very distant towers and gables of some city or seaport, in which, however, the distinctive characters of the buildings, in spite of their minuteness through distance, are wonderfully preserved, and when, as is sometimes the case, a town occupies the middle or near distance, this truth of character is still more marked.

The same observation holds good with regard to the pictures of Canaletto, and to those who have not visited Venice the modern art of photography confirms the perfect truth with which he caught and rendered the varied features of the city which he helped to make famous. Among the artists of our own school of the last and present centuries some deserve the same meed of praise for truth and precision in delineating architectural character. Francis Nicholson and Girtin among the early water-colourists, and David Roberts in the school of oil painters, especially claim this merit. F. Mackenzie, Gandy, and others, professedly architectural artists, scarcely come under the same category, as truthful delineation is the specialty of their line of art.

The great part in the expression of a picture, comprising buildings among its elements, which is dependent on the forms of those where they are included in the bounding lines of the composition, is as certainly and evidently true as is what has been said above as to natural objects, and it is much to be regretted that among the many delineators of topographical scenery this fact is so frequently lost sight of; detracting from the interest and value of otherwise often beautiful pictures, in which the artist has seemed content merely to catalogue, as it were, the features of a town or vicinage, losing sight of distinctive character, and thus sacrificing essential reality and truth. Some will argue that this precision is of no importance, and that to demand attention to it is to bring down fine art to the level of mere realistic representation; but this we hold to be a great mistake, for while deprecating as earnestly as any artist can the petty attention to mere detail, which destroys breadth in seeking reality (which it does not secure), still we hold that essential character, that which in buildings, in natural objects, as in man, gives individuality, is called for in every representation claiming interest from local associations.

Take, as no exaggerated example, the view of such a city as Oxford, and suppose the Radcliffe cupola, St. Mary's spire, and Magdalen tower all represented in due position by an artist, but of proportions evidently varying from what are really theirs, would a view comprising these objects, thus rendered, convey the impression of the scene, to one unacquainted with the place, or recal the feelings excited by it to one who knew and was attached to it? The true province of landscape art, in all its varieties, is to convey to a spectator, in the fullest extent, the best impressions which the real scene would excite; under the particular aspect or effect chosen; and to produce this, characteristic delineation of all prominent features, whether natural or artificial, is essential.

It sometimes happens, alas! that some of the leading features of an otherwise interesting scene are discordant with, and detractive from, its charms, and the artist would fain find means to omit them from his picture, or to screen their deformity from sight.

Such, for instance, are the cemetery obelisk, and gasworks chimney towards the east end of Edinburgh; the latter, indeed, forming a fatal blot in all views of the town within its range, and demonstrating the destructive power in architectural scenery of a single prominent object out of harmony and scale with its general features and character.

Such being the fact, of how great importance is it that the artists intrusted with the design of buildings, of a scale or kind occasioning their forms to enter into the sky-line of town or village scenery, should bestow upon them the utmost study to secure a character in harmony both with their own purposes and with the surrounding objects? and how much is it to be deplored that a false ambition should often lead to the production of something either fashionably trite, or novel and "striking" (mis-used phrase!), rather than fitting or congruous in such cases?

This appears to us to have become in some respects unhappily common in the present day; and as regards the first-named error, the towers of some of the lately built and more lately projected townhalls may be cited; and as to the latter, but too many of the steeples of recently designed churches.

That a type of form diverse from the ecclesiastical should be employed for municipal buildings is doubtless proper and rational; but that so many should be crowned with square towers, hip-roofed, and terminating in a flimsy timber spirelet, seems neither one nor the other; nor could any better reason be perhaps truly assigned for this than that the example has been set by one or two men of large and successful practice, and that most of these buildings being the subjects of competition, the public fancy required tickling with what its palate had learned, however uncritically, to relish and desire.

This form has in reality little force of effect, and is subject to one great source of weakness in the very small proportion which the spirelet, generally octagonal on plan, bears to the breadth of the tower when seen on the diagonal.

Not invidiously to name examples, it may be enough to say that some of our leading towns have of late years acquired additions to their architectural outline of this kind, which can never be regarded with satisfaction by unbiased critics, while an additional regret is excited that occasions have thus been missed in which the liberality of outlay might have secured, with more independence of design, features conducing vastly more to local architectural effect.

Such examples, however, as the cupola of the Leeds Town-hall and the steeples of that at Halifax (and we may add that of the new municipal buildings in Liverpool resembling the latter) must be named as exceptions to this too general form, and such as by their vigour and decision of outline conduce much to the architectural sky-lines with which they combine.

There can be really no valid excuse for monotony of design in features of this kind, if only real artistic study be given to them. Why should it be less possible to vary the towers of secular than of ecclesiastical buildings? And if in examples of such fundamentally similar structures as the towers of York, Canterbury, Lincoln, Durham, and Gloucester cathedrals such marked individuality of character can exist, why should not more variety of design on generally resembling bases be aimed at and achieved in our municipal halls?

As regards ecclesiastical design, the error seems, as said above, to run rather in the desire after novelty (often really but imitation of some exotic phase or example) than in adherence to a type; and thus we have towers corbelled, machicolated, turreted, and saddle-backed; and spires pierced, shafted, 'coroneted, pinnacled, and buttressed, producing ponderousness in one case or fritter in another, where a studious endeavour after dignity and fitness in design might have secured much more of true originality at, probably, considerably less cost.

The scope for variety in the simple combinations of form required in steeples is scarcely less extended than exists in music for melody, and to cite examples all simple, all fine in themselves, but widely differing in treatment, it is not necessary to go beyond a few English parish churches, as Ewerby, Bloxham, Raunde, Heck-

ington, Newark, and Stamford,—a list which might be vastly extended both in this simple class and those of greater scale and pretension.

It can hardly be that the oft-inoculated and most needful practice of design *in perspective* can have been resorted to in producing some of the rather ambitious, not to say ostentatious, steeple designs of the day; scarcely can it be that a diagonal elevation or section has been tried before settling their arrangements of form; or surely we should have been saved some examples of which only the direct square elevation is tolerable, while the diagonal view is weak, ill-graduated, and ungraceful, sadly contrasting with such designs as our old church builders have bequeathed to our admiration in the class of examples cited above. Recouring to the illustration with which we set out,—natural scenery is full of suggestions of design to the careful student, and in the upper bounding lines of elevated buildings no less than in those of mountain, crag, or cliff, may expressions of dignity, repose, vitality, and cheerfulness be produced without any sacrifice of structural or statal sufficiency; but only by the exercise of patient thought and careful study, proportioned to the importance of the subject under design, but all more than repaid by a result securing to some perhaps already noted point of scenic effect a new feature of recognised harmony and symmetry, enhancing without disturbing the prevailing architectural character, and such as would be felt as wanting to its completeness, could it be withdrawn after once allowing its influence to be appreciated.

THE LIMITATION OF LOSSES BY FIRE.

SINCE public attention has been directed towards an investigation of this subject through our columns, we have been favoured with various communications and statements having reference to certain issues involved. Amidst the numerous comments which have appeared in connexion with late disasters, including the destruction of the Star and Garter Hotel, and the truly piteous loss of the manager's life, we fail to note any attempt being put forward with a view of effectually lessening the general risk in similar cases which may be expected at any moment to arise.

To put into a practical form the views to which we have already given expression, as to a more efficient system of fire protection, we find ourselves again constrained to call into prominent notice the important, if not decisive, relation which the insurance system holds in this direction.

In the present juncture it may recommend itself, as a matter of good policy, even in connexion with the interests of those important associations, should they be induced to share our view.

The extensive losses to which the various insurance offices are so eminently exposed, by reason of their dependence upon the system of protection afforded by the metropolitan fire organisation, might well invite criticism. No less than 30,000l., it is stated, will have to be contributed by the insurance companies to make good the loss sustained in the destruction of the Star and Garter Hotel; and it cannot fail to occur to many that by an expenditure, with a view to protection, rather than restoration, of probably one-twentieth of that sum, advantageous results might have been fairly expected to have followed. It is at this point in our apprehension that the insurance system apparently fails to satisfactorily meet the demands of the community, and the unaccountable oblivion displayed in overlooking the risk of the insurance of the Star and Garter may challenge unjustifiable comments. There was scarcely any water in the tank, and what there was could scarcely be said to have been in any way available. There was not a really practicable fire-engine in the town. There was no fire-scope. It might have concerned even the interests of life insurance companies to have interfered. But there was scarcely anything to be detected beyond the mere acceptance of the premium, and of the risk. To point out to the insurance companies the prospective means of increased gains, although it may necessarily follow from the adoption of the course which we seek to suggest, is not our more immediate object. The long succession of destructive and fatal fires now in course of being recorded in the daily press, promptingly appeals to the common sense of the public. Our hopes of some practical remedy being at length

discovered for, at least, mitigating the usual incidents by which many of these occurrences are attended, receive some confirmation from the circumstance that the matter is now likely to recommend itself to the consideration of the insurance companies. Considering that a sum of more than one million sterling is annually returned to insurers by way of making good the annual average loss of destroyed property, it might, even upon the score of expediency, be asked why some adequate proportion of this sum should not be expended to prevent such disasters as those to which we allude altogether, as well as with a view of limiting the amount to be returned to the public on account of life and property destroyed by fire. Supposing, even, that the entire sum of one million were expended in the direction which we have indicated, the insurance companies, we find, would still in their new relation to the public stand to realise a net yearly gain of five millions; for which they would in all probability, and having reference to their own statements, be called upon to render no service or return to the public whatever.

It is obviously within the capacity, and to some it might appear within the good sense, too, of the insurance interests to take this matter in hand in a broad and liberal spirit, and to seek to arrive by actual experiment at the comparative reduction of their remissions to the public which would result by placing at the command of the Metropolitan Fire Brigade, or of some similarly constituted body, an annual sum representing one-fourth of their usual restoration returns, or, say, an amount equal to 2½ per cent. of their net gains.

In whatever form this question may be now treated by the fire insurance offices, the public have been gradually led up to a position from which it may reflect upon the curious fact that, after contributing regularly every year a sum of nearly six millions sterling to the Insurance Companies with the view of realising preservation from losses by fire, the results as to the salvage of the property are most puerile and impotent, while with reference to human life they may challenge the imputation of deliberate if not criminal indifference.

It is found that by allowing things to take their course, and in abstaining altogether from devising a more effectual means of suppressing or preventing fire, a balance of nearly five millions remains to the insurance companies after the payment of all losses. It is singular that in recording, as the public journals have done lately, the loss of more than twenty lives, owing to the absence of any practical means of rescue from fire, and a large destruction of property, this, which we regard as one of the main elements of the subject, does not appear to have attracted observation.

It is now likely to do so; and inclined as we are as guardians of the public interest, and on the broader grounds of humanity, we would lend a ready co-operation to the insurance authorities to bring the disastrous element of fire under more effectual subjection. We believe that it may scarcely be disputed at the present crisis that in approaching this matter as we have done, we are acting in favour of existing insurance associations in saying that if some practical steps be not speedily resolved upon, the public may devise some wiser appropriation of the immense resources which are entrusted to the insurance authorities for this purpose, and in the application of which at the present moment such little cause for congratulation may be discovered.

ARCHITECTURAL DRAWINGS IN THE ROYAL SCOTTISH ACADEMY.

The Royal Scottish Academy seems to have been affected by the example of the Metropolitan Academy, in turning a cold shoulder to the architectural profession; for we are given to understand that an unusual number of the drawings sent for exhibition have been returned this year. Be that as it may, the number of architectural designs exhibited is much below the average of former years. As a set-off to this, however, we may place the election of Mr. Dick Peddie, architect, as an academician,—an honour which he has fairly gained by the untiring energy he has displayed, and the careful manner in which he has endeavoured to impart an artistic feeling to the numerous important works entrusted to him. No. 214 is "A Suggestion for the Improvement of Edinburgh." The drawing represents a winter garden at the extreme west end of Princes-street Gardens, with

the Ross Fountain, now being erected, in front of it. This garden has frequently before met with the special attention of Mr. Peddie, many of his suggestions being appropriate and suitable to the locality; but we have doubts whether the placing of a Crystal Palace under the shadow of the Castle Rock would be an improvement in an architectural or artistic point of view. Such an erection would doubtless be a great boon to the denizens of the New Town in weather such as this, when the cold biting winds from the Forth render it a hazardous proceeding to lounge in the usual promenades; but Mr. Peddie had better look out for another position for his winter garden, although such, we fear, may be difficult to find. No. 277, "The Intended Permanent Station and Hotel for the Caledonian Railway Company" would, on the other hand, be an undoubted improvement. The site is conspicuous and open, and the design elegant and appropriate; it bears some resemblance to the new stations recently erected in London, but is not an echo of any one of them. We trust we may, ere long, see it take the place of the present paltry wooden erection. As to No. 13, "St. Martin's Abbey, as proposed to be altered and enlarged," we are not acquainted with the mansion proposed to be operated upon, but presume that the architects (Messrs. Peddie & Kinnear) have followed up and improved upon the style of it, which, as shown in the drawing, is of the late French Chateau variety. The disposal of the parts is effective and lively, with a sufficiency of shadow and plenty of window-light.

No. 284, "Interior of the Church of St. John the Evangelist, Alloa," by Mr. Robert Anderson, is, in our opinion, the best ecclesiastical interior produced in Scotland for many years. It is a simple nave and chancel of thirteenth-century Gothic, unusually good in proportion and rhythmical in detail and polychromic decoration. Mr. Anderson also exhibits an exterior and interior of a proposed new church (353). It is a cross without aisles, and has a tower at the intersection, which is open to the interior. It does not show much power of invention, and is too like an old example.

No. 25, "Design for Presbyterian Church, Capitol Hill, Washington" (Mr. W. Nicholson, architect), is a commonplace affair, with pinnacles, &c., displaying neither originality nor a sufficient knowledge of Gothic detail.

No. 259, "Blair Athol, Perthshire, the Seat of his Grace the Duke of Athol," is an unaffected example of the Scottish Baronial style, by Mr. David Bryce, having nothing unusual or particularly calling for remark about it. A Gothic bridge, crossing a stream, in front of the main entrance, gives picturesque to the foreground.

No. 258, "Dumfries and Galloway Royal Infirmary," by Mr. John Starforth, is carried out in the pavilion manner, with some degree of architectural pretension: the sky-line is not satisfactory, but what there is of detail is not deserving of censure. No. 14, "Messrs. Kennington & Jenner's New Building, St. David-street, Edinburgh," is an *ad captandum vulgus* in compo, after the manner of the new Boulevards in Paris. In no city in the empire is the use of compo less necessary than in Edinburgh, where the finest building material is at command. Upon a conspicuous part of the building itself appears, in gilt letters, "G. Beattie & Son, architects," an inscription in as good taste as the edifice upon which it is inscribed. In No. 272, "View of the Staircase, Craigend Mansion," by Pilkington & Bell, we have a drawing showing that the interior of this mansion—which is Gothic in style, and occupies a commanding site within a few miles of the city,—is equally ornate with the exterior. If the *utile* is not sacrificed to the *dulce* (a fault of the architects), it is a most attractive and desirable residence.

Messrs. Pilkington & Bell are not successful in their street buildings: the "Eastern Club, Dundee," is unhappy and overstrained both in composition and detail; the arched doorway and windows are stilted to a preposterous degree, and the disposition of the fenestration is destructive to unity of effect.

Mr. James Gowan's gives another view of his buildings at Castle-terrace (No. 1); and Messrs. Cousin & Lesells a "Perspective View of Proposed new Buildings on the East Side of Blackfriars-street" (No. 143). It is really a relief to find that in some parts of the city domestic street architecture is meeting with some attention; for if we turn to the extensions to the west and south we find nothing but what is

tame and commonplace appearing. The terraces and squares erected fifty years ago, under the superintendence of the late Mr. Playfair and Mr. Gillespie Graham, were remarkable in their day as architectural works; but now mere builders hold sway in this department, and when an architect is employed, he is restricted from giving any individuality or character to his elevations. Occasionally we find a new villa in the suburbs worth looking at, but the same evil prevails here also. Mr. W. Richardson seems to have made villa architecture his special study, and with some degree of success: the two designs exhibited by him (No. 27) are superior to most in the neighbourhood, and would be attractive anywhere.

Every architectural design exhibited has met with notice; so that our readers can form some notion of the meagreness of the display. Edinburgh is being outstripped in its architectural decorations by many of our second and third rate towns, which have nothing like its surpassing position for architectural effects; and, so far from discouraging the younger members of the profession by rejecting their drawings, it would be wise policy in the Academy to give them every encouragement to exhibit such of them at least as delineate buildings already or about to be erected, so that they might be subjected to a healthful criticism, even although they may not be attractive as pictures.

WORKS AND IMPROVEMENTS FOR THE CITY.

A DEPUTATION from the Institute of Architects have made another endeavour to induce the corporation of the city of London to keep open the vacant space near the Mansion House,—whether successfully or not has yet to be seen. Amongst other improvements contemplated in the City, there is a plan now under consideration by which the site of Newgate-market may be appropriated for public purposes. The market, as such, was abolished by a special Act of Parliament which came into operation in December, 1868. The City architect has prepared a scheme by which a large block of building may be erected. It is proposed to surround the building with a roadway, 30 ft. wide, and both light and air are insured to the new premises, and to the existing houses. Two passages will traverse the building, one from north to south, and the other from east to west. The ground floor will consist of sixteen shops, averaging 15 ft. wide and 35 ft. deep, and the first and second floors of offices and warerooms. The basements will be suitable for cellars. The City wish to make a direct communication from Newgate-street into St. Paul's Churchyard, but are counteracted by the authorities of St. Paul's, who have unexpectedly come into a good thing in respect of the ground, in consequence of the abolition of the market, and are not disposed to meet the propositions of the corporation to make the opening.

An offer has been made to the City Commissioners of Sewers by the Dean and Chapter of St. Paul's to lay into the public way about 6,500 ft. of ground at the west end of the cathedral for the sum of 20,000*l.*, and this has been agreed to on behalf of the Commissioners. An application will be made by them to the Board of Works, to contribute towards the cost of the improvement. Other changes may soon be expected in Ludgate-hill, where several houses have been taken down, and in various other parts of the City. Surely the sum asked by the cathedral authorities is over large, remembering that it is not land from which they could derive any revenue? We long ago urged the desirability of setting back the railways around St. Paul's, and the improvements that might thus be effected.

Arrangements are being made to effect improvements in Long-lane, Aldersgate-street, and St. Martin's-le-Grand. A new library and museum will shortly be erected near the Guildhall, at a cost of 20,000*l.*, exclusive of the land.

A plot of ground has been set apart near the Metropolitan Meat Market, on which a handsome drinking-fountain will be constructed, and trees planted.

The Markets Committee of the Corporation have recently been called upon by the Common Council to inquire into, and report on, the question whether daily vegetable, meat, and fish markets should not be established in the City. In their report they state that they requested the clerks of the different vestries and district

boards of works in the metropolis to furnish them with the names of the markets in their districts, and any particulars with respect to their establishment, construction, and working. From the answers, they have arrived at the opinion, looking at all the circumstances, that it would not be advisable for the corporation at present to take any steps for the establishment of additional markets in the City. This report was unanimously adopted at a subsequent meeting of the Court of Common Council.

A correspondent writes,—"Have you observed the plot of land at the south-east angle of the Holborn circus which the City advertise for letting, and which will block out the view of St. Andrew's Church? Have we so many fine monuments in London that we can afford to shut out even the few buildings we have?"

Certainly not: every endeavour should be made to preserve such open spaces as can be formed, and to bring our public buildings fairly into sight.

THE MATERIALS FOR ECONOMIC BUILDING.

SIR,—Of the many interesting social problems which, at the present time, are forcing themselves upon the minds of thinking men, that of "The Materials for Economic Dwelling Houses," so ably treated in your impression of the 5th inst., may well occupy a foremost place, seeing that from its even partial solution may flow results of the highest importance to society—increased of comforts, increase of wealth, and last, though not least, increase of the term of human life. Having for some time past paid much careful attention to the subject, and carried my views into practical, and, I think I may add, successful effect, so far, indeed, as to induce me to patent the application in this and in foreign countries, I am encouraged to offer for adoption, or at least discussion, the plan which appears to me to meet most of, if not all, the requirements specified in your paper, viz., "Perfect shelter, rendering inmates to a great degree independent of the rapid and violent changes to which our climate is exposed; roof, walls, and floor so constructed as to resist the fury of the winds, the downpour or drift of rain or sleet, the exudation of percolating water, and, further, to keep out the extreme cold of winter, and the excessive heat of summer."

And now I must apologise beforehand for the shock which, in unfolding my plan, I shall be forced, however, reluctantly, to administer to all well-regulated architectural and building minds. I shall have to introduce to them a much-despised member of the family of building materials, whose name up to the present has been a term of scorn and reproach, and whose status has been only that of a Pariah among his fellows.

Let me at once take my moral "header," and confess to what I well know will be held heterodox—a firm and reasonable faith in the virtues of lath and plaster when employed as I shall presently describe. Nothing, certainly, could be more sweeping than your own condemnation of the brick of the period. Like the just now much-abused British workman, he has taken to bad ways: he is clumsy, ill-conditioned, and the truth is not in him; he is for working shorter hours whilst demanding longer pay; but, worst fault of all, he drinks sadly too much when he gets a chance, which, Heaven save the mark! is often enough in this moist climate of ours. Then as to his aristocratic *confère*, stone, that gentleman's services are become too expensive for any but the most wealthy employers; besides, he is not at all to be relied upon (*vide* some of our public buildings), whilst in too many cases he is as condemned a "soaker" as his argillaceous fellow-unionist.

When employers of labour find their work-people too exacting and dictatorial, they are forced by the stern necessities of competition to introduce into their place machinery, which, almost automatic, can be easily directed by recruits from the "great unskilled" class-men, who, readily learning any simple mechanical operations, are only too content to better their condition by accepting not only lower wages than their predecessors, but being more amenable to the routine of workshop discipline: so, impelled by similar logic, when certain materials become costly, or bad, or both, a host of inventive minds at once ransack the storehouse of nature, and, sooner or later, in the search, discover some substitute, which, by

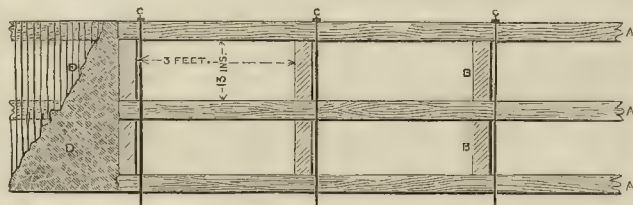
ingenious adaptation, often more than compensates for the previous deficiency.

The principal desiderata, then, for a healthy dwelling-house are, as stated in your article, that the substance entering into its construction should be non-absorbent and non-conducting. Now, brick, stone, and even granite, are to a large extent both; *ergo*, they do not fulfil the first and most important condition demanded by your argument. This conceded, where are we to turn for their replacements? Slate and iron, both of them, are non-absorbent; but, as you remark of the first, they are much too active conductors of heat and cold, whilst timber, pure and simple, though it approaches closer to what we seek, is not only too costly, but in many essential respects is completely *hors de concurrence*.

And now I will proceed to describe my system of building; and whilst entering upon the explanation, I may remark that I do so as no mere theorist, unfolding an even well-digested scheme, but I am writing from practical experience of the results of my views carried out and in use for a considerable period. On a slight base course of concrete I raise an open framework of wood, constructed on a new principle, to which I attribute most of the success of my plans.

This framework, when put together, is, without straining too much the sense of the Latin words you quote, a sort of "*opus lateritium*" and "*opus reticulatum*" combined.

The annexed sketch will best describe the idea I wish to convey.



AAA are 1½ in. battens (7 in. wide), extending the entire length or width of the building.

CCC are ½ in. iron rods, screwed at both ends, and furnished with nuts and washers, running vertically through holes bored in the centre of each batten, at distances of 3 ft. or 4 ft.

BB are wood, tile, or brick supports dividing the horizontal strings, and when braced together by the long bolts, CC, form the pillars or columns of the edifice.

DD shows a portion of the framework covered with laths, preparatory to plastering, cementing, or otherwise sealing the outer envelope of my wall, and the inner side of the wall is treated in the same manner. Not only are these bolts, CCC, used along the walls, but they are introduced at the angles in such manner as to make the building, when screwed up tight, to be as strong and rigid as a packing-case (which is mainly due to the wall being simply a cogeries of cells), and were it possible, such a framework might be turned over and tumbled about wit' out fear of any serious injury in the way of displacement or breakage of the structure.

I need scarcely draw attention to the value of this quality for countries where earthquake shocks are violent or frequent.

In place of wooden battens I use sometimes sheet-iron, bent to a trough-like shape, on the edge of which I bolt wooden strips or strings, on which to nail the laths; and in place of wooden blocks or columns, I use short iron pipes, through which the bolts pass. I ought to mention that all the flues are collected, as far as possible, into one or two groups, and built of ordinary brick or concrete.

Having completed the skeleton walls, and introduced the several windows, doors, &c., I proceed to lath and plaster inside and out (or in place of plaster I use cement, as may be most conveniently or economically procured). I have thus 8 in. or 9 in. of wall made up of cellular cavities, containing, of course, air, and forming the best possible non-conducting shelter from our wet climate and ever-varying temperature.

It would seem as though that peculiar sensation of damp which assails us on entering many houses (especially if long unoccupied), and which arises from the walls charged with moisture, hanging like a wet blanket all about, had been reduced to a minimum by this system of construction.

Various buildings have been erected on this plan by myself and others, and some of them in very exposed situations; one, by the bye, where more than once the wind pressure has exceeded 30 lb. to the square foot. In another case, although the house has remained untenanted during the whole winter, and no fire except that of the kitchen lighted, the bright steel of the drawing-room stoves remained untarnished. The fact is, the inner is so separated from the outer envelope, that, however driving and drenching the rain may be, it can never find its way across the intervening space, so perfect is the insulation, and so comparatively slight is the substance of the exposed surface, that the least sun or dry wind suffices to remove all traces of wet. Between the moisture-charged brick or stone and this, there must, to the house-dweller, be as wide a difference as between damp sheets and dry to the sleeper; and it requires little summer to determine which is likely to act most favourably on the health of the human subject.

Of the sanitary value of my system, I can only as yet speak theoretically, all the houses I have completed having so far been quite free from cases of sickness; but it appears to me that the *mephitism* of the French hygienists—foster-child of damp as it undoubtedly is—cannot possibly enter and lurk here; the first condition of its existence is wanting. Were the cavities in my walls hermetically sealed from the outer air, then they might possibly inclose a stagnation favourable to its development; but

through them flows a constant though scarcely perceptible current, which must quickly and surely eliminate from the *maison infecte* the fell miasma of disease and death.

To prevent the absorption of deleterious gases, &c., by the internal wall, I use a stout washable paper, whilst on the outside I have already applied hair mortar, and rough-cast it with clean gravel, which gives a pleasing appearance as well as great durability. I have employed also for the inside walls and ceilings, in place of laths, wire network, which not only rakes a room virtually fireproof, but gives a solidity and superior finish worthy the attention of the architect. Should there be any question as to the durability of lath and plaster, I would refer sceptics to some of the oldest buildings in this country, where it may be seen lingering on in a wonderful state of preservation, but just lacking that which, in my scheme, gives full force and effect.

Were it not that I am conscious that I have already trespassed too much on your forbearance, I could enlarge on other salient characteristics which commend this method of applying building materials to the consideration of thoughtful constructors. I am well aware that the system I have attempted to describe will provoke much prejudice and opposition, as I have found in other innovations afterwards approved and adopted by the world; but I venture to hope that the importance of the question will at least lead to its being fairly tested, more especially as its cost is considerably below that of the ordinary mode of construction. I may just remark that I am about to patent other improvements in construction, which I have reason to believe will prove valuable to the architect and builder.

W.

Education of Women at Cambridge.—It is reported that the establishment of classes for girls at Cambridge has proved remarkably successful. Upwards of fifty daughters of local tradesmen have availed themselves of the opportunity of receiving instruction from the most distinguished professors at the University. The lectures are a repetition of those which are delivered as a part of the University course. It is probable that several scholarships for girls will be established in Cambridge.

TEMPLE OF MINERVA POLIAS PRIENE, ASIA MINOR.

The newspapers have mentioned that a valuable collection of ancient marbles, the result of excavations by Mr. R. Pophewell Pullan, to whom the readers of the *Builder* have often been indebted for accounts of foreign cities, was on its way to England, and would be placed in the British Museum. The cases have now arrived and are being unpacked. They contain fragments of the sculptural and architectural adornments of the temple, including portions of the celebrated statue of Minerva, mentioned by Pausanias, a colossal female head of a fine period, parts of several draped statues, heads of the Macedonian time, and fragments of the frieze, which in style closely resembles the reliefs on the Mausoleum, and is believed, in fact, to be by the same hand. Besides the marbles discovered by Mr. Pullan, there are thirty-three cases, the fruits of the labours of Mr. Wood at Ephesus, and two cases sent from Asia Minor by Mr. Dennis, whose researches among the tombs of the Lydian kings at Sardis were abruptly brought to a close by the want of funds.

Mr. Pullan has been engaged in excavating ancient sites with varying results, at different times, during the last eight years, at considerable risk, and may be congratulated on the result of his last undertaking. The temple as uncovered presents an octastyle plan; the steps and pavements being everywhere perfect. The walls of the naos and pronaos are standing in some places to a height of 6 ft., and the columns of the porticoes to a height of 13 ft. or 14 ft. The whole is built of white marble, put together with iron cramps and copper dowels, and without mortar, and all the carved ornaments are of the most elegant workmanship. There is no other ruin in Asia Minor of a good date in so perfect a condition. The temples of Arzani and Euroumus, which alone are more complete, are of a much later period. The site is a magnificent one, being on the side of a mountain, above the plain of the Mæander, and opposite the marshes which surround the site of Miletus. At the time when Mr. Pullan encamped on the spot, three-fourths of the population were suffering from intermittent fever, and before he had been at work long he and his principal workmen were attacked by it. He was compelled to suspend operations. The wintry storms were so violent, that their encampment was blown down, and he was compelled to build a house in the ruins. Add to these *contretemps*, that he had frequent notice from the Berlin consuls, and from the Pacha, at Smyrna, as well as from the local authorities, that there were brigands in the vicinity, and that if he remained it would be entirely at his own risk, and it will be seen that such investigations require no small amount of courage and resolution.

THE ANSTICE MEMORIAL, MADELEY.

THIS memorial, intended as an Institute and Workmen's Club Building, erected at a cost of 3,000*l.*, in memory of the late Mr. Joseph Anstice, ironmaster, has been inaugurated. When the form of the memorial was decided upon, the sum of 2,000*l.* was soon raised for the erection of the building, to which the more immediate friends of the deceased added 1,000*l.* as an endowment fund, one-half of which has been required for completing the building. The other 500*l.* will remain for endowment, so that the Institute opens free from debt, and with a sum in hand towards defraying the necessary expenses. The building has been erected from a design by Mr. Johnson, of London; and executed by Messrs. Nevett, of Ironbridge, builders.

The contract with Messrs. Nevett was signed in June, 1868, and the building itself completed in the summer of last year. It contains on the ground-floor a workmen's club-room for men, 31 ft. by 15 ft.; another for youths, 24 ft. 6 in. by 19 ft.; and a smoking-room, 18 ft. by 15 ft.; a reading-room, library, kitchen, scullery, hall-keeper's apartments, stores-rooms, entrance-hall, and passages; and on the first floor a large hall or concert-room, 60 ft. by 39 ft. 6 in., with convenient retiring and committee-rooms, &c., occupying together the entire length and breadth of that floor. The hall is warmed with hot air, and the whole interior lighted with gas. The hall is furnished with benches; the club-rooms and reading and smoking rooms are provided with chairs and tables; a cooking-range is put

up in the kitchen; and the whole building is now ready for immediate application to the purposes for which it was erected.

The encaustic tile pavements of the vestibule and ground-floor passages are due to the liberality of Messrs. Maw & Co., of the Benthall Tile Works, Broseley, by whom the same were designed, and at their expense substituted for the plain quarry pavements originally contemplated.

The workmen's club-rooms and smoking-rooms are to be available for the accommodation of a workmen's club or institute (should such be formed) so long as the same shall be conducted to the satisfaction of the subscribers; and the kitchen is also to be used for the supply of refreshments to club members, subject as in the deed expressed.

The library (when formed) and reading-room are to be available for the use of club members and others, in such manner and on such terms as the subscribers shall direct.

The large hall is (by permission of the subscribers, and on such terms as they shall prescribe) to be available for lectures, concerts, or meetings for charitable, benevolent, or useful objects, or for the purposes of rational instruction, social enjoyment, or harmless amusement; but not for meetings of a religious or political character.

The entire cost of the building was 2,879*l.* 7s. 5d.

PRIVATE BILLS.

THE 240 private bills of the session, amongst which street-tramway bills are so conspicuous, are passing steadily along their successive stages, as yet without attracting much attention. To the 23rd ultimo, 146 bills had been read a first time, and 71 bills had been read a second time: the latter number, and those read a second time subsequently to that date, are now waiting committee. Some of the bills which appeared in the earliest lists, have already disappeared, and since the first readings of some of those included in the number given above, some seven have either been withdrawn, or "put off for six months," which, of course disposes of such bills for the present session. The tramway-bills, of which there is a great number petitioned for, are all suspended for the present. It is to be hoped that if the tramway system is to be introduced, the Legislature will not repeat the blunder that was made in relation to railways, which have been laid down throughout the country at a profligate cost, absolutely without anything worthy of the name of a general plan. The promoters of the tramways are, in some instances, getting up public meetings; at Greenwich, for instance, last Friday; and obtaining unanimous votes from them in favour of their schemes; but it is unlikely that private companies will be permitted to acquire as much power as they propose to get over the public highways. The public are indebted to the spirit and enterprise of those who have made these projects popular, and such of them as have obtained Acts will doubtless be enabled to surrender their acquired rights upon good terms; but it will be best for the general interests that the question be taken up by corporate and official bodies for the public good, always provided that these bodies show a disposition to act with spirit and promptitude; but further delay will not now be submitted to without impatience. The Metropolitan Board of Works, the Manchester Corporation, and other powerful bodies, have entered petitions against the tramway-bills affecting their respective localities.

ENGINEERS IN INDIA.

SIR,—It may be in the recollection of the public that some excitement was recently occasioned by the issue of a Memorandum of the Government of India regarding the payment of commission by contractors to civil engineers. The Institution of Civil Engineers emphatically and indignantly repudiated the existence of any such custom in the profession, and eventually an explanatory apology was tendered to that body. The discussion attending the issue and explanation of this circular had the unfortunate result of eliciting the animosity felt by civil engineers against the officers of Royal Engineers; and the professional journals in England especially opened their columns to the denunciation of the military engineers in their department and social capacities.

As a fit pendant to these circumstances, I enclose a copy of a circular which has been sent

from England to many civil engineers in India and would beg to inquire, whether this circular has the approval and sanction of the Institution of Civil Engineers and of Mr. Kinnaird, M.P. In conclusion, I may add that the civil engineers employed in Mysore have expressed their dissent from the statements made in this circular.

India.

R. E.

The circular states that Mr. Kinnaird, M.P., has given notice of his intention to move next session for the appointment of a Committee on Indian Public Works, and that every effort should be made to induce the committee to report in favour of that measure.

It proceeds,—

"Each civil engineer in the department is requested, in order to assist Mr. Kinnaird in making a thorough investigation, to forward to him, in confidence, such information as he may be able to give, bearing up in the incompetency of military engineers, and the inefficiency of the department under their rule."

Such disgraceful failures as those of the suspension bridges near Calcutta, the downfall of the Custom-house sheds, the recent fall of a barrack at Nussersbad, and the failure of Jubbalpoor Church before it was finished, should be described in detail. Instances of the absurd discrepancy between original estimates and actual cost of works, which must be known to every member of the department, should also be given in detail. These will help capitalists to determine how much confidence they may place in the assertions of the military engineers as to the great saving they mean to effect in the cost of railways. A comparison of the time which has been wasted by the department in carrying out such works as the Barrakur Bridge, the Grand Trunk Road, the Lahore and Peshawar Road, the Gauges and Beas Drain Canals, and the Godavary Works, with the time which contractors have occupied in making the Eastern Bengal Railway, the Chord Line of the E. I. R., and the Delhi Railway, will throw a good deal of light on the economy of military management, especially if accompanied by calculations of money lost by delay on the Government works.

Instances of the preposterous ignorance displayed by the Bengal engineers on all questions connected with iron-work, the use of steam, or other machinery and plant, and mechanical engineering in general; their opposition to all improvements; and their inveterate propensity to "penury wise and pound foolish," should be pointed out.

MIDLAND COUNTIES MIDDLE-CLASS IDIOT ASYLUM.

In reference to this competition the following report has been received from Mr. Waterhouse, the gentleman nominated by the competitors as consulting architect:—

"I beg to report that since my appointment as referee I have paid two special visits to Birmingham to inspect the five designs submitted in this competition. After a careful examination of them, I have formed the opinion, as I have had the opportunity of personally explaining to the committee, that the design bearing the motto 'Comfort and Convenience,' is, on the whole, the best as regards its internal arrangements, its external architectural effect, and its general conformity to the conditions of the competition. The design throughout is marked by great simplicity in its general construction, and in its plan. The first-class patients' rooms are 12 ft. square by 12 ft. high. The dormitories for second-class patients give 650 cubic feet per bed, and the infirmary, 1,050 cubic feet.

The buildings proposed to be erected first would accommodate 164 patients, viz., thirty-two first-class, and seventy-two second-class, while the entire design shows accommodation for 398.

With regard to the important question of cost, the authors of 'Comfort and Convenience' frankly state their opinion that the sum named, 8,000*l.*, would be insufficient to carry out the first portion of the building, though I observe that some of the other competitors are sanguine of being able to accomplish it. I am myself inclined to think the latter are mistaken; but if it should so happen that building operations can be carried out in the neighbourhood chosen by the committee at an exceptionally low rate, I must still express my opinion that the design 'Comfort and Convenience,' in the matter of cost, would be the most advantageous of the whole number for the committee to adopt, on account of its simplicity, and the almost total absence of any mere ornamental features."

We are informed that the authors of the successful design are Messrs. Matthews & Quilter, of Cloak-lane, London. The design will, in due course, be submitted to the Commissioners of Lunacy for their approval.

AGITATION IN THE BUILDING TRADES.

A FEW weeks since some of the master builders of the metropolis, looking at the large amount of unemployed labour in the market, resolved to make an effort to get the rate of wages reduced from 8*d.* to 7*d.* per hour, and for this purpose it was arranged that notices should be given by these firms, in the first place, to the carpenters and joiners, of the intended reduction. This having been done, the men stated they should resist such reduction by every means in their power, and from this, or some other cause, the firm of Mr. C. Aldin, South Kensington, was the only one where it was attempted to enforce the reduction, and where the whole of the men accordingly struck. After a fortnight's struggle, the firm found itself unable to obtain a supply of competent workmen at the reduced rate and

were compelled to re-open the establishment as an 8d. per hour shop, but refused to re-employ any of the men who had struck work. Under these circumstances, subscriptions are being collected through the trade for the support of the men, and it appears that several men who have collected subscriptions in various shops have been discharged for so doing. A meeting of carpenters and joiners was held on Saturday at the King's Head, Bury Bridge, Fimlico, when it was resolved to support those who had been thus discharged or refused employment.—A movement is also on foot amongst the metropolitan carpenters and joiners for obtaining a reduction in the present hours of labour; and at a meeting of 100 delegates on Saturday, a committee of thirty was appointed for the purpose of bringing the movement publicly before the whole trade, with a view to combined action during the coming season.—At a meeting of building trades operatives in Northampton it has been resolved that payment by the hour from May next be required of the masters, and that the rate per hour be 6d. for all skilled workmen, and others in proportion. A code of rules is also to be submitted to the employers for their approval, including a proposal to refer differences to arbitration.

PROPOSED WORKS FOR MIDDLESEX.

Last week, at a meeting of the magistrates of the county of Middlesex, a report was submitted by the visiting justices of the House of Detention, Clerkenwell, stating that this prison was insufficient for the reception of all the untried prisoners committed thereto, and that it was necessary that it should be enlarged. After a good deal of discussion, a motion was submitted to the approval of the Home Secretary, that steps be taken for enlarging the prison, according to the plans submitted to the magistrates. Accommodation will be provided for 200 additional prisoners. The estimated cost for the reception of extensions is 25,000*l.*, including the purchase of land.

A letter has been addressed to the Middlesex magistrates by the Home Secretary, pressing upon their attention the urgent necessity of providing additional asylum accommodation for the pauper lunatics of the county of Middlesex. The representations made to the Home Secretary by the Commissioners in Lunacy and the local authorities, are so strong that he can sanction no further delay, and he hopes that steps may be at once taken to erect another asylum. A special committee has been appointed by the magistrates to take the matter into consideration.

PROFESSOR SCOTT ON ARCHITECTURE, AT THE ROYAL ACADEMY.

LECTURE I.—Continued.*

In our Norman buildings colonnettes are for the most part built in the solid of the piers, which would suggest that they are not there in the earliest stage of their use.

The principle once adopted, there seems no limit to the variety of which it is capable. Shafts may be substituted for all of the arch-orders, or for such only of them as may be desired.

Where the arch consists of more than two orders, a half-column of larger size may be made to support two or more, and smaller ones may flank them carrying single orders. Where, again, the lower order is wide in its soffit, it may be carried either by a large semi-column or by coupled colonnettes; and where there are three orders, the same may be applied to the front, bringing the pillars to a uniform design on all of its sides.

We have already seen that single columns may be used to carry arcades of two or more orders, either by breaking their abaci into receding angles, to fit them to the orders of the arches, or by making round or octagonal abaci large enough to receive them; and such single columns may be alternated with clustered piers. There is, however, another extensive variety of pillar compounded of the two.

Let us suppose a single column supporting arches of a single order, and that we desire to extend the arches to three orders, retaining the same main bearing-shaft. We may imagine the additional orders to be super-added on all sides of the original square springer, and additional colonnettes (attached or detached) added round the original bearing-shaft to receive them. The same may be applied to an octagon, placed either angularly or in its usual position. The process may be carried a step farther, and eight colonnettes be set round the original bearing-shaft. In St. Mary's Abbey, at York (towards the end of the twelfth century), we have an instance of sixteen colonnettes thus placed round a bearing-shaft, but only eight of them carry separate orders; and a little later, in the cathedral at

Genoa (the work apparently of a northern French architect), we have no less than twenty-four colonnettes similarly ranged round an octagon; though here, again, only eight are represented in the plan of the abacus or of the base when it rests upon the floor, the others being introduced probably for the relief produced by the varied colours of the marbles of which they are composed.

A little later the colonnettes themselves become grouped in threes and fours, and their edges often filleted or "keeled," that is, decorated by an arria or edge projecting from their round surface. Thus, at Lichfield, in the older portions, groups of three shafts united into one, and carrying a common abacus, were set on each side of an octagonal bearing-shaft. At Wells, similar triple shafts were set alternately against the faces and in the internal angles of a cross-formed nucleus, with alternately square and octagonal abaci.

My purpose, however, is not to enumerate all possible varieties of clustered pier, but to explain its principle, and at the same time to show how unlimited an artistic element was deducible from an intent thus founded on the natural conditions of arched construction. To go much farther would carry us on prematurely into the succeeding styles, and would be also anticipating another cause, which carried on the principle to a still further development. I allude to groined vaulting, of which I shall have to treat in detail when I reach it.

Before, however, I quit the subject of arches and piers, I must say a few words on the application of their principles to doorways and windows; though each must be viewed as the subject of some future lecture.

Doorways differ in no degree, as to principle, from archways, excepting in having, at some point in the thickness of the wall, more or less recessed at pleasure, what Professor Willis calls the "doorway plane," that is to say, one of the arch-orders so formed that the door may be hinged to it, and may shut against it. The actual opening of the door may or may not be stopped on this plane to a square heading, the arch over it being filled in with a tympanum, plain or sculptured; or it may be altered from the form of the main arch to some shape having less height. In all other respects the principles already stated apply equally to doorways as to archways. The interior, however, has to be varied if the door fills in the arch-form, with a view to facilitating its free opening; but this is a practical point not needful to be here gone into. The orders of arch-mouldings in a doorway often continue down the jambs, as in one of the magnificent doorways at Malmesbury Abbey; or they may be replaced by colonnettes or pilasters, or these methods may be united in the same doorway,—just as in another door at Malmesbury, continuous mouldings alternate with colonnettes,—and the arches, jambs, and capitals, and even the shafts of the colonnettes, may receive any degree of sculptured enrichment.

The doorway being a point on which much architectural character was concentrated, and great depth being necessary to give the required effect, it was customary to thicken the walls at the doorways by various expedients, so as to obtain depth enough to give several orders of arch-mouldings; this increased thickness was covered over by gables, and by other means.

The width, too, of the jambs of doorways is often increased, and more space gained for enrichment, by giving to each order in the jamb a larger space than would otherwise be necessary of square face between the shafts.

In some cases, also (as in the exquisite doorway in the Castle at Durham), there is a small arch order which continues down the jambs between the principal orders, and adds much richness to the effect.

In later examples, two ranges of shafts were often introduced, the outer ones carrying the orders, and the inner ones having capitals lost under the main capital, as if carrying an imaginary order hidden within the visible mass of the arch. These are, in fact, the parallels of the supernumerary shafts I have mentioned as often existing in clustered piers. Thus, in St. Leonard's Priory, Stamford (a work of the twelfth century), we find two ranges backed by a plain splayed surface. In the Galilee at Ely (somewhat later), the second range is backed by large hollows between salient mouldings; and again at Lichfield, the back range is, as at Stamford, placed against a splayed surface, but relieved by ranges of large toothed ornaments running up behind each of the front shafts.

The windows, also, differ from mere arched openings in having a functional plane, which occupies one order, and is needed to receive the glazing. The orders are never so numerous in windows as in rich doorways, rarely exceeding two besides that which receives the glass. The inner side is usually splayed, to diffuse the light through the interior. It is not my intention in this lecture to treat in detail either of doorways or windows; but having stated that the system of receding arch-orders was one cause of the origin of window tracery, I will say a few words in explanation of my statement.

Many early windows and window-like openings—such as those with the triforium galleries of churches—are divided into two or more portions by pillars and small arches in the inner plane or order; the outer order or orders embracing the whole, and the plane of the inner or functional order forming a second wall-space over the heads of these subordinate arches. Thus the triforium at St. Bartholomew's is divided into four subordinate arches. This window plane, as it may be called, is often ornamented in different ways, and occasionally, even in Norman work, is pierced. At a later stage this piercing becomes systematic, and has received the name of "plate tracery," the plate being the window plane or order. It is simply the piercing of this plane of the functional order of the window arch; and as it is clear that this piercing developed itself into window-tracery, so it is equally manifest that the plane thus pierced originated in the division of the window-arch into receding orders; and, consequently, that tracery windows were a natural result of the conditions of arcuated architecture. The subject of windows being quite sufficient to occupy a separate lecture, I leave it for the present to go on with the more elementary questions resulting from the conditions I laid down at the outset.

You will have noticed that having in those prescribed conditions divided my subject into two great natural heads,—viz., the *arching* over of openings in walls, and between piers; and the *vaulting* over of the spaces enclosed by walls or ranges of piers,—I have hitherto dealt exclusively with the former; and that, as the forms of piers and clustered columns are influenced as much by the requirements of the *vaulting* as of mere *arches* they have to support, I have been obliged to leave my description of their forms imperfect; and as it is my wish to treat of vaulting as systematically as I am able, I must beg you to allow this incompleteness to remain till it is incidentally filled up as we proceed with this, the second great elementary division of arcuated architecture.

It must be clear, even on the most superficial glance, that the vaulting over of extended areas is a matter of far greater intricacy and requiring vastly more thought and contrivance than the mere arching over of an opening in a wall; and, though its primary elements are simple, I must beg you to follow me over easy ground,—and ground already trodden in my previous lectures,—because these early and simple steps are needful to the due appreciation of the more advanced and complex ones which we shall presently have to consider.

The simplest elements of vaulting are—first, the covering over of a rectangular space inclosed between parallel walls by means of a semi-cylindrical vault, usually known as a "barrel vault;" and secondly, the covering over a space inclosed by a circular wall, by means of a hemispherical vault or dome.

The first is the prolongation of an arch in a direct line at right angles to its plane; the second may be conceived as generated by the revolution of an arch upon its vertical axis.

I will keep, for the present, to the development of vaulting from that, while limited by constructive convenience to some moderate span, we have occasion to vault over an area of double that width.

The most natural expedient which suggests itself is to divide the space into two widths by an arcade whose top ranges on a level with the springing of the vaulting, and on this and the outer walls to place twin and parallel barrel vaults.

This was a system at first largely made use of, as we may see in some of the covered tanks or piscines of the ancients, and in the galleries of the Colosseum. It is clear, however, that this is an imperfect covering for a single room or hall, not only from its severing it too much into two separate areas, but from its placing so much of

* See p. 160, ante.

the covering above the level of side windows, and thus practically reducing the available height of the walls; not to mention its heavy effect.

Let us see how these imperfections may be obviated.

The solution of the question may have arisen from a different and accidental case. Let us suppose two corridors, each covered by a barrel vault, crossing each other at right angles. It is easy to see that these vaults must, by their intersection, generate angles running diagonally from corner to corner of the crossing of the corridors, and that these angles of intersection would assume curves of an elliptical form.

This square of intersection would in fact be found to be vaulted on a system previously unthought of.

Let us next suppose *two* corridors, severed only by a wall, crossing two other such corridors, all similarly covered by barrel vaults. Instead of the simple intersection of our previous case, we now have a group of four, or *two pairs* of such intersecting vaults, meeting in the centre on a mere fragment of the partition walls reduced to a square pier, from whose angles spring four of those edges of intersection before described.

This, then, contains the solution of the problem under consideration, for, returning to our first case of vaulting a hall of double width, we may, by repeating as many as we may need of these pairs of intersecting or "groined" compartments, such as we have generated by the last process, effect our object in a perfect manner; the vaults being all of equal height, and the two widths being practically united into one, while the walls cease to be stunted of their full height, and room is left in them for windows reaching nearly to their top.

The same process may be applied to an area of any extent by repeating the ranges of piers, or limited to a single span or to a single compartment, at pleasure; and in all these cases it has the advantages of giving all the internal cubic space, and all the height of wall of which a vaulted area is capable; while, by concentrating the lateral pressure upon points at convenient intervals, where it may be readily resisted by external buttresses, it leaves the intervening wall-spaces at liberty to be pierced by windows, doors, or archways at pleasure.

The Roman builders usually strengthened their vaulting by narrow strips of brickwork or out stonework from pier to pier, constructing the rest of inferior materials. Then groined vaults were similarly fortified at the lines of intersection; but, as the whole was usually encased with plaster, these constructive expedients had no effect on the appearance. Sometimes, however, in their barrel vaults (as in the piscina at Baise, mentioned by Professor Willis, and in the corridors of the Colosseum), we find these strengthening strips appearing as ribs projecting downwards from the surface of the vaulting, and supported by projecting piers.

The application of this to groined vaulting is an obvious step, and adds vastly both to its strength and beauty. Let us suppose a length of vaulting so divided; we find at once that we are getting into a very sightly system, and one susceptible of excellent architectural treatment. Let us then, before proceeding to more advanced or intricate developments, apply to what we have reached the same process of architecturalisation which we have gone through for mere arching.

Now, so far as relates to a barrel vault, it is evident that when divided by transverse ribs those may be carried by pilasters or by colonnettes just as the orders of an ordinary arch; and if we further mould or otherwise decorate the ribs and continue the capitals as an impost along the springing line, we have given a very fair amount of architectural character to the simplest form which vaulting can assume.

To pass on to the simplest form of intersecting or groined vaulting, it is equally clear that columns may be substituted for the square piers which are its normal supports.

In my theoretical description of this form of vault, I supposed the springers which are next to the wall to rise directly from its face; but in practice it is better that they should rest upon projecting piers; and it is obvious that for these pilasters or columns may be substituted. The crypt under the Church of the Holy Trinity at Caen is a good example of this class of vaulting. When we apply the transverse rib to this vaulting we give it at once a strictly architectural character, as every compartment is now distinctly defined.

The complete plan of the springer upon a

detached pier now takes the cross form, suggesting the substitution of a cluster of four shafts round a square, or of a larger column, with a capital broken into the cross form. Where, however, the weight to be carried was small, as in crypts whose vaulting supported only the floor above, this enlargement of the pier was obviated by making the ribs die out at their springing one into another, and the groin to commence a little higher up; or sometimes by the awkward expedient of making the outer curve of the rib eccentric with the inner one.

Where we have already clustered pillars carrying a main arcade, the presence of vaulting on either side adds a new member to the pier, both behind and in front; and if, as is usual in churches, the central vault springs from a higher level, the additional shaft on that side runs up through, or rather by, the capital of the pier till it reaches the higher springing, thus emphasizing the division of the bays throughout their entire height. This multiplication, however, of shafts is by no means essential, as the ribs may be brought, by a little management, on to the capital of a single column, which supports the arcades, and on their other side shafts may be carried up upon corbels to receive the higher groining.

Having said enough upon this simple case of groined vaulting to show that it may be made both the source and the vehicle for architectural treatment of a most reasonable kind; and, as you will readily imagine that its ribs and their supporting capitals, corbels, and colonnettes, may receive any amount of sculptured enrichment, and its vaulted surfaces any degree of decoration in the form of painting or mosaic work, I will here close my lecture, hoping that, though its subject matter may have appeared somewhat dull and its arguments almost self-evident, it may, nevertheless, have placed simple and familiar facts before you in a form more systematic than that in which they might otherwise have presented themselves; and that, like the definitions and axioms of Euclid, it may be serviceable in preparing the way for more intricate and less obvious matters of consideration which I shall have to bring under your notice while following out, in my succeeding lectures, the principles of vaulting into those more difficult and ornate forms which became so important an artistic element in the subsequent developments of Mediæval architecture.

MASONRY: DESIGN AND CONSTRUCTION. THICKNESS OF MORTAR JOINTS IN MASONRY AND BRICKWORK.

The following remarks were commenced in reply to a question in the *Builder* as to the advantages, or otherwise, of thick or of thin beds of mortar. They have been extended.

The quantity of mortar which may safely and with advantage be used with bricks, must in a great degree depend upon the quality of the mortar, and the purpose to be served by the brickwork. Some mortars swell (expand) in use; others shrink. The best samples of mortar in setting become hard and tough; poor samples remain soft, and crumble on exposure. A thin bed of the best mortar for such a work as a tall chimney would not be so strong as a thick bed, because in a thin bed there will be parts where the best bricks will be in contact, even where $\frac{1}{2}$ in. thickness of bed may have been specified for, and this thickness of bed and joint may show on the face of the work. With common bricks, a bed of $\frac{1}{2}$ in. of mortar will leave rough projecting portions of the bricks in contact. Good mortar, when set, is, as we have just said, hard and tough; and to secure the whole strength it is capable of giving, the entire bed and joint must be full, so that the whole area of beds and joints of bricks shall be cemented by intervening mortar. Bricks and tiles of the best kinds, and mortar as composed and used by ancient Roman builders, appear to be indestructible under any ordinary action of the elements. Samples of Roman masonry—rubble and brickwork—occasionally dug up in London, and at other Roman sites in England, do not show any signs of decay, and in Italy entire structures remain sound and firm, with the exception of mutilations purposely made, wantonly or during war, in attempts to utterly destroy them. In these old works and ruins the proportions of mortar are usually about one-third, and sometimes one-half. The best rubble-work now consists of one of mortar and grout to three of stone, and the soundest rough brickwork, as in bridge-abutments and retaining-

walls, one of mortar and grout to four of bricks. There are arches of Roman work constructed of flat tiles set in beds of mortar almost, if not quite, as thick as the tiles, and those structures which have been destroyed by man (probably in war) show sound fractures and materials undecayed.

The strongest work at the Liverpool Docks is the granite rubble, consisting of one of mortar and grout to three of stone. The late Jesse Hartley, during the last twenty years of his life and practice, constructed dock and river walls of granite rubble masonry. The first twenty years he used ashlar masonry, hewn to an exactness and truth such as no other engineer ever obtained; the blocks of stone varying from 20 cubic feet up to 200 and even 300 cubic feet. These blocks were set, stone and stone, over the entire areas of beds and joints, the backing being rubble. It is, however, the rubble backing which gives strength and endurance; and this will be sound when the ashlar has been crushed, or has decayed.

If these remarks are read by any young architect who wishes to construct cheap, sound, and enduring works, we recommend rubble to his notice for heavy masonry works, and for brickwork thin, hard, and well-burned bricks, set in thick beds of good mortar. Even for public buildings the rule holds good, as at Windsor Castle, where the rough-faced wall-stones are set with thick beds and joints of good mortar, stuck with spalls of flint. Compare the resistance of this work to atmospheric influences with the masonry at Westminster in the Houses of Parliament. The walls of Windsor Castle will be sound, in their rough strength and beauty, long after the elaborately-carved stonework of the Westminster Palace has mouldered away. The cost of the two sorts of masonry is very different, probably as one to five, and in some cases one to ten, the rough work being, of course, the cheapest.

With regard to masonry and brickwork construction generally, very much more may be said, and especially about design. The "five orders" continue to be the alphabet for one set of architects: Gothic is the style chosen by another set, the Renaissance and the Elizabethan style of architecture influencing others. Our modern club-houses, public offices, and private residences give us rusticated basements, windows with pediments beneath string-courses, and heavy cornices which bolts and cramps can only keep in place.

Columns should have something to support which could not otherwise be supported. Pilasters should give strength where it is required; pediments, string-courses, and cornices should act as protections from the weather, and ought not to be present where it is impossible for this purpose to be served. Rusticated ashlar masonry is not necessarily stronger, by reason of the amount of projection given to the face, as the true strength is in the breadth of bed, truth of workmanship, and in the care and mode of setting. If the breadth of bed to ashlar masonry is cut away to form a deep rustic joint, then is the work so much weakened by the process. With respect to design and construction in masonry, will one architect consent to design a public building in an original manner, regardless of all example and precedent, and not use one moulding or ornament which does not grace construction and is useful? Let him think over the purpose or purposes to be served by plinth, rusto, column, pilaster, architrave, pediment, impost, arch, key-stone, balustrade, string-course, cornice, and every other detail, and discard one or all if plain work will be sufficient. Ample scope for ornament may be found in the useful, and it will then be discovered that economy and power of endurance are on the side of that which is useful, and also that consistent decoration is most beautiful. Masonry will then be in keeping, as there will be harmony and breadth. Old Lambeth Palace, consisting of rubble, shames florid structures in endurance; and the noble massing and fine outlines of Windsor Castle would not be improved by converting the walls into finely-tooled or polished ashlar masonry. London smoke, dust, and dirt soon disfigure hewn ashlar, which is deeply rusticated, and elaborately moulded; and carved masonry, such as that executed at the new Houses of Parliament, must inevitably and rapidly decay. The Windsor Castle coursed wall-stone is dirtied, but is not decayed as hewn moulded and carved masonry is. Thin courses of hard wall-stone and thick beds of good mortar last longest, even in palaces and in churches.



THE PHILOSOPHICAL INSTITUTION, BRISTOL.
Plan of Ground Floor.



THE PHILOSOPHICAL INSTITUTION AND LIBRARY, BRISTOL.—Messrs. Foster & Ponton, Architects.

THE PHILOSOPHICAL INSTITUTION AND LIBRARY, BRISTOL.

The building for these amalgamated institutions, at the top of Park-street, close to several other important edifices, is progressing towards completion, and in our present number we publish a view of it, and the plan of ground floor. In our volume for 1869 we gave some particulars of the construction.* Messrs. Foster & Ponton are the architects, and Messrs. Warburton the builders; the amount of the contract is 10,000*l*. Farley Down red stone is used for the exterior. The style is French Gothic. A flight of steps, 32 ft. wide, leads to an open portico, having columns, with carved capitals and bases, from which spring seven pointed arches. The portico is laid with Coalbrookdale tiles, and is built throughout of freestone. The front wall is divided into the same number of bays, each one corresponding in dimensions with the arch which faces it. The three middle ones are devoted to doorways, and the remaining four to windows which light the entrance-hall and offices. These windows each consist of three lancet-headed lights, surmounted with a tracery light, the whole inclosed in a pointed arch, resting on carved shafts, with foliated capitals. Passing through the entrance-doors (which slide on iron rails) we get into the entrance-hall. There is a committee-room to the left, and directly in front of the entrance is the door to the ground-floor museum. This is a large apartment 22 ft. in height. Running down the middle of the room is a series of octagonal freestone shafts, from which spring arches, for the support of the floor above. The room is lighted by five windows on the Baskerville-road side, of geometrical tracery, exactly the same as those described in the front, and four on the opposite side, which looks into a small yard. From the entrance-hall access is also gained to a spacious library, and a reading-room, librarian's-room, curator's-room, and all necessary offices. The reading-room and library are lighted by means of a lantern roof. The height from the ground floor to the eaves of the lantern is 36 ft. A gallery runs round both rooms, communicating with a ladies' reading-room, and on the same level as a mezzanine floor. A flight of steps from the entrance-hall takes us to the first floor, which is devoted to a larger museum, covering an area of 4,864 square feet, and 24 ft. high.

MR. PEABODY'S GIFT.

The statement of the trustees for the year 1869 has been issued. They now possess, under the first trust, four groups of buildings, situated in Spitalfields, Islington, Shadwell, and Westminster; providing collectively accommodation for 498 families, irrespective of the rooms assigned to the superintendents and porters. A fifth range of four blocks at Chelsea of somewhat different construction, affording tenements for sixty-eight families, is approaching completion. The tenements are of one, two, and three rooms each, and the weekly rent varies from 2*s*. 6*d*. to 5*s*. 6*d*. according to the number of rooms and desirableness of location. The trustees also possess a site at Bermondsey not yet built upon. At all the buildings except Shadwell there is an increasing demand for dwellings in excess of the accommodation. Under the trust the trustees have procured land at Brixton, Chelsea, and Southwark. The sum total of the gifts to the two trusts amounts to 500,000*l*.

SIR.—The Peabody Buildings at Islington, containing 155 tenements, cost 31,690*l*. Are these figures correct? If they are, I think there has been great loss or extravagance somewhere. These 155 tenements consist of what might be called "dwellings" of one, two, and three rooms, the greater portion, namely 104, having only two compartments.

Now, sir, 155 into 31,690*l*. gives a cost of 206*l*. to each tenement, or about 99*s*. per small room. It does not require any very intimate knowledge of the building trade to know that six-roomed houses can be built for 160*l*. apiece, which gives about 27*s*. per room, instead of 99*s*. How is this startling difference to be accounted for? The rental of the Peabody tenements is about 2*s*. per week for each room, producing, if all let, something like 1,600*l*. per annum; from which income deductions must be made for interest on the purchase-money of the land; or,

in other words, ground-rent, repairs, rates, and taxes, depreciation of capital, and management, to say nothing of losses by defaulting tenants. It will, then, be seen that the outlay will barely pay 2½ per cent., although the rentals are higher than usually paid in ordinary houses; for instance, six-roomed houses are let at from 8*s*. to 10*s*. per week, being about 1*s*. 8*d*. per room, which will pay the owners 9 per cent. If the committee are satisfied in receiving 2 to 3 per cent. for the money invested, they ought to be able to let rooms, say 10 ft. or 12 ft. square, at 11*d*. per week, instead of 2*s*. As a proof, take a 6-roomed house built in blocks of four, with one large wash-house attached. The cost of building each, say 160*l*. at 2½ per cent. equal to 4*l*.; ground-rent, say 2*l*. 15*s*.; rates and taxes, repairs, depreciation, &c., 7*l*. 10*s*.; making 14*l*. 5*s*. per annum, equal to six rooms at 11*d*. per week.

Presuming the foregoing calculations are correct, allow me to ask you whether the poor of London would not be more benefited by being provided with rooms at less than 1*s*. per week in ordinary houses, than by paying 2*s*. for the same accommodation in large buildings?

An argument may be used in favour of large blocks of buildings containing several floors, because it curtails the space, and thereby saves the land in ground-rent. This argument however, will not hold good as regards the "Peabody" dwellings; for it will be seen that the cost of the ground for the Islington block was 8,646*l*. 5*s*. 6*d*., the interest of which, taken in the shape of ground-rent, and apportioned to 323 rooms, or to dwellings of six rooms each, would be equal to about 8*l*. per house, which is a monstrous rent, there being plenty of land to be had at 3*s*. 6*d*. or 4*s*. per foot, which would not exceed 4*l*. per house, with a sufficient depth (if built in blocks) as would give a larger proportionate extent of yard or play-ground than falls to the lot of the tenants of the Peabody Buildings.

WM. PAICE.

THE LATE MR. WILLIAM BURN, ARCHITECT.

WE record with regret the death of one of the oldest members of the profession, Mr. William Burn, which took place on the 15th of February, at his residence, 6, Stratton-street, Piccadilly.

Mr. Burn was born in Edinburgh in the year 1789, and commenced his professional career in the office of the late Sir Robert Smirke, where he was associated with some of his principal works, and in particular with Covent Garden Theatre (destroyed by fire), the erection of which he personally superintended. On returning to Edinburgh, he succeeded to the business of his father, which he greatly enlarged, and steadily matured into the most extensive and influential connexion in Scotland. In the year 1844 he removed to London, and from that period up to the time of his death his career was one of continued success.

Mr. Burn's speciality was Domestic Architecture, and he possessed to a very remarkable degree skill in planning. His plans for private houses have the reputation amongst those who know them of being models of simplicity, compactness, and convenience. His works are very numerous: we may allude briefly to Stoke Newington, Lincolnshire, for Mr. Christopher Turner; Revesby Abbey, in the same county, for Mr. James Banks Stanhope; Lynford Hall, Norfolk, for the late Mr. Lyne Stephens; extensive works at Eaton Hall and Fonthill, for the late Lord Westminster; and at Knowsley, for the Earls of Derby; Dartsey, for the Earl of Dartsey, and Castleweller, for Earl Annesley, both in Ireland; the New Club, Edinburgh; Buchanan House, near Glasgow, for the Duke of Montrose; Montague House, Whitehall, and numerous works at Dalkeith, Bowhill, and elsewhere, for the Duke of Buccleuch; as illustrative examples of his very extensive private practice.

Mr. Burn for some years held the appointment, under Government, of consulting architect for Scotland, and performed the somewhat thankless office of a judge in the competition for the new Government offices.

Mr. Burn had a great objection to publicity, and resolutely prevented, so far as was practicable, the publication of any of his plans; not alone because of wish to avoid criticism, but on the acknowledged grounds that he saw no reason, — great mistake, — why he should enable others to derive advantage from them. The result is that his name is much less known than that of most of his contemporaries, in proportion to the magnitude of his works; and it can scarcely be claimed for

him that he did much to advance the general progress. This, however, is not the best occasion to take exceptions: we may find another. Suffice it to add that Mr. Burn was a man of ability, and in his own circle was greatly esteemed. He was buried on the 19th ult. at Kensal Green. Mr. Burn is succeeded in his practice by his nephew and partner, Mr. J. Macvicar Anderson.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

Pugin Travelling Studentship.—Ten candidates submitted drawings and testimonials for the Pugin Travelling Studentship, and the council have elected Mr. Ernest C. Lee, of 19, Great James-street, Bedford-row, as the Pugin Travelling Student for 1870. The council spoke well of the drawings of three other candidates, viz., Messrs. W. Scott Champion, W. Henman, and W. Penstone.

Professional Practice.—Attention was called to an Appendix (No. 3) in the printed Parliamentary Report on Hungerford Bridge and the Wellington-street Viaduct, headed "Papers handed in by Mr. Cole, C.B., 3rd May, 1869," and containing certain recommendations in regard to professional practice much at variance with the present system sanctioned by the Institute.

After some discussion at a special meeting, it was

Resolved.—"That the consideration of this subject be referred to a committee consisting of the vice-presidents and honorary secretary, with power to add to their number."

The Royal Academy Exhibition.—The correspondence which passed between the council and Mr. Sydney Smirke, R.A., on the subject of the accommodation provided for architectural drawings at the Royal Academy Exhibition, has been taken into consideration. In his last letter Mr. Smirke stated that the South-eastern Gallery at the Royal Academy (41 ft. by 31 ft.) was set apart for the exhibition of architectural drawings; and, in the event of spare wall space being left, for such water-colour drawings as would not interfere with the effect of the other works exhibited in the same Gallery.

After some discussion it was

Resolved.—"That the council be instructed to acknowledge the courteous letter received from Mr. Smirke, and to request him to bring under the notice of the Royal Academy the importance of leaving to its architectural members the selection of drawings sent to the Royal Academy for exhibition, which course, if adopted, would, in the opinion of this meeting, meet the wishes of the architectural profession generally."

It was further

Resolved.—"That this Institute invite its members to do their utmost to promote a good architectural exhibition at the Royal Academy this year."

Architectural Art Classes.—It has been resolved—

"That a donation of 50*l*. be contributed, out of the funds of the Institute, towards the establishment (and first year's expenses) of the Architectural Art Classes now in course of formation under a general committee of management."

These classes will meet, we have already mentioned, at the Architectural Museum, Westminster.

SINAI AND CUP MARKINGS.

IN the course of a lecture at the Royal Institution, on Friday, the 25th ult., by Captain Wilson R.E., on the results of the recent Ordnance survey of Sinai and the adjacent wilderness, the lecturer said that in various parts of the wilderness were to be found great numbers of clusters of small stone houses, much in the shape of beehives, having walls which began to taper in at the height of 2 ft. from the ground. The interior of these houses is left perfectly rough, and the projecting angles of the stones must have been a fertile source of annoyance to the inhabitants, whoever they may have been. The doors are small apertures, generally 21 in. square, or thereabouts, and the Bedouin tradition is that they were built by the children of Israel to protect them from mosquitoes, which were sent as a punishment to them. There were also large numbers of stone circles, which were places of sepulture. In the centre of rings of stone, bodies were found in kists, interred after the manner of the most ancient interments discovered in these islands, namely, the body very much contracted and lying on the left side. The stone circles varied in size from 10 ft. to 45 ft. in

diameter. Another remarkable feature was the number of stones with indentations of cup shape, such as are found in Scotland and Ireland. In one place a stone was pitted in this way all over, and the Bedouins said that it had in very ancient days been set up as a boundary mark. On the settlement of a dispute, also, a member of each family of the two adjoining tribes made a hole in the stone. There was no fixing the date of these stones nor of the beehive houses; they might have been of the time of the children of Israel, or even of an earlier date.

STAMPS ON BUILDING LEASES.

The difficulties caused by the view taken by the Commissioner of Stamps, as first pointed out in our pages, were brought before the House of Commons last week, and the Government were pressed on all sides to pass a Bill of Indemnity, and to remove the statute which calls for a 35s. stamp on building and other leases.

Mr. Alderman Lawrence rightly said the subject must not be considered as a question of stamp duty merely, but whether it was right that faith in the securities of the country should be shaken. Until the matter was settled dealings in those deeds would be brought to a perfect standstill. At present, as the deeds represented property, they were dealt in every day, and money was lent on them. The Chancellor of the Exchequer had not stated with sufficient clearness that the promised Bill should be brought in immediately, in order that the cloud which was hanging over property should be cleared away at once. As things stood at present, insurance offices that had leases brought before them in order to have money advanced on their security, would feel a difficulty in dealing with them. If the right hon. gentleman reviewed the whole question, he would see that it was of the utmost consequence that he should not insist on treating leases taken out within the four years in an exceptional manner.

Ultimately the Chancellor of the Exchequer undertook to bring in a Bill without delay. The importance of the subject is very great.

WATER SUPPLY AND THE HOME OFFICE.

We understand, that owing to the default of the town council of Sudbury, Suffolk, in providing for an efficient water-supply, as required by an order from the Home Office, under the Sanitary Act, 1866, the Secretary of State, in pursuance of the further powers granted by the Act, will, through the Local Government Act Office, execute the necessary works at the cost of the town, and has appointed Mr. T. Hennell, C.E., of Salisbury-street, Adelphi, engineer for that purpose.

The present case possesses some interest from being one of the first where the extreme powers given by the Act have been called into operation.

SEWAGE AND THE LAND.

In the course of the discussion which followed the reading, by Mr. W. Hope, at the Society of Arts, of a paper, "On the Use and Abuse of Town Sewage,"

Mr. R. Rawlinson, C.B., said he believed the most difficult land to irrigate would be a large area of comparatively flat land. He believed the most favourable was that having a limited contour elevation, and he should not even object to rather steep gradients in some instances, provided that the sewage at the commencement was sufficient for gravity, even if they had to go to some expense for pumping. His reason was this, that in irrigating land having a considerable fall, the engineer could pass his sewage by contour grips and lines over the upper areas, could then get it over the intervening portions into a second line of carriers, and as it was almost impossible to take out all the fertilizing qualities of sewage by once passing it over and through any table-land area, he could pass it over twice, thrice, or even four times beneficially, and he could then discharge the water from the last carriers as pure as ordinary spring water. He did not say they would ever arrive at that pitch of perfection when it would be safe to recommend the clarified water from subsoil drains for culinary and drinking purposes, although he knew at that moment of an instance in which the strongest sewage he ever heard or knew of was used by the adjoining residents in this

way as it flowed from the subsoil drains, and that was at the farm at Aldershot; and as this was the most perfect system of sewage irrigation that had come under his observation, a word or two in description of it might be allowed. It was perfect in every respect, not only because the difficulties overcome were the greatest, and the sewage by far the strongest, but because the results were by far the best. The Aldershot Camp Sewage Farm consisted of about 98 acres of land, which was, as an old north country farmer once said, worth "nowt" an acre. It was absolutely worthless, consisting of 90 per cent. of sand, with a mixture of peroxide of iron, which was absolutely poisonous. Mr. Blackburn, the engineer who had charge of the works, and who, fortunately, had had some experience in agriculture, broke up the subsoil, washed out the peroxide of iron, drained it, and laid it under a sewage irrigation of from 200,000 to 400,000 gallons per day, the sewage coming from the camp, and containing 20 grains of ammonia in the gallon; and an analysis showed that, while it had 20 grains of strong phosphoric acid to the gallon as it flowed on the land, the water from the subsoil drains only had half a grain. Mr. Blackburn said it was of no use to irrigate land with sewage on the surface, or to plough it in the ordinary way; he invented a plough for the special purpose, and broke up the subsoil to a depth of 20 in., and having irrigated that well with sewage, he got a crop of Italian rye grass of from 70 to 80 tons to the acre. After two years he laid down a breadth in potatoes, which he sold on the ground at 25s. per acre, the purchaser being at the cost of digging and taking them away, and leaving the tops behind as a solid dressing for the land of considerable value. In the same autumn the land was broken up, prepared and sown with Italian rye grass, which he himself saw showing 2 in. above the surface. If, however, a good profit was to be made out of land irrigated with sewage in the vicinity of a town, it should be made to produce every kind of garden produce, used in the community, all kinds of grain crops being avoided, as entailing only waste of labour, land, and money. Italian rye grass, mangolds, potatoes, cabbages, French beans, and lettuces, could all be grown with advantage, but they required special knowledge and special care; for some must not be irrigated at all while the crop was in the ground, whilst others required quite a different treatment. In this way as much as from 100l. to 200l. per acre of gross receipts might be obtained, for he had seen a return made by persons on whom he could place implicit confidence, showing with a crop of cabbages and cabbage-plants a gross return equal to 200l. per acre. Between this and the ordinary produce of 5l. to 10l. per acre was a wide margin, quite sufficient to induce efforts in this direction. They were on the threshold of this question, and only just beginning to understand it; and as there had been so much joint-stock enterprise of late, he would suggest to any gentlemen who wished to make their fortunes that they could not do better than form an honest company and go to some of the distressed towns which had been described as in the clutches of the Vice-Chancellor, and treat with them for their sewage and the land necessary to utilize it. He knew many towns which would receive them with open arms, and let them have the land at a fair agricultural price, and let them have the sewage in for nothing; and if there was any truth in chemistry, this could hardly be a bad bargain. But, at the same time, it must be conducted with knowledge and care, for he himself was concerned in a speculation of that kind where both the sewage and the land were as good as any in England, and the climate propitious, but, owing to defective management in some way, they only got a dividend of 1½ per cent., whereas, by letting it in the ordinary way, having bought it on good terms, they could have realized 5 per cent. There were, therefore, two sides to the sewage shield, as to most others; but he believed, nevertheless, that in the proper application of this system there was a mine of wealth, by bringing common sense to bear, and avoiding blunders which had already been committed. On the other hand, in many places it had become a sheer necessity to do something of this sort, in order to avoid poisoning the rivers, and would be more and more so every day. Before sitting down, he would say that the man who could solidify sewage and make it a portable manure, could invent perpetual motion and square the circle. The most perfect chemical researches had yet failed

to do more than take out one-seventh of the valuable properties of sewage in solid form; and taking a ton of sewage as being worth 17s. 6d., and treating it in any possible way—and he spoke from having been associated on the commission with some of the first chemists of the day—the result would be to take out solid matter to the value of 2s. 2d., and leave 15s. 4d. worth to go away with the effluent water, which might nevertheless appear perfectly pure and bright. On the other hand, when liquid sewage was passed through twenty inches of soil, it had but the barest trace of these valuable salts left in it. This, therefore, was the only true and profitable chemistry.

THE FALL IN LIVERPOOL.

If we may judge from the report in the local papers of an inquest recently held, as to the fall of a warehouse in Matthew-street, Liverpool, the corporation of that town would seem to possess in one of their building surveyors, Mr. T. Hunter, a remarkably acute purveyor of practical professional evidence on such cases. After stating that "the strength of the floors depended upon longitudinal beams running nearly down the centre of the buildings," and that the beams "were not in the centre throughout, as the warehouse had been built on an irregular piece of ground," we find the comment a little further on that "a longitudinal beam would be stronger if exactly in the centre than if it were out of it," which is, to put the best face on it, a very odd way of expressing what we must suppose the witnesses intended to convey, that the bearing of the joists would be more even; but is not so surprising as the statement that "it was usual to weight a building to half its bearing power." If this is usual in Liverpool, we do not wonder that Liverpool warehouses fall down. After stating that the longitudinal beams referred to were "supported by iron columns, 9 ft. apart from centre to centre," we find afterwards that "each floor bears its own weight in the building." Then on what did the feet of the iron columns rest, on all but the basement story? Did they bear their own weight, too?

BUILDERS AND WORKMEN.

SIR.—One of your correspondents on the condition of the building trade says,—"We have miles of unoccupied houses in the suburban districts of the metropolis. The workman is asked to submit to a reduction of 12½ per cent. in his wages. Is the builder prepared to submit to a corresponding reduction in the price of the houses he has already finished?"

In asking this question, your correspondent has either overlooked the fact, or is unacquainted with it, that house property has depreciated at least 30 per cent. in value in many of the suburban districts during the last four years, and not only will the builder have to submit to this deduction on property already completed, but all the property he is compelled to erect by the terms of his agreement with his ground landlord, whatever be its cost, can only now be disposed of at the same rate. Where, then, is the "quer bit of legerdemain" by which 12½ per cent. will be transferred to the profits of the capitalist? T. H. A.

LEATHERHEAD.

I HAVE read with interest your description of Dorking, and concur in the remarks of your correspondent. From a pretty intimate knowledge of the place, I incline to think Dorking will improve but slowly. It lies in a valley, hedged in by beautiful scenery, but possessing scarcely any view of it. Persons will not come and settle in Dorking whom business does not draw there, and there are no manufactures or building operations in the immediate neighbourhood greatly to increase the trade of Dorking.

Not so Leatherhead, which is separated from Dorking by five miles of the prettiest country in England. The village of Leatherhead (it scarce deserves the name of town) is placed in the most picturesque situation, straggling up from the river Mole to the district recently laid out for building, and known as Highland Park. Lovelier views than are commanded from the latter England cannot supply, while the salubrity of the air is such that invalids in the neighbouring lowlands are prescribed a daily walk on this breezy down. Leatherhead is,

however, behind Dorking in sanitary arrangements, for it has not only no scheme of drainage, but no water except from wells dug down at great depths into the chalk. In the lower part of the village water can be obtained at 15 ft., at Highland Park only at 200 ft. This is, however, proposed to be remedied by the establishment of waterworks. As for the drainage, there is a natural fall to the Mole for the overflow, and the solid sewage is collected in cess-pools. At some new houses at Highland Park Mole's earth-closet is in use.

Of all places within twenty miles of London Leatherhead is, in my opinion, the most improving; and the extraordinary rise in the price of land, which not long ago sold at the rate of 50l. an acre, and indeed under, while it now commands 500l., attests the increasing attention of capitalists to this hitherto primitive but most charming locality. But what are we to say to no drainage—no water! It is all very well for the houses in the Park, that drain away naturally down the town, and can draw their water from deep wells undisturbed; but it is time the Leatherhead folks bestirred themselves in earnest to prevent a general pestilence. A.

TENDERS FOR THE DRAINAGE WORKS, BRIGHTON.

The Works Committee have just issued a report, submitting the following tenders for the construction of main and branch sewers in the western and northern districts of the borough, in accordance with the plans and specification prepared by the borough surveyor and approved of by the council:—

John Kirk, Woolwich	£39,698 0 0
F. W. Keeble, London	35,000 0 0
G. & E. Sawyer, London	34,361 0 0
Dickenson & Oliver, London	33,880 0 0
John M. Ivery, Fareham	30,600 0 0
John T. Chappell, Steyning	30,200 0 0
William Webster, London	29,000 0 0
W. & J. Pickering, London	29,002 1 9
William Crockett, London	29,000 0 0
W. Wilmore, Fulham	27,150 0 0
John Blackmore, New Wandsworth	25,844 0 0
Samuel B. Moore, Bedford	25,488 0 0
Thomas Morris, London	25,400 0 0
John Nicholson, London	24,950 0 0
Neave & Fry, Portsmouth	24,827 0 0
Cheesman & Co., Brighton	24,800 0 0
James Bloomfield, Tottenham	24,653 0 0
J. Phillips, London	22,978 0 0

The Committee recommend that Mr. J. Phillips's tender to perform the works for the sum of 22,978l. be accepted, subject to the approval of his sureties.

DESTRUCTION OF ST. JOHN'S CHURCH, BETHNAL GREEN.

Sir,—The report in your paper of last Saturday upon this subject will lead the public to suppose that the deficiency in the supply of water at the commencement of the fire was owing to some fault in the arrangements of the water company.

This was not the case; the turncock was in attendance, and an abundant supply of water ready before the arrival of the first engine, as testified by the churchwarden, Mr. Edw. Ford, by letter addressed to the company's inspector; but the hose brought by the engine was not of sufficient length to convey the water to the fire.

Upon the arrival of the second engine, the two lengths of hose were joined, and by this means the water was brought to bear upon the fire.

E. BATES, Secretary,
East London Waterworks Company.

LEGISLATION CONCERNING TRADE UNIONS.

The following resolutions have been passed by the Committee on Labour and Capital, nominated by the National Association for the Promotion of Social Science:—

1. That the committee are of opinion that the right principle of legislation in all matters relating to trade unions is one of complete neutrality; neither subjecting such associations to special disabilities (such as withholding redress for embezzlement of their funds), nor granting them special privileges.
2. That masters and workmen ought to be allowed to combine for the purpose of settling on what terms they will consent to employ or be employed; and, generally, that, so long as the objects in view are not criminal, and persons, of every class, should be free to unite: and to do so not only in separate bodies, but in confederation.
3. That while themselves free, trade-unions and all similar associations should, like individuals, be compelled, in turn, to respect the freedom of others; and that when this freedom is violated, certain, swift, and adequate punishment should be inflicted, so as to prevent any repetition thereof.
4. That while the committee hold that all attempts to force up wages beyond the market rate, or to prevent the use of machinery, or to exclude piece-work, or to limit the number of apprentices, or to exclude female labour, are not only contrary to justice, but arise from ignorance of economic science and from a wrong view of the interests of those who make them, and are of opinion that so long

as such attempts are confined to argument and persuasion, or even to a refusal to work with those whom it is tried to influence, they should not be forbidden by law; but that when threats of molestation are employed, and, still more, actual violence, the law should instantly afford its protection to the sufferers and punish the offenders.

5. That the many instances in which terror and maltreatment have been used, in attempts to coerce, not only employers, but fellow-work-people—and the latter, indeed, in an especial degree—as, for example, in the late lamentably disgraceful riots near Sheffield, show that the present means of preventing such outrages are lamentably inefficient; and that as respects either the criminal law or its administration, or both, there are great defects.

6. That whenever it can be shown, to the satisfaction of a jury, that any one has been wronged, either in his person, earnings, or property, through the instrumentality of a trade-union or of any other association, the funds of such association should be liable for indemnification; and that in all cases the means of obtaining the redress should be ready and inexpensive.

7. That the committee heartily agree with the Trade-union Commissioners in the great value they attach to Boards of Conciliation, as organised by Mr. Mundella; and in their opinion that it is essential, for the good working of these Boards, that they should be what their name implies, and not be armed with legal powers.

EDWIN FRANK, General Secretary.

February 7th.

WANTED, A SCHOOL OF ARCHITECTURE.

Sir,—Can any of your readers inform me, through your columns, of a "School of Architecture" in London, where a young gentleman (somewhat advanced in free-hand architectural drawing) could study and receive instruction in the principles of architecture?

He would require to study from casts and diagrams of the best examples, the orders of Grecian and Roman architecture, and also of the Norman and Gothic, &c., according to their several periods; to hand-sketch accurately, and to measure and lay the whole down on paper to scale, and shade and colour them correctly, so that previously to entering an architect's office, or taking on the works, construction, and practice, he might be a good freehand and geometrical draughtsman and colourist, and have a good knowledge of the theory of architecture generally.

We apprehend that the classes about to be opened at the Museum of Architecture will best meet our correspondent's wants.

COMPENSATION QUESTIONS.

Sir Robert Peel, Bart., v. The Metropolitan Board of Works.

THIS was an action in the Court of Exchequer to recover 5,365l., under an award made by an umpire to whom the plaintiff's claim for compensation for injury done to his residence in Whitehall-gardens by the Thames Embankment Works had been referred, as well as 258l., the costs of the award.

The house was No. 4, Whitehall-gardens, and was erected in 1824 by Sir Robert Peel for the late Sir Robert Peel, on a part of the site of the Palace of Charles I. In that year the Crown granted a lease of the ground to Sir Robert Peel for ninety-nine years, and it contained a covenant that he should construct upon it a building which should cost not less than 14,000l. At the rear of the house there was a large garden running down to the Thames, with a dwarf wall at the end, and a gateway and steps leading to the foreshore. In 1862 the defendants obtained an Act of Parliament for the formation of the Embankment, and during the progress of the works the plaintiff was exposed to great annoyance in his occupancy of the house from the noise, vibration, dust, and other disturbing causes. In consequence also of the continual pumping there was a subsidence of the foundation, and cracks were caused in the walls and ceilings. On the 12th December, 1867, the plaintiff sent in a claim to the defendants for 7,500l., and being disputed, the matter was referred to two arbitrators, one being appointed by each side. They were not able to agree; and Mr. A. Mathew, Q.C., being called in as umpire, on the 29th June last, made his award, giving the plaintiff 2,000l. in respect of the occupancy being depreciated by the execution of the work, and 5,365l. for permanent depreciation in the value of the house from the subsidence, and from the landing steps, with free and direct access to the river, being destroyed. Formerly the steps were used for landing coats, furniture, and other articles required in the house, as well as for taking pleasure-boats.

Mr. Baron Bramwell asked whether an action at common law would lie for the annoyance of a foundation caused by the abstraction of water from adjoining land.

Mr. Williams thought it would, if there had been an occupation for twenty years.

Mr. Baron Bramwell.—A man has a right to withdraw water from his own land, and it has been held in a well-known case that where a well had been destroyed by a neighbour digging a deeper well he was not liable. There was no easement in subterranean and unseen water.

Mr. Williams said the subsidence was caused not only by the withdrawal of water, but also by the vibration resulting from constant pile-driving.

Evidence having been given for the plaintiff.

Mr. Baron Bramwell, in summing up, said the case was undoubtedly one of great embarrassment, but the questions of fact were very simple. First, were the vibrations, noise, and dust, a substantial grievance? Secondly, if they were, was that grievance or nuisance the result of a proper or improper way of doing the work? If the result of an improper way, the plaintiff's remedy would be by another action against the defendants or their contractor. Thirdly, did the umpire include in the sum he awarded for temporary damage anything for the annoyance caused by so many workmen being on the spot? If he did, that would not be the subject of an action. Under the head of permanent damage, he asked the jury whether the plaintiff sustained any damage by the loss of access to the river per se; and next, if he had, whether it was compensated for by the substation of the embankment. He also asked whether there was any structural damage to the house, and if so whether it was the result of the defendant's works, and further whether the umpire had given anything for loss of view, or what were called the amenities of the residence.

The jury, after having retired, answered all the questions with regard to the temporary damage in favour of the plaintiff. With respect to the permanent damage, they said there was damage by cutting off the access to the river, but, taking into account what had been substituted for it, there was no such damage. They also found there was structural damage of money value caused by the defendant's works, and that the umpire had given something for loss of amenities. They also answered several other questions which had been put to them by the learned judge.

Mr. Baron Bramwell directed a verdict to be entered for the amount claimed with interest, giving the defendants leave to move the court above on points of law.

ISLE OF MAN PUBLIC OFFICES COMPETITION.

We have more than once referred to this competition, especially with reference to the stand made against the decision by Mr. Ellison, one of the competitors, and the support his view appears to have received in the island. The question last week again came up, and the Tynwald Court, by 17 votes to 4, rejected all the drawings, including those to which the committee had awarded prizes; so throwing away the amount spent on premiums, and the labour of the last twelve months. As it is more than probable that another competition will be asked for, it is right the profession should know how some of its members have been treated in the matter.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE third annual general meeting of the donors and subscribers, to receive the report and balance-sheet for the past year, to elect the officers for the ensuing year, and to consider sundry propositions for alteration of the rules, was held at the offices of the Institution, Bedford-row, on Thursday, the 24th ult.

The report showed that within the period of the three years of its existence the Institution has had five pensioners depending upon it, in addition to the sums expended in grants for temporary relief.

Mr. Thomas Stirling has consented to accept the office of president for the present year.

The Chairman (Mr. Thomas Stirling), in moving the adoption of the report and balance-sheet, gave a brief account of the rise and progress of the Institution. The collections to the end of last year amounted to about 1,190l.; expenditure, 290l.; pensions and relief, 80l.; invested 760l. Five pensioners had been elected, and there were at the present time applications from three more candidates, one (an especially distressing case) being a clerk, totally helpless, from paralysis and softening of the brain, having a wife and four young children, three of whom were ill with the measles. Most likely an election of pensioners would soon be held; in the meantime the committee had already granted this year 20l. as temporary relief.

FROM AMERICA.

AMERICAN newspapers give us a few items that interest or amuse. One says,—Mr. Thomas Kennard demands of Mr. James McHenry, in the courts of Cleveland, Ohio, the modest little sum of 1,128,609-19 dollars, as damages, the claim being founded on an account for services rendered as civil engineer since April 1, 1866, on the Atlantic and Great Western, Buffalo Extension, Western Central, Morris and Essex, and Catawissa railroads, and the International Bridge. —An Englishman named Ringrove, lately died in New York, worth 150,000 dollars. He was a carpenter by trade, and by shrewd investments accumulated the above sum, living to the age of eighty-five, in the most abject manner. —Mr. F. D. Robinson, of North Haven, Conn., has invented an apparatus for dropping feed to horses, cattle, and poultry, in the absence of the attendant. It consists of a hopper with a lid at the bottom, which is made to drop at any time desired by a small clock, working on the principle of the alarm clock. If the farmer wishes his cattle or horses fed at an early hour, before he gets out of bed, or at any time during his absence, he has only to fill the hopper and set the clock, and the machine does the work at the appointed time. —Then comes a new version of the goose time. —Five geese expired suddenly on Mormon Island among the gold mines. The owner examined the entrails and found auspicious augury. The fowls had been feeding near an old claim, and were poisoned by amalgam. Forthwith their mortal remains were panned out, and yielded precious metal from 2-50 dollars to 5 dollars apiece. Immediately the miners went wild. A fury that spared neither age nor sex, ripping up elderly ganders, and tearing out the gizzards of green goslings, was exhibited. The cries

of the web-footed rent the air; their blood dyed the Sacramento river.—In California, the other day, a number of shoemakers, being told that their wages must be reduced, struck; but not desiring to remain idle and eat up all their savings, and finding that there was no work to be had in the shops, they held a meeting, organised a co-operative society, raised funds, and immediately rented rooms, purchased stock, and in a very short time, it is said, will be able to give employment to persons who are not stockholders in the society.

FROM IRELAND.

Dublin.—An application is being made, it appears, to the Attorney-General, to grant a patent for a new theatre. The promoters of the enterprise are the Messrs. Gann, music publishers. As they intend their theatre to be specially devoted to operetta, vanderilles, and light comedies,—a class of dramatic entertainment rarely presented on the Dublin stage,—they will not interfere with any existing interest. A small, comfortably appointed, and well-conducted house, in which light and sparkling pieces will be presented by cultivated artists, has long been a desideratum in Dublin. The site chosen for the new theatre is in Grafton-street.

Ballymena.—Sir Shafte Adair, who owns a large estate in and near Ballymena, and who has always shown great interest in the improvement of his property, has presented to the inhabitants of Ballymena a "People's Park" of fifty-five acres. Sir Shafte further proposes to inclose and ornament the park, at an estimated cost of 1,500l.

LONDON, 1869.

According to the Registrar-General's report it appears that the rate of mortality per 1,000 for the past year was 24.66; that of males being 27.01, and that of females 22.61. The population is estimated at 3,170,754, consisting of males 1,478,840, and females 1,691,914. The number of deaths was 77,933, consisting of males 39,812, and females 38,121. The number of births was 111,930, or 56,876 males, and 55,054 females. The population was increasing annually between 1851 and 1861, at the rate of 1.73 per 1,000. Scarlet fever, whooping cough, and diarrhoea were the reigning epidemics of the year; and to them 12,958 deaths were due. "Howard's devotion to the criminal population," remarks the Registrar, "rescued them from the hands of fever, and our prisons are now models, which only excite regret that their favorable sanitary conditions cannot be placed within the reach of honest labourers." The average mortality for thirty years of the five regions of London ranges from twenty-three in the north and twenty-three in the west, to twenty-five in the south, twenty-five in the central, to twenty-six in the east districts. In the year 1869 the mortality exceeded these averages everywhere except in the west districts and South London, where the effects of drainage are manifest. The mortality was at the rate of 28 per 1,000 in the east districts.

SCHOOL-BUILDING NEWS.

Manchester.—The Fallowfield new schools have been inaugurated. The schools are located on a site in Portland-grove, and form an unpretentious building, the style of which is, in the main features, Gothic. The interior measurements of the schoolroom are 55 ft. by 28 ft. The ground-floor is divided into six class-rooms, of which the two central rooms, one on each side of the main corridor, are the larger, being 21 ft. by 16 ft., and the others respectively 18 ft. 6 in. by 12 ft. and 16 ft. by 9 ft. A partition divides the upper floor into two large schoolrooms, with separate entrances, one for boys and the other for girls; but the partition will be easily removable, so as to convert the floor into a hall, occupying the full extent of the building. It is estimated that good accommodation will be provided in the schools for 300 scholars. The architect is Mr. Ernest Bates, and the cost of the building is said to be about 1,000l.

Chelmsford.—A new schoolroom has been erected in Cadogan-terrace for the Belgrave Presbyterian Church Schools, and has been opened by public meetings. The buildings occupy a site over the Metropolitan District Railway, and provide, on the ground floor, in the rear, a schoolroom, 43 ft. by 27 ft. by 25 ft. high, with a gallery at one end

for the convenience of the elder scholars and infants, whose class-rooms are on the first floor in the front building. It has an open roof, with iron ties, struts, &c., and a large lantern in the centre, by means of which effectual light and ventilation are obtained. At the platform end of the room the angles are cut off to provide the necessary W.C. and other accommodation, and also to secure uninterrupted light over the same for this end of the room. In the front building, which faces the street, two class-rooms for elder scholars, and one for infants, are provided; also sitting and bed rooms for the attendants, a kitchen, and coal-cellar. There is a stone staircase to the upper rooms, and beneath the same a librarian's closet. The front is faced with white Suffolk bricks, with red arches, cornices, &c., into which black bricks are occasionally introduced; and an inscription in tiles bearing the name of the school is to be placed under the first cornice. All the internal woodwork is stained and varnished, and the walls of the schoolroom are covered with Portland cement. The whole has been carried out at an outlay of about 1,250l., by Messrs. Scrivener & White, under the superintendence of Mr. T. Heygate Vernon, whose design was selected in a limited competition.

Coley, Reading.—A new school building has been opened here. It contains accommodation for 400 children. The estimated cost of the building was about 600l., exclusive of site (old St. Mary's workhouse) 300l. Mr. Smith, of Reading, was the architect; and the contractor was Mr. Simmonds, also of Reading.

PROVINCIAL NEWS.

Nantwich.—The foundation-stone of some new almshouses at Nantwich has been laid by Miss Tollemache. The site is at Welsh Row Head. The builder is Mr. James Parker, of Beeston. The six old houses were so many hovels, only consisting of one room each, as a dwelling for all purposes. They were built and endowed by Mr. Tollemache's ancestors, the Wilbrahams of Woodhey Hall, about 200 years ago. The new cottages, six in number, will consist of a lower floor, and a second story, having two sleeping-rooms, 14 ft. by 10 ft., and 10 ft. by 8 ft. On the bottom floor there will be a house-place, measuring 12 ft. by 14 ft., a chamber 8 ft. by 8 ft., a pantry 7 ft. by 6 ft., and outbuildings.

Tarlagarth.—Recently two or three meetings have been held at the magistrates' room, the vicar presiding, to consider the propriety of erecting a new market-house, the present one being too small, inconvenient, and in a dilapidated condition. The scheme has been talked of for some time past, but, owing to the difficulty of procuring a suitable site, nothing could be done. This difficulty has at last been surmounted by the gift of Lord Ashburnham of a suitable situation in the centre of the town. Mr. R. Davies has received orders to prepare plans for the building, which is to be 47 ft. long by 27 ft. wide, with a spacious room over it, to be used for concerts and other public meetings. The scheme is proposed to be carried out by a company, with 250 2l. shares. The town has been improved of late.

Books Received.

"THE Appropriation of the Railways by the State. By A. J. Williams, Barrister. Cassell, Petter, & Galpin." This is a people's cheap edition of Mr. Williams's proposals for the conversion of the railways into really public highways.—"The Railway, Banking, Mining, Insurance, and Commercial Almanac for 1870. Edited by W. P. Smith. Simpkin, Marshall, & Co." This is much more of an annual review of the material interests of the United Kingdom,—as, indeed, a sub-title calls it,—than a mere almanac. It gives a variety of information useful to the merchant, manufacturer, and the general public, with notices of coal, iron, metal, cotton, &c. The book contains reviews of some length of the following:—metropolitan expansion and social and sanitary requirements; railways; the iron trade; trade and finance of 1869, &c.—"The Animal Kingdom: an Elementary Text-book in Zoology. By Ellis A. Davidson. With illustrations. Cassell, Petter, & Galpin." This little

volume is specially classified and arranged for the use of science classes, schools, and colleges. It makes an interesting little volume, and is well illustrated by engravings.

Miscellaneous.

Glasgow University Buildings.—It is expected that, although not perhaps finished in all respects, the new buildings will be ready for occupation by November. The university has frontages to the north, the south, and the east, with, at the west end, a row of professors' houses. In the centre is a spacious quadrangle, divided into equal parts by the great hall, running from north to south. The foundations of the great hall have been laid, but the superstructure yet remains to be erected. The main front of the university is to the south, with, in the centre, a tower, which is to rise to a height of 300 ft. from the ground-line. Externally this front is completed, with the exception of the tower, which has only reached the ridge of the central wing. Four shafts will be led from the top of the central tower, down which the air will be drawn to a capacious air-tube running underneath the quadrangle. At the mouth of this subterranean passage is a large fan, which will serve the double purpose of sucking the fresh air from the top of the tower, and passing it into the tube at the bottom. Along the air-passage are a series of openings leading into chambers furnished with metal pipes, and communicating with the apartments above; and, by means of boilers which are fitted up in various parts of the building, these metal pipes in cold weather will be supplied with a constant stream of hot water. In all, thirteen self-contained dwellings have been provided, but this is only half the number of professors connected with the university. The contractor for the buildings is Mr. John Thomson. Professor G. G. Scott, our readers will remember, is the architect.

Society for the Encouragement of the Fine Arts.—On the 24th ult. there was an exhibition of paintings of James Ward, R.A., including the celebrated "Mill," painted in 1806 in emulation of a similar picture by Rembrandt. Mr. G. R. Ward occupied the chair, and there was a very large attendance of artists and others interested in art to do honour to the occasion. Mr. S. C. Hall opened the proceedings with an able address, in which, after paying a graceful compliment to the different members of the family present,—all of them distinguished artists,—and some brief allusions to his first acquaintance with James Ward, R.A., he declared that for truth, force, and accuracy, and the faithful delineation of animal life, no British artist before or since had surpassed him, one or two of his works being rivalled only by those of Paul Potter, added to which he was eminently skilled in landscape painting. Mr. G. R. Ward said his father obtained his first reputation as an engraver, his Cornelius, after Rembrandt, having been pronounced by a competent authority the finest work in mezzotint ever produced in England, but that in order to become a Royal Academician he gave up engraving, his first important work being the horse Adonis (belonging to George III.) attacked by a boar-constructor,—a painting rejected by the Royal Academy, which made the fortune of its exhibitor in America.

Sewer Ventilation.—Mr. John Kennett has been lecturing at Eastbourne on this subject, with reference to a patented invention of his own,—a modification of the furnace principle, in which the town lamp-posts and lamps are made use of, one half as upcast shafts and the other as downcast shafts. "In the upcast the burning of the coal-gas in the lamp creates a vacuum at the point of combustion, consequently the air from the sewer is immediately drawn into the light and becomes decomposed, and supposing that the lamp draws no more air from the sewer than is necessary for the support of combustion, then the whole of the sewer gases pass through the light; or in case the heat force draws more air than can be consumed, then the whole being warmed from 30° to 50° by the burning gas, or from 20° to 30° by the radiant heat of the sun (which is absorbed by the glass lantern) above that of the external atmosphere, the molecular condition of the air is altered, being dried, diluted, and then forced upwards without creating a nuisance. The heat is transmuted into work," and "the current of the main body of the sewer air is diverted from the dwellings."

The Grand Stand Accident at Cheltenham.—After three years' tedious litigation, a judicial decision has at length been given in the case of Francis v. Cockrell, the question at issue in which was the liability or otherwise of the defendant, as a member of the race committee, for the damages sustained by the plaintiff, who was one of those injured by the fall of the grand stand at Cheltenham races in 1867. As this case might, to some extent be taken as governing others, it has been closely fought. Originally, it stood for hearing at the Gloucester Midsummer Assize following the accident, but on its being called on a reference was made by consent to Mr. J. O. Griffiths to find as to facts. Several months elapsed before the special case was drawn up, and it was not until last July, more than two years after the mishap, that it came on for argument in the Court of Queen's Bench. Judgment was then reserved, and after another six months' delay the decision of the Court was delivered on Monday, the Lord Chief Justice, Justice Mellor, Justice Lush, and Justice Hannen sitting in Banco. Justice Hannen delivered the judgment, in which he reviewed a number of cases bearing on the issue. The result was that the authorities appeared to be in favour of the plaintiff, on the ground that a person entering into an implied contract for safety was not exonerated simply because he had employed a competent builder. Judgment was therefore pronounced for the plaintiff.

The Equalisation of the Poor Rates.—Mr. Goschen's Bill in the House of Commons proposes to place half the expenditure of the metropolis for poor relief on the Common Fund. That is, the half of 1,400,000. This is a great step towards an equitable distribution of the cost of the metropolitan poor on the ratepayers. A grant of 8s. 6d. per week for each inmate is to be allowed out of the Common Fund. To that fund fifteen parishes contribute, and twenty-four draw upon it. Medical officers, relieving officers, and paid nurses will be increased in number, but nothing will be done to assist out-door relief from the Common Fund. To prevent guardians giving as much relief as possible within the workhouses, a limit will be placed upon the number. The proposal demands the earnest attention of the metropolitan members. At the last meeting of the Marylebone board of guardians notices of motion were given by Mr. H. C. Tucker, amongst others, as to the 8s. 6d. —

"That it will be a great cruelty and hardship to the most respectable poor, to whom alone the house is a test, by breaking up their homes, and destroying the remains of self-respect, and leaving those who decline to enter the house to die of slow starvation. That recent improvements in dietary, ventilation, warming, and general comfort in workhouses render them no longer a test and terror to the workless; and that if any allowance be given from the common fund, it should be given impartially to every adult, whether in receipt of in-door or out-door relief." Surely this is a retrograde step of Mr. Goschen's. The time is past for adding to the hardships of the deserving poor, by forcing them into the workhouse, and sustaining it as a terror to the worthy rather than to the worthless, as he proposes to do.

Explorations in Palestine.—Captain Warren has recently been conducting explorations at the following points:—The district of Coelo, Syria, has many important ruins of temples, which have nearly all their entrances towards the east; and their positions are similar to the temple of Jerusalem; and the ruins of the synagogues in Galilee have many points of resemblance. There is one peculiarity about some of these temples which appears to distinguish them from those of Europe. They are mounted on stylobates, and have no steps or staircase up to the entrance, and the only method of entering is by a small door opening from the side of the stylobate into the vaults underneath, and thence by some means into the temple itself; from this it would appear either that only the priests went into the temple, or else that there was some temporary wooden staircase up into the stylobate. The small temples about Hermon appear to be somewhat of more ancient date than those in the Bukia's; they are of the Ionic order, and are in *antis*.

A New Opera House for Paris.—Whenever there is a big house to let in Paris, it is sure to be turned into a theatre. The huge Magazines Réunies are about to meet their inevitable fate. M. Gueymard has obtained permission to cover over the court-yard, and to convert it into an opera-house, where the masses are to be initiated into the works of the great masters. —Galignani.

Value of Land in Liverpool.—At a recent sale of corporation property in Liverpool, a small office and about 162½ yards of leasehold land (corporation lease of 72 years), situate in the old churchyard, Chapel-street, sold for 3,860l., being at the rate of 20l. 13s. 7d. per yard; and a block of 262 yards of unoccupied land in New-street, Victoria-street, realised 4,380l., being at the rate of 16l. 14s. 4d. per yard. An inquiry was held before Mr. J. J. Aston, Q.C., and a special jury, to assess the value of one front house, let at 8s. 6d. per week, and two court houses, at 3s. 9d. each per week. Mr. Hornblower, Mr. Peter Ellis, and Mr. Wordley were called for the claimant, Mrs. Bartlett, their valuations being respectively 586l., 575l., and 622l., including 10 per cent. for compulsory purchase, and being calculated at about sixteen years' purchase on the net rental. Mr. Calshaw and Mr. Scott, who were called for the Corporation, considered that the rents were excessive, and that, after deducting 20 per cent. for outgoings, the net rents would not be more than 30l., which they capitalised, one at thirteen years' purchase, and the other at twelve years' purchase. Mr. Calshaw's valuation, including the 10 per cent., was 429l. Mr. Scott's being only 398l. The jury retired, and gave a verdict for 510l.

Official Expenditure in the Metropolitan Board of Works.—At the last weekly meeting of the Board, on bringing up the usual report of the Finance Committee, Mr. D. Rogers drew the attention of the Board to the very heavy charges which were being constantly made by the officers of the board for cab hire, and instanced one case where a cab was charged for from Spring-gardens to Charing-cross. Mr. Collinson also complained that officers sent out on their duties were in the habit of charging for refreshments, and spent the time that ought to be occupied in their duties in taking those refreshments, at the cost of the ratepayers. Mr. Richardson referred also to the charges made for coach hire for the Fire Brigade, and generally condemned the expenditure incurred beyond the ordinary expenses of the Brigade. After a long discussion, and an amendment that the report be referred back to the committee for further consideration, on a division the amendment was negatived by a majority of 17 to 13, and the report was adopted. Captain Shaw, chief officer of the Fire Brigade, sent a letter requesting an increase of his salary. The application was referred to the General Purposes Committee.

A New Cab Register.—A new vehicle register, which has been invented by M. O. Vivier, a French chronometer-maker, and is intended to put an end to overcharges by the drivers of hired vehicles, is described in the London International newspaper. The register occupies but a very small space; it may be fixed inside or outside the carriage. It has two distinct parts—one for the guidance of the proprietor of the cab, the other for that of the driver and the public. The part which is intended to guide the public consists of a couple of dials, always visible, one of which indicates the number of miles travelled, and the other the fractions or subdivisions of the last mile entered on. A spring can be pulled which instantly sends back the hands to zero. There is a self-acting arrangement by which, when the carriage is empty, the register ceases to act. But would not such a register be apt to tempt cabmen to prefer long routes to short ones, for the purpose of increasing their fares?

Tewkesbury Water Supply.—The Cheltenham Water Company having nearly completed their works for the supply of water to the inhabitants of Tewkesbury from the Severn, a public meeting, convened by the mayor, was held on Monday last, at the Town-hall, to arrange the terms on which the company should supply the water. Mr. McLansborough stated that the company's charges would be 5 per cent. on the gross estimated rental of houses over 10l., with extra charges for closets, gardens, baths, and so on. After an animated discussion of upwards of two hours, this resolution was carried:—

"That unless the Waterworks Company consent to supply the town at 5 per cent. on the rateable value instead of on the gross estimated rental, it is the opinion of this meeting that the inhabitants should confine themselves to their present private supply for culinary and domestic purposes."

A second resolution was agreed on to the effect that the public should only pay for extras they really needed and used.

Salisbury Cathedral.—The report of Mr. G. G. Scott, R.A., on the restoration of the choir of Salisbury Cathedral as a memorial to the late Bishop Hamilton, is published. He estimates that the works will cost 8,500l., including the restoration of the stonework of the choir without the aisles or transepts, the screens and sedilia in the north and south-eastern bays with the tomb of Bishop Poore, the screens to the eastern transept arches, the restoration of the stalls and subseals with new desk-fronts to the same, the Bishop's throne, the new pavement and steps, with the probable amount of the architect's charges, and the salary of the clerk of the works. The rearedos he supposes to be given. The grilles behind the same will, he thinks, cost about 450l.; the pulpit, 300l.; the organ screen, and remodeling of the organ, from 3,000l. to 3,500l.; the incidental expenses, 1,000l. The plans show that it is proposed to bring back the choir, with its arrangements and decorations, as nearly as circumstances will permit, to its original condition. He is in favour of opening out the choir to the nave, and considers an open screen a *sine qua non*.

Good Tunnelling.—A great underground work is the Ernst August Gallery—one of five belonging to a metal mine in the Hartz. "The mouth of it is at Gittelde, in Brunswick. It is 10 ft. high, 6½ ft. wide, and has a fall three-fifths of an inch in a yard. Like a railway tunnel (but it is twice the length of the longest), it was begun simultaneously at various different points, and finished in thirteen years. The gallery is 6½ miles in direct length; but if its lateral branches are taken into account, and a subterranean gallery, navigable for boats, which opens into it, the Ernst August Galleries are said to be not less than fifteen miles long. All the junctions of the different sections fit accurately into each other, the precision of the results having been partly insured by the aid of a magnet, weighing 200 lbs., which induced the compass through the solid rock 65 ft. deep, and which was kept in one of the working-places, while the compass was held in the other."

Working Men's Club and Institute Union.—The council of this society having always regarded the institution of discussion meetings at working men's clubs and institutes as an object of very great importance, both as a means of mental discipline and political education, and also as affording opportunities for persons of different occupations and positions in life to become better acquainted with each other's opinions and interests, propose to invite their members, as well as representative men of all classes and opinions, to meet from time to time at their office in the Strand for the discussion of questions in literature, sociology, politics, history, and ethics. A conference was held at the rooms of the Union, on Thursday, March 3rd, when the question discussed was,—"Is it expedient to substitute the Metric Decimal System of Weights and Measures for those now in use?"

Improvements in Locomotion.—Sir Joseph Whitworth, at a recent dinner of the Foremen Engineers, deprecated the use of horse tramways as unsuited to the times. He further intimated his opinion that "mechanical engineers have a right to enter their protest, considering the many obstructions there have been for many years past to the employment of road locomotives." Sir Joseph thinks it quite possible to produce a small, light, locomotive, which would work quietly and effectively for use on roads, but, as a preparatory condition, he recommends that the roads should be better made, and kept in a proper state of surface by the use of steam-rollers, steam-sweeping machines, and other appliances.

A Board of Conciliation and Arbitration for Liverpool.—The Liverpool operative leaders have held a preliminary meeting with the view of establishing a court of arbitration in Liverpool. The chairman of the trades' council presided, and the meeting was unanimously in favour of the object in view. A circular was agreed upon, inviting the co-operation of the employers. This circular has to be submitted to the trades' council.

Landscape Architecture.—In December last an advertisement appeared in the public papers, offering a premium of 30 guineas for the best plan for "Public Parks and Recreation Ground at Luton, in Bedfordshire." The premium has been awarded to Mr. J. H. Carrington, landscape architect, of Mile-end, near Stockport.

Instruction in Economic Science.—The Executive Committee, on Labour and Capital, of the National Association for the Promotion of Social Science have urged on the President of the Privy Council their strong conviction,—

"That the hostility between labour and capital, arising from an erroneous belief that the interests of workpeople and their employers, and of tenants and landlords, are opposed to each other,—a belief leading, in manufactures, to attempts to impose harassing restrictions regarding rates of wages, hours of labour, piece-work, number of apprentices, and the use of machinery; and, in agriculture, to attempts to dictate the amount of rent to be exacted, and the selection of tenants; and leading, in its further stages, to strikes, lock-outs, rattening, and threats of personal violence, and ultimately, in many cases, to murder itself,—might have been mitigated, and in great measure prevented, had the people of this country in their youth, and before the mind could be warped, been instructed in the elements of economic science; and on this and on other grounds they respectfully urge that no more time be lost in taking measures for introducing this knowledge, as a regular branch of education, into all schools to which the State gives pecuniary aid."

New Cabs.—The London Depot Carriage Company will, in a short time, offer to the public private carriages at the same rate as the existing cabs. These carriages will combine the convenience of the *voiture de remise* in Paris, with the comfort of a London brougham. There will be covered stands provided for them in all the principal thoroughfares, to each of which there will be an overseer or checktaker, who will be responsible for the civility of all the men under him. There will be 900 new carriages and 900 strong horses, at the cheap rate of 2s. 6d. the hour, or arrangements to be made for a whole or half a day.

Steam Boiler Explosions.—From the annual report of the chief engineer of the National Boiler Insurance Company, it appears that the boiler explosions reported during 1869 have been unusually numerous, and the fearful loss of life and number of persons injured thereby, much exceed the average recorded of late years. He had received information of no less than 60 explosions, by which 84 persons were killed and 142 seriously injured.—Total, 226. Out of the 60 explosions 23 were of plain cylindrical boilers, externally fired; and 14 of Cornish, or one flued, internally fired. The chief cause of the explosions were fracture at riveted seams, deficiency of water, and internal corrosion.

Sculpture.—We understand that at a meeting of the subscribers to the Gladstone statue, held in the Mayor's parlour at Liverpool recently, it was unanimously decided to offer the statue to the mayor and town council of that town, for the purpose of having it placed in St. George's Hall. The statue is the work of Mr. Adams Acton.—The bronze statue of the late Earl of Carlisle has, we understand, been completed by Mr. Foley, and is about to be erected in the People's Garden in the Phoenix Park, Dublin, a place in which his lordship took considerable interest.

Monumental.—A cross of granite has just been erected in Stoke Canon Churchyard, to the memory of the late Mr. Ralph Barnes, the secretary and legal adviser of the late Bishop of Exeter. This tribute of the affection of his children has been carried out by Messrs. Easton & Son, of Exeter. The cross is bold, and rests on massive steps of granite. The work is analogous in its design to one erected by the same sculptor over the remains of the late John Koble, the author of the "Christian Year."

Glass Manufacture.—At a recent meeting of the Paris Academy of Sciences, M. Fiel exhibited specimens of flint glass of great density (Faraday's glass), obtained by a new process, enabling masses of this material to be manufactured, weighing from 25 to 35 kilos, perfectly pure, homogeneous, and free from striae, and of a density equal to and even greater than that of Faraday.

Smethwick.—The committee, and members of the Smethwick and District Building Society met on Monday last for the purpose of appointing an architect and valuer. There were fifteen applicants for the appointment. Messrs. T. C. & J. P. Sharp, of Birmingham and Smethwick, were unanimously elected architects; and Mr. J. Howell, of Birmingham, valuer to the society.

Windsor Castle.—The occupants of the houses in the Horse-shoe Cloisters at Windsor Castle have received orders to vacate them as soon as possible, so that the work of restoration, in the timber and herring-bone brickwork style, which may now be seen in many parts of the building, may be commenced.

Her Majesty and Epping Forest.—In the House of Commons, on Tuesday evening last, Lord O. Fitzgerald, the Comptroller of the Household, brought up the reply of Her Majesty to the address with regard to this forest, as follows:—"I have received your address, praying that I will take such measures as I may deem most expedient in order that Epping Forest may be preserved for the recreation and enjoyment of the people. Concurring with you in the desire that open spaces in the neighbourhood of the metropolis may be preserved for the enjoyment of my people, I will carefully consider how effect may be given to the prayer of this address."

Northern Architectural Association.—A special meeting of the members of the Northern Architectural Association was held on Saturday, the 26th ult., at the Old Castle, Newcastle-on-Tyne, for the purpose of taking into consideration and preparing a report upon the minutes and proceedings of the eighth annual meeting of the Architectural Alliance. After a lengthened discussion on the several subjects contained in the minutes, a report was adopted.

South Kensington Museum Model.—Mr. W. H. Gregory, in the Commons, asked the Secretary to the Treasury if he would place in the library the model of the buildings of South Kensington Museum and the explanation of the model. Mr. Stansfeld said the model was on a very large scale; but if a convenient place could be found for it in the library there was no objection to its being placed there.

Royal Horticultural Society.—Wednesday's exhibition of spring flowers included magnificent specimens of orchids, camelias, cyclamens, and primulas. The weather was so genial that a more than usually large number of members attended. There is every prospect that the hyacinth show on the 16th inst. will be one of great interest, as the foreign growers offer prizes to a considerable amount.

Protection of Iron.—Nature states that a method of protecting iron from atmospheric influences has been proposed by Messrs. Macmillan & Macgregor, of Dumbarton and Glasgow. They bring melted sulphur into contact with the cold metallic surface to be protected. The sulphur chills and sets into a hard, thin, protecting covering.

TENDERS.

For erecting St. Jude's Church, South Kensington. Messrs. George & Henry Godwin, architects. Quantities supplied by Messrs. Gardiner & Bell:—

		If second mains used internally in place of picked stones, add
Fish	£13,200	£45
Fanson, Brothers	12,575	141
Perry & Co.	12,500	43
Patman & Fotheringham	12,615	130
Colls & Son	12,475	115
Duns, Brothers	12,375	65
Scrivenor & White	11,995	110
Nightingale	11,857	65
Manley & Rogers	11,840	100
Higgs	11,781	62
Browne & Robinson	11,515	141
Myers & Sons	11,300	

For sewers, at Brighton. Mr. Philip C. Lockwood, borough surveyor, engineer:—

	Contract No. 5.
Kirk	£39,096 0 0
Keeble	35,000 0 0
Sawers, Brothers	34,051 0 0
Dickinson & Oliver	33,890 0 0
Ivery	30,500 0 0
Chappell	30,200 0 0
Webster	29,800 0 0
Pickering	29,602 0 0
Crockett	29,000 0 0
Wignmore	27,150 0 0
Blackmore	25,914 0 0
Moore	25,486 0 0
Morris	25,400 0 0
Nicholson	24,850 0 0
Neave & Fry	24,827 0 0
Cheesman & Co.	24,600 0 0
Bloomfield	24,563 0 0
Phillips	22,975 0 0

For alterations and additions at the Sussex County Lunatic Asylum. Mr. H. Card, architect. Quantities supplied by Mr. B. H. Nunn:—

Bushby	£1,618 0 0
Deacon	4,050 0 0
Pannett	3,980 0 0
Farnons	3,740 0 0
Howell	3,687 0 0
Chappell	3,657 0 0
Therless	3,655 14 2
Cheesman (accepted)	3,600 0 0

For house and shop, in North-road, Brighton, for Mr. Balcombe. Mr. John Hill, architect. Quantities supplied:—

Hill	£903 15 0
Marshall	800 0 0
Hampton	773 0 0

For house and shop, for Mr. A. B. Laws. Mr. John Birnie, architect:—

Hobson	£1,850 0 0
Thomas	1,650 0 0
Crabb & Vaughan	1,625 0 0
Best	1,467 0 0
Johns	1,399 0 0
Hollidge	1,390 0 0
Chapman	1,375 0 0
Wolsey	1,350 0 0
Pesket & Taylor	1,325 0 0
Ward	1,290 0 0
Poland	1,280 0 0
Lose	1,267 0 0
Hunt	1,240 0 0
George	1,215 15 0
Wright	1,199 0 0
Turner	1,172 0 0

For alterations and additions to No. 6, Fore-street Parade, Tanton, for Mr. J. C. Brown. Mr. James H. Smith, architect:—

Shewbrooks	£908 0 0
Moss & Handell	890 0 0
Giles	838 0 0
Manham & Diaband	756 0 0

For a ground-floor shop only, with basement, near New-castle-street, Strand, for Mr. J. H. Ferner. Mr. J. H. Rowley, architect. The quantities supplied by Mr. J. J. Green:—

Rivett	£633 0 0
Hill, Keddell, & Waldram	599 0 0
Macey	598 0 0
Crabb & Vaughan	598 0 0
Browne & Robinson	598 0 0
Boston	594 0 0
Brass	561 0 0
Kulby	534 0 0
King & Sons	528 0 0
Giles & Brothers	515 0 0
Scrivenor & White	512 0 0

For proposed alterations and additions to a house, at Abington, for Mr. Pauline Martin. Mr. Edwin Dobly, architect:—

Townsend	£255 0 0
King	255 0 0
Dress	248 10 0
Williams	235 0 0
Bryan	225 0 0
Davis	221 7 3

For flushing houses, St. Luke's-road, Westminster. Bristol. Mr. W. Cloutman, architect:—

	Contract No. 4.
Stannoms	£275 0 0
Stephens	253 12 0
Perkins & White	248 0 0
Howell	211 15 0
Millett	208 1 10
Lock (accepted)	194 0 0
Hobbs	190 0 0
Hobbs	188 0 0
Lloyd	185 0 0

Contract No. 5.

Perkins & White	537 0 0
Millett	500 9 0
Lloyd	490 0 0
Hobbs	481 0 0
Howell	481 5 0
Stephens (accepted)	399 0 0
Harding	350 11 0

For additions to the parsonage-house for St. Silas, Pentonville, for the Rev. J. Wilkinson. Messrs. E. Habershon & Brock, architects:—

Manley & Rogers	£1,087 0 0
Cooper	1,073 0 0
Sharrington & Cole	1,050 0 0
Nightingale	999 0 0
Scrivenor & White	981 0 0
Parshall & Weeks	937 0 0
Newman & Mann	898 0 0
Carter & Son	857 0 0
Palmer (accepted)	636 0 0

For alterations, at Lissom-grove, for Messrs. Spencer Turner, & Boldero. Mr. T. R. Parker, architect:—

Edbs & Sons	£247 0 0
Atkinson & Walker	815 0 0
Thompson & Smith	837 0 0
Blower	830 0 0
Potter & Son	825 0 0
Morseman	790 0 0
Snowden	749 0 0

For rebuilding warehouse, Nos. 26 and 27, St. Mary Axe, for Messrs. Salomon. Mr. B. Tabberner, architect:—

Cohen (accepted)	£2,976 0 0
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For building house and shop, Exeter-place, Walham-green, for Mr. David Oldfield:—

Taylor & Fitts (accepted)	£463 0 0
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TO CORRESPONDENTS.

Obituary Notice.—We have had a dozen requests for the address of parties who have at different times written in our pages on this subject, but cannot comply with them. Those who have effected engagements must take their own means of rendering their

J. P. (out of our line).—Architect (various circumstances would have to be inquired into. We might succeed by answering generally)—J. P. (see note to J. P.). H. P. J. M. A. H. C. M. C. Q. E. W. G. B. H. J. H. S. C. H. J. R. & Son. J. C. A. M. E. B. C. W. J. D. D. B. D. A. Newcomer. R. O. L. J. H. R. E. T. S. B. W. J. H. L. W. C. E. H. T. J. H. J. B. G. O. R. G. B. N. E. M. H. T. R. C. & F. P. D. T. J. W. N. D. & R. W. P. L. H.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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The Builder.

VOL. XXVIII.—No. 1414.

Memorials of Temple Bar.



that not one in ten thousand is aware of the purpose it served in old times. There is, it is true, a general impression that the present structure is one of the designs of Sir Christopher Wren; and ever and anon the question of its destruction, or removal to some other site, is discussed and dismissed. The history of the fabric is, however, a wonderment, save in a limited circle. But now a citizen, who rejoices in being the descendant of other citizens, has stood forth as the historian, and, incidentally, the champion of the Bar, and in a painstaking and careful volume has noted most of the scenes and many of the people associated with it.* Somewhat of the jostle, hustle, rattle, and rumble of the crowded thoroughfare the building spans comes to us as we read, owing to the author's desire to include kindred topics and adjacent courts and alleys in his history, which introduces a greater number of figures into his picture than we should have chosen. But on clearing the ground around the main subject of his work, the history of Temple Bar can be thus read:—

In the reign of Edward I. (1301) a grant was made to one Walter le Barbour of "a void space in the high street in the parish of St. Clement Danes, extra Barram Novi Templi." This is the earliest known mention of the famous gate between the City and the 'old court suburb. In the reign of Edward II. the inhabitants of Westminster petitioned that monarch for a remedy for the bad state of the road between the palace and "la barre du Novel Temple de Londres." They declared they were greatly interrupted in their traffic by the mire in the rainy season, and by the thickets and bushes. In the reign of Richard II., Wat Tyler, at the head of his great gathering, is said to have destroyed the bar, as well as two forges, one on either side of St. Dunstan's Church. Thus we

gradually realise the roadway through the open country, with a sprinkling of houses along the way, here and there a glowing forge, and then long lengths of tangled hedges straggling over the trackway and narrowing it. But it is not clear that the bar took the form of a structural gateway at this early date; and it is possible that it was but a bar, literally, or chain stretching from post to post across the road. The first mention of a building on the site that Mr. Noble has been able to find belongs to the reign of Henry VII., and occurs in the records of the City:—

17 Hen. 7 [1502.]
Broke Alder, } Assignate ad custodiend
flavian. } Portas de iudicio, Nugas post
Johes Warner, } un domo ordie, frain, p'dicator
nup Vio. } nec non Carres Novi Templi.

After this, the accounts of pageants and processions give us many glimpses of the Bar, always as a building, and nearly always as newly painted, repaired, or decorated, to meet the exigencies of the respective ceremonials with adequate state. Stow's description of the procession of Anne Bullen from the Tower to Westminster Abbey, on the occasion of her coronation, in 1533, says the bar was "newly paynted and repayred" for the occasion, and that a group of singing men and children stood there to salute the young favourite. Again, when Edward VI. passed through the bar to his coronation, in 1547, we hear that it was "painted and fashioned with battlements and buttresses of various colours, richly hung with cloth of arras, and garnished with fourteen standards of flags; there were also eight French trumpeters blowing their trumpets, after the fashion of their country, and a pair of regals with children singing to the same." This procession was made the subject of a set of paintings long preserved in the dining-room at Cowdray, in Sussex, which were attributed by some to Holbein, and by others, with more probability, to Bernardi, and which were unfortunately burnt in the great fire there in 1793. One of these paintings showed Temple Bar. We may see it, too, in Hollar's map, gabled, with a central gateway and two foot-passages, with the royal arms and those of the City set up over them.

When Queen Mary was crowned, the bar was again newly painted and hung; and when she was about to be married, it was resolved that a new pair of gates, that were to be good and substantial, should be set up there. Mr. Noble thinks it likely the former ones may have suffered in the rebellion of Sir Thomas Wyatt, who, it will be remembered, was taken prisoner by Sir Maurice Berkeley "by the Tempull Barre." The City records set forth that the new gates were completed in the course of a few weeks:—

"1 & 2 Phil. & Mary, 23 Oct. [1554].
Item yt was agreed that Mr. Chambeyne shall comytt the custodye of the key of the new gates, now sett up at Temple Barre, to the cyties tenantes, dwelling nyer unto the saide gates, takinge over the lesse especial order with hym, for the shutting and openynge of the same gates at convenient hours."

Queen Elizabeth was the central figure of the next ceremonial in which Temple Bar was one of the chief stations. When she passed to her coronation through the leading streets of the City, and came to this boundary, she found the bar in possession of giants, who bore in their hands, above the gate, a set of Latin verses painted on a tablet, and a translation of them, on a smaller tablet, in "English meter." A group of singing children stood at the gate, too, as on former occasions; and one of these little ones, "richly attyred as a poet" (Pope had not located the whole army of poets in Grub-street in those days) stepped forth, and bade her farewell, as she left the confines of the City for those of the Court. "Be well assured I will stand your good queen," was her reply. This queen revisited the citizens several times; and once with extra state, when she went to St. Paul's to return thanks for the defeat of the Spanish

Armada. The City waits were posted on this occasion on Temple Bar to salute her with minstrelsy.

Still more sumptuousness was exhibited when the King of Scotland made his entry into London to be crowned King of England. Ben Jonson, as poet, was among the workers who were employed to make his progress as royal as possible. A temple was erected against Temple Bar, 57 ft. high and 18 ft. wide, with a passageway 12 ft. wide. It represented the Temple of Janus; and in it were Peace, with Wealth in attendance upon her, and War grovelling at her foot; while four handmaids,—Quiet, Liberty, Safety, and Felicity,—asserted dominion over Tumult, Servitude, Danger, and Unhappiness, who lay at their feet. As the king approached this edifice, the heart of the City was placed upon an altar within, and offered as a tribute. Gilbert Dugdale says of this structure, "It was neither great nor small, but finely finished. Some compared it to an exchange shop, it shined so in the dark place, and was so pleasing in the eye; wherein a young man, an actor of the citie, soe delivered his mind and the manner of all, in an oration, that a thousand gave him his due deserving commendations." Great magnificence, too, was displayed when Charles II. passed through the City to be crowned. Evelyn, we know, was among the crowd near Temple Bar, on the Strand side, and "blessed God;" and in a balcony erected over the gateway stood the Duchess of York; while close by were drawn up the benchers and others belonging to the Inns of Court. At the bar "was a delightful bosage full of several beasts, both tame and savage," and eight waits ever and anon filled the street with music. The houses fluttered with tapestry, and the roadway was strewn with flowers on this occasion.

But there were other sights the old gate saw before it was demolished and the present structure erected on its site. Here is an unhappy knight, Thomas de Turbeville by name, on his road to the gallows. He had been taken prisoner by the French at Rheims; had returned to England as a spy; and, having been tried and convicted, is now being drawn on a fresh ox-hide from Westminster to Cheapside previously to his execution. Few of the citizens that saw this ghastly sight lived to see the commotion caused by Wat Tyler's mob, as the great unwieldy mass marched to the Savoy Palace to destroy it; for this last terror was felt eighty-six years subsequently to the horror expressed at the knight's ill-fate; but many who made way for Wat Tyler saw a smaller concourse in 1392, when there was "a grete debate in Flete-strete" between the servants of the Bishop of Salisbury and the citizens, which led the king to take a large fine of London, "or he wolde be played." And now it is night, and a dead goldsmith, slain outside "Tempull Barre," is dragged by the merciless guilty slayer down to the water's edge and thrown under the "Tempull bregge." Here is a sad scene, too, in broad golden daylight. Eleanor Cobham, Duchess of Gloucester, is doing penance, walking bareheaded, with a large wax taper in her hand, to St. Paul's, to make an offering at the high altar. Her enemies declare she has a wax image of the king upon which she has wrought the ill that has resulted in his sickness; and, although they are going to let her off with penance and a life-long imprisonment, they have hanged one of those they call her confederates and burned another. Who is this broad-shouldered, thick-set personage, dressed in one of the coats of the guard of bluff King Hal, passing through the bar? It is no other than the king himself coming into the City *incognito* to see a periodical spectacle in which royalty took no part. As he strides along the footway, carrying a halbert over his shoulder, 2,000 horsemen are mustering round a galaxy of burning

* Memorials of Temple Bar; with some Account of Fleet-street, and the Parishes of St. Dunstan, and St. Bride, London. By T. C. Noble. London: Diprose & Bateman,

crests, for the purpose of marching through the wards to see that they are properly watched and lighted. The life and gaily and unusual character of the scene have so many charms for him that he resolves to bring his queen for the time being to see it. And on St. Peter's Eve they both arrive in state to the spectators of the citizens' magnificence. The old gate saw, too, more riots than we care to count. Now they were "pretences who were out;" now it was a Lord of Misrule; then the Earl of Essex; and now, again, it was but a scuffle to obtain possession of a sword, that converted his Majesty's highway into a sea of heads, and filled the air with the roar of many voices. But now and then it looked down upon sights that we must not pass by. On the 19th October, 1637, for instance, an ambassador from the Emperor of Morocco arrived in London, and on Sunday, attended by a goodly company, proceeded to Westminster, taking with him four Barbary horses, resplendent with embroidered saddles and golden trappings, sent by his Majesty as a present to the King. Two Moors were among the throng, the one carrying the ambassador's scimitar, and the other his slippers and trappings; and behind marched eighteen captives whom Master Robert Blake had redeemed from slavery. Let us stand aside again whilst a procession of another kind passes. It is the funeral of a murdered man, Sir Edmund Godfrey, and as it stretches through and finally clears the bar, we may count seventy-two London clergymen walking two abreast before the body, and a thousand others following. A great concourse looks on silently.

Hackney coaches, about this time, began to rumble through the bar, and stand in the Strand, much to the chagrin of the watermen, who opposed them right and left, and petitioned the king to prohibit them from plying and carrying people east and west, and to and fro; and the unwary populace often failed to get out of the way of the unskilled drivers, and lives were lost.

Here is a group of excited citizens round the bar now, while the Lord Mayor is presenting the City sword to a grave-looking gentleman in an olive-coloured coat with gold buttons and loops, and a gold band round his hat, who is on his road to dine with the chief citizens. The grave stranger thus honoured is Oliver Cromwell. Thirty years later, 200,000 people are abroad enjoying a fantastical procession, formed of mock cardinals and bishops, which precedes a mock Pope, who, at Temple Bar, is jerked out of his chair of state into a bonfire. But between these two events there occurred the Great Fire, which burned Fleet-street as far as the third house from St. Dunstan's Church on the north side, and exactly opposite the church on the south side. The bar was one of the posts of guards placed to prevent the spread of the flames; and the officers in command of it were Lord Bellars, Mr. Chicheley, and Mr. Hugh May, who were empowered to appoint sub-commissioners to distribute the biscuit and cheese allowed by the king to those that assisted in this duty. On the night of September 6, when Lord Oxford made his rounds, he found Lord Bellars, Mr. May, and the constables had all quitted their posts, leaving Mr. Chicheley in sole charge. But the fire did not attack the old gabled barrier.

We first hear of the intention to build a new gate upon its site in the following entry in the City archives, authorizing a consultation with Inigo Jones:—

Item according to an order of the Lords of his Majesties most honourable Privy Council of the xxviiith April last, it is ordered that Mr. Recorder, Mr. Aldran. Flen, Sir Morris Abbott, and Mr. Aldran. Garroway, that were lately before the Board touching the repairs of a house at Temple Bar, shall meete and conferre with Inigo Jones, esq., Secretary General, of his Majtie. Works, touching a convenient gate to bee built in that place."

Kent published an engraving of the design that was furnished by Jones in compliance with the instructions he received at this conference, and a MS. in the Harleian Collection gives us every particular of it. The design was not, however, carried out; and it was not until after the coronation of Charles II. that the subject was again discussed. About three years after that event the Council of the West, Mr. Noble finds, intimated to the Council of the East that it was very desirable to rebuild the gate; and in an Act for repairing the highways, in the fourteenth year of the same reign, there is a proposal to widen, among others, "the passage at Temple Barr." But still nothing was done, for the

widening of Temple Bar was urged anew in a paper upon City nuisances, particularly irregular timber buildings, read to the Privy Council by Sir John Popham in 1664. Further on we find Charles writing to his trusty and well-beloved Mayor, Recorder, and Aldermen, desiring them at once to proceed to widen the bar in conformity with the recommendation in the Act, and promising them he would aid and encourage the work. Among the architects who took an interest in this question was Sir Balchazer Gerbier, knight, whose academy for teaching arts and sciences was the predecessor of the Royal Academy, and who, it will be remembered, wrote "A Brief Discourse concerning the Three Chief Principles of Magnificent Building, viz., Solidity, Convenience, and Ornament," in which he addressed Parliament, in the preface, as follows:—

"To the Lords and Commons assembled in Parliament,—May it please your honour: It being lately reported that your honours have deliberated to have the streets made clean, to enlarge some of them, and to build a sumptuous gate at Temple Bar, I thought it my duty to present this small discourse of the three principles of good building, and with all a printed paper concerning the cleaning of the streets, the levelling the valley at Fleet Bridge with Fleet-street and Chappin, and the making a sumptuous gate at Temple Bar, whereof a draught hath been presented to his Sacred Majesty, and is ready also to be produced to your honours upon command, with all the devotion of

Your honours' most humble and most obedient servant,
B. GERBIER DONTVILLE, Knight."

Their honours never commanded the production of this design, and the Great Plague and the Great Fire postponed the consideration of the question till 1668, when a meeting was arranged between the City officers and the king's commissioners to confer about the business of the improvement of the bar. A year later, and we find the City council in communication with Sir Christopher Wren, and by-and-by, the lord mayor relating to his fellow officers how he was sent for by the king, and pressed to accept the sum of 1,005*l.* out of the revenue arising from hackney coaches, to which they had hitherto demurred, as a fitting assistance from his Majesty towards the rebuilding of the gate and widening of the way through it. He added, that he accounted for the delay by urging the great expense incurred by the fire, and the consequent rebuilding of public works, and the still large outlays required; but that the king insisted they should take down the said bar and buildings, and accept the said 1,005*l.*, and made his royal pleasure less exacting, by promising that when that sum was expended he would take care they should have another, either out of the tax upon hackney coaches or from some other source. This royal interview sealed the fate of the bar; and within two years from that date, in the twenty-fourth year of the king's reign, Sir Christopher Wren erected the present structure.

Mr. Noble has looked through the Guildhall books, and found several entries relating to the new building. Those of the most interest prove that Joshua Marshall and Thomas Knight were the masons employed, and John Bushnell was the sculptor of the four figures in the niches. Joshua Marshall was the son of Edward Marshall, master mason to Charles I.; he carved the fine pedestal of King Charles's statue at Charing-cross, usually attributed to Grinling Gibbons, and erected the Monument. Walpole gives an interesting account of Bushnell, the sculptor. He commenced to build himself "a large house fronting Hyde Park, in the lane leading from Piccadilly to Tyburn;" and dying, of a disordered brain, his sons lived in the shell of this house, with neither floors nor staircase, in an eremetic kind of way. For the four statues upon the bar, Mr. Noble finds Bushnell received 480*l.*, which sum was paid in instalments spread over ten years. Counting 700*l.* paid to Marshall and Knight, 12*l.* to Anthony Tanner, bricklayer, and other sums in fees and compensation, the total of all payments is 1,397*l.* 10*s.* Scarcely had the newness of the fabric begun to tone down, before a proposal was set on foot to remove it altogether. The extra traffic caused by the hackney coaches evidently led to its enlargement, and now the enlargement of its accommodation upon the road called for its removal. John Gwyn, in 1766, seems to have been the first to print a proposal to do away with the time-honoured barrier, though it appears the corporation went so far as to make provision for the lessees to quit possession at six months' notice, in 1769. Thirty years after this last date, Alderman Pickett, exasperated at the constant block of vehicles at the bar, doubtless, presented a petition, signed by the most respectable inhabitants of the district, praying the

Court of Common Council to remove this and other impediments to their progress. There was great excitement with much talking and writing over the matter, as one selected "prophesy," by John Williams, will indicate:—

"If that gate is pulled down 'twixt the court and the City,
You'll blend in one mass prudent, worthless, and witty,
If you leagued it and lorded, as brother and brother,
You'll break order's chain, and they'll war with each other.
Like the great wall of China, it keeps out the Tartars
From making irruptions where industry barters."

But the bar had too many friends in the City, if not at court, to be rooted up in any such unceremonious manner; though Alderman Pickett's indefatigably urged scheme for the removal of impediments was acted upon ultimately, as far as the demolition of Bulcher-row was concerned.

We have said few are aware of the use now made of the chamber over the central gateway. In old times, as our readers will have gleaned in the course of our remarks, it was let as a residence, just as Aldgate-gate was let to Geoffrey Chaucer. But at the present day and for many years past, it has been in the occupation of Messrs. Child & Co., bankers, and is fitted up with shelves, on which are ranged their array of ledgers. Mr. Noble gives a very interesting chapter on the banking-houses of Fleet-street, and in course of his acquisition of information for it, was allowed to inspect this chamber over the central traffic of the great highway. It is entered from the first floor of their banking-house "by a series of steps, iron doors, and a passage, the approach certainly carrying in one's mind the idea of it being the entrance to a prison cell," he relates; or, as the ledgers would suggest to many, to a bridge of sighs. Charles II., Nell Gwynne, Samuel Pepys, and Prince Rupert had accounts with this great firm. In the first-floor room of the banking-house, over the chimney-piece, he noted a painting, by Michelangelo Rooker, of the City side of the bar, with, as he puts it, forcibly, "the luckless skills of luckless traitors spiled upon the summit of the gate;" and in the same apartment hangs a portrait, by Sir Thomas Lawrence, of the recent head of the firm, Lady Sarah Sophia Child, Countess of Jersey, arrayed as for the coronation of George IV. The member of the firm who permitted him to tell us these and other facts, he adds, is a descendant of the great "Spectator," whose writings have helped, as much as Dr. Johnson's association with the locality, to cast that halo round the bar that has hitherto prevented its destruction.

Like the Memorials of London Life compiled from the City archives by Mr. Riley, and noticed in these pages, Mr. Noble's "Memorials of Temple Bar" picture the middle classes, and, in the great crowds, the lower classes, rather than, as a rule, the upper ten thousand, and special favourites of fortune. Prince Rupert's fluttering plume and sparkling jewels, or Mistress Gwynne's gay coach, may occasionally have brightened the surroundings of the bar and the routine of every day business; but the great stream of passengers on foot, in coaches, and on horseback, that constantly flowed through the gateway, was composed in the main of the industrial classes. When he has duly chronicled the pereggrinations and processions that have been, down to the arrival of the Princess Alexandra, Mr. Noble passes on to the worthies that have lived in Fleet-street, the great goldsmiths, as we have seen, the famous taverns, the clergy and benefactors of St. Dunstan's Church, extracts from the register, with insight into sorrows and joys of the Marshalls, Masons, Isaac Walton, the families of Cavendish, Somerset, Wentworth and Talbot, and others; and thence to the Temple and Inns of Court, Whitefriars, the three old theatres, the Fleet River and Prison, and Bridewell. One sensational aspect of Fleet marriages, however, he has missed. In Barr's "History of Fleet Marriages" it is recorded that a certain woman "ran across Ludgate-hill in her shift," under the impression, it is supposed, that in going to her husband without any property he would not be responsible for her debts.

Among the curiosities which the author has so industriously and appreciatively grouped together, is an account of the various Fleet-street exhibitions, from the mandrakes, in 1611, to the fire-ear in 1713, who sucked a red-hot poker five times a day; and including Mr. Salmon's waxwork, at the sign of the Golden Salmon, Temple Bar, removed from the Golden Salmon in St. Martin's, near Aldersgate, because of the

greater conveniences "for the qualities" coaches to stand unmolested." Like Miss Linwood's needlework in our own time, Mrs. Salmon's figures outlived their popularity, and were, ultimately, sold for 50*l.*, in 1812. The signboards, tokens, courts, are next treated, and even the occupants of some of the shops at the present day are named, and their descent from former celebrities related. Thus it will be seen that incompleteness is not a fault that can be found with the memorial before us. On the principle that last need not be least, Mr. Noble devotes his concluding chapter to a history of the Fleet-street printing-press. Wynkin de Worde, "in the Flete-strete in the sygne of the Sonne," heads the long line of illustrious publishers who have helped to make the locality the very core of letters. Pynson, who printed the Chronicle of Fabian, the alderman whose name occurs in the first entry on the City books relating to Temple Bar as a structure, and Friesar's Chronicle, worked at his press at the "Temple-barre of London." When we call to mind, as we look further down the list of printers, that some of Shakespeare's works, and those of Milton, Quarle, Walton, Butler, Dryden, Gibber, Pope, Gay, Rowe, Swift, Dismell, Sir Walter Scott, and Byron, have been published within a small radius of this gateway into the City, we must allow that Mr. Noble would have passed over an enthralling phase of the attractions of his subject if he had not noticed the many eminent booksellers whose houses have been founded in the locality; though, on the other hand, this comprehensiveness crowds his canvas as much as the precincts of the bar have been crowded on State occasions and in troubled times. Just, however, as the looker-on can always find entertainment in a great gathering, so every reader will find something to his taste in the thronged little volume we now close with compliments.

PROFESSOR SCOTT ON ARCHITECTURE, AT THE ROYAL ACADEMY.

LECTURE II.

In my last lecture* I explained the general principles of groined or intersecting vaulting, and just carried on the subject through its simplest case,—the covering of a square space or any repetition of square spaces, by the intersection of semi-cylindrical vaults; and I just showed how, by emphasising the outlines of the squares so covered by means of transverse ribs or angles, and by placing impost mouldings, pilasters, columns, or colonnettes in the sustaining piers, such a mode of covering a space might be readily made at once susceptible and suggestive of architectural treatment.

Let us now proceed to consider the application of the same principles to the vaulting of spaces of other forms than the mere square.

The next form, perhaps, in point of simplicity is an equal-sided polygon,—say, for example, an octagon. We must here suppose eight cylindrical vaults crossing one another from the opposite sides of the octagon; and it is clear that their intersecting lines will be the diagonals or lines joining the opposite angles of the octagon, which will coincide in position with the transverse ribs. The only objection to this form of vaulting is the low proportion of the arches produced by these intersections, which, though more than twice and a half the width of the side arches, only rise to the same height, or about one-fifth of their span,—a defect which will be remedied by a development I shall presently have to describe. Just as the half-dome (as seen in the chapel of the Tower of London) forms a natural covering for an apsidal termination of a barrel vault, so a portion of a polygon, thus vaulted, would appear to be the co-relative apsidal termination of a groined vault. A difficulty, however, at once presents itself in the small height of the vault last described, which is not one-half of the height of the semicircular vault which it would have to meet. How, then, is this to be got over? How are the vaults proceeding from the narrow arches of the sides of the octagon to be brought to range in height with the wide vault which spans the whole space?

The solution of this difficulty will be better considered by means of a simple and more familiar case. The intersecting vault in its most normal form is plain enough in its application to a square compartment, but becomes difficult when applied to a space longer one way

than the other; yet oblong spaces continually present themselves as requiring to be vaulted.

Mathematically this is readily met, and that with perfect accuracy, by making one or the other of the intersecting vaults *elliptical* instead of *circular* in its curvature; making, for instance, the narrower arch a semi-ellipse with its longer semi-diameter vertical. This, however, is an unsightly form, and was always rejected, though the natural mode of effecting the object, and though it would give intersecting curves which would be complete and in vertical planes.

The Roman builders solved the problem, at the sacrifice of mathematical accuracy, by what is called *stilt*ing the narrower arch; that is, raising its springing till its crown becomes level with that of the wider arch. This is a practical solution of the difficulty, but is not a very pleasing one, inasmuch as the line of intersection is most uncomely twisted, and, in point of fact, begins at considerable height above the springing of the vault.

To go back, however, to our previous case of the apsidal termination of a vaulted space, it affords a very fair solution of the difficulty by which we were before encountered; for it is clear that the arches on the sides of the octagon may be lifted up till their crowns become level with that of the main vault; and, as the intersecting angles of a polygonal groined vault coincide with its transverse ribs, we have nothing to do but to raise from every angle a transverse rib similar, or very nearly similar, to those of the main vault, and to make the smaller vaults of the octagon to intersect upon them. There will be a little geometrical inaccuracy in the forms of these cells of vaulting; but, as the angle ribs would assume correct lines, these inaccuracies would not seriously offend the eye.

There is, however, another method of meeting the difficulty; but before describing it, I will say a few words on the treatment of other difficulties resulting from the irregularities in form of spaces which have to be vaulted.

Let us, as an example, suppose an aisle or corridor passing round such a polygonal figure as we have been considering. It is manifest that its compartments will have a form enclosed by unequal sides, or, to say the least, one side will differ greatly in width from that opposite to it.

The stilted system before mentioned is the most obvious method of getting over the difficulty. It may be, that three of the arches surrounding such a compartment may be about equal, and no great difficulty would occur as to their intersection; but the fourth, being far narrower, would have to be stilted to raise its crown to the level of the others, and its lines of intersection will consequently be more or less disturbed.

The difficulty is, in early specimens, increased through the apse being usually round instead of polygonal; though this does not very materially alter the case. We have in London two excellent examples of this apsidal aisle: that in the chapel of the Tower of London and that in St. Bartholomew's Church in Smithfield. The former of an early and the latter of a later type.

In both, the narrow arches are greatly stilted; and at first sight the two may appear to be similarly treated; but on closer examination there will be found to be much difference between them. In the Tower Chapel the transverse ribs are made to increase prodigiously in width towards the outer wall, so as to reduce the want of parallelism of the groined compartments, a very unsightly expedient; and the capitals of the columns are square, which makes the backs of the arches they support nearly double the width they present in front: while at St. Bartholomew's the ribs are of uniform width, and the capitals, instead of being square, have their sides radiating from the centre of the apse, so as to share with their arches the spreading of their outsides. The difficulty is really increased in the later work, but is met by more skilful workmanship somewhat similar to the case of the aisle round a semicircular apse, in the case of vaulting a circular building with a central pillar. In each, the main surrounding vault, if unclothed by others, would assume the form of a portion of an annulus or ring. In the aisle such a ring would be wide in the opening it surrounds, but in the circular building its opening would be reduced to the diameter of the central column or its capital.

This annulus, or curved vault, would become divided in plan into triangular portions by the transverse ribs which would meet on the central pillar and the cross vaults, proceeding from the surrounding arches, would intersect with only

the outer portion of the vault, the inner portion which rests on the pillars being unclothed by them, and assuming the form of a concave conoid, something like the flower of the convolvulus.

This form of vault is well seen in two instances in the cathedral at Worcester. The best known of these is the chapter-house, a circular building, between 50 ft. and 60 ft. in diameter, whose circumference is divided into ten parts, from which small ribs run across to the central pillar. The intersecting cells of groining are at present pointed, possibly the result of a subsequent alteration, and simply intersect with the surrounding vault. In this case the central conoid is broken into a polygonal form to give piquancy to its otherwise too unbroken surface. This may be considered the father of our beautiful polygonal chapter-houses, of which I shall have more to say as I proceed.

The other instance I have alluded to at Worcester is in the crypt. In this, the case in question occurs not in a distinct form, but in combination with an apsidal aisle on the one side, and a vaulted span, with a central range of pillars, on the other; the last pillar, forming the central point of the semicircular apse, is exactly parallel in position, and forms very similar groining to that of the chapter-house.

The same problem, when applied to a polygon instead of a circle, is open to two different modes of solution. In the one, the main vault is always supposed to run from each side towards the central pillar; in the other, from each angle towards the pillar. I shall, however, have to go more minutely into this when I come to pointed-arch vaulting, to which the last-named system more especially applies.

Having now briefly touched upon the most prominent forms of round-arched vaulting in its more normal form, as resulting from the barrel vault and its intersections, I will digress for a short time to consider some of the conditions which relate to what I in my last lecture stated to be the other most simple kind of vault,—the dome. I do so, however, not with any idea of treating at large on a form which should be made the subject of a separate lecture, but merely to facilitate the explanation of certain indirect influences which it exercised upon ordinary vaulting.

A dome in its most typical form stands upon a circular wall; this, however, is by no means a necessary condition. It may in reality cover a square or polygonal space just as well; for, suppose a square or a polygon inscribed within the base of a hemisphere, it is clear, from the properties of a sphere, that vertical planes erected on the sides of such square or polygon will cut the hemisphere in semicircles of the diameter of those sides. It follows, therefore, that the walls of a square or polygonal building would intersect with a dome in the form of semicircular arches standing on each of its sides; and, consequently, that such a square or polygon will carry a hemispherical dome, or rather the remainder of it left after cutting the base into a square or polygon.

For our immediate purpose we will limit the case to that in which the inscribed figure is a square.

Now, a dome cut in this manner by four planes is not a very sightly form, and needs some embellishment; but if a horizontal circle be drawn within it by means of a cornice resting on the crowns of the supporting arches, it assumes at once an agreeable form, and one which has been largely used both in Byzantine and in modern architecture. My present purpose, however, suggests another mode of giving sightliness to the squared dome. The lines drawn on its surface may lie in vertical as easily as in horizontal planes, and by making such lines pass through the angles of the square, touching the dome throughout their length, and intersecting one another at its apex, we obtain a form not wholly unlike a square groined vault; the great differences being that the intersecting diagonals of a groined vault assume elliptical curves, whereas these are semicircles; that in the one they represent an actual angle, while in the other they are arbitrarily drawn on an unbroken surface; and that the ridges or crowns of the vault in one case are horizontal, while in the other they are raised and circular. This mode of vaulting, though frequent in some parts of France, is seldom found in this country.

There is, however, an instance of it in the vaulting beneath the tower of Goring Church, Oxfordshire.

Though this is not really groining, but a disguised dome, there is a ready process by which

* See pp. 160, 164, ante.

it may be, and continually was, converted into genuine groining.

I have defined the barrel vault as the prolongation of an arch in a direct line at right angles to its plane. But an arch may be prolonged in other than a straight line. Let us in the previous figure suppose the arches which rise from the sides of the square to be prolonged, not horizontally, but in a curve rising as it proceeds, and so regulated that the semicircle as it moves forward retains its vertical position, and is guided in its motion by the diagonal lines drawn in the dome. This process at once generates a new form of vault. For each of the triangular gores of the dome we now substitute a vault, of which every vertical section parallel to the side of the square is a portion of a circle of the same diameter with those raised on the sides, while the angles of the intersection of these newly generated vaults are themselves semicircles. It is a perfectly accurate geometrical figure, none of whose salient lines are other than portions of circles, though the ridge or crown lines now become elliptical. It is a most useful development, as being much stronger than the ordinary groined vault. Oddly enough, it has—so far as I am aware—no suitable name. It is usual to speak of such vaults as being "domed up," but this is a very rough description. When adapted to the pointed arch, it has been called by Mr. Petit the Angerive vault. I know no better way of describing it than as round-arched vaulting with a raised ridge.

Now, though less obvious at first sight, the very same processes are applicable either to an oblong, to a tapering four-sided figure, such as the bay of the aisle of an apse, or even to one of the triangular compartments of the apse itself, or of a circle.

For, in either case, we have only to cut out the required slice from a hemispherical dome, to draw the diagonal lines from the angles of such form to the apex, and then to substitute for the gores of the dome the vault generated by the motion of the semicircle produced by the plane of the sides of the figure parallel to itself, and rising under the guidance of the diagonal lines. This process it will at once be seen, is capable of solving all the problems of irregular figures which I have enumerated at an earlier stage in my lecture, without the aid of stiltting, and without giving intersecting curves which deviate from the vertical plane, while it avoids the use of the ellipse for any prominent line.

The last case I have named—that of the triangular gore of an apse, or circle—also solves the difficult case I mentioned at the beginning of this lecture as arising in the groining of a polygon, owing to the excessive lowness of the arch formed by the intersecting angles. These are now raised to the full height of a semicircle, while if half of such a polygonal vault be used for an apse, it agrees in height with the main vault without the use of stiltting.

It may, however, be mentioned that, as stiltting is sometimes most useful in making room for windows, it was not superseded by this invention; the two systems continuing to be used at pleasure, and sometimes a union of the two, which, however, is so arbitrary as to defy definition. The form last described for a vaulting circle is often used as a variety of the dome by raising numerous small arches round its circumference, and giving a sort of fluted or shell-like surface to the dome.

I think I have now described the principal varieties of round-arched vaulting with two exceptions. The one is that in which the side vaults of oblong compartments cut the higher and main vault at a level lower than its crown. This is vulgarly known as a "Welsh" groining, and though not quite pleasing in effect, it is a very legitimate mode of covering an oblong compartment. It is customary to obviate the unpleasant coal-scuttle shape of the true line of intersection (such as may be seen in St. Martin's Church) by making them take the lines given by vertical planes, and throwing the geometrical curve into the surfaces of the cells where it does not strike the eye, or perhaps generating them by the motion forward of the side arch. This has been done in the Sistine Chapel, and Mr. Smirke has, I think, done the same in our Great Exhibition Room above. In a ceiling to be decorated with painting, this form of vaulting possesses the great advantage of being the central range unbroken by diagonal lines.

The other form I have omitted is the square or polygonal dome, or that generated by the

intersection of vaults running parallel to the sides of the base, instead of, as in the groined vault, running at right angles to them.

The square dome is, in fact, the exact correlation or complement to the square groined vault. Like it, it is generated by the intersection of two barrel vaults of the diameter of the sides of the square; but the parts of such vaults which are retained in the one are precisely those which are omitted in the other. The angular lines are the same, though in the one case the angles project, and in the other they recede; and while the groined vault is reduced in its bearing to four points in the corners, the square dome demands for its support the whole line of the walls, which, however, reduces in height to the level of the springing line; while the other allows them to rise in their centres to the full height of the vault. In some cases, as in the vaulting beneath the tower of Grantham Church, "Welsh" groins are united with the polygonal dome, a form quite applicable to the vaulting of an apse.

There is another peculiar feature in the square or other straight-sided dome, viz., that it may be cut by vertical planes, as is the case with the spherical dome. Thus if we inscribe within the base of a square or triangular dome another square or triangle where corners bisect the sides of the original base, and erect upon the sides of this newly-formed figure vertical planes, these will intersect the dome in arched forms, and the parts left will give a new form of vaulting, rising from the angles of the figure, and terminating in an unaltered position of the original dome. This form was not infrequently used, especially in vaulting triangular spaces.

I have now gone through all the normal varieties (of which I can think) of the round-arched vault, and it is time that I should allude to a great step which, after perhaps the first quarter of the twelfth century, was introduced into their construction. I allude to the addition of a moulded rib beneath their intersecting angles. It is clear that these angular lines are, both in reality and in effect, the weak points of plain groining. I have mentioned that the Romans fortified them in construction by using in them stronger material than in the rest of the vault; and the early Norman builders made a feeble attempt to take off from the dullness of the intersection, where it approaches its apex, by artificially sharpening the edge in plastering it; for, without this, it becomes (in a vault where the courses of stone or brick are concealed) almost invisible.

The great step in advance which I have now to mention provided both the construction and the artistic strength which the line required.

It is also clear that any irregularity of form may render these lines shapeless and unpleasing, and it is an obvious gain from an artistic point of view, to adopt a system which will at once render them pronounced and regular. While, then, the introduction of the angular rib was in many cases a departure from geometrical accuracy, it was a vast gain both in strength and beauty.

In that form of vaulting, which I have defined as that with the raised ridges, no geometrical inaccuracy would arise, the angles of intersection being semicircular, and in vertical planes; but in the more ordinary form of vaulting, where these lines are elliptical, that curve being unpleasing, two courses offered for choice: the use of segments of circles for the diagonal ribs, or the bringing down the springing to a lower level than that of the vault. In either case the true geometrical figure has to be departed from, and the error has to be thrown into the vaulting-surfaces, a course which subsequently became so thoroughly adopted as a principle, that it may be received as an axiom that in ribbed vaulting, where the ridges are not raised, the ribs are made of such forms as will satisfy the eye, and the vaulting-surfaces made to fit themselves to them as best they may, apart from geometrical accuracy—a principle which, though it may at first sight offend the mathematical mind, has proved in practice so wonderfully useful, and to offer so many facilities, as to be a sort of *Magna Charta* to the art of vaulting.

This step once taken, round-arched vaulting seems to have completed its work. Square and oblong spaces were vaulted either with mathematical accuracy on the raised-ridge principle, or with deliberate departure from such accuracy on the level-ridge principle. Irregular spaces were covered over by expedients which satisfied the eye, and met practical conditions tolerably well, and many beautiful works were the results.

The diagonal ribs, too, became a new source of decoration, not only by means of their own mouldings or enrichments, and through the bosses now sometimes placed at their point of intersection, but also because they were suggestive of additional colonnettes, and thus added more richness and intricacy to the piers; and sometimes they were carried upon sculptured corbels, as in the cathedral at Oxford. Among the richest specimens of this vaulting may be mentioned the gateway and the chapter-house of Bristol Cathedral, the chancel of St. Peter's Church at Oxford, &c.*

THE NEW BRITISH INSTITUTION.

The first Spring Exhibition of the new institution is somewhat of a miniature reflex of the old it would revive, even to the little staircase that brings you into the midst of the picture display,—and has nearly as much of what may be designated "good" to recommend it, as formerly, with no room for those of converse quality. If the phoenix make no great promise of a very bold flight at present as it rises from its ashes, at all events a fair prospect of a renewed life greets its revival; and Mr. T. J. Gullick, with those who have so loyally assisted him in his labour of love for art, and desire to help artists, may be congratulated on its pleasant first view; success being measured by the difficulty of its attainment.

The questions, however, still obtain, as to whether opportunity for exhibiting is a want to exceed that of what is really worth exhibition; and if the numerous calls on painters have not the effect too often of breaking the sovereign into small coin for easy currency.

No doubt, next year will show a better recognition of the favourable conditions under which ambitious performances are invited to contest public opinion in this gallery. On this occasion the most noticeable pictures are contributed by those whose best efforts will be applied in other interests than that of this new society, deserving so much general confidence for its liberal principles and constitutional government.

The Royal Academy acknowledges the desirability of some such aid to ease them of an ever-increasing plethora of paintings; and it is very much to be wished that so available a remedy for probable disappointment as Mr. Gullick's energetic attempt at a re-establishment offers, may be wisely and properly accepted by many who, year after year, depend upon the one chance of one exhibition.

Mr. Peter Graham's admirable power of depicting "Mist and Sunshine," Highland hills, and brawling water, has enabled him to paint a great picture on a small canvas (172),—one that leads in this, the landscape department; as Mr. H. Wallis's charming poem,—that sings the placid delights of spring and early life,—must be allowed to take similar precedence in another. "Blue Bells" (92) that splash the hill-side in their course to submerge the green meadows, were never seen to prettier effect, though they serve but to enhance the loveliness of Nature's most exquisite form of beauty, than in this representation, with graceful female figures to give vital interest to the scene that both bells and *bellas* adorn. That Mr. F. Goodall, R.A., continues the undertaking, "A Sheikh's Son," will be some evidence (11), though a livelier token of how long and regularly his best of earlier successes were associated with the old Institution, might have been expected from him than this rather uninteresting study, supplemented with a cleverly-sketched little bit of Eastern fact, "The Potteries, Old Cairo" (55). Mr. F. R. Lee, R.A., contributes two characteristic small specimens, of which "Over the Wooden Bridge and through the Wood" (5) is the better; Mr. T. Faed, R.A., "A Fisher Girl" (10), painted with, even, more than his usual deftness; Mr. W. C. T. Dobson, A.R.A., a clear-complexioned, soft-eyed German peasant-girl, whose appeal in the catalogue, in her own language, is "Forget me Not" (26) (as if it were possible!); and Mr. W. E. Frost, A.R.A., two small studies, "The Daughter of Israel" (27), and a slighter "Sketch of a Head" (39), that help to bring back to recollection the little pearls of pictures by the same hand, bathers, water or wood nymphs, and the like, that in former days were sure to be found on the walls of the old gallery. Old reminiscences, again, are awakened by "A Welsh Peasant Girl" (52), by Mr. P. F. Poole, R.A., although a green, unnatural hue

* To be continued.

that now suffuses all Mr. Poole's productions, leaves the exquisite colour and power of imitating daylight, or any light and shadow effect, only a recollection. Messrs. Linnell, father and sons, are ably, and therefore very conspicuously, represented. "A Study in the Fields," a pathway skirting acres of ripening corn (46), by Mr. W. Linnell, is especially brilliant and forcible: near this is some capital shadow painting, with beech trees to give cause for the effect, by Mr. W. Holyoake (50); and more depth and darkness, with some grandeur too, in Mr. A. MacCallum's view of "The Cedar Grove, Chiswick" (128). One of the best landscapes here, emanates from Mr. Alfred W. Williams (138), "Through the Woods and over Mountain." With some analogy to Mr. Linnell's reading of nature, there is so much strength of apprehensiveness as well as of power of hand to realise it, that excellence becomes almost individuality in this capital performance.

To return to the figure subjects for a change, Mr. W. Gale has nicely contrasted hale old age with happy unconscious childhood. "The Bee-Master" is manufacturing a hive; and the little child who amuses him during his task by merry prattling, will have his turn at hive-making presently, no doubt (35). Careful finish has been the *ultimatum*, as well as the first intention of this simple composition,—a very agreeable and satisfactory one. In sympathising with the parting of lovers, Mr. Gale is far less successful, unless he meant to make a joke of it (205). Anne Page and Master Slender will ever remain of the world's stage's characters, and it is as difficult now to make a new reading of A, B, C, as of Shakespeare (notwithstanding Mr. Bellew); so Mr. B. Farren (37) has gone ahead with his costume for the sake of variety. It is nicely and prettily done, or it would not be worth mentioning. Mr. Weekes is still a staunch admirer of "Border-riders." And why should he not be? Unless bigger thieves who lift, in the time it takes to life a dropped paper from the floor, and to the tune of thousands—not Scotch,—are worthier of renown. No; the glory of robbers died with the dye of their clothes, though they of the past were easily satisfied fools, indeed, compared with the worse—and their betters—of the present. "Hiding from Parant" (53) shows us one of Mr. Weekes's best thieves; and Mr. J. R. Dicksee, one of another sort, if she were "Irresistible" (54), which she is not. Indeed she is not half so handsome as "Ophelia," by Mr. T. F. Dicksee (200), who, who—meant Ophelia, not Dicksee,—is not half mad enough to satisfy any jury that she did mischief without knowing what she did or did not—such mischief as those of her sex who cogitate as they sit "In the Firelight" of conscientious reflection, by Mr. W. Maw Egley (61), will guess at and of the intensity of its cruel wrong. There was little hope left for Mr. C. Lucy to throw a fresh light on any incident of Mary Queen of Scots' history after the exhaustive analysis of Mr. Fronde. Her forced abdication at Lochleven Castle, A.D. 1567 (87), has so often been painted before, that the last depicter must of necessity be the hindmost: and yet there is much executive skill here brought to bear on this tattered and threadbare subject. Natural fact, as opposed to theory and belief, is worthier consideration if the wish is to reach general conviction. So thinks Mr. J. Archer, R.S.A. Truth, as it stands, is better worth the sitting than any model who could be used to revive dead dates. Sunburnt, active children give more promise to him for typifying life than any reading of one man's opinions, or any cogitation of his own imagining could help in his real presentation. Such sturdy facts of folks as he portrays owe all the interest they excite to a ready identification. Admirable naturalness and artistic tact will secure for his commonplace young labourers who are "Bringing Home the Heather," or meaning to take it home presently,—for they are resting quiescently to be "took off,"—wider sympathy than any stretched subject from the tomb of history. Mr. J. C. Thorne's "French Shepherds going to Midnight Christmas Mass" (113) asks for a cognate acknowledgment for earnest, modest representation of fact, as they plod on their way in the cold winter's moonlight.

"Venus's Looking-glass" (116) is somewhat like a fantastic creation of Mr. Woolmer's and is all the better on that account, though painted by Mr. H. Tidey. "Rosy Slumber" (124) might be taken for the first chapter of obligation entailed by the "Heirloom" (123), though this is painted by Mr. P. R. Morris, and the sleeping, still more embryo hero is one of Mr. Hayllar's

pretty creations, who may wake, perhaps to the contemplation of a notched sword presently—the tale of what he owes to primogeniture.

"Haddon Hall in the Olden Times" (127), by Mr. T. J. Barker, introduces more such promising young sprigs from a time-honoured stem, gaily caparisoned with their pretty white ponies, groomed to a polish that befits them to their riders.

Mr. W. Cave Thomas shows his proficiency as a master in the good drawing of his figures in the allegory of "Angels contemplating Men" (134), achieving thoughtful expression which produces thought, and demands acknowledgment; and though honest opinion cannot, in our case, accord with any great admiration for Professor C. Verlat's "Virgin, Child, and St. John" (31), with those who identify the difficulty of satisfying abstract conceptions of such embodiments,—an idea of the many would be impossible to be realised by one,—this is entitled to great respect. Mr. A. Legros sends a study, broadly and simply treated, of "Le Joueur du Violoncelle" (30), which appertains more to ancient art than to the schools of present date.

Amongst other works we noted in the catalogue are "The Wayfarers" (17), by Mr. Haynes King; "The Black Mount" (44), by Mr. J. A. Houston, R.S.A.; two moonlight effects, by Mr. A. Gilbert, "The Mermaid's Cave" (58), and "On the Coast" (59); "A Lonely Shore—Cloudy Moonlight" (60), a little bit, but very admirable, by Mr. G. F. Teniswood; "Craven Point—a Grey Day" (65), by Mr. J. W. Oakes; "Not Enough" (74), by Mr. A. T. Verhoeven-Ball; "Loughrigg Fell, Westmoreland" (90), by Mr. Sidney R. Percy; "Noreham Castle" (91), by Mr. A. Perigal, R.S.A.; "Goodrich Castle" (98), by Mr. G. Sant; "A Cornfield" (102), by Mr. N. O. Lupton; "Cast Away" (122), by Mr. J. Danby; Mr. C. J. Lewis's large landscape (135); "Hris Trovaso, Venice" (145), by Mr. G. C. Stanfield; "Watching an Unexpected Arrival" (177), by Mr. C. Castiglione (we naturalise everybody!); "Over the Heath—Summer Storm" (195), by Mr. E. Beavis.

Mr. H. Foley, R.A., is the only sculptor who exhibits on this occasion; his well-known statuettes of "Edmund Burke" and "Oliver Goldsmith" (212—213) are very excellent as likenesses so far as paintings and prints can lead to a judgment.

Again, we wish the "New British Institution" all success.

THE RIVERS POLLUTION COMMISSION AND IRRIGATION.

THE first report of the existing Commission has been issued in a printed form.

It gives a detailed description of the rivers and running waters in the Mersey and Ribble basins; considers the various influences to which river water is subjected; and investigates the pollutions by town sewage and by manufacturing refuse which it has suffered in these districts, and the various remedies within reach. The supply of water and its purification have also been considered.

The Commission propose the establishment of a River Conservancy Board, but they differ individually in detail on this subject, and two reports by the three Commissioners are appended; one signed F. Frankland and John Chalmers Morton, and the other W. Denison, Major-General.

The Commissioners, in course of their report, review what has been done towards the establishment of sewage irrigation. Of most of the examples, as at Croydon, Rugby, Edinburgh, &c., we have already repeatedly given details; but we may run over some of those instanced by the Commission, and indicate their opinions on the subject. The experiments, as our readers know, are mostly partial, or do not deal with the whole sewage of a town. On the whole the evidence of the Commissioners is very favourable to the irrigation principle.

The often-quoted Edinburgh meadows, which they begin with, are not regarded as a good example of the agricultural remedy for the nuisance created by town sewage, which is poured over the limited area in such an enormous quantity that the soil has not fair play given to it as a cleanser, and the water therefore leaves the grass land still filthy and offensive. Even here, however, they observe, we have a remarkable illustration of the purifying power of soil and plant; but the Edinburgh experience is rather one of agricultural profit from the use of

sewage than of that perfect abatement of its waste and nuisance which, in the interest of rivers, we desire to see. Altogether there are only 400 acres to a population which must largely exceed 100,000.

Lodge Farm, Barking, is an example of another kind, where the supply of sewage is limited, and where the object has been, from this limited supply, by means of an ample extent of land, to obtain the largest annual produce. But neither here nor at Edinburgh has the sanitary result, or the purity of the water, been the object aimed at, although in the Barking case that object has been incidentally secured. The soil of the farm is considered to be too hollow and porous to allow the most to be made of the manure. Sinking away even in the channels which carry it from the reservoir, much of the sewage is wasted before it reaches the plant, and the remainder which trickles over the surface of the grass remains there too short a time for the entire extraction of the fertilising matter which it conveys. The effluent waters, however, are to a great extent purified. It appears, upon the whole experience, that for every 100 tons of sewage applied, one ton of grass per acre is obtained, over and above the natural produce of the soil and climate; the other results were also considered to be good. The Lodge Farm experience, as regards grass, is said by the Commissioners to represent a return of 5s. annually from every individual contributing to the sewage upon it.

The report then turns to a large number of instances of irrigation where the object has been, not only to make a profit, but to abate a nuisance. Such are the cases of Aldershot, Banbury, Bedford, Croydon, Norwood, Rugby, Warwick, and Worthing.

At Aldershot, the reporters remark, the extreme natural poverty of the soil does not seem to have been a hindrance to the efficiency of the process of cleansing by irrigation, and the farm produce was of vigorous and abundant growth. We have here a return of 1,200l. from the waste of 7,000 adults, or 3s. 4d. per head per annum.

In the Carlisle experiment about 100 acres are employed, and the sewage is lifted and deodorised by carbolic acid before it is distributed on the land. There is, properly speaking, no effluent water from the meadow, the whole of the sewage being absorbed by the sandy soil; and there being no drain outlet, the result is not quite so trustworthy as in the other cases; nevertheless, it is concluded from it that the soakage from the irrigated land into the neighbouring river is effectually purified.

At Penrith the drainage of a town of 8,000 people, only partly provided with water-closets, is received on 80 acres of good meadow land, near the Eamont. A little more has been done here than at Carlisle, to distribute the water by means of permanent carriers, but the treatment is otherwise the same, and the result is very similar. A very large stock of cattle and sheep is supported on the land.

At Rugby the nuisance of the sewage is entirely abated, and so much produce realised as to make it probable that the remedy, which has been an expensive one, will yet prove very profitable.

At Banbury a population of about 11,000 people drain into tanks, from which, through a 12-in. pipe, the sewage is driven by steam-power, a mile or more, to the upper end of a farm of 136 acres. By this means the extreme filthiness of the river is now satisfactorily abated. The produce is satisfactory; and it is believed the farm will soon repay rent, costs, and loan.

At Warwick the sewage of 11,000 inhabitants is poured over 100 acres about a mile from the town. The nuisance of the sewage is sufficiently abated, and large crops of Italian rye grass have been obtained, for which there is a ready sale.

The Bedford undertaking is shown to suffice as a sanitary agency, and its ultimate profitability is said to appear probable. The land at present rented is only about fifty acres, but 500 will ultimately be put to use. At Croydon the success of sewage irrigation, remark the Commissioners, as a deodorising and cleansing process, is complete. The sewage is much more efficiently purified than that of Norwood.

The Woking results are still incomplete, and are reserved till the issue of a later report: they are, however, sufficiently encouraging to justify the prosecution of the experiment on a larger scale.

The Commissioners recommend that additional powers be given, under proper regu-

lations, to corporations, local boards, manufacturers, and others to take land compellerly for cleansing sewage or other foul liquids, either by irrigation, filtration, or otherwise; and to obtain easements for culverts and outfalls for drainage through private property, compensation being given for damage actually done.

ARABIAN DESIGN AND ART.

IN the course of the discussion on Mr. J. D. Crace's paper, part of which we printed, Sir M. D. Wyatt, after strongly complimenting the author on the mass of information he had brought together for instruction and gratification, said,—The subject which Mr. Crace has so well treated is a deeply interesting one under several aspects. In the first place, it is highly interesting to us from its relation to the development of style, and its connexion with the history of a great family of the human race, under peculiar conditions of faith and social relations. I need scarcely remind you that the germs of the Arabian technical and ornamental arts are to be found in those of the Byzantine empire, to which they had for the most part descended from the decaying Roman empire. If there is anything in Mr. Crace's admirable paper to which any one could take exception—a cavilling in which, indeed, it would be almost wrong to indulge,—it might possibly be that the speaker's notice of the history of Arabian art scarcely sufficiently carried us back to the stock upon which it was engrafted. The victorious armies of the Prophet and his immediate followers speedily carried Islamism over vast tracts of country, upon many of which technical and decorative arts had long been cultivated with signal success. Hence the peculiar conventional character with which the Arabians so early stamped the eclecticism arising from the junction effected at Byzantium, in Asia Minor, Africa, and Spain, between the Orientalism of Persian and Indian arts (as they existed before the Hegira) and the classical type traditional amongst artists and workmen trained on the system of Imperial Rome. I have myself had occasion to point out in this room the intimate connexion which existed between the Persians and Justinian, and its influence on Byzantine art. The peace which was concluded between Justinian and Chosroes Nushirvan was one that was "to last for ever," according to the terms of the treaty; and Persian architects were largely employed by Justinian. Thus we see in the details of St. Sophia an evident departure from both the technicalities and the principles which characterised the old Roman works, and a certain marked anticipation of some of those changes of form and predilection for inlay and surface decoration in structure which were afterwards manifested to a great extent in the works of the Arabs. The second aspect under which this subject is interesting to us as practical professional men,—students, at least, if not masters, of the handicrafts we control,—is the technical basis of this style. This it was which made it vigorous from its earliest date, and has imparted to it the perfection of execution which always characterised it. From first to last it has exhibited the skillful workman compelled to do his best unflinchingly, and obviously to please a master, jealous of good works, who would put up with no half-hearted service. Every artisan, whatever may have been his speciality, engaged on the great works described by Mr. Crace, was a master of his craft, who carried out his work in subservience to the methods and best traditions of his trade, keeping closely to every characteristic of design and workmanship which the materials he used demanded, and which the tools and processes at his command best enabled him to execute. From his intelligence as an operative, his enlightened ideas as a designer, and the perfection which the revival by the Arabian mathematicians speedily effected of the study of geometrical form (which had been carried so far by the ancient Greeks), enabled him to bring to bear upon his special branch of industry, he was speedily in a situation to originate new features in his business, and to make the old ones far more beautiful than they had previously been. Thus in carpentry and joinery, from the very dawn of technical Arabian art, we may observe a clear recognition of the best mode of combining and contrasting both in form and colour, all the various woods which appeared to be at command. Not only was this the case with woods, but we find the same intelligent use of other materials in all the

architectural works of the Mahomedans. I differ a little from my friend, Mr. Owen Jones, in what he has remarked with regard to the place and period in which Arabian architecture was most highly perfected. No doubt, it is to be recognised in the earlier portions of the Alhambra, as having attained a thoroughly concreted system, in which, as in perfect Grecian architecture, every part had its definite form and dimension allotted to it, without confusion, and with such true and absolutely mathematical design and setting out as to preclude the possibility of the occurrence of a pattern geometrically inaccurate, or one which does not complete itself in all its parts and repetitions. We find this development of completeness in the Alhambra in its extreme complication, but we find it no less complete, though in a simpler form, in the earlier works at Cairo, such as those of the Mosque Touloun, and in the Mesquita at Cordova. At the same time, we find it associated with better ideas of structure in the technical simplicity of the primitive Arabian system, and in the clear expression of function in every architectural member. Certainly in the Alhambra, with which I am myself better acquainted than with the monuments of the Khalifate, we find the overlaying of the stucco and coloured decoration has to a certain extent hidden the structure itself; and beautiful as this overlaying certainly is, and perfectly as it has been made to harmonise with all of structure which is allowed to remain visible, it generally, to my eye at least, obscures too much. In earlier works, both of the Arabs and Moors, a principle of simple masonic construction is always indicated, and the stone is never overlaid by the plaster, nor is the eye misled by the inlays into confusion as to the system of joining. In thus dwelling upon the beauty of Arabian masonry, I would not be understood for a moment as depreciating the plaster-work (as such) of the whole range of Mahomedan design, from the days of Ebn Touloun to those of Boabdil el Chico, since during all the many centuries intervening between the reigns of those sovereigns we find, in stucco, admirable hand-worked patterns, executed with a precision and force at least equal to those we meet with in the works of ancient Rome itself. There is one more aspect under which this subject is interesting to us. In the present day there exists on all hands great desire for novelty in the main features of design, as well as in the decoration of buildings. I believe that legitimate novelty in this direction is not to be obtained by a mixing up of styles, or by confusing them together; it is rather to be found in the development in new directions of technical arts, which, if they have not already done so, may in the future be made to minister to the operations of building and decorating. It was by "developing" in this direction that the Arabians found strength, novelty, and completeness of style; and as they did, so may we do. When I look at their tiles, I see one direction at least in which we have been for some time so following an Oriental lead, and I note in them a very legitimate and excellent form of decoration, calculated, I think, to effect a great change in the aspect both of our exterior and interior architecture. I know it has, to some extent, done so already, and I believe it will do so yet more. I see also in this variety of Arabian woodwork, involving an apparently very intricate, though really simple, combination of different patterns, nothing which any skilled workman with the least desire to do what has been so well done, and what seems so thoroughly congenial with a just idea of good joiner's work, would not be able to do perfectly in this country at the present day. When one looks at the rude materials and processes by which elaborate and beautiful works were carried out in almost every technical art by the Arabians, it is difficult to imagine why the same good work should not be designed by us architects, and wrought by our artificers, who should learn to take a pride in their calling, and be honoured in proportion to their merit in it, as the Arabian workmen were. All that is wanting is that the same simple taste, good judgment, and technical energy should be bestowed upon our designs and upon our works. Men are yet to be found in India and Persia, in Cairo, and even in Spain, who, in some degree, retain the theory and practice of the most ancient Arabian tradition. I myself saw in Granada, only a few months ago, a man working with a lathe of the kind described by Mr. Crace; the only difference was, that the lathe I saw consisted of a long iron bar, with "gudgeons" sliding on it, and capable of being fixed by screws at

any distance apart. Between these gudgeons a piece of wood was so held as to be capable of gyration, with the least possible amount of friction. The workman sat down with this in front of him, and kept it working with a bow, similar to that constantly used by Indian turners, which twirled the wood round rapidly on the iron gudgeons. This he did with his left hand, while with the right hand he steadied himself, changed his cutting tools, and measured from time to time the gauge of the work he was doing. For what right hands usually do with ordinary lathes, he substituted his right foot, which exhibited an elongated great toe just like a thumb, and a metatarsal development such as I never saw before. He held the chisel tightly between the great and second toe, and seemed to use his foot just as easily as we ordinarily use our hands. It was curious to find at Granada such a retention of the simple machinery and method by which it is probable that the Moors executed the bulk of their larger ornamental works in wood, dependent upon the lathe for the fashioning of their leading forms. I trust I may be permitted to allude to one more point before I sit down; and that is, the opportunity for surface decoration which was afforded by the large wall surfaces in which the Orientals have always delighted, and by their simple arch soffits and vaults, rarely cut up by moulded work or chamferings. I cannot help thinking that these remarkable "reversible" patterns which we see here, and the effect of which is invariably excellent, were probably originally due to the desire to economise labour and cost, by making one piece of material serve, by counterchanging and interchanging the parts into which it was cut, to produce patterns in different coloured materials without the waste of any portion of material. At the same time I cannot but consider that, speaking theoretically, patterns so formed appear to be in strict compliance with that which was, and should be always felt to be, a bounden duty to carry out in coloured decoration, viz., equalisation of superficial areas of contrasting colours in the design of patterns intended to convey a sense of tranquil beauty. The principle was no less important when the contrast was intended to be effected by *chiaroscuro* only or by variety of materials than it was when the effect was intended to be produced by contrasting colours. Equalisation was demanded of the light and dark shades. It is such regular balance which keeps ornamentation quiet, and which gives to it its dominant aspect of repose. Balance, it should always be remembered, is just as essential to repose in decoration, as equilibrium is to security, and its appearance to a sense of security, in structure.

MODERATION IN RESTORATION.

SIR,—A variety of thoughts, hopes, and aspirations were engendered, upon a recent visit I paid to some of our cathedrals: there were more than one very old friend among them, friends whose aspects I had hoped never to see changed for the worse, friends who had always seemed to greet me with the same old look of confidence and close intimacy, and in whose embrace I forgot the busy whirl of the present, and betook me to the days when the care of the hour was quite sufficient to fill the whole of my thoughts, and the chance of a broken neck from a parapet or a broken hand from a verge was not fearful enough to prevent certain visits and expeditions which I and other bold spirits used to pay to the sacred fane.

Alas! that such things are necessary; but these old sentinels of religion seem one and all to have become imbued with the celebrity of the wonderful power of Madame Rachel; they seem to believe that their charms have departed, and that their strength has failed. They have held a chapter, they have put resolutions, they have carried exemplary amendments, and they have demeaned themselves in a most extraordinary manner. Stormy discussions have taken place, fiery words have been uttered, wisdom has been disesteemed and reinterred, and the great point has been carried. One fine old fellow, who seemed as firm on his pins as ever, drew attention to his teeth: alas! they had been drawn, his articulation was indistinct, and the food which he took did neither credit to the donors nor good to himself, and the symmetry of his portals had vanished. Another ancient and honoured individual pointed to his eyes; they had gone out, those orbs whose brilliant glories had once flashed all the colours of the rainbow over all who came within their influence, were represented by empty sockets; and so one after another drew

attention to his failings, and the heralds were commanded to proclaim that SS. Peter, James, John, Andrew, Michael, Nicholas, Bartholomew, &c., were about to be made beautiful for ever (?).

This Racheilian process has now been going on for a sufficient length of time to enable one to judge of its success in nearly all instances. Is the judgment upon all counts in favour of the enamelling, renewing, exchanging, reversing, perpetuating, restoring process?—who will say. But where a professor commences operations without well-defined rules for his guidance, it will not be difficult to predict failure somewhere. Now, however porky my old friends may look, glorying in their scragged faces, brilliant glass eyes, renovated mouths, restored joints, and new skin generally, many of them have lost that solidity of character, that majestic presence, which at once charmed and awed the beholder. May we hope that these attributes may at some future time return, and that all spirit, all fire, has not been improved and restored out of them. The first old friend that I came across, was Gloucester Cathedral. I had paid periodical visits, had before marked the commencement of some processes, the completion of others, and had looked forward with some amount of dread to the continuance of the doctoring. I had noted the glorious south aisle, with its rich decorated windows, with their unusual and exquisite tracery, and their profusion of ball flowers, the massive and noble buttresses which flanked the wall, and exhibited in their fertility of design the hand and eye of the master. These windows and buttresses are without parallel,—were, I had almost said. Some years ago, the wall, which had been pushed out by the groining, leant over dangerously; something was absolutely necessary to be done, and it was done. The inside face of the wall was made perpendicular, the windows were restored, and now the buttresses are undergoing the same process.

In reproducing, say, the moulded jamb of a window, the great point is to obtain a profile of the mouldings as they left the workman's hands four or five hundred years ago; not their present profile, for naturally the effect of time has been to alter the original form considerably. The most projecting portions being more exposed to all the storms of heaven, will have been worn away greatly, whereas the hollows with the protection of these very mouldings, will have suffered little or nothing; indeed, I have often found that instead of being deeper, the dust of ages from the exposed parts of the same jamb, as well as from the ground and surrounding objects, has formed a hard coat of some thickness, made the hollow smaller, and thus materially aided in the flattening process. The new portion of jamb, when fixed in its place, would exhibit two peculiarities: the projecting members would come beyond the face of the old; the hollows would recede behind it. This is all so natural, that I may be told to teach a female progenitor of mine how to extract the meat from an egg; but when I see the principle of restorations so often ignored, I think I am not wrong in inviting attention to it. Should a richly-moulded doorway have to undergo in the course of time, say half a dozen restorations, the sixth would triumphantly end, in all probability, in a bald splay, had care in obtaining the original profile been neglected, and simply a mending or joining of the old performed. Careful supervision of each stone should be the rule, and a clerk of the works appointed who would inflexibly reject every stone not coming up to a perfect standard. I say this because I have found, however willing a builder may be to have genuine work done, however clear and correct an architect's instructions may be, men will take every opportunity of going wrong, and making an even face, arguing that their work looks better.

In connexion with the work at Gloucester, I may mention one thing which may interest church restorers: a similar point has been discussed in the pages of the *Builder*. The windows between the porch and transept, as I before said, are rare specimens of decorated work, with one exception, and that is the seventh or easternmost one. Here portions of the original three-light decorated window have been worked up into a wretched Perpendicular insertion of four lights. When the repairs were started, I believe the dean and chapter and the architect determined to replace the decorated work. A gentleman obtained permission to fill this with stained glass; turrets were made, and a costly and successful window produced in Munich, by Chevalier Max Aimmüller, but a change of deans or architects taking place in the mean time, it was

discovered that the condemned insertion was a fact. The cripple is to be patched; and, awaiting a permanent habitation, the glass can be seen at the Gloucester School of Art: it well repays study, is superior to German glass generally, and the correctness of the architectural adjuncts is as praiseworthy as the masterly drawing and harmonious colour.

The interior and exterior of the choir were crowded with scaffolding and workmen, and the services had to be held in the grand old nave, where much praiseworthy work has been done simply in clearing; it has been more than once described in the *Builder*, who seems to have an eye for everything. May it still continue to keep a tight rein upon restorers, and to check sometimes the too great enthusiasm of building chapters.

M. U.

EMIGRATION.

ACCORDING to newspaper reports, the country is in a state of great agitation and excitement on the subject of emigration; and having travelled a little abroad myself, and visited many of our colonies, I shall be glad if you will allow me the opportunity of making a few observations on the subject. The movement is a matter of grave import, and one attended with serious consequences to this country, to the intended emigrant, and the colonies; and therefore should be well considered.

There is, doubtless, a fine field for extensive emigration in many of our colonies, to bring into cultivation the vast extent of uncultivated land that exists there; but the class of persons to be sent out should be those well accustomed to agricultural operations, or who possess the physical ability and aptitude to acquire such knowledge quickly when taught the respective modes of cultivation adapted to their particular produce. On my recent return from Honduras I was brought into contact with several American families, who were returning from that colony to the United States, whence they had emigrated during the war, or at the termination of it, and, though brought up as agriculturists in the States, they failed to carry out the cultivation of tropical produce, perhaps from the want of capital: they had sunk their little all in the colony, and were returning to their native land dejected, threadbare, and penniless.

Although that colony has a very extensive tract of uncultivated land, and is covered with bush, no encouragement was afforded them in their pursuits, no effort was made to keep them in the country, or inducement held out for them to remain; and so it will be with any emigrants we may send out, unless they are specially adapted to the wants of the colonies, or possess a sufficient amount of capital to embark in agricultural operations on their own account, or are assisted with money by capitalists until they have acquired a thorough knowledge of the country, its climate, and proper mode of the cultivation of the produce; and that knowledge will require some time to acquire,—say two or three years,—until they are thoroughly established.

Most of the uncultivated land in our colonies is covered with forest and bush, and the trees are of such magnitude, and the forest and bush so thick and dense, that they would astonish the people of this thinly-timbered country. They would require advice and assistance as to the best method of clearing and preparing the land, which none but men experienced in such works or backwoodsmen would understand. Of course they would be supplied with and take out with them all the necessary tools, implements, &c., required for agriculture, building, and other operations, because they are not always to be obtained there, or of the best kind; but if they can be procured there they are generally at an exorbitant price.

In the expeditions I have been connected with, I have always taken out every tool, implement, &c., required for my operations; not relying at all upon the resources of the country; but preparing myself for any and every emergency.

But, although tendering this advice on the subject of emigration, I by no means approve of the movement on the extensive scale contemplated, particularly if we send out those that our colonies require, who are just the class of persons who can be ill spared from home, as I shall endeavour to show. Have we no waste lands in Great Britain that are capable of cultivation, which would well repay the outlay of the employment of these people? Have we no public works, railways, or tramways required in

this country to extend and complete our system, so as to facilitate commerce, and add to the wealth of the country, on such a plan as would well repay the cost? Are there no sea embankments required to protect our coast in various places; or is our territory to be left to the mercies of the wild wind and waves, because we are not, as poets allege, "an iron-bound coast" everywhere? Is all our land in the best state of cultivation possible? Is science invoked everywhere, and the earth not capable of producing another blade of corn? Is no draining or irrigation required, so as to produce hereafter heavier and better crops? Or are we to pay away millions sterling annually for that which produces the staff of life, and which we might grow to a great extent at home? Are all our rivers in the best possible order for navigation and the drainage of the country of its pure water? Are our town improvement works in that happy state of forwardness as to need no further employment of labour, so as to properly dispose of our town sewage, and not to pollute our beautiful rivers; and thus to get rid of one of the causes of pestilence in the country, and to render the delightful shelving banks of our rivers habitable? Are our water-works completed everywhere? Do we not require an extensive series of reservoirs on all our rivers, so as to conserve the rainfall in wet seasons that would yield a supply of water through all dry seasons, even the driest known, for the growing necessities of the population and for agriculture? Remember 1868, its dry season and scarcity of water. Or are we to be hereafter as reckless with our rainfall as we appear to be with the bone and sinews of the country?

Since the introduction of railways, are not our public roads a disgrace to us? We are drifting into that state of normal difficulties of transit of a century or so back that drew from obscurity the talents of a McAdam and a Telford to mend our ways, and to force on civilisation whether we would or no. Look at our roads, urban and suburban!—on this picture and on that. Who can answer these questions satisfactorily? And what a glorious field is there for the Government, the capitalist, and the wealthy philanthropist. We are sending out our useful population and scattering them before the four winds of heaven to do that in our colonies, and for foreigners, which we urgently require at home. Let us put our house in order before we think of our neighbours, and let us take up many of the important measures I have suggested above, and thus profitably employ capital at home, and at the same time afford employment to an orderly and a contented people, even with the bitter dregs of poverty, and thus add materially to the prestige of the Anglo-Saxon, the national honour, and the strength and welfare of the country.

But if there should be any doubt on the subject, let a Commission of eminent philanthropists and engineers be appointed to chalk out a course for the Government, the Legislature, and the country. Surely some such step is as necessary in this emergency as the expenditure of millions sterling during the Irish famine, or of twenty millions sterling to abolish slavery in our colonies, and to release men from a servitude under which they enjoyed privileges which but few of our working classes possess, and which had the effect of literally ruining an important part of her Majesty's possessions. I have no hesitation in saying that if, instead of embarking such large sums of money in foreign loans, to aid, as alleged, foreign works, or possibly to strengthen an enemy and find him sinews of war the better to cope with us in the field, the money were spent in useful works at home we should hear little of distress or of want of employment. All that is required is that those who by good fortune have amassed wealth from social position or success in trade and commerce, should well consider philosophically that they hold it in trust for the good of the community at large; that money is useless unless it is speculated with, circulated, and distributed in such a way that will confer the greatest benefit and happiness on the greatest numbers.

If the Government and those humane and able men who are now doing all they can to promote emigration would endeavour to introduce and stimulate some of the various schemes I have shadowed forth, they would confer vastly greater benefit on this country than by raising hundreds of thousands of pounds, and freight ships with perhaps unwilling cargoes to seek fresh homes and fields and pastures new; and the intending emigrants, and many thousands besides, now on the verge of

pauperism, would hail them as noble regenerators of their country's welfare, the worthy saviours of their hearths and homes, and brave peers of England, pillars of the State. It is not the way to meet the cry of the distress and anguish so prevalent in this country, and to clear the streets of the reeking misery occasioned by the want of work, by closing up the public dockyards and other establishments, or by corporations—Liverpool for instance—suspending sanitary and improvement works for the sake of saving a petty rate or two; for these are times, of all others, when every encouragement and assistance should be given to the helpless masses to tide over this great national calamity, until better times dawn, and until the Government, our great capitalists, men of wealth, and well-to-do, soften and relent a little, and, by patting their shoulders to the wheel, set in motion that machine which alone could spread comfort and happiness through the country, in the full tide of employment for willing hearts and hands, that a liberal embarkation of capital would produce, in useful undertakings, throughout the length and breadth of this small proportion of her Majesty's vast dominions.

I fear I have trespassed at too great length on your valuable space; but the questions raised are important ones, and cannot be too strongly and forcibly impressed on the minds of your readers and those able and willing to lend a helping hand to mitigate the heavy calamity that now weighs upon the vital energies of our common country.

B. BAYLIS.

THE BELGIAN STATE RAILWAYS AND TELEGRAPHS.

A PAPER on the passenger traffic of the State railways in Belgium, with remarks on the telegraphic system, by M. Corr-Vander Maeren, was read and discussed at the last meeting of the Social Science Association. From the statistics quoted in this paper, it appears that the total of the lines in working at the beginning of 1869, in Belgium, was in length 2,730 kilometres, or 546 leagues (about 1,640 English miles), divided as follows:—

Worked by the State	Kilometres.
Worked by companies	802
Together	2,730

The amount of the capital which the Government had expended for the construction of railways up to January 1, 1868, was together 262½ millions of francs (about 10½ millions of English pounds sterling).

The cost of construction of the State railways amounts to 49,647 francs (about 16,400l.) per kilometre (or five-eighths of an English mile), divided as follows:—

Railway (the cost of the lines)	France.
Buildings, stations, &c.	236,424
General expenses	67,783
Rolling stock	8,685
Rolling stock	96,798
Total cost per kilometre ...	49,647

Or at a cost of 26,200l. per English mile.

The general result of the working for the year 1868 is as follows:—

Total receipts	Franks.
Total working expenses	38,318,909
Surplus	24,826,964
Surplus	13,491,545

Or about 540,000l.

These 13½ millions of francs profit upon the workings of 1868 give 5½ per cent. upon the whole capital expended upon the railways (say upon 262½ millions of francs).

These figures show that the railways, which have done so much for the country, both in a political and economic point of view, have not only been self-sustaining, but that their general pecuniary result is a profit since their origin of nearly 57,000,000 francs, about 2,280,000l., including interest on loans, sinking-fund, and all incidental expenses.

The lowest rates of tariff have been found to be the most productive. The differential fares introduced by the decree of the 20th March, 1866, and now operative, instead of the fixed rates of 8, 6, and 4 centimes per kilometre, substituted upon the bases of those rates a system of reduction, decreasing the rates with increased distances. The fares, however, are not so low as they once were, neither are they so profitable. The telegraph in Belgium is, like the post-office and the principal lines of railway, worked by the Government under the direction of the Minister of Public Works. The tariff established

by the State at the onset was calculated, by dividing the country into three radii, zones, or different distances, fixing the rates respectively at 2f. 50c., and 5f., and 7f. 50c. for twenty words (2s., 4s., and 6s.).

As the use of the telegraph increased, the tariff was reduced time after time, until the 1st of December, 1865, when the uniform rate of 50 centimes (about 5d.) for the whole of the country was introduced and carried out with great vigour and success. Previously to the 1st of December, 1865, the rate for simple telegrams of twenty words was 1 franc. This was for telegrams of the interior of Belgium.

The telegraph in Belgium has long since completely paid off the entire expenses of its first establishment. Beyond that it shows, on the 1st January, 1869, in the general account, a net profit of about 700,000 francs (28,000l.).

"FEATHERS" IN MAHOAGANY AND OTHER WOODS.

We have been asked by a correspondent for an explanation of the so-called "feathers" in the grain of mahogany, satin-wood, &c.: thinking other of our readers who have to do with woods may be interested in the subject, we offer the following explanation:—

In the structure of all woods used in building, there is, firstly, a series of vessels of woody tissue surrounding the heart of the tree, having a vertical growth, and arranged in annual concentric circles; secondly, there are certain hard woody growths, called the "medullary rays," radiating from the heart, and consequently more or less horizontal: these vertical and horizontal growths are intimately but regularly platted and inter-twined together, to give strength to the trunk, and thus far all is regularly. Now, where the branches burst through the stem, this regular arrangement is upset, and the above-mentioned woody vessels are disarranged, and pushed at different angles. When the tree is cut down and sawn horizontally across amongst these branches, these disrupted horizontal and vertical vessels (of different colours, be it remembered), are seen cut at every conceivable angle, and an ornamental "feather," more or less extensive, is the consequence. These feathers do not exist at the base of the tree, because there are no branches there to disturb the annual growths of the wood (minute feathers do indeed exist at the very heart, and these were caused by the growth of leaves and twigs when the tree was a seedling or little cutting). "Feathers" are not seen in deal because the fir is a straight-growing tree, without branches, in the portion of the trunk used in commerce. "Feathers" are seen most abundantly in "pollards," for the simple reason that after the top of the tree has been sawn off, an immense growth of branches is always induced disturbing the tissues in every imaginable way: the action of the light on the "feathers," adds greatly to their beauty after the wood is polished.

MILK.

A LARGE establishment has just been completed in the Moscow-road, Bayswater, for the Aylesbury Dairy Company, Limited, which deserves a passing notice, from some peculiar features in its arrangements and construction. The business of the company is the delivery of pure country milk day by day throughout the London districts; and when we say that already it supplies daily 1,400 families, entailing the necessity of making more than 20,000 visits per week, it is evident that some peculiar arrangements are required. The objects of the company speak for themselves. London milk has long been a proverb, and the mere fact of a responsible body of respectable men guaranteeing the character of the article delivered, and inviting any and every test of their sincerity, is of itself a great advance, in a commercial point of view.

The company was established about four years ago, on a small scale, deriving their supply at that time only from the district of Aylesbury; but since then they have extended their operations into Bucks, Berks, Wilts, and Oxfordshire, and are not dependent on any one particular line of railway for supply.

The establishment in Moscow-road is about 100 ft. wide by 130 ft. deep, and is occupied exclusively for the purposes of the company and their employees, all of whom, about forty in number, reside upon their premises. The early

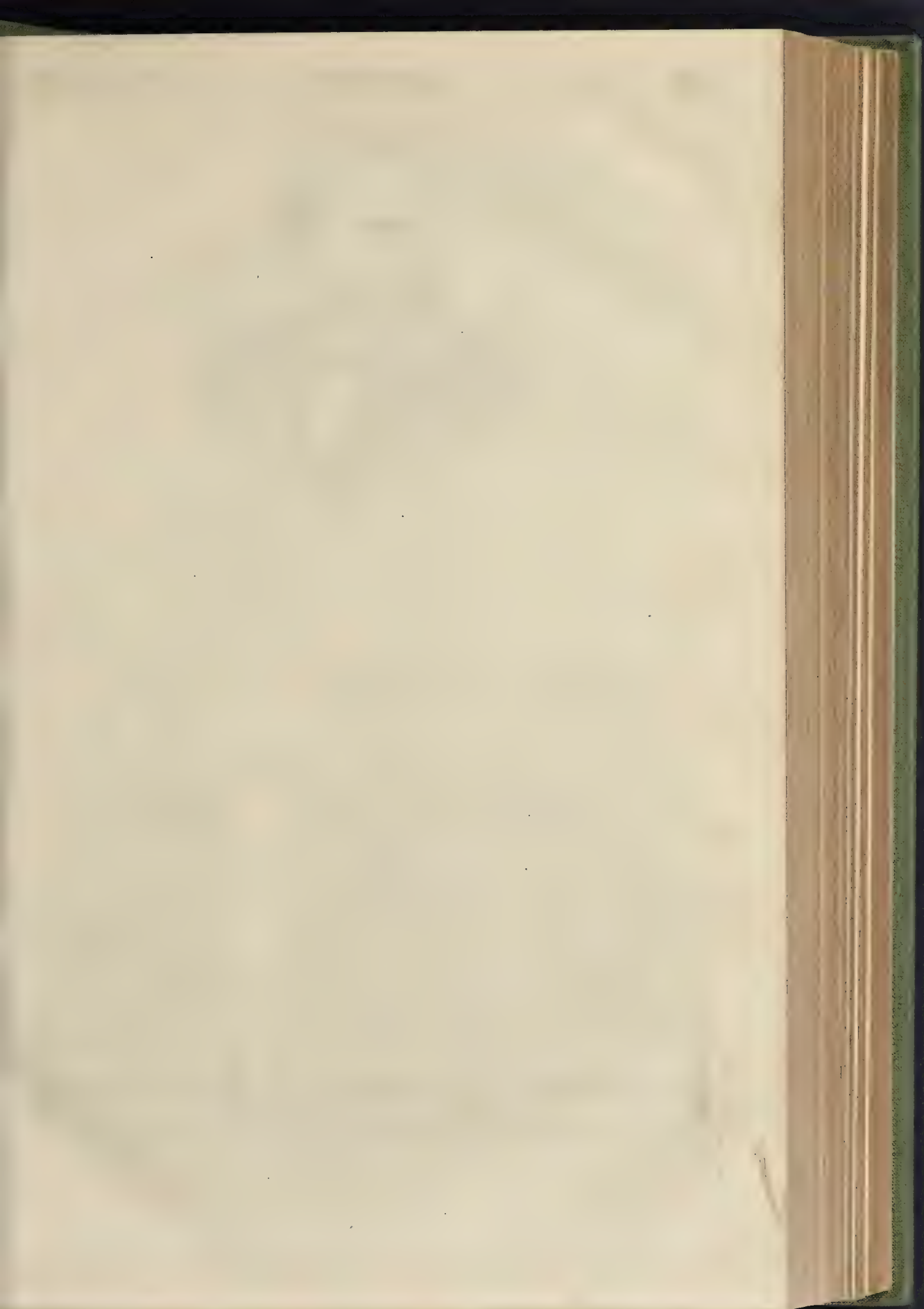
and late hours required (five in the morning, all the year round, up to twelve at night for the men attending the late trains), render this a *sine quâ non*.

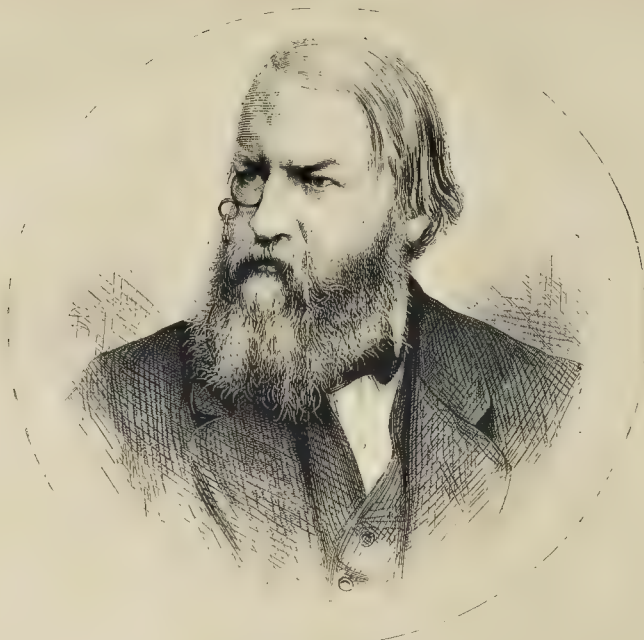
A large area, partly covered with glass, occupies the centre of the space, where the loading and unloading of the vans is carried on at a platform 100 ft. in length; and around this are disposed, in various floors, dwellings for the men, a house for the foreman, a residence for the secretary, accommodation for the clerks (in this case young ladies) residing on the premises, a very complete set of offices for the transaction of business, stabling for twenty horses, and accommodation for the vans, as they are called, but which are, in fact, light carts on two or four wheels, drawn by one fast-trotting horse, and more resembling a dog-cart than a van. The basement is arranged for the storage of the milk, and a very capital reading-room for the men forms part of the establishment, which has thus a curiously domestic character, though so extensive in its operations.

The buildings have cost more than 6,000l., and have been carried out from the designs of the late Mr. Williams, of Montague-street, Russell-square, by Mr. Conder, the contractor, under the supervision of Mr. G. Taylor, Mr. Williams's successor. Fireproof floors, both of Dennett's and Phillips's construction, are partially introduced. The building will be open for public inspection from the 19th to the 26th inst.

WORKMEN IN NEW YORK.

"THOMAS CONNOLLY, Stonemason," has addressed another letter to the *Daily Telegraph*, wherein he says:—The weather has been extremely fine and open here since I landed—much finer weather than I ever experienced in England at the same time of the year; yet most of the works have been stopped these two or three months past, and fully 30 per cent. of the working population are now unemployed, and will, in all probability, so remain until April or May. Still, in my opinion, they manage to get through the winter better than the unemployed in London, owing, in a great measure, to the bountiful resources of the country. The season just passed is considered to have been one of the best since the close of the war, especially for those engaged in the erection of buildings—which, by the way, they do in a different manner from that common in England. The brick fronts are all put up after the other walls of the house have been built, and are usually surmounted by a cornice made of zinc. The roofs are flat, covered with tin plates; and most of the stone fronts are merely a veneer 4 in. thick, tied into the brick-work with iron cramps. Labourers get from 1½ dol. to 2.75 dol. per day of ten hours; builders or wallers receive 5 dol. for ten hours; bricklayers, 5 dol. a day of ten hours; but the men who lay the front bricks, usually by the piece, earn as much as 7 dol. a day. Plasterers get 4½ dol. for eight hours, the number they work per day. Joiners have 3½ dol. to 4 dol. for ten hours; a great deal of the woodwork is done by machinery, and their principal task is to put it together and fix it. The carpenters' work, or framing, is done by Dutchmen—as all Germans are called here—at about 3 dol. a day. Painters get 4 dol. a day of ten hours in the summer, and 3½ dol. in winter. The stonemasons generally employed here are granite, from Maine; a chocolate-coloured sandstone from Connecticut and Jersey; a fine-grained drab-coloured sandstone, from Ohio and New Brunswick; and a basalt white marble, raised at Tuckahoe, about fifteen or twenty miles from New York. These stones cost about 1½ dol. a cubic foot. The stone-cutters, when employed by the day, receive 5 dol. for eight hours; but a great deal of their work is done by the piece, according to a book of prices agreed on by the employers and the men. If a man can earn his wages, or more, he is set to work by the day; if not, he has to work by the piece, and earn what he can. Owing to the high price of materials, builders dispense with stone as much as possible, and construct the fronts of warehouses and many other large buildings of cast-iron, at one-half the cost of stone. These iron fronts are well designed, in every style of architecture, and are painted to imitate white marble. I have invariably found, that when a trade assumes the character and dimensions of an industry, the men are not better paid than in England; in fact, sometimes less, when the purchasing power of the money is taken into account.





MR. A. J. BERESFORD HOPE, M.P.

First President of the Royal Institute of British Architects.



CARVED BENCH ENDS IN CHAPEL OF HATFIELD HOUSE, HERTFORDSHIRE.



CHURCH FOR NORWEGIAN SAILORS, ROTHERHITHE.—MESSRS. GILES & BIVEN, ARCHITECTS.

THE SCANDINAVIAN CHURCH,
ROTTERHAM.

So numerous are the Norwegian and Swedish seamen who come to the port of London, that it is proposed to build a church for them in Rotherhithe, and we have engraved the design for it that has been made, under the direction of a committee, by Messrs. Giles & Biven, architects, though, as we now understand, it may possibly be somewhat altered before the intention is carried out. In plan it is hexagonal: the accommodation is for 250 persons, and a small gallery could at any future time be added. There are two distinct reading-rooms adjoining, for the use of merchant seamen and captains; and these rooms, also, could at any time be thrown open by means of a movable screen, so as to increase the accommodation of the church. Two living-rooms are provided for the use of a resident official, in whose charge the whole establishment would be. The building is of a simple Gothic character; the material for the walls would be brick; the roofs covered with slate. The interior of the church is to be faced with marble. The apse of the chancel is semicircular, and lighted by small lancet windows.

The somewhat peculiar plan was necessitated by the shape of the ground; but as the committee have now obtained the grant of a larger piece of land, a change of plan to some extent is contemplated.

BENCH-ENDS IN THE CHAPEL, HATFIELD HOUSE.

The Marquis of Salisbury has just now made some alterations and additions in the private chapel of his mansion (Hatfield House, Herts). These alterations include an altar-rail, a reading-desk, a double-seated chair, a light rood-screen, and some bench-ends. All these fittings are executed in oak and teak, inlaid with ebony and other woods, and were designed by Messrs. Carpenter & Slater, architects. Mr. James Forsyth has executed the carving, under the direction of the architects, in an admirable manner. The delicacy and finish of the details of each design are remarkable. Of three of the bench-ends, which are very elaborate, we give representations.

The rood-screen is in the Elizabethan style, very light in construction. It is composed of fifteen arches, supported by slender shafts, enriched with carving. The caps are of teak, and highly wrought. The centre arch, which forms the entrance, is about double the width of the others.

THE SEWAGE QUESTION.

Leek.—The clean and good-looking little town of Leek promises to become, in vital statistics, a model town to the country. The sewerage works have been in existence nine years. The beneficial results have been great. The annual number of deaths in the decade ending in 1860 was 29 to the 1,000; during the last decade it was 24; and the average ages of the dead have risen from 24.8 to 32.5. Thus the average duration of life has been prolonged by nearly one-third. 492 persons are now alive in Leek, who, had the ratio of deaths in the first decade continued, would now have been dead. Those who died during the last decade lived, in the aggregate, 16,309 years longer than they would had the average age at death during the previous decade been continued. Had no sanitary improvements been made, many would have been widows and orphans whose husbands and parents are now living. There has been a corresponding decrease in sickness, the money savings of which, reckoning each case at five shillings a week for 50,752 weeks, amounts to 12,638*l*. Of the sickness prevented 16,917 weeks are saved to the workers between 15 and 55 years of age, being a saving of 6,343*l*. 17*s*. 6*d*., even though a man's wages were only 10*s*., and a woman's 5*s*. per week. The funeral expenses saved, at 5*s*. each, amounted to 2,460*l*. The direct money saving was 21,491*l*. 17*s*. 6*d*., not to speak of the unspeakable advantages of every kind from improved health and prolonged life. Thus the drainage of a town not only benefits the owners of property, it benefits the poor above all persons.

Brighton.—That there will be opposition to the Brighton Intercepting and Outfall Sewers Bill appears from three petitions lodged against it; one by the West Hove Improvement Commissioners, another by the Brunswick Square

and Terrace Commissioners, and a third by Vallance's Trustees. The first petitioners submit that they and the inhabitants of the said district will be most injuriously affected by the provisions of the Bill; urge various reasons against it; and insist that a better and more efficient and less costly scheme can be devised for draining the town of Brighton and the district of the Brunswick Square and Terrace Commissioners and of the petitioners.

Leicester.—A report by Mr. Baldwin Latham, C.E., on the proposed utilisation of the sewage of Leicester, is about to be placed before the public. The local *Advertiser* thus refers to some of the chief points in the report:—

"The first consideration is, how to get the refuse of our large town on to the adjacent lands. Happily, the physical features of the town and neighbourhood are admirably suited to this object, quite one-half the area of the sewerage portion of the town being at a level of, at least, 29 ft. above the lowest portions of the district. This favourable circumstance Mr. Latham would take advantage of by dividing the town into two areas—the high-level and the low-level; the former he would surround with an intercepting sewer of dimensions sufficient to carry away 1 in. of rainfall in twenty-four hours. For the low-level he proposes that the rainfall should be carried direct to the river; disconnecting the surface-water drains from the sewage; and he would convey the sewage from this district to the works in the Abbey Meadow, where, by an alteration of the machinery, he would pump it up to the moderate elevation of the outfall works of the proposed intercepting sewer, which will be quite sufficient to insure its distribution on the land at no remote distance from the town. By this means the working expenses of pumping the sewage to the land would be greatly reduced. Mr. Latham informs the town council that about 800 acres would be wanted. But the same authority states that there are 1,350 acres between Thurston and Sibley entirely commanded by gravitation from the higher level of the town; while between Leicester and Thurston there are 650 acres that would be reached by direct gravitation from the higher district, and by pumping the low-level sewage. There is land in proximity to the town, in sufficient quantity for double the present amount of sewage; and the means of getting it there pointed out. The expense Mr. Latham estimates at 23,000*l*., entailing an annual outlay of 6,312*l*. for working expenses, interest on capital borrowed, and annual instalments for repayment of capital. The receipts are estimated at 9,750*l*., thus leaving a very handsome annual profit. Should this prospect be realised, it would afford a wonderful contrast to our present system, whereby a loss is sustained of 1,200*l*. a year, while our river is polluted, and a great deal of annoyance suffered in many districts."

A dairy-farm is suggested in the report as an additional source of profit.

KITCHEN BOILER EXPLOSIONS.

THE explosion of kitchen and circulating boilers, in the north of England especially, is at length exciting attention.

At the last meeting of the executive committee of the Manchester Steam Users' Association, Mr. Thomas Schofield, in the chair, in the absence of the president, Sir W. Fairbairn; Mr. L. E. Fletcher, chief engineer, referred to the number of fatal household boiler explosions that have recently occurred. Owing to the number of lives which had been lost by such explosions during the recent frost, it was thought important to circulate at once some suggestions with regard to the cause of these disasters, with the hope of preventing their recurrence should the frost return. Under these circumstances the subject was only briefly touched on, the chief engineer hoping to treat it more fully, with the aid of illustrations, in his next ordinary monthly report.

The cause of kitchen or bath boiler explosions, he said, is very much misunderstood, and hence the constant recurrence of these disasters. They are wrongly ascribed to the introduction of a few drops of cold water into a red hot boiler. They are attributed to the thaw, whereas they are the result of the pipes being sealed by the frost. That the sudden introduction of cold water into a red hot boiler will not cause an instantaneous generation of pressure sufficient to produce an explosion was shown by repeated experiments, fully described in the chief engineer's report for January, 1867.

The boilers that explode on the occurrence of frost are on the circulating principle. They are connected by two pipes to an overhead cistern, the result of which is that on the application of a fire to the boiler, as soon as the water becomes heated it rises through one of these connecting-pipes, while the cold water, by its superior gravity, descends in the other, so that a constant circulation is kept up as long as the fire remains in action, while the boiler and pipes are full, the passages open, and there is any water left in the overhead cistern. As long as these pipes are open they form a natural safety-valve, and afford a pressure due to the height of the column of water; and no more; but as soon as the frost seals them up the pressure accumulates as long

as the fire burns, when explosion becomes merely a question of time. This is the simple cause of these disastrous explosions, and that being so, it is clear that all that is needed to prevent them is to adopt the very simple precaution of fixing to every circulating boiler a reliable safety-valve that will not be affected by the frost. The valve recommended was of the external pendulous dead-weight construction, and, having no lever, hinged joint, wings, or spindle, was not at all liable to derangement. These valves should be fixed in the front of the range, being brought out, if necessary, by means of a connecting-pipe, so as to be always in sight, and accessible. If it is once fairly recognised that the cause of these explosions is a gradual accumulation of pressure, added Mr. Fletcher, it will not be long before some suitable measures are contrived to meet it. To set a boiler in a kitchen alongside of a brisk fire, without a safety-valve, or something equivalent thereto, is very much like putting a cask of gunpowder into the oven to bake.

Since our last note of cases of kitchen-boiler explosion, one has occurred at Abbeydale, near Sheffield, and another in Derbyshire. In that at Abbeydale two men were killed while at breakfast; and in that at the Rectory, Long-lane, Derbyshire, one woman was killed, and two others were terribly injured.

A WORD ABOUT THE THAMES
EMBANKMENT.

Sir,—I believe the Thames Embankment will illustrate two proverbs: 1st. "Penny wise and pound foolish;" 2nd. "The ship will be spoiled for want of a pennorth of tar."

First, as to the footway. Can anything be more miserably insufficient? It might be the very finest promenade in London. It is about one-half the width it should be. It is of more importance to London as a recreation-ground than the opening of a new park in any situation would be. Think of the numbers of poor women and children who cannot go out of London, but who might on any fine day stroll upon the Embankment for an hour. Think of the crowds who, in summer time, go by steamer, and who would go in yet greater numbers, if the river were made as it might be made,—the most beautiful thoroughfare in London. Think of any public occasion, like Lord Mayor's Day, the arrival of the Belgians, a coronation, a great public funeral, the entry of any distinguished potentate, any public procession. Can it be contended for one moment that the present proposed width of roadway and footway would be sufficient for such a purpose?

The Thames Embankment, properly carried out, should be, for the poor women and children of Southwark and Lambeth, Seven-dials, Holborn, &c., what Hyde Park is for the upper classes. It should be, and will be, their Sunday promenade. The simple question is, shall it be a great public boon, giving health to these poor creatures who so much need it? or shall it be a great failure, as it will be, if built upon, as proposed? A huge piece near Westminster Bridge is already appropriated for private gardens, at a great sacrifice, as far as the public, and especially the poor, are concerned. B. J.

THE TRADES MOVEMENT.

THE movement for the reduction in the hours of labour in the metropolitan building trade, just set on foot by the carpenters, has been taken up by the other branches in the trade, and at a meeting of operatives—painters, bricklayers, masons, joiners, plasterers, &c.,—held at the Lord Palmerston Tavern, Chelsea, on Saturday evening last, a society was formed to promote the nine-hours movement, and the following resolution was adopted:—

"That an invitation be given to the various societies in the building trade to send delegates to the society for the purpose of co-operating with it, and making a united effort of both unionists and non-unionists to obtain the reduction of the hours of labour to nine per day, the present depressed state of trade affording a favourable opportunity for the attainment of that object."

This society is quite independent of the delegate meeting of the carpenters and joiners, exclusively, who have drawn up the following new code of working rules for that branch of the trade:—

"That the working time be fifty hours a week, namely, nine hours on the first five days, and five hours on Saturday; that the wages be 8*d*. per hour; that piecework be

abolished; and that all overtime be paid for at the rate of time and a half up to 10 p.m., and double after that hour. Three months' notice to be given for the alterations. All disputes to be settled by arbitration."

A case has come before the Poplar Board of Guardians which illustrates the working of the Shipwrights' Union in Poplar. Mr. Traill, a shipowner, having a vessel under repair, at Millwall, applied for some shipwrights to execute the work, but, though he offered 6s. 6d. per day, none would accept the engagement under 7s. It was then suggested that among those in receipt of relief from the guardians there might be some willing to take the work. Accordingly, the relieving officer of Poplar examined the list of outdoor paupers, and found two shipwrights who were in receipt of outdoor relief. He sent for them and acquainted them with the facts, and even accompanied them to the dock. But they declined the offer, saying that they would gladly work for 4s. or 5s. a day, but that the work now offered them was "old work," and, as they were members of the Shipwrights' Union, they could not work for less than 7s. a day. On the men coming before the Board of Guardians to ask for a renewal of their relief, strong indignation was manifested at their conduct.

LONDON CORN EXCHANGE COMPETITION.

We give a list of architects who were invited to compete for the Corn Exchange, and have consented to do so. Mr. Whichcord, it will be remembered, declined to compete, he saw so many difficulties in the way as to rights of lights. The drawings are to be sent in on the 31st of this month:—

Messrs. Taylor, Manchester; G. Scott, jun.; J. Peacock, Giles & Biren; B. Heekath; Salter & Wyatt; Cutburt Broderick; W. G. Caldwell; W. H. Crossland; H. Stook; Banks & Barry; H. Carr; R. C. Baxter; E. A. Gruning; H. Dawson; and G. Truesdell.

LAMP STANDARD FOR THE THAMES EMBANKMENT.

A LAMP-STANDARD has been set up at the landing-place between Hungerford and Waterloo Bridge. It was designed and modelled by Mr. T. Butler, sculptor, and is intended to supersede the ordinary lamp-post, by the combination of artistic composition with allegorical narrative.

The meaning intended to be conveyed by the boys mounting the shaft, the one handing up the torch to the other with which to light the globe above, is allusive to that energetic spirit which characterises the British nation; and the reward of which is signified by the abundance poured forth from the cornucopias. The device on one of the panels below, composed of the caduceus and trident, symbolises our marine ascendancy and commercial spirit. The other panel presents a bold oak wreath, within which is the date of the opening of the Embankment. The whole is intended to harmonise with the lions' heads, executed by the same artist, which already appear on the river front of the pedestals both on the north and south sides of the river.

The composition is better as seen from front or back than at the side. Should more of the standards be executed it would be desirable to reconsider this aspect of the design. We would observe also that it is somewhat too massive for a single lamp. It is better adapted to carry a group of lamps.

BUNHILL-FIELDS BURIAL GROUND.

A REPORT of the Bunhill-fields Committee of the Corporation just published shows that for the re-erection of the wall of the ground near the City-road, and for the provision of new gates and railings at an expense not exceeding 1,000*l.*, the tender of Messrs. Browne & Robinson was accepted, and the work had been completed in a satisfactory manner, and within the sum provided. They also gave directions for the construction of a number of paths, so planned as but slightly to interfere with the position of grave-stones, and yet leading to or near the tombs of principal interest. Adjoining the paths they have caused to be planted at intervals on either side an additional number of plants and other trees, exceeding 600 in all. Some of the head and foot stones were in a dangerous condition, and others had sunk into the ground so as to be almost lost

to view. These they directed should, where necessary, be raised and set in upright positions, and upwards of 450 stones have been so dealt with. The inscriptions of certain of the tombs have also been removed, and in some instances the tombs have been bricked up and repaired, where such a course appeared to be imperatively requisite. A plan of the ground and a record of every name and inscription have been made by Mr. George Rogers under their direction, and are to be kept in the Guildhall for public inspection. The total expense connected with the proceedings of the committee is 3,199*l.* 18*s.* 11*d.* Annexed to the report are copies of the inscriptions on five pillars erected on the ground, by which it would appear that it was inclosed in 1665 during the mayoralty of Sir John Lawrence; that in 1852 more than 120,000 bodies had been interred therein, and that it was opened on the 14th of October, 1869, by Sir James Lawrence, M.P. Other pillars furnish the names of the most eminent persons buried there, including John Bunyan, Daniel Defoe, Dr. Isaac Watts, Thomas Fowell Buxton, John Horne Tooke, General Fleetwood, Henry, Richard, and William Cromwell, Thomas Stothard, R.A., Lady Ann Erskine, Susannah Wesley, Thankful Owen, Dr. Thomas Goodwin, and others. Early readers of the *Builder* will remember how often we brought forward the claims of this burial-ground for careful preservation.

THE INCIDENTS OF RATING.

Sir,—Since the subject of rating is receiving special attention this session, it may not be out of place to consider recent legislation on the subject.

First, as to "The Valuation (Metropolis) Act, 1869." I fear the schedule of maximum deductions will lead to considerable unfairness. Take the following example:—"A" occupies buildings which would come under Class 5, and from their condition would require the maximum deduction of one-sixth; "B" occupies the adjoining paddock, rightly included in Class 7, and fairly, entitled to an allowance of one-twentieth.

	Gross value.	Rateable.
Say "A"	£50	£50 0
Say "B"	10	9 10
	£70	£59 10

Now, assume that subsequently X becomes the occupier of both these properties, they would then come under Class 6, and be entitled to a deduction of one-tenth only—viz., 7*l.*, instead of 10*l.* as before, showing a loss to X by way of deduction equal to 33 per cent.

Secondly, as to "The Poor Rates Assessment and Collection Act, 1869." The power to distrain on the occupier's goods would appear to be entirely nugatory, as, if he chose to decline to pay without a distress, he could evade doing so altogether by taking care to hand to his landlord the rent before it was actually due. Provision that, after receiving the "demand in writing" from the overseers for the rate, he should be obliged to pay all future accruing rent to them until the rate was liquidated, would, I think, have rendered the provision effective; and if the occupier declined to do this, then to distrain on his goods would not be unfair. WM. EVE.

THE TRAMWAY BILL.

THE Board of Trade's Bill to facilitate the construction of tramways, and to regulate their working, has been issued. It provides that certificates authorising the construction of tramways may be obtained by the local authority with the consent of the rate-payers in such district; or by any person, persons, corporation, or company with the consent of the local authorities of such district. The promoters may sell or assign their right, but within two years or less must complete the tramway, and open it for public traffic. Every tramway shall be constructed of such width as may be prescribed, and shall be laid and maintained in such manner that the uppermost surface of the rail shall be on a level with the surface of the road. The promoters may open and break up any road, subject to regulations, and must reinstate the road and pay expenses of repair for six months. The promoters are at all times to keep in repair that part of the road where the tramway is laid. There are provisions as to the pipes of gas and water companies, and for the protection of sewers. The general pro-

visions of the Bill give power to the promoters of tramways and their lessees to use on their tramways carriages with flange wheels, or wheels specially adapted to run on a grooved rail; and the promoters and their lessees shall have the exclusive use of their tramways for carriages with flange wheels, or other wheels specially adapted to run on a grooved rail. All carriages used on any tramway shall be moved by animal power only. Licences to use the tramway may in certain events be granted to third parties by the Board of Trade. There are also powers with respect to the future purchase of undertakings by local authorities, and for the removal of tramways.

MEDALS AND PRIZES OF THE INSTITUTE OF ARCHITECTS.

THE Council have recommended,—

That the Soane Medal (with the sum of 50*l.* under certain conditions) be awarded to the author of the drawing distinguished by the device of "A *Comma within a Circle*."

That the Institute Silver Medal, with 5*l.* 5*s.*, be awarded to the author of the drawings distinguished by the motto of "St. Lawrence."

That in the same competition, a Medal of Merit be awarded to the author of the drawings distinguished by the device of a "Square and Compass within a Panel." That the Institute Silver Medal be awarded to the author of the essay distinguished by the motto "Light, Utility, and Progress."

That the Students' Prize in Books be awarded to the author of the drawings distinguished by the motto of "Truth."

These recommendations will be considered and determined at a special meeting on Monday evening next.

THE ARCHITECT AT THE HOUSES OF PARLIAMENT.

We are sorry to learn that the First Commissioner of Her Majesty's Works has again called on Mr. E. M. Barry to deliver up the plans and drawings of the Palace at Westminster, and to forward all the contracts or correspondence constituting contracts, which at present remain unexecuted. Mr. Barry, in the interest of the profession, will doubtless hesitate before he complies with the first part of these requirements, and will have, in turn, to look to the profession for such an expression of opinion on the subject as may strengthen him in any endeavour he may think it right to make to support its rights.

ARCHITECTS' COMPETITION IN 1769.

A SUBSCRIBER writes,—At page 781 of your volume for 1869, in the article relating to a list of architects who sent in designs for building the Royal Exchange, Dublin, in 1769, I do not observe that "C. O. H." makes any mention of William Newton, No. 54. Was he not probably the William Newton who made the translation of "Vitruvius," in 2 vols. folio, in 1791? If he were a young man in 1769, he would be only of fair age on the completion of his translation twenty-two years after.

I name this, as you invite "waifs and strays" of information about the architects in his list.

FOREIGN WORK.

Sir,—We have at the present time large buildings being erected where a very large portion of the woodwork is imported from far up the Baltic Sea, and it is reported that it is anything but what it ought to be in its construction; and that for England's benefit. Such, in my opinion, is a great fallacy, neither do I believe it can be borne out by facts. We may ask who has the chargeability of the poor? I say English industry, by its great taxation. Then I say English labour has a right to be heard, and receive fair consideration at the hands of the Government. I would ask is not our architects' future affected in this question of foreign competition in our home markets? I believe it is. The architects of the future are to hold a position in the future, as in the past, where architectural beauty and soundness of construction have added so much to their fame, then I ask them, with all due respect, is it their credit to allow the case of luxury to be used in the construction of our large public buildings, where seasoned materials and sound workmanship are a matter of the greatest importance both to their own standing as a profession, and to the English public, who have to pay an enormous tax to feed and shelter its unemployed? Is it England's policy to purchase cheap foreign rubbish in the present condition of labour? Ask the mechanics, or the shopkeepers, and the answer will be, No. Those who pay the musicians should have the right to dance.

One word to your correspondents "T. L. D." and "Senex," who think it justifiable for the building trades to assist their present condition, and to make labour more abundant by agreeing to a reduction of wages. With such a policy of political economy I cannot agree. Will the officials of our military and naval departments agree to have their salaries reduced? Will doctors and lawyers agree to work for less? If so, no doubt the building trades will equally agree. Dr. Adam Smith says that the

respectability and fame derived in some professions make up a large portion of reward, both of education and skill; but the skillful operative receives no special mark, and according to the economist must submit to the great fluctuations, as they present themselves. This is, no doubt, the principal cause of the existence of trade societies,—the concentration of labour, for the purpose of appraising it at its fair value, in consideration of a whole trade. The profits of employers are little known among building workmen, and I presume they would think them rather iniquitous by asking to be allowed to look at their books in reference thereto. A JOINER.

TOWN HALLS.

Scarborough.—At the last quarterly meeting of the Council, a report was read respecting the Old Town-hall property. Three estimates had been prepared by Messrs. Stewart, architects. The first amounted to 790*l.*, and proposed to convert the lower part of the building into two shops, and to effect other alterations; the second (1,075*l.*) provided for the rebuilding of the front with stone; and the third (2,300*l.*) was for a new building, containing two shops, large hall, &c. The rebuilding of the hall was finally resolved on.

Widksworth.—The Town-hall and Market-house scheme is progressing favourably. From the prospectus issued by the company little doubt is felt but that the movement which the inhabitants have so long contemplated will now be carried out. The names of the committee include most of the gentlemen of influence in the town and neighbourhood. The prospectus states that "although the nominal capital of the company is fixed at 5,000*l.*, it is not anticipated that more than 4,000*l.* will be required to carry out the proposed objects." Of this sum more than 3,000*l.* have already been subscribed. A site has been purchased for 1,500*l.*

Epsom.—A meeting has been held at Crandon's King's Head Hotel, to take into consideration the desirability of erecting a new Market-house and Town-hall between the Clock Tower and Clay-hill, on the space of ground which the old town pond formerly occupied. The meeting was preliminary to a public one that will in a short time be called. Mr. Treherne, surveyor to the board of health, had made a drawing which explained the style of erection contemplated. Several suggestions were made and questions asked as to probable cost, how to be defrayed, &c., all agreeing on one point, that it would be most desirable and beneficial to the trade and interests of Epsom if carried out. It was suggested, subsequently, that the site selected could be improved upon by purchasing Albion-terrace, commonly called Coffee House-walk, and erecting it there instead of filling up the open space which gives a healthy appearance to the town. The estimated cost near the Clock Tower would be about 8,000*l.*

Cuckfield.—A correspondent of a local paper says:—"I understand it is intended to build a Town-hall on an eligible site, for the accommodation of the Petty Sessions, County Court, and other public business, and I hope it may be made suitable for lectures, concerts, penny readings, balls, &c. This would render our town more lively during the dull winter months, and be a permanent benefit to us also. Should this be carried out, I would suggest whether it would not be worth the serious consideration of the promoters to make an attempt to restore our 'Lost Market.' I can see no great difficulty in the matter, provided a suitable building be erected, which might be done economically by making the hall two stories; the upper one for Petty Sessions, County Court, &c., and the lower one for the market."

CHURCH-BUILDING NEWS.

Bolbroughton.—A meeting has been held in furtherance of a proposal for rebuilding the parish church. It appears that several professional men,—architects and others,—have pronounced the roof unsafe, owing to the destruction, some time since, of one of the pillars which support it. The south wall has bulged out considerably; the north wall is more out of perpendicular than the south; and these two outer walls have mainly been kept from falling by means of an iron rod which crosses the church, and braces them together. Half the church and more is overhung by a huge gallery, greatly interfering with the sight and hearing of those placed under it; and the whole is filled with high-backed pews. It is considered necessary to rebuild the whole of the nave and south aisle, with the exception of the two remaining arches and a small portion of the south wall, and it is proposed to add a north aisle. The tower

also requires various repairs and restorations, from mutilations it has undergone. The sum required for these objects is 2,000*l.*, at least. A subscription was opened a few months ago in aid of the scheme, and a sum of about 1,000*l.* has been promised. At the meeting a committee of management was appointed, and other steps were taken.

Carlisle.—The foundation stone of the new church of St. Paul has been laid. The new edifice will be bounded by Spencer-street on the east, Lonsdale-street on the north, and by two other new roads on the west and south sides respectively. The building will be erected of the Newbiggen red stone, and with high-pitched roofs, covered with green slates, and will be in the Early Gothic style, having windows with different patterns of geometrical tracery. Within the church will consist of a nave nearly 30 ft. wide, and 73 ft. 3 in. long, divided from north and south side aisles by five Gothic arches of alternate red and white stone on each side, supported by circular columns. Height will be given to the nave by a clearstory above the arches, containing a series of circular windows and tracery. The chancel and vestries will be at the east end as usual, and the former will be 20 ft. 10 in. deep, and the arch dividing it from the nave will be of the entire width. The whole of the roof will be of open timber work, and the seats will be open benches. The west front, which will look towards Lowther-street, and be visible from it, will have a large Gothic window, filled in with tracery. Two entrances are provided to the church, in addition to a third from the vestry, one being under the tower, and the other at the west end, under the large west window. It is hoped that funds will shortly be forthcoming for the erection of the tower and spire. These are designed to occupy the north-east angle of the church, and a portion of the foundations has already been provided for. When completed the spire will have an altitude of 120 ft. to the top of the vane. The tower will have angle buttresses and four pinnacles above, which will be the belfry windows in an octagonal story, and above which will rise the spire, having high open pinnacles over the spire lights in addition to the larger ones below. The church will accommodate rather more than 600 persons, and has been designed by Messrs. E. Habershon & Brook, of London, architects, and is in course of construction by Messrs. C. & J. Armstrong, of Carlisle, builders, whose tender for the execution of the works was recently accepted after a competition. It amounts to 2,930*l.* 5*s.*, being a little less than the architects' estimate. The walls are several feet high.

Silloth (Carlisle).—At a meeting in Silloth, in support of the cost of the new church there, the honorary secretary stated that he had 2,458*l.* provided or in hand. They were now, however, about 35*l.* short of the first contract of 2,493*l.* But beyond the contract there were several necessary expenses, as commission, salary, lighting, heating, and granite (previously provided). The cost of these would amount to 400*l.* or 450*l.* There would, therefore, still be some 500*l.* to raise (exclusive of the cost of the tower, estimated at 1,000*l.*). The church was rapidly advancing.

Upper Easton (Bristol).—The new church of St. Gabriel, Upper Easton, is about to be consecrated. The edifice is situated near Messrs. Leonard & Boul's collieries, and is said to be the first brick church that has been built in this neighbourhood. It consists of a nave, north and south transepts, chancel, and side chapels forming vestry and organ chambers. The tower is placed on the south side of the chancel, and the ground floor is set apart for the organ, when one has been procured. Stone has been used as little as possible, the intention of the architect, Mr. J. Neale, of Bristol, having been to produce as much effect as possible by means of colour and arrangement of plan, rather than of expensive labour in the shape of mouldings, stonework, &c. The reredos consists of three arches, resting on shafts of Mansfield stone, and the creed, commandments, and the Lord's prayer have been written on a gold ground in the panel. The pulpit and font are of stone. At the west end of the building is a gallery, approached by a separate entrance. It is intended for the use of the school, and will accommodate about 100. Altogether, including this gallery, the building will accommodate about 700 persons. The entire cost will amount to about 3,000*l.*, and of this sum upwards of 2,700*l.* have been obtained.

Nomanswood.—The ancient church of this parish having undergone a restoration, has been

re-opened for divine worship. The walls have been restored, and the roof renewed. The east window has been filled with stained glass, the three lights being to the memory of the late incumbent, his wife, and his son respectively. The altar floor has been paved with Minton's tiles, and that of the other part of the building with uniform red tiles edged with black. The old high square pews have been superseded by open benches of deal, stained and varnished; and an altar-table, pulpit, and reading-desk, of similar material, have been erected. The cost of the work is about 1,100*l.*

Broughton Pagns.—The church of this parish (a very ancient one, dating, it is supposed, so far back as the tenth century) has lately undergone considerable repairs and alterations. It has been re-seated with stained deal benches. Two stained glass windows, manufactured by Messrs. Heaton, Butler, & Bayne, of Covent-garden, have been placed in the east end, one at the left hand, representing the "Fall," with the words, "As in Adam all die;" the other at the right hand, the Marys at the empty sepulchre, with the words, "In Christ shall all be made alive." We are informed that the windows have been inserted by surviving members of the Goodenough family, in memory of their ancestors who have lived and died in the parish. The last addition to the church is a small organ, of four stops, built by Messrs. Bryceson, Brothers, of London. The cost of the organ was 50*l.*

FROM SCOTLAND.

Edinburgh.—It is in contemplation to have a rotary steam-engine in Edinburgh for street-cleaning and other purposes. The gearing and machinery are to be very light, moving upon one directing and two supporting wheels. The city being built up a long ridge, having a continuous incline from Holyrood to the castle, the draught for horses in the "falzie" wagons is frequently at present too heavy.—The Edinburgh engravers on wood recently met for the purpose of forming a society for the advancement of their art. The profession was largely represented, and it was unanimously agreed that such an association should be formed. A code of laws was drawn up, and office-bearers for the present year chosen. These were—Mr. J. M. Corner, president; Mr. R. Paterson, vice-president; Mr. T. Robertson, secretary; and Mr. G. Morrison, treasurer.

Glasgow.—It is proposed to erect a Masonic hall in Glasgow at a cost of about 15,000*l.*—At a recent meeting of the Glasgow Philosophical Society, Dr. Gairdner delivered an address "On Defects of House Construction in Glasgow as a Cause of Mortality." He reviewed the evils arising from overcrowding, which has been repeatedly adduced as one of the most prominent causes of the lamentably high death-rate in Glasgow.

"The first consequence," as he remarked, "was enormous liability to epidemic disease, and not only to epidemic disease but to consumptive disease and various diseases of the lungs; and, further, an enormous rate of mortality in young children in particular—partly of course from epidemic disease—but partly also from the great number of other diseases, nervous diseases, convulsions, hydrocephalus, and tubercular diseases of the abdomen, and various other kinds of diseases which were known to be very destructive to infantile life. That he regarded as the primary and most obvious consequence. The second consequence was that, living in this state of habitual overcrowding, the sense of decency was injured inevitably, and ultimately it was lost utterly. The third consequence was, that almost inevitably a craving for alcoholic stimulants was generated, due to the want of all those natural stimulants which went with us all to make up the idea of domestic comfort. . . . The fourth consequence of this state of overcrowding in badly-constructed houses was a great degree of moral degradation and of religious apathy."

The lecturer then prescribed the remedy, and pointed out the essentials in house-construction necessary for the preservation of health and morality. These included, chiefly, adequate space in sleeping apartments, the proper separation of the sexes, judicious ventilating arrangements, facilities for cleanliness, and such like.

Kirkcaldy.—At Mr. Douglas's works at Dunkirk Foundry, a steam-roller, specially designed for consolidating the road metal upon a number of great highways now in course of construction in the East Indies, has been made. We should like to hear oftener than we do of the construction of such rollers for our British roads as well. The machine comprises a 12-horse power engine.

Wick.—A terrible storm has raged at Wick. The wind threw up prodigious waves, which demolished a large portion of the new harbour works, and entirely destroyed the staging. The gale blew with terrific violence. The sea struck

in prodigious mountains against the new harbour; rose again several hundred feet above it, and then came across the bay, like a huge bank of fog. The harbour was thus entirely hidden.

Blackford.—Some time ago a number of the influential inhabitants of this village set themselves to bring in a supply of water, and after considerable exertions they have at length been successful. A reservoir was made in a field on the farm of Kimpunch, about a mile from the village, where there was a good and plentiful supply of spring water. Pipes were laid, and public wells erected along the sides of the streets. The inauguration of the supply has just taken place.

Glasgow.—Public attention has of late been called to the excessive mortality now prevailing in Glasgow; and although the exact cause is not quite known, it is held to be to a considerable extent consequent upon the operations of the Union Railway Company and the City Improvement Commissioners who are engaged in demolishing some of the more densely-populated districts, without providing at present adequate accommodation for the persons evicted. The necessity for a scheme to provide additional accommodation for the poorer classes by the erection of houses on the English model-dwelling plan, has engaged the attention of several influential gentlemen in Glasgow. In August last a meeting was held for this purpose, and Mr. Thomas Corbett, of London, guaranteed a contribution of 2,000*l.*, with the further offer, if the proposal should be favourably received, of a large additional sum. Bailie James Watson also agreed to hand over 1,000*l.*, Bailie Salmon 1,000*l.*, and Mr. John McGavin 1,000*l.* It was calculated that about 30,000*l.* would be necessary to give the scheme a fair trial, but up to this time no action has been taken. Mr. Corbett, however, a short time since communicated with Mr. Hugh Barclay, architect, requesting that he would arrange for the erection of four self-contained cottages in the neighbourhood of the city. Suitable ground was obtained at Whiteinch, and the erection of the cottages is now far advanced. These cottages consist of a ground floor, having a large kitchen, with scullery, a bed-room or sitting-room, and a water-closet; and in the attic two good bed-rooms.—In all four rooms. The cottages cost each about 150*l.*, with a ground-rent of 1*l.* 10*s.*, and the yearly rent will be about 10*l.* There have been already between seventy and eighty applicants for them. Mr. Corbett intends to put up other thirty similar cottages, but the site for them has not yet been fixed upon.

Books Received.

Collection of Epitaphs from the Ancient Church and Burial Grounds of St. Pancras, Middlesex. By FREDERICK TEAGUE CANISICK, London: J. Russell Smith.

We have delayed noticing Mr. Canisick's little book with the intention of supplementing it with some notes in our hands of the old church of St. Pancras. Pressure of other matter, however, has prevented this. Let us briefly say, then, that the author, seeing the destructive operations that were going on in the burial-ground of his native parish, has devoted many of his spare hours to recording the principal inscriptions to be found there, and in the church of St. John the Baptist, Kentish-town. It was a worthy work, and seems to have been performed with conscientious care. The success of the book, we are glad to hear, has so far exceeded the author's expectations, that he intends to proceed at once with the next volume, which will contain ancient and modern epitaphs from the six following cemeteries in St. Pancras:—Highgate, St. George's (Bloombury), St. George the Martyr's, St. Andrew's, St. Giles's, St. Martin's, St. Aloysius's Chapel, Foundling Chapel, and New St. Pancras Church.

Mr. Canisick seeks to become the Old Mortality of Middlesex, and we shall rejoice if he find imitators in other counties. Many of the epitaphs in his St. Pancras volume have an historic value.

In speaking of the epitaph on the tomb of William Woollett, the engraver, he mentions that the following lines, now defaced, were written on the tomb in pencil,—

"Here Woollett rests, expecting to be saved;
He graved well, but is not well engraved."

and thinks it not improbable that these led to the monument to Woollett erected by subscription in the cloisters of Westminster Abbey.

VARIORUM.

We have before us several works on Domestic Architecture, which will receive due attention before long. Meanwhile we mention the titles of two of them:—"English Country Houses: Forty-five Views and Plans of recently-erected Mansions, Private Residences, Parsonage-houses, Farmhouses, Lodges, and Cottages; with a Practical Treatise on House-Building." By William Wilkinson, Architect, Oxford (Jas. Parker & Co.); and "Picturesque Designs for Mansions, Villas, and Lodges, with Decorations, internal and external, suitable to each Style. Illustrated by about Five Hundred original Engravings." By C. J. Richardson, Architect, author of "Old English Mansions," &c. (Atchley & Co.).—The first part has been issued of "Picturesque Architectural Studies," by William Young, architect, author of "Picturesque Examples of Old English Churches." It will be fair to wait the appearance of another part or two before expressing an opinion of the work.—Messrs. Chapman & Hall have issued a fine work, "The Arts of the Middle Ages and of the Period of the Renaissance," by Paul Lacroix, an account of which we shall, of course, give our readers. The illustrations are profuse, and include nineteen chromolithographs.—The eighth edition has been published of "Every Man his Own Lawyer" (Lockwood & Co.). This is a handy book of the principles of Law and Equity, comprising the rights and wrongs of individuals. The author has sought—

"to point out to those who consult it how to seek and obtain redress for every injury and wrong; how to substantiate their rights; how to buy or sell an estate, a house, a ship, a horse, or any other thing; how to enter into contracts of all kinds, and with all persons; how to hire and let farms, houses, lands, and tenements; how to enter into agreements; how to take and give warranties, guarantees, notices, &c.; and to perform, in a legal manner, all such every-day transactions. And although it is not always, nor in every transaction, that the services of a solicitor can be dispensed with, still it is believed that many a six-and-eightpence may be saved, many a wrong redressed, many a right reclaimed, many an evil avoided, many a lawsuit avoided, and many an individual saved from heavy expenses, and, in some instances, from ruin and misery, by a careful consultation at home with the pages of this treatise."

—The *Photographic Art-Journal*, illustrated with photographs printed in permanent pigments (S. Low, Son, & Marston), has a good intention, and may be made an interesting, perhaps valuable, serial; but why, in the name of common sense, not to say honesty, take the name that belongs to another? The *Art-Journal* has made a position, and so others seek to trade on its name. This is always going on: "Punch is a success, so we will start a similar paper, and call it *Punch-and-Judy*." The eminent publishers of the *Photographic Art-Journal* could scarcely have given this point a thought.—The current *Fraser* contains Professor Tyndall's discourse on Dust and Disease, to which we have before made reference. Under the heading Reciprocal Duties of State and Subject, the editor, Mr. Froude tells some weighty truths which demand consideration.—"Debreit's House of Commons and the Judicial Bench, 1870," just now published, contains 1,000 armorial bearings. Most of the information has been furnished by members themselves, and the editor groans over the illegible manner in which much of it was supplied. He says,—"Indeed, in several instances where the proofs were altered, the corrections could not be deciphered by the most able expert." The illegible writing in which many persons indulge at the present day is an insolence that ought to be protested against on every possible occasion. There are secretaries of public companies who sign their names so that it is quite impossible for any person unacquainted with the signature to read it; and they do this persistently, and with the knowledge that it is unreadable. If we had the power of influencing their directors, they should at once be discharged from their office as being obviously unfit for it. Every man who writes at all can write his name so that it may be read, if he please, and it is an insolent waste of other people's time and attention when he does otherwise.

Miscellaneous.

Wire-Rope Tramways.—It appears that the method of transport by wire-ropes which was tried on an experimental line near Leicester last year has made considerable progress since that time. Thirteen lines, varying from short distances to four miles in length, have been constructed, and upwards of 100 miles are in course of preparation or under contract.

Royal Literary Fund.—The annual general meeting of the members of this corporation was held on Wednesday, Earl Stanhope, the president, in the chair. The treasurer's report, read by Mr. W. H. Harrison, showed that the permanent fund, which at the commencement of last year consisted of 27,000*l.* Consols, has produced in dividends the sum of 810*l.* During the year a legacy of 3,000*l.* bequeathed to the institution by Mr. Thomas Brown, has been received and invested. The permanent fund, therefore, now amounts to 30,238*l.* 17*s.* 8*d.*, producing an annual dividend of 907*l.* 3*s.* 2*d.* The stock of the Newton property consists of 8,167*l.* 15*s.* 10*d.* in the 3 per Cent. Reduced, producing an annual dividend of 245*l.* 0*s.* 8*d.* The Newton estate, at Whitechapel, has produced in rents, during the year, the sum of 285*l.* The president, in moving a vote of thanks to the honorary registrars, treasurers, and auditors, said in regard to the augmentation of their funds, a great deal depended upon the result of their anniversary dinners, and upon a judicious choice of a chairman. The chairman had always been chosen without reference to party politics, and had sometimes been represented by members of the Church, the Law, and the State, the especial object of the council being to take care that the responsible post should be filled by a nobleman or gentleman of undoubted merit and popularity. He thought they had been successful in selecting for the next anniversary one who realised the picture he had drawn,—he alluded to Lord Dufferin. Mr. Godwin took occasion to allude to the extraordinary largeness of the grants which had been made in the past year. In the year 1868 there were thirty-nine cases relieved, and the total amount was 1,350*l.*; in the year 1869 there were fifty-seven cases relieved, and the total amount was 2,255*l.*, which was the largest sum they had ever distributed in the same space of time. A cordial vote of thanks was then passed to Mr. Octavian Blewitt, the secretary.

Women's Club and Institute.—On Wednesday evening the first annual meeting of the members and friends of this institution was held in the drawing-room of the club, Newman-street, Oxford-street, under the chairmanship of Mr. Hodgson Pratt, who delivered a stirring introductory address, pointing out that the society was likely to be the precursor of many others, not only in London, but in the large towns of the provinces. He hoped to see engrained on them funds to assist women during temporary sickness, or while anxious to help them into businesses adapted to their taste and abilities. Such undertakings as this had a strong claim to the sympathy and active support of the affluent, and he recommended that prizes should be established as an inducement for women to write papers illustrative of the mental and material capacities of their sex, and the best mode of developing them. The report, which was unanimously adopted on the motion of Mrs. M. Bore, stated that the club was opened on the 15th Feb. 1869. During the subsequent twelve months 260 members joined, and the number is gradually on the increase. Of the total number, 137 are known to be engaged in maintaining themselves in various branches of business, some as artists, teachers, &c., but the occupation of the remainder is unknown, though some are ladies of private means, who visit the club occasionally to render valuable assistance by recommending to employment, or doing friendly services in some other way.

Stamps on Building Leases.—In the House of Commons, the Chancellor of the Exchequer, in bringing in the Bill on this subject, said that having considered what had been urged in relation to this matter, he thought it would not be just to insist on the limit of the indemnity he at first proposed. He therefore now only made it a measure applicable to the future, and should insert a clause by which stamps on building leases would be 10*s.* instead of 3*s.* Leave was then given to bring in the Bill.

Government and Science.—Replying to Mr. Samelson, in the House of Commons, Mr. W. E. Forster announced that Earl de Grey intended to advise her Majesty to issue a Commission to inquire into the aid given to schools of science, and to consider whether such aid could be given with better advantage. The question of the amalgamation of the Jernyn-street and Oxford-street schools with the new School of Science at South Kensington would come within the scope of the inquiry.

Thames Mud, and what London Butter is made of.—Dr. Muter, the analytical chemist, has been analysing our London butter, and he finds that some of it, at least, is not made of that "nasty scum" which occasionally floats on London milk after it has stood for two or three hours; and this is, no doubt, so far, satisfactory to Londoners, if not to others. Much of it, on the contrary, now appears to be made of a pure, rich, and buttery grease, which is extracted from Thames mud! A sample of this useful article has been examined. It was derived from the mud at Battersea, and is of a yellowish tint, "very like" butter in appearance, taste, and smell; and what more can a Londoner require, if it be nutritious, as it no doubt is? Of course, the nature of it and the method of obtaining it are chemists' secrets. Mud in itself, as consisting of particles of inorganic matter, such as flint, granite, sand, clay, or wood, reduced by attrition, and mixed with water, can yield nothing of a nutritious character, as the *South London Press*, in announcing the discovery, remarks on please to observe that there are exceptions to every rule; and the clay upon which certain savages feed must be an exception here; as also the wood out of which, some years ago, it was proposed to make bread for starving families. The silicates of potash and soda, or oil of flint, are greasy, and when in solution have a gelatinous appearance; but this is not quite what we get from the rich and valuable mud of the Thames. Peat is a more likely source, as it yields paraffine, and also stearine, and analogous bodies; but it is still more likely that the mud of the Thames is impregnated with real fatty matter, the refuse of manufactories, of ships, and derived from dead dogs, human bodies, and various other sources. One thing is certain, and seems, the manufacture of this grease from Thames mud has been going on for a long time, and quantities of it are shipped weekly to Holland, where much of our "fine dainty butter" is "manufactured," in more senses than the agricultural one.

Concrete Buildings, Wales.—A correspondent says:—"It is worth while to visit the farmstead of Dolmalnny, in the parish of Tregynon, to inspect the farm buildings erected thereon by the Hon. H. Hanbury Tracy. When you enter the farmyard, you come to a range of cow buildings built of 12-in. concrete, the roof of which is made of concrete slabs, 31 in. thick, the rafters T form, 12 ft. long, without any tie-beam. The ground on which the building is erected being very unlevel, the interior is all arched, so that the cow-house and calves' stand on arches underneath, which are intended for young cattle. The Bing core, *Bussy*, and stalls are all concrete; in fact, the cows are tied to a concrete wall, the floors being all of the same material. The next building which will meet your attention is a stable for five horses erected of, and covered with, concrete. This building is on arches; the space underneath is intended for roots, &c. The manger is made of concrete, which, under the new system of feeding horses with damped provender is much preferable to wood. In the same range as the stable are the barn, the cartsheds with granary over, which are all of concrete, even to the barn floor and the division of the 'bay.' The cart-houses are arched, and the granary floor is of concrete, so that it is impossible for rats and mice, which are the pests of such places, to enter."

Lectures, Working Men's College.—The programme for the current term shows that the following lectures, free to all members of the College and Adult School, will be delivered:—Saturday, March 12, "Sir John Falstaff," by the Rev. L. D. Swan, LL.B.; March 19 and 26, April 2 and 9, "Crystals," by Mr. N. S. MacKelyne, M.A.; April 23 (not settled); April 30, the "Science of Language," by Mr. Richard Morris; May 7, the "Theory of Proportion the Basis of all Formative Science;" and May 14, the "Science of Education as Founded on the Theory of Proportion.—The Education of the Workman," by Mr. W. Cave Thomas.

St. Silas's New Schools, Islington.—A public meeting has been held to celebrate the completion of the new schools belonging to St. Silas's district. The schools are situated in a neighbourhood where they are much required. They are calculated to hold 650 children. The basement floor is intended for the infants' school, the floor above for the boys, and the top story for the girls. The schools are fitted up with class-rooms, lavatories, and other conveniences.

Roman Wall, near Kustendje.—At the last meeting of the Newcastle Society of Antiquaries a letter was read from Mr. Henry Cullen, a physician at Kustendje, giving a detailed description of Trajan's Wall, which, he said, began at the edge of the cliff, about a mile distant from the town of Kustendje to the west, and ran across the country to Rasora. Like the Roman wall, it went up hill and down dale. It had now nearly disappeared, having been grubbed up by the Tartars for building purposes; but at the time when he first went to the place it was very extensive. It was about 6 ft. wide, and built of blocks of stone from 4 ft. to 5 ft. in length, and from 1½ ft. to 2 ft. wide. To the north of the wall, at about 100 ft. distant, and running parallel with the wall at an equal distance, was a rampart of earth still in good preservation, the slopes being defined, but no stone work being visible. At a short distance from the cliff there were the outlying walls visible of what must have been a large fortified building, about 100 yards; and about a mile distant from that, on the western side of the wall, was another such building. The writer's opinion was that the wall was not built by Trajan at all, but by Constantine. These ruins would seem to imply that the foe the fortifications had to defend the inhabitants from was to come from the Danube and the districts about its mouth, and that led him to the belief that the wall had been erected by Constantine to defend Kustendje,—the ancient Tomi,—against the Scythians and other barbarians.

Wurtemberg Schools of Industrial Art. After the Great Exhibition of 1851, drawing classes were added to all primary schools in Wurtemberg, in order to furnish manufacturers to compete with those of France. At first these schools were gratuitous, but it was soon found that attendance would be more regular if the parents of the children were required to contribute to the expenses in proportion to their means. The fees imposed vary from one shilling to one pound per annum. The teachers are, as far as possible, selected from amongst those workmen and employers belonging to the principal trades in each town who have themselves previously attended similar classes; the workmen thus transformed into teachers do not quit their ordinary occupations, but are paid at the rate of 3s. 6d. per hour for the lessons which they give. At Geislingen there is a class with 180 pupils, under the direction of a mason or bricklayer. In many towns employers have so highly appreciated the instruction given in these classes that they themselves send their young workmen and apprentices to attend them. It has been found that artists of acknowledged talent have not succeeded so well as artisans in the conduct of these classes. Great attention has been paid to the provision of copies and models for these special schools, which include lithographs, plaster casts, and wooden models. Collections of these were shown at the Universal Exhibitions, in London in 1862, and in Paris in 1867.

Houses Unfit for Human Habitation.—A number of summonses as to a pestiferous neighbourhood have been heard at the Woolton Petty Sessions. The summonses were issued at the instance of the Wavertree Local Board, against owners of property in Rose-lane, Wavertree, for permitting a nuisance to exist on their premises, the said nuisance being described in the summonses as "an offensive cesspool, accumulation of water and sewage, soil saturated with sewage, and offensive sewage overflowing into the adjoining premises, arising from defective drainage and want of paving." Evidence for and against was heard, and the magistrates having consulted together for a short time, Mr. Gibson said they had come to the unanimous conclusion that the houses were unfit for habitation. Their decision, therefore, was that these houses be closed until the nuisance was abated.

The Visitation and Relief of the Poor. Mr. Henry Pownall, the chairman of the Middlesex magistrates, has issued a pamphlet advocating some important reforms in connexion with the visitation and relief of the poor. He recommends a much greater distinction to be made, in poor-houses, between the aged poor and the able-bodied, and that greater facilities be permitted for the relatives and friends of the former to visit and bring them presents. He also recommends, with us, that the poor-rates should be raised by national taxation in equitable proportions, and that the laws of settlement should be altered.

The Liverpool Gas Company's New Offices.—The erection of the new office buildings required by the Liverpool Gas Company, in consequence of their present premises in Newington, having been purchased for the central railway station, has just been commenced by the contractors, Messrs. Jones & Son, of Liverpool. Some time ago the Gas Company purchased from the corporation the building in Cornwallis-street, formerly occupied as the Public Offices, together with adjoining land, the entire area being upwards of an acre; and it is on a portion of this land that the company's new buildings are about to be erected. The designs for the new edifices, which will occupy about 1,160 square yards, have been furnished by Messrs. Lucy & Littler, architects; and the works will be carried out under their superintendence. The main elevation of the building, which is in Italian style, will front Duke-street. The interior will be very large and commodious, and will contain every requisite for carrying on the business of the company. Next year the railway company take possession of the Newington premises.

Dock Extension.—A fine dock, in extension of the East and West India Company's system, was opened at Poplar last Saturday. The river from Blackwall to Limehouse describes a horse-shoe curve, and the South Dock (by which name the new property is to be known) runs in a straight line from point to point. There are 33 acres of water in the new dock, and four pairs of gates, through which entrance can be obtained from either end. The main lock is 300 ft. long, 55 ft. wide, and 30 ft. depth at high tide, and it leads in the first place to a basin of six acres in extent. On the north, or export side, there is a mile and a quarter of quay frontage, with sixteen jetties. The total length of quay is three miles. Warehouses are built, or building; two of them for the storing of jute, and others for tea, coffee, rice, &c. A railway, bringing the dock into connexion with all parts of the country, will be laid down along the quay. After luncheon, the chairman of the East and West India Dock Company, Mr. Kemshead, incidentally stated that the company had been in existence seventy years, during which time three docks, representing something like 80 acres of water, had been opened. Mr. Hawkshaw complimented Mr. Wythes, the contractor, upon the good quality of the work.

Accidents.—The wall on the side of Main-street, Rotherham, abutting on Mr. Nightingale's garden, is of considerable depth, and the pressure upon it from the great traffic along this thoroughfare has proved too much for its strength. A portion of the wall, perhaps to the extent of some ten or twelve yards in length, and to a considerable depth, as well as part of the pathway, have given way and fallen into Mr. Nightingale's garden. The wall, we believe, was built by the South Yorkshire Railway and River Don Company.—The ruins of the old Manor at Sheffield are now rapidly crumbling away. During the past few weeks considerable portions of the wall have fallen, and other and still larger portions are expected at any moment to follow them. The old structure is of historical interest.—The Italian papers contain particulars of a melancholy accident which has just taken place at Sienna. A meeting was being held of a working men's benefit society, at which about 300 members were present. On a sudden the floor of the room gave way, and nearly all the persons present fell with it to the floor beneath. More than eighty were injured, twenty of them severely, and two were killed.

A Failing Court.—Business in the Supreme Court at Hong Kong was brought to a rather sudden termination on January 11. According to the *Times of India*, after the judge had taken his seat, a report was handed to him from the chief engineer, saying that the building was unsafe. The judge, we are told, at once adjourned the court *sine die*, remarking that he did not wish to listen to any long arguments on the report, but would take it as proved. O! wise young judge!

Value of Property in Leeds.—The freehold house and shop occupied by the late Mr. Cross, bookseller, Commercial-street, was offered lately for sale. The premises have a frontage of 43½ ft. to Commercial-street, and cover an area of 114 square yards. They were knocked down to Mr. Wedderburn, of Moor Allerton, for the sum of 2,920l., being at the rate of about 25l. 12s. per square yard. In 1860—exactly ten years ago—this property was bought for 1,080l.

Printers' Pension, Almshouse, and Orphan Corporation.—The annual meeting of this institution was held on the 7th inst., at the London Tavern; Sir Joseph Causton in the chair. Mr. Hodson, the secretary, read the report, from which it appeared that there were now seventy-eight pensioners upon the fund. The twenty almshouses were all occupied, and five orphans were now in charge of the corporation, and placed out at boarding-school. The litigation respecting the bequest left by the late Mr. Biggs for granting annuities to decayed printers or their widows had been closed, and the committee of the corporation who were the medium through which the annuities were granted, had received the sum of 3,910*l.* from the Court of Chancery. The total income of the Pension Society for the year had been 2,532*l.*, and, including 1,053*l.* paid to pensioners, 700*l.* invested, and 256*l.* transferred to the Almshouse fund, the expenditure had been 2,864*l.*, leaving a balance of 168*l.* The invested fund was now 13,324*l.* The legacy of 2,000*l.* from Mr. Wright, and the subscriptions of 1,000*l.* for building a new wing to the Almshouse at Wood-green, had been invested.

The Fund for Archaeological Excavations at Rome.—The treasurer's report, July 1 to December 31, 1869, has been issued in a printed form. It gives a list of the discoveries made, and says in conclusion:—

"The 'Roman Exploration Fund' is now a British Fund, in which name we include our American citizens, and the other descendants of the British race in the colonies; and we hope to show that the British race can do as much for the cause of history as the French and the Germans have done and are doing. We cannot undertake the noble work of the Emperor of the French, in buying the land and leaving the excavations open; that could only be done by the Government, who could easily make a second Pompeii in the southern part of Rome. We cannot expect such discoveries to be made every year, but we hope to confirm and prove what we have discovered, and to be able at the end of the season to give a good account of our stewardship."

The subscription list for the half-year amounts to 568*l.* 2s.; there was a deficit on July 1 of 122*l.* 1s., and the balance on hand, January 1, 1870, was 435*l.* 19s.

London Labourers' Dwellings Society (Limited).—At the seventeenth half-yearly general meeting of the company, held last Monday, Mr. Richard Foster in the chair, the report of the directors for the six months ending December 31st was presented and adopted, and the usual dividend at the rate of 5 per cent. per annum, free of income-tax, was declared. The capital of the society now amounts to 42,200*l.*, the sinking fund (for the redemption of the leasehold property of the society) to 1,850*l.*, and the reserve fund (for the equalisation of dividends, or extraordinary expenses) to 4,093*l.* Of this last sum 2,000*l.* are deposited at interest, in order to provide the means of purchasing temporarily at par any shares that a member may from unforeseen circumstances wish to realise.

Pier and Promenade, Portobello, near Edinburgh.—The Portobello Pier Company have accepted jointly the tenders lodged by Mr. J. Waddell, contractor, Bathgate, and Messrs. John Stewart & Son, engineers and ironfounders, Irvine, for the construction of the new pier. The estimates include the erection of a large saloon on the jetty, at the seaward extremity of the pier. Fourteen offers were lodged—seven for the pier and seven for the saloon—including tenders from some first-class engineering firms in England. The conjoint estimates amount to upwards of 6,000*l.*, and the total outlay in connexion with the pier will be met, it is anticipated, by the capital authorised to be raised by the company, viz., 7,000*l.*

Death from Gas Water.—Last week the bodies of a man, his wife, and three children were taken to the Central Police-station at Hull. The man was the captain of the "keel" *Sarah* of Goole, and had been taking in gas-water at the Central Gasworks. The fumes from the gas-water proved fatal to the whole family. The mother called out to the husband that one of the children was dying; he went to see, and in ten minutes all were found dead in the cabin. It is only when some shockingly immediate result such as this comes before the public that people will believe that what is invisible may nevertheless kill.

Surveyor to the Kingston Highway Board.—Mr. James Bateman, late an officer under the Islington Local Board, has been elected surveyor to the Kingston Highway Board district.

The Royal Society.—Sir Edward Sabine, the president, has given his first *conversazione* this season, at Burlington House, when a large number of distinguished persons were present. The visitors began to arrive at nine o'clock, and were received by the president, attended by the vice-presidents and principal officers of the society.—Dr. W. A. Miller (treasurer), Dr. Sharpey and Professor Stokes (secretaries), and Professor W. H. Miller (foreign secretary), in the entrance saloon. The several rooms thrown open were filled with a great many models of inventions and instruments relating to improvements in science.

Fire, and Destruction of Workmen's Tools, &c.—A destructive fire occurred on Saturday, the 5th inst., on the premises of Mr. W. F. Stanley, mathematical instrument manufacturer. Fortunately it extended to the cabinet workshops only; but the tools of eight workmen were destroyed, as well as several hundred instrument cases, cabinet work in hand, and a large quantity of material.

Marbles from Vermont, U.S.—Our attention has been called to some fine specimens of richly-veined marble from quarries on the shores of Lake Champlain, in the State of Vermont, having direct water communication by the Hudson River with New York. They were exhibited at the Institute of Architects, by Mr. A. Mason, of Russell road, Kensington, and are worth attention.

New Lighthouse at Port Said.—The Egyptian Government, in order to better protect ships entering Port Said for the Suez Canal, have just constructed a lighthouse at the entrance to the port. The new light is a flashing one, flashing every three seconds, and the illuminating apparatus is electric of the first class. The tower, which is built of sand and cement, is of a light grey colour.

The Halifax Workhouse Infirmary.—The new infirmaries at the Halifax workhouse have been inaugurated by a grand banquet, given by the chairman of the Board. The new infirmaries are erected on the pavilion plan, and provide accommodation for 72 males and 72 females.

Surveyor to the Board of Works.—It will be seen in our advertising columns that the Metropolitan Board of Works propose to elect a surveyor to deal with questions under the Building Act, line of frontage, and so forth, at a salary of 250*l.* per annum, rising gradually to 300*l.*

The late Mr. Moses, Engraver.—The *Times* obituary records the death of the eminent engraver, Mr. Henry Moses, on the 28th of February, at his residence, Lincoln Villa, Croyley, Middlesex, aged 88 years and 9 months.

TENDERS.

For building an infirmary for the Guardians of St. George's-in-the-East. Mr. Andrew Wilson, architect:—

Gill.....	23,725 0 0
Hart.....	27,254 0 0
Heddie.....	20,119 0 0
Holmes.....	19,640 0 0
Winchup.....	19,645 0 0
H. & J. Johnston.....	19,280 0 0
Hill & Co.....	19,194 0 0
Perry & Co.....	16,124 0 0
Mortimer.....	18,391 0 0
Crabb & Vaughan.....	18,950 0 0
Wicks, Bangs, & Co.....	18,100 0 0
Kully.....	18,767 0 0
Capps & Rice.....	18,746 0 0
Kearney (accepted).....	18,720 0 0

For new fever wards, Hungerford Union, Berks. Mr. J. H. Money, architect. Quantities not supplied:—

Whitaker.....	269 8 11
Whitaker.....	673 10 0
Cruse.....	684 0 0
Dyer.....	611 0 0
Hodgkins.....	610 0 0

For rebuilding No. 70, North-road, Brighton, for Mr. Spencer Weston. Mr. J. Dalhousie, architect. Quantities supplied:—

Garbutt.....	4875 0 0
Parsons (too late).....	647 0 0
Elliot.....	615 0 0
Barnes.....	630 0 0
Gates.....	625 0 0
Holloway.....	620 0 0
Blackmore (accepted).....	612 9 6

For premises at Witham, for Messrs. Johns. Mr. Chas. Pertwee, architect:—

Smith & Swale.....	11,260 10 0
Fincham.....	1,045 0 0
Brown.....	830 0 0
Goat.....	832 0 0
Gardner.....	850 0 0
Coat & Son.....	833 10 0
Roper.....	800 0 0
Saunders.....	790 0 0
Crabb & Letch.....	728 0 0

For enlargement of Orsett Union House. Mr. Chas. Pertwee, architect:—

Hall.....	42,109 2 0
Larkin.....	1,965 0 0
Ferguson.....	1,900 0 0
Clements.....	1,860 0 0
Brown.....	1,844 0 0
Place.....	1,820 0 0
Nightingale.....	1,815 0 0
Fincham.....	1,793 0 0
Blake.....	1,770 0 0
Davey.....	1,700 0 0
Withers.....	1,630 0 0

For building four houses at Westgate Bay, near Margate. Mr. C. N. Beasley, architect:—

Smith & Swale.....	43,160 0 0
Gascogne & Goddard.....	3,075 0 0
Hollis.....	8,000 0 0
Wigmore.....	2,600 0 0
Whittaker.....	2,250 0 0

For new wings to Old Balinghore Girls' Refuge. Messrs. E. Habershon & Brook, architects:—

Sharrington & Cole.....	43,303 0 0
Nightingale.....	2,182 0 0
Ebbs & Son.....	2,176 0 0
Carbutt & Son.....	2,068 0 0
Scrivenor & White.....	2,043 0 0
Manley & Rogers (accepted).....	1,877 0 0

For detached residence, No. 3, on the Yew Bank Estate, Kenley, Surrey. Mr. Charles Rutley, architect. Quantities by Messrs. H. Blackwell and F. Rutley:—

Smith & Swale.....	41,836 0 0
Waters.....	1,779 0 0
Stainer & Son.....	1,775 0 0
Gordon.....	1,749 0 0
Garrad.....	1,723 0 0
Hockley.....	1,703 0 0
Heddie.....	1,694 0 0
Loas.....	1,677 0 0
Gover.....	1,675 0 0
Gibson.....	1,650 0 0
Perket & Taylor.....	1,675 0 0
Harrison & Edwards.....	1,550 0 0
Blackmore.....	1,495 0 0
Ferguson.....	1,418 0 0
Johns.....	1,397 0 0

For new station at Hackney, for the North London Railway Company:—

Baylis & Ramsay.....	215,600 0 0
Snowdon.....	15,405 0 0
Winchup.....	15,350 0 0
Myers & Son.....	13,763 0 0
Gill & Fairbrother.....	13,740 0 0
Mansfield & Price.....	13,372 0 0
Hill & Keddell.....	13,360 0 0
Hilly.....	12,900 0 0
Turner.....	12,870 0 0
Ax-ford.....	12,810 0 0
Parquison.....	12,650 0 0
Crabb & Vaughan.....	12,494 0 0
Scrivenor & White.....	12,350 0 0
Perry & Co.....	12,350 0 0
Heddie.....	12,184 0 0
Wicks, Bangs, & Co.....	12,000 0 0
Watts.....	11,990 0 0

TO CORRESPONDENTS.

Line Notes.—Can any of your subscribers inform us the proper way to construct a drawing of running lines?—M. C. O. G. M. W. F. P. W. F. W. F. P. J. R. S. L. W. Y. D. H. C. C. R. E. H. W. D. J. C. T. A. H. S. F. S. L. H. B. F. J. V. O. P. H. & A. M. R. J. H. R. P. O. W. L. M. O. W. S. A. B. W. G. T. A. B. D. (we will give an opportunity to print it if so). W. R. P. (make of paper to hold on portion of the Ballroom. Curran has been pointed out in our paper). Student (we can't do more than value the otherwise of free-trade. The question is settled). B. (and surveyor's charges are regulated by circumstance. We know of no recognized scale). W. O. A. (next week). F. B. H. (next week). A Student (next week).

We are compelled to decline printing out books and giving addresses.

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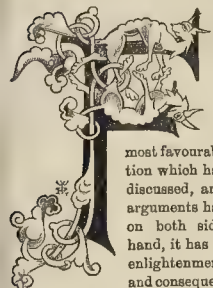
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The Builder.

VOL. XXVIII.—No. 1415.

Alexandria: Art and Despotism.



OR the culture and development of the fine arts, which form of government, the despotic or constitutional, is the most favourable? This is a question which has been frequently discussed, and many plausible arguments have been advanced on both sides. On the one hand, it has been affirmed that enlightenment and education, and consequently taste, advance side by side with political freedom; that while men's minds are not convulsed by upward struggles towards the sun of liberty, and are unclouded by those apprehensions which constantly overshadow the enslaved, they are most open to receive impressions of truth and beauty in both nature and art; and that the enlarged appreciation of, and constantly increasing taste for, the beautiful, which is likely to take root and spread abroad amongst a people who are thus free from political cares, would induce their legislators to take the fine arts under their charge, make them a branch of national education, and foster them by every means in their power. As this state of things could only come about under a constitutional Government, that is evidently the most favourable for the culture and progress of the fine arts. It may be advanced also, in support of this view of the case, that art flourishes best in an atmosphere of truth; that undue favouritism, intrigue, plotting, and jobbery of all sorts are destructive to its growth; and it may be asked, where will you find greater freedom from jobbery than under a popular and liberal administration?

On the other hand, it may be asserted that refined taste does not necessarily accompany political ability and influence, and that under a liberal Government any man who is great upon the platform may be successful at the poll; and that, with a special talent of some kind and a great deal of boldness, he may even attain unto office, and to such an office that he may have the handling of his country's ornaments, her crown jewels,—architecture, painting, and sculpture; and that this man may be utterly destitute of taste, and incapable of sympathising with artists or of comprehending art of any description. Then it may be asked, would not such a man inflict irreparable injury upon art? Yet such a state of things is possible, and does occur in the most liberal countries and in the most enlightened period of the world's history. How, then, it has been demanded, can that form of government which admits of such a case be most favourable to the growth of the fine arts?

We must here beg our readers to remember that we are merely repeating what has been, or may have been, advanced on both sides of the question.

However much we may be of opinion that art and education ought to be developed together, we cannot but own that hitherto in the history of the world practical results show that the larger number of great works of art have been accomplished under despotic rulers, without the consent or concurrence of an enlightened people. In order to comprehend this apparent paradox,

let us look at Egypt, covered with stupendous temples, surrounded by a series of sphinxes, and guarded by gigantic genii, all perfected under the most crushing of despotisms. The palaces of Persepolis and Nineveh were constructed under a similar condition of affairs. Let us go to Greece, and see the Parthenon, erected by Pericles after he had made himself master of the Athenians. Rome owes its Coliseum, its enormous baths, its triumphal arches, to the Cæsars, not to tribunes and decemvirs. Venice owes all its finest structures to the dogs of the time of its oligarchy, not to the time of its democracy; and lastly, the two finest cities of ancient and modern times owe their grandeur to the magnificence of imperial taste.

Paris as it now stands, re-edified and rectified by Napoleon III. and his faithful Haussmann, is a splendid monument of imperial greatness—a vast Napoleon-ville, which will remind posterity of that remarkable man, who, having crowned the edifice, is content with simple dignity to resign the trowel into the hands of those whom he condescends to call his employers.

Alexandria, the city of the conqueror of the world, accomplished by his architect Dinocrates, was the glory of the Levant, and the greatest empire of the East,—a worthy memorial of Alexander the Great and of that architect who built the Temple of Diana at Ephesus, and who proposed to cut Mount Athos into a figure of his master, representing him with a city in one hand and a cup in the other.

Nevertheless, no one desires despotism in England. The tendency of our observations is simply to show the necessity for proper arrangements, under a liberal form of government, to insure attention to matters of art.

When Governments are compelled to economise by the pressure of public opinion, but are not in the same manner impelled to any large-mindedness, or even to common rectitude, in dealing with matters of art, evil results must follow; and the reason of this is that art and artists are so little considered by the community, that in the case of a public competition the selection of an inferior work by the judges is not believed by them to be an act of injustice to art and to competing artists, but rather a mark of cleverness on the part of those who have exerted themselves to bring about such a result for the benefit of a friend or dependent. No wonder, then, that Mæcenæ enters the lists for the advantage of his *protégé*, and that it is thought a matter of little moment if the strawberry-leaves be tossed a little awry, the lawn slightly soiled, or the ermine a little ruffled in the tussle of unblushing jobbery that ensues. It is to be owned that this state of things is partly owing to the conduct of artists themselves, who often allow themselves to be made handles to a job. They write and talk about Beauty, Truth, and Sacrifice being the handmaids who surround the triumphal car of Art, and attend her on her progress, yet they would not hesitate to immolate Truth and Beauty and Art herself at the shrine of a patron who helped them to a job.

In England, as in France, there should be a department specially devoted to the advancement of the fine arts, and formed of men duly qualified by their attainments, their taste, and their experience to direct it.

The despot and his adviser have hitherto been the best friends to art. Pericles and Phidias, Alexander and Dinocrates, Justinian and Anthemius, Napoleon and Haussmann,—all accomplished monuments of which the world was and is still proud. The occasion makes the man. It is not likely that architects will again have commissions to build cities with *carte blanche* as to cost, or orders for temples, very splendid, with no limit as to the number they would hold, or as to thickness of walls and number of columns; but if they had but the just satisfaction of knowing that if they produced the best de-

signs they would be employed by the government of their country, those best designs would be produced, and they would in their manner equal, if not excel, the works of Dinocrates, Anthemius, and other architects of the past; for talent belongs to no particular age or country, and is more rife now than in the earlier ages of the world, when opportunities of learning were few.

When the conqueror of the world set foot in Egypt, 331 B.C., after his conquest of the Phœnicians, a city sprang into existence at his word. The site he chose was a fine one: it was on a slip of land situated between the Lake Mareotis and the Mediterranean. There was an island in front of it, which afforded shelter for vessels, and formed a port; and on the other side there was a port on the lake, to which the products of Egypt and Nubia were conveyed by the Nile, which communicated with the lake.

Pliny gives a short account of the manner in which Dinocrates, or, as he calls him, Dinocrates, proceeded with his work. "Building the city upon a wide space of ground, 15 miles in circumference, he formed it in the circular shape of a chlamys, uneven at the edge, giving it an angular projection on the right and left; while at the same time he devoted one-fifth part of the site to the royal palace." As the city was to be the great place of exchange for the products of Asia, Africa, and Europe, the chief thing to be done was to form a communication between the outer and inner ports: so he constructed a wide road between them; and then at right angles to it, intersecting it at about the middle of its course, he laid out the principal street of the town, 100 ft. wide. This street ran almost parallel with the seashore, and was called the Bruchion. This grand way was lined with palaces and other public buildings. A similar street is to be found in all cities built about this period. At Damascus, in the street called Straight; at Soli, and in the deserted towns of the Hauran. This rectangular arrangement was first adopted by Hippodamus, who built Rhodes, and was celebrated as an architect of cities. Around the Bruchion were grouped those magnificent edifices which gave renown to Alexandria. Such were the Serapeion, which was built on an eminence, and approached by 100 steps; and the museum, which contained the Alexandrine library.

After Alexander's death, Egypt fell to the lot of his lieutenant, Ptolemy Soter, who enlarged and improved the imperial city by connecting the island with the mainland by means of a jetty called the Hepstadion, and building on it the celebrated lighthouse which was considered one of the seven wonders of the world. He was the founder of the family of Lagides, who reigned in Egypt till the time of the Cæsars. He and his successors took a pride in decorating the capital. The palace of the Ptolemies, the tomb of Alexander, the theatre, Possidion, Timoneum, Gymnasium, Paneum, and Hippodrome, were all erected by them in and around the Bruchion. Thus Alexandria became the finest and most prosperous city in the Levant, at about the time of the commencement of the Christian era. Three centuries after it began to decline; for, as it became the theatre of many of those violent political and religious convulsions which preceded the fall of Paganism, one of which has been so powerfully described by the author of "Hypatia;" it suffered fearfully in each outbreak, and was devastated by the revolted, and by the repressors of revolt, till its final destruction was consummated by Amron, the lieutenant of Calif Omar, who took possession of it A.D. 641, and burnt the Alexandrine library, the loss of which was greater than would be that of all the libraries at present existing in England and France. What was the extent and magnificence of Alexandria at that time may be gathered from the report of Amron to his chief, in which he

mentions that the city contained 4,000 palaces, 4,000 public baths, 400 circuses, and 12,000 gardens; so that even in the time of its decadence its inhabitants did not lack places of amusement. Subsequently, it fell into utter decay, and became an immense heap of ruins. Le Brun, who visited it in the seventeenth century, says he "never saw anywhere finer ruins;" he describes the remains of the Palace of Cleopatra, the obelisk called the Needle and Pompey's Pillar, and adds that he saw very few inhabitants amongst the ruins. In 1777, there were only 6,000 residents, in the place of 600,000 who occupied it in the time of the Lagides. Since the commencement of the nineteenth century, however, owing greatly to the energetic character of Mahomet Ali, but more especially to the circumstance that it has become our stepping-place on our road to India, the prosperity of Alexandria has revived, and it has again become one of the most flourishing places in the Levant. Its pristine grandeur has, however, been replaced by modern comfort. We were astonished on landing, after being accustomed to the semi-barbarous equalities of the Frank quarters in Stambul, Smyrna, and Beyrout, to encounter there certain signs of European civilisation in its rows of handsome houses, having an air of English comfort about them, in a square laid out with some degree of taste, and surrounded by consular residences and hotels, and above all in seeing stylish-looking carriages drawn by spirited horses, which whirl about the sandy streets of the town in place of the rickety arabas with which one mounts the tortuous narrow lanes that lead from Galata to Pera. Most, if not all, this life and prosperity is owing to Anglo-Saxon gold and Anglo-Saxon enterprise, which alone seem to have the power of animating the dead East.

The modern town is built almost entirely upon the Hepsestion, which from a jetty became a wide isthmus; and, owing to this position, it enjoys the sea-breeze from whatever side it blows. Here is situated the great square. On emerging from it the traveller who has not studied a plan of the town before his arrival is surprised to find that on all sides but one his peregrinations are stopped by the sea. By going southwards, he, however, can get clear of the modern town, and, after passing the Arab walls, will find himself among the heaps of sand which alone mark the site of the ancient palaces of Alexandria. He will find but few traces of its ancient splendor. The most renowned is the falsely-called Pompey's Pillar. It stands a few hundred yards outside the gates of the town. Before reaching it he will pass a forest of date-palms covered with bunches of tempting fruit. He will also have an opportunity of examining the towers of the ancient fortifications, which present interesting examples of Saracenic vaulting.

The column—which has been ascertained from a half-obliterated inscription to have been erected by one Publius, in honour of Diocletian,—consists of a granite shaft, with Corinthian capital and base, standing on a pedestal. It is about 100 ft. high, and appears to have sustained a statue. In the sandy mounds adjoining the Arab villages near the column are to be seen some catacombs adorned with Christian paintings.

Cleopatra's Needle is one of two obelisks brought from the Temple of Heliopolis—the On of Scripture—near Cairo. One of them belongs, or did belong, to the British Government, and it is to be regretted that as we have so many vessels in Government employ constantly in the harbour of Alexandria, none of them have been commissioned to bring away this relic of antiquity, which might grace our city if it were allowed standing-room.

France spared neither trouble nor expense in transporting the obelisk of El Uskor from a still greater distance in order to place it in its present position in the centre of the finest Place in Europe. We could very well have afforded to follow the example she has set us, and if a few square feet in the City were denied it, it might have been erected in front of St. Paul's, under the protection of the Dean and Chapter, or in one of the parks, as a memorial of the gallant admiral who, by crippling Buonaparte in Egypt, prevented him from becoming a second conqueror of the Eastern world. But no: economy is the order of the day; were the Admiralty to send a ship for such a purpose, they would be exposed to the attacks of the Opposition, and that act of zeal in the interest of art would be in itself almost enough to overthrow a Ministry.

Let the traveller to Alexandria beware that there is no place where there is such an abuse of backsheesh. Spoiled by Indian travellers, the Arab population live upon backsheesh. It is the first word the traveller hears upon landing, and the parting salutation he receives upon leaving. If pestered beyond endurance, we counsel him to follow the example of our fat friend, who, when surrounded in the Cairo railway-station by a knot of Arabs (each of whom had lent a finger to aid in the transport of our friend's luggage, and who kept up a continual croaking chorus of "Backsheesh! Backsheesh!" in every possible tone of voice), feigned to be deaf and dumb, and talked to them volubly on his fingers. Their cries and vociferations ended in wonder, and, beckoning their neighbours to come and see the wonderful man who had got no tongue, they allowed him quietly to establish himself in the railway carriage. Nor was the charm broken till, as the train was starting, he called out to them from the windows, "Backsheesh is dead and buried long ago. I went to his funeral in America;" leaving those who understood the English language to translate his speech to the rest.

GLASGOW, SANITARY AND SOCIAL: A BRIEF GLANCE.

"GREAT cry and little wool" is a trite expression, but it tersely and truthfully represents the practical results as yet of all the social and sanitary reformation achieved in the city of Glasgow. We will even go further, in saying social and sanitary matters in that city will make but slow progress until the work required to be done is mapped out, and thoroughly pursued in detail. Fiftful efforts will always be fruitless ones, and fitful efforts have been the general character of the sanitary attempts hitherto at improvement on the banks of the Clyde.

Glasgow, as a great city, is well placed, at least on its modern basis, to effect all that the most sanguine reformer could desire. Its leading thoroughfares run in parallel lines, and these radial arteries are well intersected at right angles on both sides of the river. The traveller who would go astray in Glasgow, after the first day or two's glance at the city, should be a man of little intelligence or discernment. Glasgow is great in commercial spirit and enterprise, and it needs no octogenarian mind to remember the day when the Clyde was hardly navigable for respectable ships any nearer to the Bromielaw than Greenock. But the deepening of the river opened up great resources that were soon availed of, and, with the shipping interests of the port, the mighty increase of the population, and the growth of the city, moved apace. As far as Glasgow is concerned, her corporation has had no excuse for blaming the Government. Little or no Government interference or aid was required; it all rested with the local authorities of the city whether their capital should in time become a model city or a spoiled and irreparable one. To be plain-spoken, Glasgow has not become a model city, inasmuch as the chief elements that constitute our idea of modern greatness is wanting. Glasgow is wealthy and populous, but the primal source from which springs the vital element of her life-blood is not only tainted, but is impure. Her heart has imbibed an incipient disease, and her lungs are threatened. Without entering into allegory, Glasgow is in bad health, and her many doctors have failed to give her the least respite from the violent maladies that are pressing her down to earth. In Glasgow, as in Edinburgh, radical evils exist, and, until these are eradicated, the pulse of this great city will not beat with a healthy pulsation. As in Edinburgh, the old city is webbed with an almost interminable number of closes, wynds, courts, entries, and villainous vennels, seething with foulness and putrefaction. Whether we direct our course through the Briggate, Saltmarket, her High-street, or Gallowgate, or whether we penetrate her plague-ridden Cowcaddens, or her Gorbals, we are confronted with the same endless and unvarying pictures of poverty-stricken humanity, cholera ova, and chronic filth. If we write strong words, we nevertheless write truthful and honest ones, and we do so for the sole purpose of leading to improvement. The poor must certainly live; they must be housed.

If improvement committees pull down human rookeries and demolish hearths and homes without providing for the location of the evicted, they override their functions, and are in criminal ignorance of the spirit of their formation.

Glasgow is dirty, and filthy, and plague-stricken at this moment. Some natures, they say, grow inured to filth, and they cannot exist out of their congenial atmosphere. We bluntly deny this. No man with a spark of common sense in his brain or a manly feeling in his breast would prefer living in filth and dirt, or would give preference to dwelling in a loathsome court rather than a clean cottage or a comfortable and healthy room. Life and health are precious to the humblest and most forlorn members of the human family, and there are none so stolidly stupid, save they are incurable eccentrics, who would sottiably hug lasting dirt and certain disease and death in preference to health-prolonging surroundings. Here we take issue in the interest of that science that will yet revolutionise the face of the world, and lengthen the life-span of unborn generations.

Improved dwellings and thorough drainage are the first step; next, a plentiful supply of pure water and the circulation of unpoisoned currents of heaven's unexhausted air. In the thickly-populated localities already enumerated, the working-classes are matted together. Let us instance again any of those darksome alleys of High-street. How, we ask, does the sanitary wisdom of the Glasgow Board of Health or Corporation intend to deal with the purification of these entries, until progress replace them and find suitable homes for the dwellers therein? This is, perhaps, a difficult question. A monthly inspection of these courts may sound very well in the annual sanitary statistics of the city, but this kind of work will not do. The landlords of these abodes throw the onus of the collection of the rents on the factor, as he is called in Scotland; but on whom does the onus rest of seeing after the sinks, or of whitening the walls; of sweeping the entries from end to end, or giving a sufficient supply of water. This work is hardly the factor's work; and certain we are that the poverty-stricken inmates of these courts do not feel called upon to move in the matter, however they may grumble and remonstrate. A street-to-street and lane-to-lane visit in the worst quarters of Glasgow opened our eyes and staggered us. We found in our way leading thoroughfares fairly and cleanly swept; but we had only to turn into the nearest close to our hand, and the odious comparison of "Look on this picture and on that" arose. To lighten the evil along the line of these wretched quarters, we would have the fire or water plugs closer, and more numerous, and at least once a week the application of the hose could be given for the flushing and cleansing of the channels, and every base line and angle of these courts. This would be comparatively easy work, and such work would be invaluable in these narrow courts and vennels, where fever and other contagious diseases are of constant recurrence.

Glasgow has recently appointed a sanitary officer, or an inspector of nuisances, under the Board of Police. The sanitary inspector, or inspector of nuisances, who would undertake such a task for Glasgow, and perform it in a middling manner even, should be a marvel of locomotion and industry. Such a task in such a city as Glasgow, not only requires an inspector-in-chief, but inspectors in number. In fact, the sanitary work in this line in Glasgow requires a system and a department, and the duty of the staff of this department would require a subdivision of districts. As a beginning, we would say Glasgow, should be divided into at least four districts, over which there might be appointed distinct district inspectors. The city police individually, would form useful auxiliaries in the work, as they could take notes on their line of duty or "beat," which notes would be useful data for the local board at head-quarters. Thus a rudimentary system of inspection would rapidly assume the proportions of a well-organised scheme, and in time it would develop good results.

It would not be necessary for the police to arbitrarily interfere with the inhabitants in sanitary matters. They might draw attention to evils, and direct the inmates' or owner's attention also to cases of apparent negligence; but otherwise, their report would subvert the purpose desired. It seems to us that the law that regulates the erection and construction of dwellings in Glasgow, must be a very loose and lax one. We entered several intended dwellings for the working classes, but they did not at all come up to the standard nor approach it, in meeting the requirements of the lower or working-classes. In each of those we saw the space

of room is too small, and the questionable system of "flats" is worked on the narrowest health-supporting gauge. The tenant is here provided with bed-spaces, boxed up between lath and plaster, or half-brick thick partitions, and the space occupied by these bed-spaces, when deducted off the room, makes many of them about 8 ft. or 9 ft. square, hardly more. No neat iron bedstead or clean and polished birch or mahogany one is wanted in your Scotch working-man's "flats." Two parallel pieces of scantling run from wall to wall, and a 9 in. or 11 in. piece forms the external sideboard. The Scotch tenant in these working-men's "flats" may "bolt the moon" betime, and run away with the bedding, but we are bound that he will not levitate with fixtures. The bed is intended to serve a generation or two. On each "flat," in some of these houses there are six rooms. Two are intended for each family, and a water-closet is on each landing. The rent is 10s., including the tenant's share of the taxes and rates. How families can be reared up in decency in these narrow structures we do not know. But even these are not the lowest description of your working-men's tenements. There are some flats where only one room is appointed for the sleeping, eating, washing, cooking, and living purposes of a family, and the water-closets of these latter dwellings are not on each landing, but one is designed to subserve the entire purpose of several families. What must be the state of these dwellings, and what can be the morality and decency alive within them? And, mark ye, these are not the old town structures, but the new ones for the working classes of Glasgow in course of erection now. And they will be inhabited, though the accommodation is small; for the rents, though not low, still are lower than elsewhere. These improved (?) dwellings will leave a record of doom behind them yet that the nearest churchyard and the jail will show, and the streets of Glasgow in living contamination exhibit.

Why should we point them out by name and name? They are built to sell and to kill; and your sanitary inspectors of nuisances, people of Glasgow, consider them fit and proper dwellings for your working classes!

Turn we through the fever-stricken Cowcaddens, and are there not more of them? The dying are here burying the already dead; but the turn of the former will be to-morrow. The black plumes will nod, and the murdered innocents will be carried out on the same bier with the parent, and the choked sob and the suffocated sorrow will be drowned in the maddening glass, for all will be gone of that desolate home that was worth living for. The epitome of a life condemned to breathe in a poisoned atmosphere, and to vegetate amidst dirt and disease, is easily written.

We walk along the streets again, and we find ourselves in Rotten-row, not in Hyde Park, but off the High-street, Glasgow. No grand equipage, nor courtly dames, nor green sward, nor leafy trees, nor crystal pool; no, we wade through dirt and disease-germs once more. Public institutions are around us, industrial schools are in our midst, asylums for the aged are a few paces on, and a hospital for the social evil is by our side. We penetrate lanes, and filth is everywhere. We ascend staircases, and dirt and the smell of the graveyard choke us. The streets are in rats, and the footways are broken as if an earthquake had shaken them; and the water-courses and side channels are thick with filth. Is there a curse here, or is the contrast allowed to exist for sake of effect?

Pass we away, and after several windings we are in the great Argyll-street, the popular, the fashionable, the wide, and wealthy shop-keeping thoroughfare, extending in a long line through the heart of the city. A few yards more bring us into the Irongate, and under the shadows of the old church we disappear from the wide pathway through the narrow entry. Wealth is without on the paved roadway, but want and wretchedness are in here. This is the Backwynd, and it leads from the notorious Briggate to the fashionable Irongate. Where are your sanitary inspectors, Glasgow? Ashes and filth, stench and intolerable nuisances, are under our feet. The old walls are dropping asunder with damp. The aged and crumbling tenements are chock full. No rooms are empty, and no cleanliness is here. You breathe in an atmosphere of stench. Cat-skins are here in heaps, fresh from the butcher or knacker, as may be, and they are undergoing their preliminary process of soaking and hacking, drying, scraping, and dressing, or other more technical courses. "Twixt human and beastly

smells, disease and dirt, dampness and poverty, the Back Wynd has its share. In here, then, is work for the hose. But not alone is it required on the pavement, but in the hall-ways and on the staircases of each house. The majority of the houses in this wretched court are unfit for human habitation, and apparently there is no attempt made to keep this place clean. Here, in this quarter, there are minor and many entries equally dirty. Off the Saltmarket, Briggate, Stockwell-street, and scattered over that inner space contained between the former and the latter street, there are dozens of foul places not unknown to authority, but neglected by it. Along the line of the Gallowgate there are networks of courts and lanes, filthy and foul, dark, and unfit for human creatures; and yet, in these dismal rookeries, and in the thick pestilential atmosphere of these dreary quarters, many of the labouring and working classes are located. The Union Railway, which is now in course of construction, has swept many of these fever dens away, but with what good effect we need not inquire. Had there been a sufficiency of good dwellings for the dispossessed to betake themselves to, no harm would have been done; but, in the absence of such, quarters already over-crowded have been resorted to for the necessary shelter.

The subject is so large, so sorrowful, and so important, that we must take another Number to pursue it in.

ART-WORKMANSHIP COMPETITION, SOCIETY OF ARTS.

The following is the report of the judges, appended to which is the list of prizes awarded:—

"In submitting our list of awards for the competition amongst the art-workmen for the session 1869-70, we desire to congratulate the Council of the Society of Arts upon a more worthy response to their liberal invitations to the workmen, to forward good specimens of their handicrafts, than was made last year.

This improvement is manifested rather in the absence of the very bad than in the presence of the very good. In the second division, however, comprising the application to ordinary industry of prescribed art-processes, we have met with several works of conspicuous excellence. Foremost in the list of these, we must place the ornamental ironwork for the balcony of a window, executed by Messrs. William & Henry Robson, a work uniting three special merits—elegant and not overloaded design; masterly technical execution in forging, twisting, &c.; and moderate price. We are fully aware of the high position occupied in metal working generally by this country at the present time, but we look upon this work of the Messrs. Robsons as an especially good example. We have, therefore, awarded to it the North London Exhibition prize for the best specimen of skilful workmanship at the Society's exhibition, in addition to a premium of 10l.

In several other instances the Exhibition contains good evidence of excellence in metal working, and the Messrs. Emms's balcony and wrought-iron banister are very satisfactory.

In metal working in other divisions we have to commend highly the 'Virgin and Child,' worked in low relief in iron, after an example in the South Kensington Museum, by Mr. A. Dufour. In this case we have also to notice excellent work combined with moderate price. To Mr. A. Dufour we have awarded a premium of 10s.; while, for a corresponding work, executed by Mr. Adolf Ostertag, we recommend that a prize of 5s. should be given.

The hammered iron knocker, executed by 'A. S.,' is large in style, and well and simply treated.

In coppersmiths' work, the repoussé mask wrought by Mr. G. Deere is well 'bossed' out, and may be regarded as a skilful piece of workmanship. Mr. A. Millward has forwarded a good specimen of the inlay of German-silver in copper, and a still better circular ornament pierced in metal; the latter is agreeable, and characteristic in design, and is worked with a cleanliness of cutting and truth of figure highly to be commended.

It is to be regretted that, in working in the precious metals, in which at the present time the art-workmen of Paris and Vienna are so superior, the Society's Exhibition should contain nothing worthy of notice.

In the second division, however, we are glad to recognise, on the part of Mr. Alfred Gray, a

power to execute enamelling on metal in the style (a novelty in this country) which has gained so much reputation for the houses of Christofle and Barbedienne, of Paris. We have awarded Mr. Gray, for his miniature frame, a premium of 7l. 10s., and shall hope to see him, on some future occasion, displaying his command over the various processes of enamelling upon a more elaborate and important scale. The application of enamelled colours on ceramic bodies, so as to form elegant commemorative tablets, has been fairly shown by Messrs. Evans & Griffiths, of the Potteries, to whom we have awarded a premium of 5l.

We are further pleased to be able to remark that the Society's invitation to workmen to compete under their second division has succeeded in eliciting marked novelty and excellence in English glass-working. Mr. Joseph Leicester's three champagne glasses, with filigrai in the cup, stem, and foot, fairly rival the products of Venice. The works of Mr. Barnes, though not so elegant, display command over several difficult processes in glass-blowing. In the same division, Mr. Charles Pfänder contributes various agreeable specimens of painted book-covers of a more or less novel character; and Mr. E. T. Grove an envelope-case, in various woods, enriched with carvings in low relief, and marquetry, of neat execution, and marking progress in the application to ordinary industry of an art-process hitherto comparatively little used in this country.

In the classes of carving in wood, carving in ivory, painting on porcelain, and modelling in plaster, there is little call for remark, although a fair average has certainly been maintained.

In cameo cutting, we remarked an excellent portrait of Dr. Billings, for which we have given a premium of 5l.

Among the works of exceptional merit, not previously referred to, should certainly be noticed Mr. H. J. Hatfield's beautiful bronze missal cover, pierced, and chased with great truth and taste.

In etching and engraving on metal, the works of Mr. S. Gill and Mr. J. Gittins were of such equal merit in our eyes, as to entitle each of them to a premium of 5l.

The embroidery executed by the Misses Pfänder reflects credit upon those ladies.

We noted the contributions to the exhibition of the veterans, Mr. Louis Genth and Mr. Mark Rogers, whose works we have commended.

A decided novelty in marquetry, contributed by Mr. W. Clayton, to which we have awarded the premium of 7l. 10s., appeared to us likely to be valuable for purposes of internal mural decoration.

Upon the whole, and in conclusion, we have to express our conviction that the Society of Arts, should it see fit to continue its liberal invitations to art-workmen to compete for prizes, cannot do better than offer a somewhat similar programme for the ensuing year to that of 1869-70, varying, however, some of the prescribed designs, the repetition of which has now become monotonous.

RICHARD REDGRAVE,
GEORGE GODWIN,
M. DIGBY WYATT."

FIRST DIVISION.

Works executed after Prescribed Designs.

CARVING IN WOOD.
No. 2. Panel carved in oak, after a work in the South Kensington Museum; by Mark Rogers, jun., 111, Tachbrook-street, Pimlico, S.W. Price 10l. 10s. Prize of 7l. 10s.

No. 4. Panel carved in oak, after the same design as the above; by J. Omond, 6, Featherstone-street, Bunhill-row, E.C. Price 14l. Prize of 10l.

No. 5. Carving in wood, after an establishment of a chimney-piece in the South Kensington Museum; by C. H. Line, 41, Prince of Wales-crescent, N.W. Price (when finished with enriched moulding) 12l. Prize of 7l. 10s.

REPOUSSÉ WORK IN ANY METAL.

No. 7. "The Virgin and Child," iron panel, in low relief, after an example in the South Kensington Museum; by A. Dufour, 10, Cranbourn-street, Leicester-square, W.C. Price 9l. 1st Prize of 10l.

No. 8. "The Virgin and Child," iron panel, after the same example as above; by Adolf Ostertag, 24, High-street, Bloomsbury, W.C. Price 18l. 2nd Prize of 5l.

No. 10. Repoussé work in silver, after a tazza in the South Kensington Museum; by A. Clark, 29, Gloucester-street, Hoxton, N. Price 6l. Prize of 5l.

HAMMERED WORK IN METAL.

No. 11. Hammered iron knocker, after an example in the South Kensington Museum; by A. S. Price 6l. Prize of 5l.

CARVING IN IVORY.

No. 14. Plaque executed in ivory, after one of Silenus and Amorini, by Flaminio, in the South Kensington Museum; by H. Godart, 1, Harrgrave-part-terrace, Junction-road, N. Price (when finished) 50l. Prize of 22l.

CHASING IN BRONZE.

No. 15. Work executed after a missal cover in the South Kensington Museum; by H. J. Hatfield, 8, Great Fulney-street, W. Price 18l. 1st Prize of 10l.

ETCHING AND ENGRAVING ON METAL.

No. 16. Niello work, engraved on niello silver, after an arabesque by Lucas Van Leyden, in the South Kensington Museum; by James S. Gill, 26, Moreton-street West, Pimlico, S.W. Price 2l. 10s. Prize of 6l. for the exhibit of this and No. 17.

No. 20. Engraving on copper, after the same example as the above; by John Gittins, 8, Angela-gardens, Hackney-road, E. Price 4l. Prize of 6l.

PAINTING ON PORCELAIN.

No. 21. Painting on porcelain, after a drawing by Raffaele, in the South Kensington Museum; by Herbert Simpson, 4, Queen's-road, Baywater, W. Price 3l. 3s. Prize of 2l.

No. 25. Painting on porcelain, after the same example as the above; by Miss E. Henwood, 18, Craven-terrace, Baywater, W. Price 3s. 3s. Prize of 2l.

No. 27. Painting on porcelain, ornament after Alderger; by J. B. Evans, Howard-place, Shelton, Staffordshire Potteries. Price 6l. 10s. Prize of 2l.

No. 28. Painting on porcelain, ornament after Alderger; by W. H. Slater, 7, James-street, London-road, Stoke-on-Trent. Price not stated. Prize of 3s.

No. 29. Painting on porcelain, ornament after Alderger; by Miss E. Henwood, 18, Craven-terrace, Baywater, W. Price 6s. 6s. Prize of 2l.

DIE SINKING.

No. 34. Die, sunk after a Woodeng medallion, in the South Kensington Museum; by A. Walker, 10, Alexandra-cottages, Fenge, Surrey. Price 7l. Prize of 3l.

EMBROIDERY.

No. 36. Work executed after an Italian altar frontal in the South Kensington Museum; by the Misses Emma and Henrietta Pfänder, 29, Bayham-street, Camden-town, N.W. Price 7l. 1st Prize of 5s.

SECOND DIVISION.

Specimens of the Application to Ordinary Industry of Prescribed Art Processes.

No. 40. Clock Dial, enamel painted, white ground and black ornament; by James Thwaites, 26, St. John-street-road, E.C. Price of 2l.

No. 42. Frame for a miniature, engraved and enamelled on metal; by Alfred Gray, 41, Brookley-street, Islington, N. Price 5l. 8s. Prize of 7l. 10s.

No. 44. Tablet, painted with enamel colours; designed and painted by J. B. Evans, Howard-place, Shelton, Staffordshire Potteries; modelled by James Griffiths, 14, Hartshill, Stoke-on-Trent. Price 5l. 5s. Prize of 6l.

No. 45-46. Champagne-glasses, with filigree in the cup, stem, and foot; by T. C. B. Barnes, 135, Camden-street, Birmingham. Price of 3l. for the exhibit of these and No. 121.

No. 118-120. Three champagne-glasses; by Joseph Leicester, 13, Toulon-street, Lambeth, S.E. 1st Prize of 7l. 10s. for the exhibit.

No. 50. Pair of book-covers, decorated by painting and varnishing on both sides, china tints on black ground; and gold ornament, on chromatic ground; by Charles Pfänder, 29, Bayham-street, Camden Town, N.W. Price 10l. 10s. Prize of 7l. 10s. for his exhibit, Nos. 50-53.

No. 58. An envelope-case, in various woods, enriched with carvings in low relief; by Edward T. Grove, 14, William-street, Regent's Park, N.W. Price 6l. Prize of 7l. 10s.

No. 59. Design for balcony; by G. Emms. Executed by J. Emms & Sons, 3, Prince-street, Union-street, Borough, S.E. Price when finished, 12l. Prize of 7l. 10s. for the exhibit of this and No. 76.

No. 60. Ditto; by William Robson and Henry Robson, 8, Park-terrace, Battersea Park, S.W. Price 7l. 1st Prize of 10l., and "North London Exhibition Prize."

THIRD DIVISION.

Articles sent in for Exhibition in addition to those in accordance with the Prescribed Designs and Processes.

METAL WORK.

No. 61. Mask, repoussé in copper, of one of the Laocoon Group; by G. Deere, 11, Hernes-street, Pentonville, N. Prize of 6l. for the exhibit of this and No. 62.

No. 63. Grotesque mask in copper; by Robert Tow, 36, Aldenham-street, St. Pancras-road, N.W. Price of 3l. for the exhibit of this and No. 64.

No. 68. "Hercules and Omphale," embossed in copper; by Joseph C. Day, Church-road, Tottenham, N. Price 10l. Prize of 2l. for the exhibit of this and No. 70.

No. 75. Inlay of German Silver in Copper, centre embossed in sheet copper; by A. Milward, 7, Hanover-street, Long-acre, W.C. Price not stated. Prize of 7l. 10s. for the exhibit of this and No. 74. Pierced ornament.

WOOD CARVING.

No. 76. Inlay in various woods, "Moses;" by W. Clayton, 125, Wardour-street, Oxford-street, W. Price 10l. Prize of 7l. 10s. for the exhibit of this and No. 77.

No. 81. Carved frame in lime-tree wood; by G. H. Bull, 16, Millman-mews, Millman-street, Guildford-street, W.C. Price 18l. Prize of 3l.

No. 82. Conventional frame, for gliding (unfinished); by C. McKezie, jun., 14, Bishop's-terrace, Walcott-square, Kennington-road, S.E. Price 5l. Prize of 3l.

No. 83. Oak bracket; by E. A. Brang, 64, Foley-street, Portland-place, W. Price 30s. Prize of 5l.

No. 85. Panel in birch-wood, for a sideboard door; designed and executed by William Matthews, Manor-street, Chelsea, S.W. Price 10l. 10s. Prize of 5l.

MODELLING IN PLASTER.

No. 93. Medallion (original), "Cardinal Wolsey;" by G. Morgan, 41, Pelham-street, Brompton, S.W. Price 1l. 1s. Prize of 1l. for the exhibit of this and No. 94.

No. 100. Wreath of Flowers; by T. Godfrey, 21, Chatham-road, Wandsworth-common, S.W. Price 2l.

No. 101. A North American Indian; modelled by A. Dufour, 10, Cranborne-street, Leicester-square, W.C. Price 7l. Prize of 3l.

MODELLING IN WAX.

No. 106. Ornament; by C. Jahn, 3, Egbert-street, St. George's-road, N.W. Price of 1l. for the exhibit of this and No. 107.

* This prize consists of 4l. 13s., the interest of 1874-75. 3d. Console invested in the name of the Society of Arts, to be awarded by the Council "for the best specimen of skillful workmanship," at the Society's Exhibition of Art-Workmanship.

CARVING IN MARBLE.

No. 102. Bracket; by Samuel Moudrie, 219, Stanhope-street, Hampstead-road, N.W. Price 6l. Prize of 3l.

CARVING IN STONE.

No. 116. Study in Tisbury stone, "May;" by J. R. Heath, 2, Tension-street, York-road, S.E. Price 7l. Prize of 6l.

No. 117. Corbel, in stone, with inlay of marble; by T. E. Jaco, 122, Vauxhall Bridge-road. Price 2l. 10s. Prize of 1l.

GLASS BLOWING.

Nos. 122-123. Two plain champagne-glasses, with twisted stems; by Eliph Barnes, 135, Camden-street, Birmingham. Price of 3l. for the exhibit of these and No. 124.

PAINTING ON PORCELAIN.

No. 125. Tea-service; designed and executed by Isaac Wild, at Sutherland Works, Longton. Price 13l. 10s. Prize of 6l.

No. 128. Head; by W. P. Rhodes, Newcastle-under-Lyme, Staffordshire. Price of 2l.

No. 131. Slab, "The Burning Heart;" by Miss L. Leila Hawkins, Fossil-villa, Belvedere-road, S.E. Price 5l. 6s. Prize of 2l.

No. 134. Tray; subject, "David the Psalmist;" by the above. Price of 3l.

No. 135. Fruit, after Hunt; by William Slater, Field-place, Stoke-on-Trent. Price 4l. 4s. Prize of 1l.

No. 139. Slab, an original design; by W. G. Fenton, 10, Chatham-street, Howard-place, Shelton, Stoke-on-Trent. Price 10l. Prize of 2l.

CAMEO CUTTING.

No. 140. Portrait of Dr. Billing, F.R.S., executed from life; by (name not stated), 37, Mornington-crescent, N.W. Price 16l. 15s. Prize of 6l. for the exhibit of this and No. 141.

BROWNE'S BEDE-HOUSE AT STAMFORD.

In the wide, busy open part of Stamford, known as the Beas Market, stands an ancient stone building of part domestic and part ecclesiastical Early Tudor architecture. This is Browne's Bede-house, or hospital, a charitable institution founded for the residence of a warden, confrater, and twelve old men, by William Browne, a prosperous merchant of Stamford, in the fifteenth century. It is built upon a bank by the wayside, and is therefore, considerably raised above the street line. The elevation towards the road consists of a long line of building, divided, as we shall presently describe, into two parts, having a large entrance-porch, with a wide, boldly-moulded archway in it, approached by a flight of many steps, and a room over it, at the west end. The division alluded to is formed by the western portion of the building, consisting of two stories, while the easternmost is occupied by the chapel, which rises to the full height. On the ground-floor, on entering by the porch, is a long wide corridor, running from west to east, having five doors on either side, which open into the small apartments of the bedesmen; and at the end of the corridor is the chapel, which is divided from it only by a transverse passage, leading to the terraced walk above the street, the easternmost side of which consists of an open oaken screen. Over the corridor and the bedesmen's rooms is a large venerable chamber, now called an audit-room, divided into two by an oaken half-timbered screen. Between the windows are carved projecting cornices, evidences that each wall-space was once filled with tapestry hangings; and some rich stained glass also bears witness to its former consecration. A long table, dated 1583, and a chest, 1629, are additional though later relics of old times. This upper room also once opened into the gallery of the chapel, though it is now partitioned off from it by a screen; so that it was possible, when convenience required it, that persons could witness the service in course of celebration below, without descending. Very rich and beautiful must have been the scene they looked down upon from this elevation. The windows of the chapel shone, as they still shine; with some of the rarest stained glass in the kingdom; and the bench ends of the stalls were carved, as well as the misericords, as we may still see. In the rear of this, the main portion of the hospital, is a cloister court, round which run chambers for the wardens and officers. From this enumeration of the features yet to be looked upon of the merchant's old charity, it will be seen that we have here veritable specimens of Mediaeval art-work of great value and interest, enclosed in a building of equal worth.

In the hope that this art-work may be preserved for those who come after us, we draw attention to the recent fortunes of the quaint and picturesque hospital. A few years ago it was deemed an improvement to remove the slope of the bank between the building and the roadway, to gain a little extra space for the farmers at corn-market, and to build in its place a retaining-wall, to keep the earth up. The

consequence of this ill-advised step was that the foundations have ever since given way, and great fissures appeared some time afterwards in the front elevation and towards the west end. As this was evidently only the commencement of the mischief, it was imperative that steps should be taken to put a stop to it. It will scarcely be believed that, in the present day, there were persons who were for demolishing the whole fabric; clearing it away, stick and stone; razing it to the ground, under the impression that an enlarged annuity to each bedesman, with liberty to lodge where he chose, would be a better mode of carrying out the founder's intentions of benefiting him; but, happily, there were others of a different degree of culture who thought otherwise, and whose tongues were weighty at the councils upon the decision of which the fate of the building depended. Finally it was resolved that the old men's rooms should be rearranged, for which purpose some apartments at the back only need be demolished, and the front of the hospital should be taken down only so far as the cracks, and be rebuilt, with the porch also, stone for stone; furthermore there should be a clock-tower added at the west end, and a house for the warden at the east end of the chapel which last part of the fabric should be held untouched.

The old place is now in the hands of the restorers. We plead for care and conservation, at all hands, at every step. Already buildings at the back have been taken down, and a token found by which we may know that those who went before us took some pains to preserve at least one item of antiquity, though the mode pursued was not one we should now hold up for imitation. Boarded up, in a cupboard of the warden's old house, was found a worm-eaten wooden alms-box. It is of a jar form, measuring 8½ in. in height and 16½ in. in circumference at the base, where it is larger than at the lid, which is slightly narrowed, with a neck. It is banded about with iron, and has a hasp box-lock, and a staple and loop to keep it fast to the wall. Similar alms-boxes have been noted at Harbledown and Nether Sollen. It is to be hoped that this one will be carefully used, and placed in some convenient position, where it will be, at the same time, out of harm's way.

It would be commendable in the highest degree if any of the ancient features we have mentioned should be removed. The venerable air of the upper chamber, with its cornices and screens, is beyond price; and even the Mediaeval names scratched upon the plaster-work of one of the partitions are a pleasant sight to the archaeologist, and might be spared. We shall help to give a realisation of the hoary charm of the place by transcribing the following lines, which are now to be read, painted on a tablet, upon one of the partition walls, and which are a translation, made in Stuart times, of the earlier Latin inscription, "An' Dom' 1495 An' Regis Henrici VII. Decis' :—

"THIS STRUCTURE NOW CONTAINS TWELVE HABITATIONS
WHAT STALLS REMAIN FOR FUTURE GENERATIONS
FOR OLD OR POORE OR WEAKE AND MEN UNHEALTHY
THIS BLESSED HOUSE WAS FOUNDED NOT FOR WEALTHY
MEN BUT ENDOWED FOR AID AND THIS HOUSE BUILT
BY THIS GOOD ACT RATH TO SINNE PARDOON YIELDED
THE MONK OF THE COUNTRY AND THIS TOWNE
ALAN NOW DEAD HIS NAME WAS WILLIAM BROWNE
BEE IT A HOUSE OF PRAYER AND TO DIVINE
DEITIES DEVOTED ELSE NOT CALLED MINE."

The chapel is equally, or still more, captivating. Every caution should be used that the matchless stained glass be not destroyed, and the rare carved stalls should be considered. In Leland's "Collectanea," Yorkshire is said to be "a full of knights," and "Lyncolnshe men full of might." Granting these last are as mighty as of yore, they can show but few things to compare with William Browne's "House of Prayer." Not that it remains absolutely intact as he reared it, for the original altar stone is now imbedded in the pavement. But the inlaid brass of the founder, in the Lady Chapel of All Saints' Church, near at hand, or that of John Browne, his father, merchant of the Staple of Calais, who is represented in a sleeved gown and mantle, standing upon two woolpacks, is not more quaint, and calm, and meet, than this old place. We trust we have said enough to impress its guardians with the wrong they would do should they suffer the removal, damage, destruction, sale, or barter of any of its component parts.

St. Saviour's, Eastbourne.—The Duke of Devonshire has given 1,000l. towards a fund for building a spire to St. Saviour's Church, Eastbourne.

PLANTS AS SANITARY AGENTS.

An interesting address on this subject was recently delivered in the Museum in Leicester by Mr. Ingram. After considering some of the causes which contribute their quota of dirt to the world, the reader thus adverted to those sanitary agents which are found in the vegetable kingdom, to which nature appears to have assigned the task of assimilating and reconvert- ing the matters resulting from the waste of the animal creation:—

The beneficial action of trees and shrubs in a town consists not only in the work the roots perform of removing decaying matter from the ground, but they effect a further good. Plants absorb carbonic acid, and give out oxygen; and as in towns the air is vitiated by carbonic acid and other products of combustion, the multiplication of trees, shrubs, and plants, large and small, increases the volume of oxygen, which is the vital principle of the air, and so adds to the salubrity of every street or square in which they grow.

Trees are not alike in taste or constitution. Adapted by nature to suit the varying circumstances found in the world, some thrive best in rich, others in a poor siliceous soil; some delight in a calcareous soil; others abhor it: hence all trees are not equally suited for planting in towns. Accustomed to the pure and freshening breezes of the mountain-side, some of the pines and firs fail to grow in an atmosphere not altogether pure. The cedar of Lebanon is a tree of wonderful adaptability, and should be introduced in the new plantations on the race-ground. The Wellingtonia appears to thrive everywhere, as does deodar and Lawson's cypress. Deciduous trees, with large woolly or hairy leaves, are not suited for towns; the particles of carbon that float in the air resting on the leaves, often destroy them. The smooth-leaved lime, the Oriental plane, the eucalyptus, elm, alanthus, chestnut, and acacia are amongst the trees best suited for planting in towns. The evergreen oak is a noble tree, and it might be planted experimentally. The aucuba, holly, lilac, laurastinus,—all do well in town gardens, and recent experience shows that many plants do exceptionally well, even in the smoke of great cities like London: the chrysanthemum is an example.

There are many climbing plants that, while they embellish a house, purify it, sending roots about its walls, where impurities are often found, and thus assisting to check all unwholesome exhalations; amongst which may be enumerated ivy, Virginian creeper, clematis. Fruit trees planted against the wall of a house do more than embellish it, although the vine is sufficiently handsome to grow even without hopes of fruit; it is one of the most valuable sanitary plants that can be employed; its roots travel far in search of the pabulum they love, and nothing is too gross for a hungry and healthy vine. What more striking illustration is wanted of the cunning alchemy of a fruit tree; who would dream, looking at this dry stem and those dry roots, that so wonderful a production as a luscious pear or a juicy bunch of grapes could be the vital result of their action.

We speak of the impurities of a town, and although the causes actually arise within it, the effects extend beyond its limits, and particularly when a river passes near, which has been made a common sewer. Towns are as often injured in sanitary respects by the accumulation of matters which have been permitted to increase around them as by internal pollution. The palliative immediately suggested by the proximity of low lands unenriched with sewage is heavy cropping. I would intersect the fields with trees, such as willows, poplars, and alders, abolish permanent meadows, and grow mangold wurtzel, turnips, beet, Italian rye grass, cabbage, and such quick-growing vegetables, and keep the land constantly cropped. The poor sandy wastes of Barking Creek, in spite of the counter predictions of Liebig, have, when irrigated by London sewage, grown wonderful crops of rye grass.

A remarkable instance of the power of plants to divert malarious exhalations was lately related to me. Washington Observatory, U.S., is situated in a deadly marsh: the observer's assistants were killed off wholesale. Sunflowers were sown all round, and the period of greatest luxuriance was about the time when fever was most rife; the happy result was that fever disappeared, the plants luxuriating on the poison that had killed the unfortunate astronomers.

Trees draw up from the depths of the earth

moisture that, charged with animal or other impurities, would otherwise appear in miasmatic exhalations; the moisture oxygenised by vegetable action is liberated into the air free from taint, and fit for human lungs. Trees present in their myriad leaves an immense evaporating surface, and the influence they exert on climate is greater than is commonly supposed.

However animate and instinct with life the outward or aerial development of a living tree may appear, its terrestrial action is not less interesting. Although we cannot see, we may imagine the eager progress of the roots in search of food, penetrating the dark recesses of the soil, or rising to the surface where the ground is warm and rich, or stretching wide, led by some wonderful instinctive power towards soil more congenial than it found near the tree. The root action of a tree is not only wonderful in the mechanical force it exhibits in feeding the hungry living thing it sustains, but in the power of selection and repulsion possessed by these functions.

It has occurred to me that trees or their roots might be employed as filtering machines about wells open to the suspicion of being tainted by the percolation of foul matters into the water within them; a network of roots round the well would probably keep everything of a nature calculated to render the water impure from passing in. Southey, in describing the Well of St. Keyne and the efficacy of its waters, gives us a good practical fact with his beautiful poetry.

As we have seen, vegetable life is stimulated by the application to it in the soil of the various waste and refuse substances, the wreck of humanity, the decay of animal matter, the results of the attrition of civilized life with the forces of the world. The solution of the question as to the disposal of the sewage may appear more practicable; we have hungry ground that might profitably be enriched by the waste of cities; we have plants, the produce of which might be increased by being fed on the same substances; but that obstacle to ponderable bodies, space, intervenes; the collection, transport, and distribution of manurial matters from our great cities to our hungry soils is surrounded with difficulties; but as these are great, so must our exertions be to overcome them.

The earth is ready to absorb and deodorise matters up to a certain extent. The plants are ready to seize the substance placed in the earth and prepared by it for their food. Let, therefore, the earth and the plant, as the means provided by nature, be employed both in town and country as far as practicable. The result will be purer air, better water, and enriched soil, that will give our teeming millions greater resources of food, which may be regarded more highly when it is considered the result of native skill, intelligence, and industry.

ARCHITECTURE AND POETRY.

A few weeks ago the council of the Institute of Architects made the mistake, as it seems to us, of allowing a paper to be read, and a discussion to take place, on the merits of an eminent living writer, Professor Ruskin.

Professor Kerr, in the course of the latter, said it is not always convenient to propose for discussion, in a society like this, the opinions of a popular writer; and it will be readily understood that no one could venture to carry the present subject into debate without considerable misgivings. In point of fact, this meeting can scarcely be called upon at all to give expression, either directly or indirectly, to its opinion. At the same time we may, I think, trust ourselves to consider generally the condition of things architectural, which is indicated by what the lecturer has laid before us. It seems to me that he has done well in advancing no criticism of his own. He has also done well, I think, in confining himself to the mere attempt to condense, as I understand him, into a short statement, the essence of the views of this eminent author, as developed at least in his earliest, and perhaps best writings. One could easily perceive, from the very tone of the lecturer, that he did not expect practical architects to agree in all respects, or even perhaps in many respects, with the theories which he was quoting. Indeed, as a practical architect himself, he could not but have felt, in the very process of quotation, how very limited was the extent to which such dramatic principles could apply to sober every-day work; and it is not unlikely that even Mr. Ruskin has often felt the same.

Now, I may venture to say that architecture seems to me to have been, during the last generation or two, very much overriden by theorists; and what I would now endeavour to do is to examine the position of Mr. Ruskin, as the last and most popular of these. The position which he occupies is, in fact, one which has been arrived at by a direct and intelligible process; and this process it may be interesting to trace.

Some of our seniors remember, and all of us know, that less than fifty years ago the dilettanteism of classic antiquarianism was supreme in architectural criticism. Everything in design was referred to certain more or less authentic precedents derived from the works of the ancient Greeks and Romans. Direct copyism, therefore, was not merely authorised, but universally inculcated. Every "attempt at originality," as the phrase went, was met literally with these very words:—"Where is your precedent from the ancients?" We may consider this absurd. But, at any rate, it was an absurdity so firmly established as to be deemed impregnable for ever.

We now see that it was impossible for such a romantic principle to remain absolute for any great length of time, without at all events undergoing some material change. Accordingly before long it was found that a certain other romanticism had been gradually creeping into architectural learning, springing out of the same kind of admiring contemplation, not of the classic ruins of Greece and Italy, but of the Gothic ruins of our land. So in course of time, very slowly (we are seldom sufficiently alive to the fact that our Mediæval revival has been at this moment a whole century in progress,—thus swiftly does time move); very slowly, I say, and by imperceptible degrees a new kind of copyism arose—for Mr. Ruskin himself, with all his advocacy of Gothic architecture, is decided enough, I believe, in the language he uses with respect to this mere transfer of copyism from one field to another—a new kind of copyism arose, and every day gained ground, until the first was ultimately overthrown; but overthrown, be it observed, by nothing more elevated, or more elevating, than the precisely similar practice of the second. If, therefore, the theories of academic classicism had ridden architecture hard, those of the archaeological mediævalism had come to be no less oppressive. Then came another kind of romanticism into view, which under the name of Ecclesiology acquired a distinct character and definite demands, becoming indeed a potent influence, and almost profound science. Suffice it to say upon this delicate point, that it is well known how deeply many of the best of us have deplored the embarrassment into which the theories of the ecclesiologists in their turn have led architectural practice during the last twenty years,—triumphant as they are, indeed, at this moment. But this is not all: at the next step, new theories of the picturesque were introduced, and, apart from both archaeology and ecclesiology, took their place in architectural criticism. Many writers, thinkers, and designers in architecture have been very glad to dwell upon this element of the picturesque; and if they have gone too far, professing it to be the one essence without which architecture is of no value, there is certainly something of genuine art in the sentiment, compared, with which the copyism of antiquarians and archaeologists, and the formulae of ecclesiologists, all alike fail to satisfy the intellect. At all events, here we have one more step in our march of theories.

The last step which seems to demand mention is the introduction of the theories of the poetic. Here, at last, we come to Mr. Ruskin. He is neither more nor less than the high priest of a faith which directly identifies architecture with poetry; and this for the first time in artistic history. Other writers enough have given us sentimentality and rhodomontade; but it is this writer alone who yokes together intelligently, and intelligibly if such a thing were possible, the shapeliness and unshapeliness—both loved alike—of building, with the figments, frenzies, paradoxes, and pangs unutterable, of the poetic soul. Such, then, being Mr. Ruskin's position, what has he up to the present moment made of it? Our lecturer has laid before us, from perhaps the best of his works, a pretty complete system of his principles; but what do they amount to? We cannot say they are canons of architectural criticism; we cannot say they are precepts of architectural practice; all we can say is, they are wayward architectural dreams. We listen, some of us charmed, some mystified, some amused, all

astonished,—fortunately none offended; but I fear none in any way edified. We perceive a certain sensation in the mind of having listened to a piece of masterly music thoughtfully and often powerfully rendered, but beyond its own utterance useless. When we are called upon to accept Mr. Ruskin's definition that Architecture is Uselessness, let him not be offended if we put it thus, that this architecture of his is most emphatically useless.

I would not detract, however, from Mr. Ruskin's eminence in his own particular field; and I do not know that he himself has ever claimed the merit of any direct practical teaching in professional architecture, as some suppose. Indeed, I fear those of us who assign to him so high a place in architectural criticism and in the advancement of architectural knowledge and skill, are only doing with him as he did with Turner, who is said to have declared himself all unconscious of the possession of those abstruse merits which the Oxford graduate so elaborately discovered. It is very likely that Mr. Ruskin himself is much less ambitious than his admirers profess to believe him to be. But, taking him as a charming writer, and, as I have said, Priest of the visionary Poetry of Architecture, we will every one of us I am sure be most willing to assign to him a high place. In amusing the public on architectural ground, in gilding brick and mortar with glowing words, no one can compete with him; but, as practical men, we must not forget, or permit others to forget, that when he brings to bear upon a subject so familiar to us that kind of thought and expression which is significantly called "word painting," he is using the most treacherous of all possible argument, fair and false, fascinating to the uninformed, but utterly uninstructional to the initiated, and always dangerous to the young. I am most anxious not to say a word unjustly: I would not turn upon such a writer and challenge him to take pencil in hand and show what he means; I do not admit that he takes such ground as to entitle us to appeal to that otherwise infallible test; I prefer to allow him to say all he pleases, reserving only to myself the assurance that he desires to keep within rational and respectful limits; but I think it is at the same time most important that we should prevent it from being understood by the public at large—who look to us for common sense and not for poetic passion,—that we architects are the admirers of this writer which we are often supposed to be. Give him all praise and approbation for his manly eloquence, his gracefulness of thought, his intensity and unimpeached honesty of purpose, and for his bold critical whimsies, the more vague the more suggestive, as all dreams are; but let it not be said that he is to be recognised as an architectural teacher. Mr. Ruskin is an honorary member of this Institute, and this shows the appreciation in which we hold him. We do not discourage his efforts; on the contrary, we honour them, but this is enough.

There is no doubt a certain definite philosophy which Mr. Ruskin develops in his studies of criticism (for this, I think, is the proper phrase); but it is never purely architectural—indiscriminately artistic, perhaps, and dramatic,—but never anything like an æsthetic system. For instance, it must have been frequently observed in what the lecturer read to-night that although there was something that bore on the face of it the appearance of æsthetics, yet when it came to an issue it proved to be not æsthetic after all, but romantic, and quite illogical. When Mr. Ruskin says there can be no architecture without building, and no good architecture without good building, this, as a general statement, is one which, to his mind, as an uninitiated person, may be eminently suggestive of what may appear to be important truths; but we, who know what building is,—he not knowing it,—can see nothing in the proposition but the vaguest commonplace, to which he could not by any possibility attach any real meaning in detail. The suggestiveness is not that of æsthetics, therefore, but that of poetry,—and indeed of paradox, if we revert to the leading axiom, that architecture is uselessness. So in the whole of the propositions which the lecturer has quoted, some apparently sound, and some apparently unsound, there are no really sound æsthetic canons, but only exercises of the poetic fancy. And why should poetry be brought thus to bear upon architecture? At the best it can be little more than a play upon words,—the suggestion of that which may be a fact by the assertion of that which must be a figment; and Mr. Ruskin, as a poet confessed, can never be

expected,—and it is in vain for us to demand it of him,—to condescend upon plain intelligible statements involving practical architectural principles. Let us look, therefore, at this great writer in that particular view, and I think we do him far more honour, and assign to him more creditably his proper place in the economy of architectural study, than if we thoughtlessly accede to a mere compliment of courtesy by which he is made to appear to be a great teacher of our art. I hope Mr. Ruskin will yet do great service to other art; but I have no hope of him in architecture. It is too complex a thing in detail, and too commonplace in practice, for any such passionate wooing as his. When we congratulated him in this Institute not long ago on his appointment to an important professorship of art, we did so cheerfully enough; and we may cordially believe that in fulfilling the duties of his appointment he will be able to work out some important principles of art; but I for one can only hope that he will say less of architecture than of other arts. There is a great field open to such a thinker and such a writer in sculpture, painting, and the minor delineative arts; but architecture had better be left to other, not abler, but more practical hands. I think Mr. Ruskin has not written much on architecture lately. We have heard that he speaks even disparagingly of his own writings. A German philosopher says, "We are very near waking when we dream that we dream;" so also let us say that Mr. Ruskin has come all the nearer to correct principles of architectural criticism when he mistrusts his own writings. I will not say that he has done damage to architecture; but I must ask leave to say this, that if he will consent to devote the great powers bestowed upon him by nature to the development of poetic principles in arts of the more poetic sort, he will do more for the promotion of his own mental enjoyment and the public benefit than by random efforts in respect of that undoubtedly great and fascinating art which we who know it best, know to be nevertheless confined, as respects its poetry, within narrow limits.

STREET ARCHITECTURE IN BRADFORD.

THE example set in London, Liverpool, Manchester, Leeds, and other large towns, of erecting large establishments for the purpose of carrying on the various departments of the retail drapery trade, is now being followed in Bradford. The local *Observer* lately recorded the completion of a large building erected in Westgate for this purpose. Another firm is about to be dislodged from premises they have long occupied in Market-street, by the improvements about to be effected in this quarter by the corporation, in the widening of Market-street and the continuation of Ivegate. The firm have decided to rebuild, and plans have accordingly been prepared by Messrs. Knowles & Wilcock, for the construction of a new building for them.

By an exchange of land with the corporation, a square plot, with an area of 71½ square yards, has been secured, partially that occupied by the present premises, and situated at the junction of New Ivegate with Market-street. The building to be put up on this site will have two fronts—to Market-street and to New Ivegate—each over 80 ft. in length. The building will rise to a height of 54 ft. above the street level,—an elevation that will enhance its appearance all the more, inasmuch as the width of Market-street at this point will be 60 ft., and of New Ivegate 42 ft. The building will have five floors, exclusive of the basement. The whole of the fronts will be of the finest ashlar stone, and the style of architecture adopted is of an expensive and elaborate character. Massive rusticated piers, placed between the windows on the ground floor, will support the first floor, the windows of which will have pilasters with caps and bases. In the third and fourth stories, the windows will be arched. The main entrance to the premises will be at the angle formed by the junction of the two fronts. There will be an Ionic column on each side of it, and the decorations will be carried upward to the roof, where there will be a balustrade, with ornamental finials. The building will be warmed by hot water circulating on the different floors. The back portion will be lighted by a well, about 29 ft. long by 22 ft. wide. The whole of the interior will be supported on ornamental cast-iron columns. The contracts for this structure have been let to the following persons:—Mr. Thomas Burnley, mason; Messrs.

Booth Illingworth & Son, joiners; Messrs. J. Cliff & Co., ironfounders; Mr. James Keighley, plumber; Mr. James Smithies, slater; Messrs. Thos. Cordingley & Sons, plasterers.

Another addition to the shop architecture of Bradford is being made by Messrs. Watson, Brothers, who have now nearly completed an addition to their shop in Well-street, which will give up a large and lofty block at the junction of Market-street and Well-street to the purpose of their extensive business. The addition is being carried out under the architectural supervision of Messrs. Andrews, Son, & Pepper. The building is of four stories and basement, and when completed will have a total frontage of 120 ft., the new portion being 86 ft. in length. The style of architecture is Italian, and is to be of a character to correspond with that of the old front. Over the angle of the building intersecting Kirkgate and Market-street a circular tower is to be erected, rising 83 ft. above the ground. The whole front of the building is constructed of cleaned ashlar walling, and the shop front is formed of an ornamental wood frontispiece. The kitchens are placed in the top story, in order to prevent any disagreeable smell from rising into the working portions of the shop, and hoists are fitted up connecting them with the several other floors, for the conveyance of kitchen necessaries, &c. The whole premises are to be fitted up with heating apparatus. A great portion of the old property had had to be pulled down in order to the formation of an open area in compliance with the requirements of the corporation bye-laws.

LECTURES OF THE CAMBRIDGE SLADE PROFESSOR OF FINE ART.

In the inaugural lecture delivered last week in the Senate House, Cambridge, Sir M. D. Wyatt said, abroad, in France, Germany, Italy, and even in far away Russia, the fine arts had long ago received every encouragement from the proper authorities, whilst in England the deficiency had been supplied simply by the native energy of the student; and if that alone, without any civilisation, had achieved so much, what was there that might not be expected when talent was to be fostered and encouraged in the two principal seats of learning by such a noble benefaction as that of the late Felix Slade? The specific subject of his present discourse would be an examination of and attempt to reply to these three questions:—

1. What is fine art?
2. Why should fine art be studied?
3. How should fine art be studied?

In reply to the first of these questions, Sir Digby Wyatt traced the gradual development of art historical, from the savage to the civilised man, and the results of association in the establishment of historic style. He referred to the identity in principle of the creation of God's and of man's most perfect works, and the indispensability of shaping the latter in emulation of the former.

In discussing the second question, he assigned as first reason the sense of delight such studies confer on man; he found a second reason in the spirit of gentleness and refinement which follows as a sequence of art culture; a third he traced in man's instinctive desire to create and call into permanent existence forms of beauty conceived by his imagination and fashioned by his hands. A fourth reason why art should be studied was, he thought, to be recognised in the fruit such study bears to national importance; by such study alone, he added, man really learns how to see, and enjoys the beauties of nature with a new and quickened organisation, and so long as art retained its universal and perennial interest, so long must it retain its hold upon man's affections. Whilst dwelling on this portion of his subject, the lecturer introduced the imaginary dialogue between Phidias and Archimedes, in which the latter dwells upon the glory and benefits that would result from the erection and decoration of a series of buildings which should illustrate the triumphs of the country in arms, in arts, and in civilisation. Happy the country worthy of such illustration, which had artists capable of executing and people capable of appreciating it. He concluded his treatment of this part of the theme (how art should be studied) by dwelling upon the privileges and responsibilities which accumulate upon the artist as the fruits of such studies. They must, he said, study art unceasingly, laboriously, unselfishly, comprehensively, and conscientiously; for Art only granted

other rewards to those who, by constancy in the pursuit, proved themselves worthy of them. By investigation so conducted they would receive great benefit, and that benefit they should endeavour to extend to others, whereby the recipients would be all the richer, and the donors none the poorer.

In turning practically to the question of "How should art be studied?" the lecturer showed the dependence of any answer to that question upon a realisation of the initiative and constitutional nature of abstract and applied art. Having defined the leading conditions of these, and made manifest the extent to which they pre-determine, as it were, the limitations of practice, he observed that the first step towards successful practice consisted in the education of the eye; the second, in the education of the hand. The first efforts necessary for the education of the eye he regarded as the analysis of, and consequent power to re-constitute, complex form. Such forms he attempted to classify, and to exhibit the various modes in which they became visible, tangible, and reproducible through the contrast of light, shade, and colour. He dwelt upon the endless variety existing in nature, and susceptible of reproduction in art, as well as upon form as expressive of function, and the just expression of function as arbitrarily determining form.

THE SEWAGE QUESTION.

Leeds.—This town has made a large main sewer, emptying itself into the Aire about a mile below the town, but it now finds itself restrained from using it. This is the effect of a decision just given by Vice-Chancellor James. The decree will not begin to take effect till the last day of the next session of Parliament. It is expected that before that period arrives a general measure on the subject of rivers pollution will have been passed.

Rotherham.—The state of the Don, and the possibility of getting the attention of the Rivers Pollution Commissioners directed to it, has been the subject of remark at a meeting of the Rotherham Local Board.

A Sewage Case in Chancery.—Vice-Chancellor Malins has delivered judgment on an information preferred by a millowner against the Local Board of Bishop Stortford, calling upon the Court of Chancery to restrain the Board from permitting the sewage of the town to flow into the river Stort, so as to create a nuisance. The plaintiff's witnesses complained that the river was in such a state that fish could not live in it; animals could not drink the water; and that "it had been converted from a pure and pleasing stream into a foul and filthy sewer." The Local Board tendered evidence contradicting every material allegation made by the plaintiff. The Vice-Chancellor said it was of the highest importance that the Court of Chancery should interfere where a nuisance had been created, but it was of equal importance that it should exercise its jurisdiction to stop those who came into court with a trivial charge. He was satisfied that the allegations of the plaintiff were grossly exaggerated and utterly untrue, and he therefore dismissed the bill, with costs against the plaintiff, who had set the Attorney-General in motion.

THE TRADES MOVEMENT.

Glasgow.—At a recent meeting of joiners on strike in Glasgow for the nine-hours day's work, it was stated that thirty-eight employers had acceded to the full demands of the men. It was reported that there were upwards of 920 men still on the strike-roll, the others who had gone out having succeeded in getting employment elsewhere. The meeting seemed to be unanimously of opinion that the full demands of the men should be prosecuted, and arrangements were made for continuing the movement, as also for bringing out a number of outside foremen and others who remained at work under the ten-hours system. It was agreed that, as the request for a conference with the masters had not been acceded to, the resolutions formerly passed should not presently be brought before a general meeting. In course of the discussion an opinion was freely expressed that though a conference with the masters regarding the bye-laws, &c., might be advisable, there was no necessity to confer as to the present demands of the men, as they were determined to persist in their original request. At a meeting of the master joiners, Mr. James

Henderson presiding, the proposal of the operatives to hold a conference for the purpose of framing a code of bye-laws for the trade was considered; and it was agreed to state, in reply, that the "masters are quite satisfied with the present bye-laws of 1866, and therefore decline a conference on the subject."

Edinburgh.—At a general meeting of the joiners, a deputation from Glasgow having made a statement as to the present position of the dispute there, the following resolutions were unanimously adopted:—1. "That this meeting, after hearing the statement made by the deputation, approves of the position taken up by the joiners of Glasgow in their efforts to shorten their hours of labour to nine per day;" and 2. "That this meeting, being convinced of the importance of the joiners of Glasgow reducing their working hours to nine per day, and believing that that object can only be achieved by the firm and decided action of the whole trade, resolves to raise subscriptions at once for the support of the non-union men."

SCHOOLS OF ART.

The Cirencester School.—The annual distribution of prizes in this institution took place at the Corn-hall. An address was delivered by Mr. T. S. Bazley, of Ighiteop Castle, who also presented the prizes. The attendance was not very large. The committee's report stated that the classes are still self-supporting, and that there has been a slight improvement in the second grade, though the students have been less successful in the third-grade examinations, and the schools for the poor also show a falling off in proficiency. They point to a considerable amount of sound steady work which the school is doing, and acknowledge the unremitting labours of the art master; but still they regret to see that the advantages offered by the evening classes are not sufficiently appreciated by the working men in the town.

The Dublin School.—The annual meeting of the Royal Dublin Society for the distribution of prizes in the Art School, has taken place in the theatre of the society. As on previous occasions, the Lord Lieutenant (who was accompanied by the Countess Spencer, and attended by several of the staff), presided. The attendance, including ladies, was very large. Mr. Mansell said that for the 140 years the school had been in existence it had sustained that reputation for taste which belonged so essentially to the Celtic race; and in the recent contest for the Princess of Wales' Scholarships, open to the entire United Kingdom, they had carried off in two successive years one of the two prizes, the other going to South Kensington. Colonel Adamson said the efforts of the committee during the past year had been principally devoted to an endeavour to extend art education amongst the lower classes. They had extended facilities to the artisans, of which there had been nearly 500 attendants at the school. They had used every effort to obtain the formation of a museum of ornamental art. By the kind assistance of Mr. G. A. Hamilton, an amount had been put on the public estimates which would enable a museum to be built adjoining the school, and which they trusted would receive the formal approval of the Chancellor of the Exchequer and of Parliament. They had great reason to be proud of the designs executed by the pupils for manufactures. They were anxious to utilise these by having them deposited in a depot for such designs, which it was proposed to form for all the art schools of the United Kingdom. The conduct of the pupils was admirable. Although belonging to different grades and different religions, they worked harmoniously together. Colonel Adamson then spoke of the energy and zeal of Mr. Lyne the head master of the School of Art. The report stated that the attendance of students during the year has been 538, consisting of 279 males, and 259 females. The attendance of the artisan class has been 356, consisting of 259 males, and 97 females. The total receipt in fees amounted to 510l. 9s. 6d. The local examination of the school took place on the 9th, 10th, and 11th days of March, in the evening, when, notwithstanding the inclemency of the weather, 169 students presented themselves; 105 of whom, 64 males and 41 females, succeeded in passing examinations in 151 papers; consisting of 52 freehand, 40 practical geometry, 24 perspective, 32 model drawing, and three projection. The report of the judges of the works executed in competition for the Society's prizes, spoke of the satisfactory

progress of the school, and also complimented the master.

The Marylebone and West London School.—At the distribution of prizes to the students of the school in Portland-road, Mr. Peter Graham presided, and delivered a suitable address. He congratulated the students upon the success of the school, and he complimented the masters for the exertions they had used in promoting that success. He then referred to the great influence of art education upon the manufactures of the country, and expressed his astonishment at the apathy shown by the manufacturers of the district, the majority of whom did not contribute to the support of the school, and he trusted they would by their future support make up for past deficiencies. Mr. G. A. Stuart, the head master, then read the report, from which it appeared that during the past year 479 students studied in the school, showing an increase of ninety-eight over the previous year, and in that number twenty-five different trades were represented. During the year, 271 students sent 1,999 works for examination at South Kensington, of which number the works of seventy-six students were marked satisfactory, nineteen received book prizes, four honourable mention, twenty works were selected for further "national competition," and four received Queen's prizes of books. The national competition prizes were awarded to J. Rowley, G. Lethbridge, H. Noble, and E. H. Simmonds. In the ladies' competition in designs for fans, Caroline Pfander obtained honourable mention, and her design was purchased. The chairman then distributed the various prizes; and upon the conclusion of the distribution, a handsome time-piece, subscribed for by the students, was presented to Mr. W. Pilbrow, who is about leaving the school.

The Warrington School.—The annual distribution of the prizes won by the students has taken place. There was a large assemblage, chiefly ladies. The report stated that—

"the number receiving instruction in drawing in or through the agency of the school, during 1869, has been 323, showing an increase of ten since last year. This number includes 187 students of private schools, and 136 students who had attended the Central School, from whom 1321, 11s. 6d. have been received. The total amount of fees show an increase of 3l. 6s. 3d. over the sum received last year. The attendance at the classes has been:—Day classes, eighty-six students, who have paid 1l. 1s. and 12s. 6d. per quarter, and 1s. 2s. 3s. per month; total, 133l. 17s. 6d. Evening classes, fifty students, who have paid 1s. 2s. 3s. per month, and no entrance fee; total, 38l. 14s. The school received three Queen's prizes of books at the National Competition, in addition to which seventeen third-grade prizes of books were awarded to students whose works were sent up for inspection; and seven second-grade prizes were awarded at the local examination; fifty-four students sent 317 works to the annual examination in London. Payments were made on account of the works of thirty-nine artisans. The public examination of the school took place on the 9th and 10th of March, at which eighty-five persons presented themselves for examination, of whom forty-two were successful. An exhibition of the students' works took place in April, and was attended by 1,723 visitors."

PREMIUMS AND MEDALS OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute, held on Monday evening last, Mr. Charles Barry in the chair, it was announced that the president, Sir Wm. Tite, M.P., had presented a donation of 100l. to the travelling fund of the Institute, which was established several years ago in order to afford help to students travelling in pursuit of their professional studies. A letter from Professor Ansted was read, in which that gentleman tendered his services to deliver occasional lectures before the Architectural Art Classes now in course of formation, under the auspices of the Architectural Association and other cognate bodies, and in aid of which the Institute has voted a sum of 50l. from its funds. The thanks of the meeting were voted to Sir Wm. Tite and Professor Ansted.

Mr. Herbert Ford, of Aldermanbury, and Mr. Charles Smith, of Reading (Associate), having been elected Fellows, the meeting was made special "to consider the recommendation of the Council with respect to the award of the Royal gold medal and other medals and prizes of the Institute for the year 1869-70."

The Chairman having read the recommendation of the Council that the Royal gold medal be awarded, subject to her Majesty's gracious sanction, to Mr. Benjamin Ferrey, F.S.A., member of the Institute, Mr. T. H. Wyatt, after referring to Mr. Ferrey's long and honourable professional career, proposed, and Mr. J. H.

Good seconded, the approval of the recommendation of the Council, which was adopted in the most cordial manner.

The other medals and prizes were awarded as follow:—
 Soane Medalion, with 50s., under certain conditions (design for Railway Station in the Gothic style), to Mr. Ernest C. Lee, of Great James-street, Bedford-row; successful competitor for the Pugin Travelling Studentship for this year, and winner of the late Sir Francis Scott's Prize two years ago.*

Institute Medal, with 5 guineas, in the competition for drawings, to Mr. R. J. Hunt, of John-street, Adelphi.
 Medal of Merit in the same competition, to Mr. A. HUI, of Cork.

Institute Silver Medal, for Essay, to Mr. J. Huskisson Guillaume, of Marlard-place, Southampton.
 Student's Prize, in Books, to Mr. Adolphus Came, of Great James-street, Bloomsbury.

For Sir W. Tite's Prize, no drawings of sufficient merit were sent in.

The list of subjects for the medals and prizes of 1870-71 having been discussed and agreed to, the meeting adjourned.

ARCHITECTS' BENEVOLENT SOCIETY.

THE annual general meeting of this society was held on Thursday, the 10th inst., at the Rooms of the Royal Institute of British Architects. In the absence of the president (Mr. Sydney Smirke, R.A.), Mr. Geo. J. J. Mair took the chair.

The report of the council, read by Mr. J. G. Turner, showed that since the efforts made some time since to enlarge the means of the society, twenty-eight new members have been added to the list of subscribers, besides the augmentation of the funds by various liberal donations. Unfortunately, owing to the depression in all branches of art, applications had been considerably increased in number; and, therefore, the special efforts before alluded to had been most opportune. The report further went on to say that many of the early friends and liberal donors to the society had, during the last twelve months, been lost to it through death; and it concluded with an appeal to all its members not to allow their efforts to languish, but to pursue the good work on which they were engaged, thankful that they themselves were spared and able to carry on a task which they knew full well to be a becoming and a worthy one,—viz., that of assisting those who were helpless, and encouraging those who were unfortunate.

A discussion then ensued as to the best means of recruiting the subscription-list, in which Messrs. C. F. Hayward, Edwin Nash, and C. Mayhew took part, and during which it was elicited that the number of the subscribers to this society did not by some hundreds amount to that of the Royal Institute of British Architects; and that many distressing appeals for assistance were very inadequately responded to by the council, through the want of funds at their disposal.

Sir William Tite's account (the treasurer's) for the year showed—

Total receipts	£419 13 11
Disbursements,—	
Expenses	£107 6 4
Invested	11 0
Gifts to applicants	150 0 0
	345 16 4

Leaving a balance in hand.....£73 17 7

The sum of 107l. 6s. 4d. expenses included cost of special appeals to the profession.

The amount received by donations in about twenty years, and invested, amounted to 1,557l. 1s. 3d. stock.

The election of council and officers and other routine business was then proceeded with, and various votes of thanks were passed.

"MEMORIALS OF TEMPLE BAR."

SIR,—I thank you for your notice of my little volume, and have to acknowledge the justness of your remarks as to the crowded nature of its contents. My apology is conveyed in the preface to the book,—a "desire to give as many facts in a cheap and collected form, so as to be within the reach of every citizen of London."

May I ask a small space to correct a slip in your notice—trifling, yet of interest. It was Lord Bellasis, not Bellagres, who was appointed to the command of the guard-post at old Temple Bar at the time of the Fire of London. Though he deserted his post here, he was, nevertheless, a trusted officer in the service of the First Charles, sharing the troubles of the Civil War, and receiving many appointments of great trust. He was at various periods Governor of York, Newark, Tangier, and Hull; Lieut.-General of Yorkshire; eldest Colonel in the Twelve Regiments of Volunteer Noblemen in the second Dutch War; and yet did not escape having to fight a duel in the Marylebone fields, in the cause

* The drawings marked "N. B.," sent in for the Soane Medalion, are so good that we should have been glad if the council had awarded some recognition.

of the beautiful wife of the jealous Earl of Carlisle, a daughter of Edward Lord Howard, of Bewick. He was no less than four times sent a prisoner to the Tower, and only escaped by the merest chance the Tower-hill scaffold for a supposed hand in the Tins Oates plot. His head was much nearer to Temple Bar than then his body should have been some years previously. He served each king in offices of trust, assisted to restore Charles II., and eventually was appointed by his successor, James II., a Privy Councillor and First Commissioner of the Treasury. He died September 10th, 1689, and was buried in the churchyard of St. Giles-in-the-Fields. This notice of a remarkable character I trust you will not consider worthless, especially as it is derived from the Birch MS. 4162, in the British Museum, fo. 74-84,—*"A Brief Relation of the Life and Memoirs of John, Lord Belaysay, written and collected by his Secretary, Joshua Moore."*

As for the "Memorials of Temple Bar," I assure you my materials are not exhausted, and I yet entertain a hope to bring out, some time hence, a more creditable history of a remarkable London building, and a world-renowned City street.

T. C. NOBLE.

ARCHITECTURAL ART CLASSES.

THE arrangements for opening the classes at the Architectural Museum, are progressing; but subscriptions are needed.

All students of architecture and the cognate arts will be eligible for admission.

The meetings of each class will be divided into two sessions of four months in the year, commencing with the opening of the Architectural Association.

The Course will consist of the following classes:—1. Drawing from the flat and round; 2. Drawing from the life; 3. Modelling; 4. Colour decoration; 5. Water-colour drawing; 6. Perspective and sciography; 7. Architectural drawing.

Admission is to be by separate fees for each course, proportioned to the expense of the class, and as moderate as circumstances will admit.

"ARCHITECT, BAKER, AND DEALER IN CHAFF."

SIR,—What is the profession coming to? In a Horney paper I find advertisements from a firm, call them Stitches & Co., setting forth,—first, that they are architects and surveyors, and that the plans of a chapel they are about to build may be seen at their office; then that they are auctioneers, and have "the following valuable property to sell." Anon comes the announcement that they deal in "bricks of every description, slates of all kinds, chimney-pots, gravel, garden mould, paints, oils, and colours." While, lo and behold! elsewhere they advertise that they are really "bakers, confectioners, corn merchants, and dealers in chaff."

I enclose the various advertisements, or you will scarcely believe that I am not a dealer in chaff myself.

PRODIGIOUS.

BIRMINGHAM FREE ART GALLERY.

AN instructive little catalogue has been written of the objects of art and art manufacture in the Birmingham Free Art Gallery: it is calculated to increase the interest with which the collection will be visited. The writer contends with justice that the abuse which has been heaped wholesale on the ornamental manufactures of Birmingham, may be traced to the absence (until recently) of any collection of objects calculated to increase and cultivate the aesthetic faculties of its artisan population. The absence of such means of education has been dearly paid for locally, and has cost more in the aggregate than the maintenance of a dozen art galleries.

An appeal is made for the distribution of the superfluities of the National collections. It has been shown, as our readers know, that these would suffice to form several collections of works of art for distribution in the provinces. On the 19th of July, 1869, on the occasion of the vote for the educational supplies being put in "the House," in answer to a question asked by Lord Henry Lennox respecting the distribution of the superfluities of the National collections, a reply was given by a Lord of the Treasury, "that two collections of Turner drawings had been chosen, and would be established in Dublin and Edinburgh." The provinces were passed over, and will

be, until united action be taken by members of Parliament, and a band be formed by them to demand from the Lords of the Treasury the immediate selection of the superfluities from the National collections, the formation therefrom of one collection, its division, and the distribution of the parts to localities, in order to aid the public generally, and the art and special industries practised in each. In this way alone can strict justice be done as regards the proper distribution of works of art to provincial free art galleries, that of Birmingham being specially included.

PROFESSOR SCOTT ON ARCHITECTURE, AT THE ROYAL ACADEMY.

LECTURE II.—continued.*

WE have now arrived at a stage of our investigation when we must pause for the sake of asking ourselves what need or requirement yet remained unsatisfied, which was essential to the perfecting of our arcuated developments, and what means remained—hitherto unused—by which such need might be met.

We have followed out our arched construction, and the process by which it was rendered at once susceptible and productive of artistic beauty, till we might fancy it to need nothing but the gradual additions of refined art to render it a perfect style; and it would be both an interesting and a profitable field of speculation to take up the style at such a point, and to study how best to clothe it with the charms of the highest art, irrespective of our knowledge of its historical destiny; how, in fact, to perfect our round-arched style to the highest and most refined artistic status: and I feel that any one who could fulfil such a task would be a benefactor to our art.

The semicircle is unquestionably the typical form for an arch, and one well suited to the majority of purposes and positions. I, therefore, wish well to him who will push a style which claims it as its leading element to its highest possible pitch of perfection. I should rejoice to see a round-arched style rendered as perfect, and its accompanying art as noble, as the Greeks did their treabated architecture and its ever-glorious sister arts; nor do I see why such an end should not be attained, and God speed the man who worthily attempts it!

This task was, in fact, notwithstanding unconsciously approached by the artists of the twelfth century; nor can any one examine their works, particularly from the close of the first quarter of that century, without being filled with the warmest admiration at their determined strivings after refinement; their earnest aim to perfect every form, and to eliminate every footstep of barbaric element; to rid their work of all rudeness of execution; and in every way within their reach to raise the architecture they were developing into a really high art.

These earnest and restless strivings, however, had the effect of rendering apparent to them a defect, both structural and artistic, in the conditions prescribed by a round-arched style. They had freed themselves from the trammels of the arbitrary rules of proportion, and might render their structures lofty or the reverse at pleasure: their columns might be as short and sturdy as the most archaic Doric, or might outdo the most elegant Corinthian in the lightness of their proportions; yet the arch they were condemned to carry was limited in height to one-half of its own diameter; or, if allowed to exceed this, by means of silting. This was evidently but a clumsy expedient, and only suited to particular positions.

The whole tendency, too, of the onward movement of the art was towards increased height; and, while walls and pillars might avail themselves to the full of this upward striving, it was hard that the arch—the very essence of the style—should be condemned to unalterable stuntness. Proportion evidently claimed that the arch should have its fair share in the increasing height of the buildings, yet the inexorable semicircle said,—*"Nay; my proportions are fixed. You may lengthen your straight lines as you please; but by no law of science can my height exceed one-half of my width."*

A geometrician might reply that the semicircle might be stretched upwards into a semi-ellipse with its major axis upright. I do not think that our Medieval builders ever tried this dismal experiment, nor do I know that it was ever attempted, except by the barbarous Par-

* See p. 189, ante.

thians, in a building you will find figured in Mr. Fergusson's Handbook; and so hideous was the result that one may well suppose it to have been handed down as a warning to subsequent generations!

Nor was this craving after a loftier arch the result of taste alone. Constructive motives pointed in the same direction; for it was found that round arches, when carrying great loads, as those sustaining towers, &c., were apt to overcome the resistance of their piers; and many failures were the result. The same was found to result from vaulting over wide spaces. True it is that the Romans, in the great halls of their baths, had vaulted over spans of double the width of the naves of our Norman cathedrals; but this had been effected at the expense of the utility of their aisles, which were cut up into short lengths by the ponderous abutments needed to sustain the tremendous pressure of the central vault. Besides which, the Mediæval builders aimed at raising the springing of these vaulted naves to a height out of the reach of the abutment of the aisles. An arch of less lateral pressure was therefore desired.

Another motive might have led to a similar aim. We have seen what difficulties and contrivances resulted from the exigencies of vaulting over irregular spaces where it was desirable that the crowns and springers of the surrounding arches should range on the same levels, though their spans might differ to any extent. It was clear, then, that an arch of more elastic proportions was the grand desideratum.

The claims, then, of proportion, of construction, and of geometrical convenience, all took the same direction and demanded an arch of variable proportions.

This three-fold demand was met by the introduction of the *Pointed arch*.

To apply this to our main subject of *vaulting*, we at once see that, in addition to constructive advantages, the arch could now be proportioned in height to its supporting piers, and the unequal sides of the vaulted spaces could now be arched in such a manner as to satisfy the exigencies of the vaulting without the necessity of resorting to awkward contrivances; so that an accession was obtained at once of strength, beauty, and facility of application.

I have some time since called the use of diagonal ribs the *Magna Charta* of the art of vaulting; but it must share this honour with the Pointed arch. Let us now proceed to trace the progress of the art under this double charter of liberty.

The first introduction of the Pointed arch into vaulting seems to have been made without a full consciousness of its advantages, and rather with a view to strength and general beauty than to the convenience of covering irregular spaces; for in many early specimens,—as originally in the Cathedral of Sens, and in the work of William of Sens at Canterbury,—the round arch continued to be used in the narrow bay against the walls, where the pointed arch was used for the wider spans. In nearly all English specimens, however, full advantage was at once taken of the newly attained freedom: thus, at St. Joseph's Chapel, at Glastonbury,—a work otherwise purely round-arched,—the groining assumes throughout the pointed form, the narrow bays being especially acute. The same is the case at St. Cross, another very early transitional work; and in the nave and transepts of St. David's Cathedral (erected about 1180), though the groining was never carried out, we have the preparations for it with pointed wall-ribs, while the round arch is mainly used beneath. I shall, therefore, disregard this occasional inconsistency.

Before going further, I will, to prevent mistake, give the names of the parts of a groined compartment. The main ribs from wall to wall are called by us *transverse ribs*; by the French, *arcs doubleaux*. Those which pass from angle to angle, intersecting in the middle, we call *diagonal ribs*; the French, *arcs ogives*. Those which adhere to the wall, we call *wall ribs*; the French, *formentels*. If there is a rib or moulding along the apex, we call it a *ridge rib*; the French, a *terme*. The latter, however, does not exist in early examples. Other features appear as we proceed, but I limit my first list to the simpler forms of vaulting. The French names are found in the treatise of Philibert de l'Orme, a work of the sixteenth century; whether they have been tradition-kept up I do not know, but they are now universally adopted by French writers on the subject.

I will just go over our leading cases, already

treated of, showing the changes effected in them by the use of the pointed arch.

In the square groined space with level ridges there was no alteration excepting in the form of the arch, and in the more finished mouldings made use of. The diagonal ribs often took the form of a round arch, but this depended wholly on the proportions of the surrounding pointed arches.

As the diagonals were not formed by elliptical curves, it followed that the vaulting surfaces were not portions of cylinders, and that an error had to be thrown into them. In fact, they were filled in from rib to rib without any view to purely geometrical forms.

When the pointed arch is applied to an oblong compartment, or to the sides of a polygonal apse, its advantage becomes more manifest; for the power of making the narrow arches against the walls as high as we please wholly removes the difficulty which we encountered while limited to the round arch, and that without the necessity of stilt, though the convenience which the last-named method offered for the introduction of windows still led to its frequent use.

The irregular compartments of an apsidal aisle ceased now to present difficulties as all their arches could be made of equal height.

It is curious that, while we have in London two specimens of such aisles in the round-arched style (those in the Tower of London and St. Bartholomew's), so have we also two in the pointed-arched style, and those very different indeed in their treatment. The aisle round the apse of Westminster Abbey has compartments enormously wider on one side than on the other, and this is met simply by the varied proportions of the arches; while that surrounding the round portion of the Temple Church has double as many compartments as there are pillars in the arcade, and consequently behind every arch of the great arcade is a groining compartment which is nearly square, while behind every pillar is one of a triangular plan, vaulted in a peculiar manner from its corners without any ribs between the transverse ribs.

The vaulting of a polygon with a central pillar assumed now a form of exquisite beauty. Its two special types in its simpler form are the chapter-houses at Salisbury and Westminster,—truly a *nobile fraterum*,—and claiming special attention as showing the extraordinary beauty attained by the use of ribbed vaulting united with the pointed arch.

I have already mentioned that in this form of vaulting there is a choice between two methods of effecting it: either by supposing the main vault to span from wall to pillar, or from angle to pillar.

The former is, on a *prima facie* view, the more natural, but it has the disadvantages of breaking the chief side of the vaulting compartment which rises from the corners into a resalient angle, and also of rendering the main ribs from these angles across to the pillar, in one half of their length *diagonal ribs*, and in the other *transverse*; and of making one half represent a *projecting* and the other a *receding* angle, while the angle ribs of the outer half meet the *transverse ribs* of the inner half of the vault.

These objections are entirely removed by supposing the main vaults to run directly from the angle to the pillar. In either case the ridge which surrounds that half of the vault which springs from the pillar takes the form of an inner octagon.

In the first case, the sides of this are parallel to the walls, while in the second they take an intermediate direction; the angles of the inner octagon being opposite the centres of the sides of the outer one, and *vice versa*.

The vaulting compartments which rise from the angles of the great octagon are precisely similar to the opposite ones which rise from the pillar, and the ribs which rise from the angles to the pillar are throughout *transverse ribs*, while the angle ribs from each side daily meet one another.

I exhibit a model of a portion of the vaulting of the Chapter-house at Westminster, prepared by the clerk of the works, Mr. Kaberry; also a view of the interior, to show the beauty of this form of vaulting. Few forms, in fact, in any style of architecture present such beauties as an octagon vaulted in this manner; and I am happy to think that our London specimen, which has been lost for the last century or more, will now very shortly be restored to its original form and condition.

I have already mentioned that in all these forms of vaulting,—that is to say, those with

level ridges,—owing to a geometrical error resulting from the use of circular curves for all the ribs, the filling in of the vaulted spaces must be artificially shaped to fit those curves.

The use, however, of a form of vaulting analogous to that before described as having *raised ridges* would obviate this inaccuracy.

Suppose, for example, an oblong compartment with pointed arches of similar proportions on all its sides and on its diagonals, and the vaults of each cell generated by the motion of the curve of the surrounding arches towards the point of intersection, guided by the diagonals, we obtain at once a vault with pointed arches and raised ridges, the precise correlative of that before described with round arches and raised ridges, and one in which the filling of the vaulted spaces assumes a systematic and accurately geometrical form.

The proportions of the arches are not essential, though the form I have supposed may be considered the most perfect, as where the narrower arches approach the height of the wider ones, a curious effect is produced on the form of the ridge, which, always elliptical, becomes then so obviously so as to be unpleasant.

This form of vault was of very frequent use, though the exact method of filling in the spaces was not rigidly adhered to. Its disadvantages are, that it either limits the height of the walls available for windows, or runs up so high into the roof as to interfere with its construction. It is in many cases, however, a very convenient, as it is a very sightly, form of vaulting.

Even the simple form of vaulting with level ridges is not always convenient for windows, particularly in clearstories, where they have often to fill the whole space. This led to the practice of stilt, the wall-rib to such a degree as to have the effect of twisting the groined surface of the cross vault to an extraordinary extent. This may be seen in the vaulting of the cells adjoining the clearstory at Westminster Abbey, and at St. Saviour's, Southwark. This twisting of the surface has received the very appropriate name of *plough-share vaulting*.

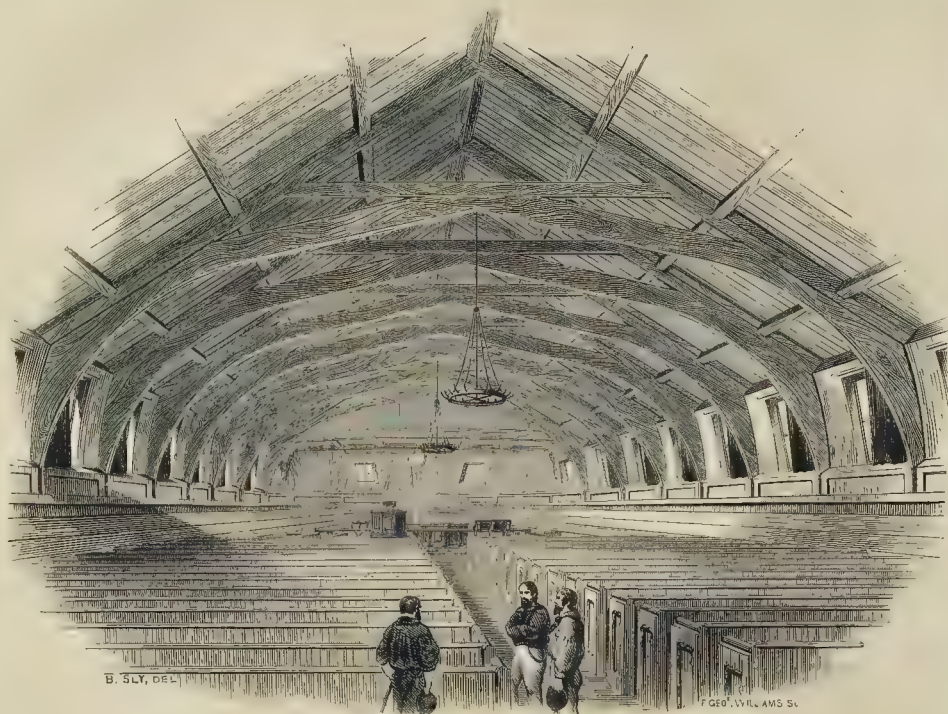
The liberty which was felt in dealing with the surfaces of vaulting-spaces, when once the salient lines became emphasized by ribs, led to the practice of the "dorming up," as it is called, of those spaces, whether the ridges were raised or level; that is to say, that each course of the filling in stonework was often laid on a course, so as to increase the strength of the work, by rendering every course a kind of arch from rib to rib.

I must, however, reserve to my next lecture a description of many of the forms which the vaulting of this period assumed, and a number of practical facts relating to it; as well as the pursuit of the subject into its more advanced history; where, instead of limiting its features to such as originated in obvious and functional utility, others were added for purely decorative purposes. The subject is so extensive that I am compelled to divide my lecture upon it abruptly.

Let us, then, pause here and consider for a moment the artistic sentiment and character of the stage at which we have arrived. I will suggest, in passing, that this stage in which no architectural features were introduced for mere purposes of decoration, and which consequently leaves wide vaulting spaces, is peculiarly suited to the extensive introduction of the works of the sister arts of painting and mosaic, which may be used almost as freely here as in the Byzantine domes. The point to which, however, I desire to direct your attention is rather the *purely architectural sentiment*.

Small as is the difference of principle between the later Norman vaulting and that under consideration the impression produced upon the mind is entirely changed. The one suggests weight and pressure systematically met and resisted; in the other those forces appear to have vanished; and the effect suggested is rather a shooting boldly upwards, like the growth of a tree, than any downward pressure towards the earth. True it is that, in the decorative treatment, a colonnette is placed under every rib or group of ribs as its artistic support; yet, in its effect upon the imagination, the action is reversed. It is not the column bearing the weight of the arched ribs, but the latter springing vigorously upward from the column.

Who, while viewing a stately tree in the pride of its growth, ever thinks of its weight or of the pressure of its boughs upon the stem? It is with its upward soaring that the mind becomes impressed; and just so it is with the interior of a Gothic cathedral. The perfection



THE SHIP CHURCH, "HELENA," IPSWICH.—MR. H. M. EYTON, ARCHITECT.

with which all physical forces are met has to the mind the effect, not merely of having annihilated, but of having actually reversed them. So that upward striving, stately growth, and heavenward aspiration are the ideas customarily suggested as illustrating the impressions produced. The lofty avenue, with its intersecting branches, has become the chosen similitude to which it is popularly likened, and it has been universally received as the form of architecture most expressive of the heavenward soarings of our religion.

No one who contemplates our glorious Abbey Church of Westminster, and lays his soul open to its inspiration, can fail to feel sentiments in harmony with those suggested by the cognizance of its saintly founder—selected as if in anticipation of its future glories—the symbol of our religion surrounded by martlets, whose feet are erased in token that they have lost all tendency to rest on earth, but, like the aspirations of Christian worship, ever mounting on the wing towards the supreme object of adoration, and

"Flying up to Heaven's gate ascend,
Bear on their wings and, in their notes His praise."

THE SHIP CHURCH "HELENA," IPSWICH.

WE spoke in our last of endeavours that were being made to meet the spiritual wants of sailors in the port of London. To provide in a similar way for the sailors in the port of Ipswich, the rector of St. Clement's, the Rev. R. H. White-way, applied to the Lords of the Admiralty for a ship, and obtained from them the *Helena*, a fourteen-gun sloop, which is now moored in the dock at Ipswich, and is fitted as a chapel and residence for the chaplain; it being a well-known fact that sailors have a great dislike to attend the ordinary places of worship, and the floating churches which have been provided in the various

ports being generally well attended by the seamen.

To alter the ship into a chapel and residence pains have been taken not to change the general appearance of the ship, and, with the exception of the roof and a small porch, there is nothing in the exterior to denote the great change that has taken place inside. The ship is moored 40 ft. from the shore, and is approached by a lattice wooden bridge, 10 ft. wide, fixed at the shore end, and resting on two bearers under the porch, so as to rise and fall with the tide.

On entering at the level of the main deck, through a doorway cut in the side of the ship, every one must be struck with the great size and the ecclesiastical appearance of the interior. The whole of the upper deck being cleared away over that portion used for the chapel, leaves the hull from the main deck to the top of the gunwale, 11 ft. high, the height between decks being 6 ft.; an open-timbered roof was framed over the hull at the level of the gunwale, with principals between each port with carved ribs, which were brought down to the level of the upper deck, and follow the curve of the side of the ship. The whole of the roof is of deal, stained and varnished: a panelled string was formed round the ship at the level of the upper deck to hide the ends of the beams which had been sawn off, and the rough appearance caused by the removal of the deck and beams. The fore-castle deck was left, and covered with corrugated iron, and forms the roof over the "chancel;" the underside, being too rough to scrape and varnish, was painted, grained, and varnished. The eight ports on each side had the reveals lined, and sashes inserted hung on pivots. The hole for the bowsprit was also glazed.

All the fittings, which are designed in a simple ecclesiastical style, are of deal, stained and varnished, with the exception of the Communion-rail and the chairs on each side, which are of oak. There is a raised dais at the stern; and the

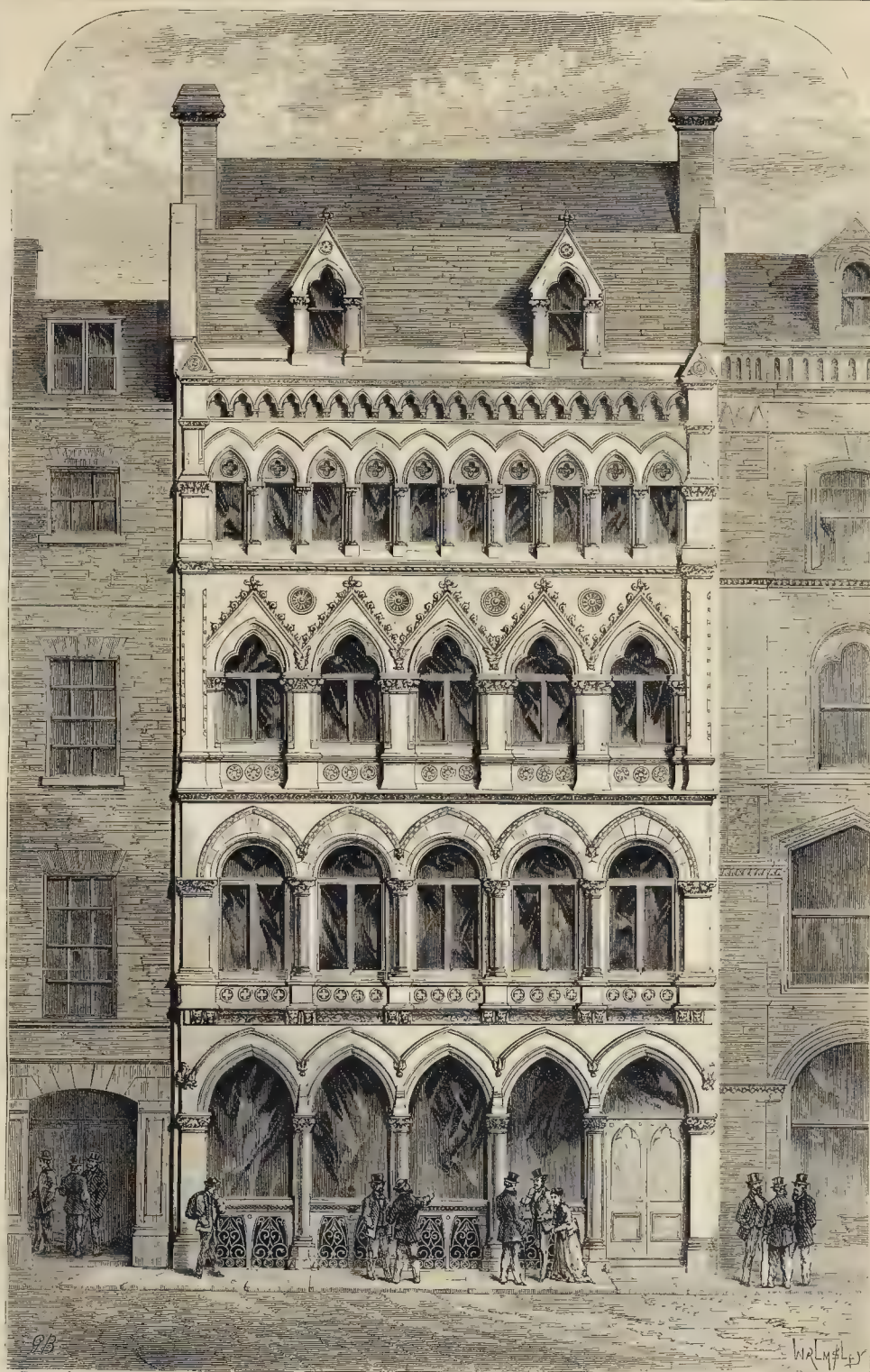
Communion-table is fitted into the bow of the ship, with a projection in the centre of 1 ft. 6 in. by 2 ft. 9 in. wide, with wings on each side with opened panel tracery-work lined with red cloth. The seats on each side are fitted into the side of the ship.

Accommodation is provided for 500 persons in forty-two seats in the body of the chapel, and six cross seats in the "chancel;" the dimensions being 88 ft. long by 35 ft. in the widest part.

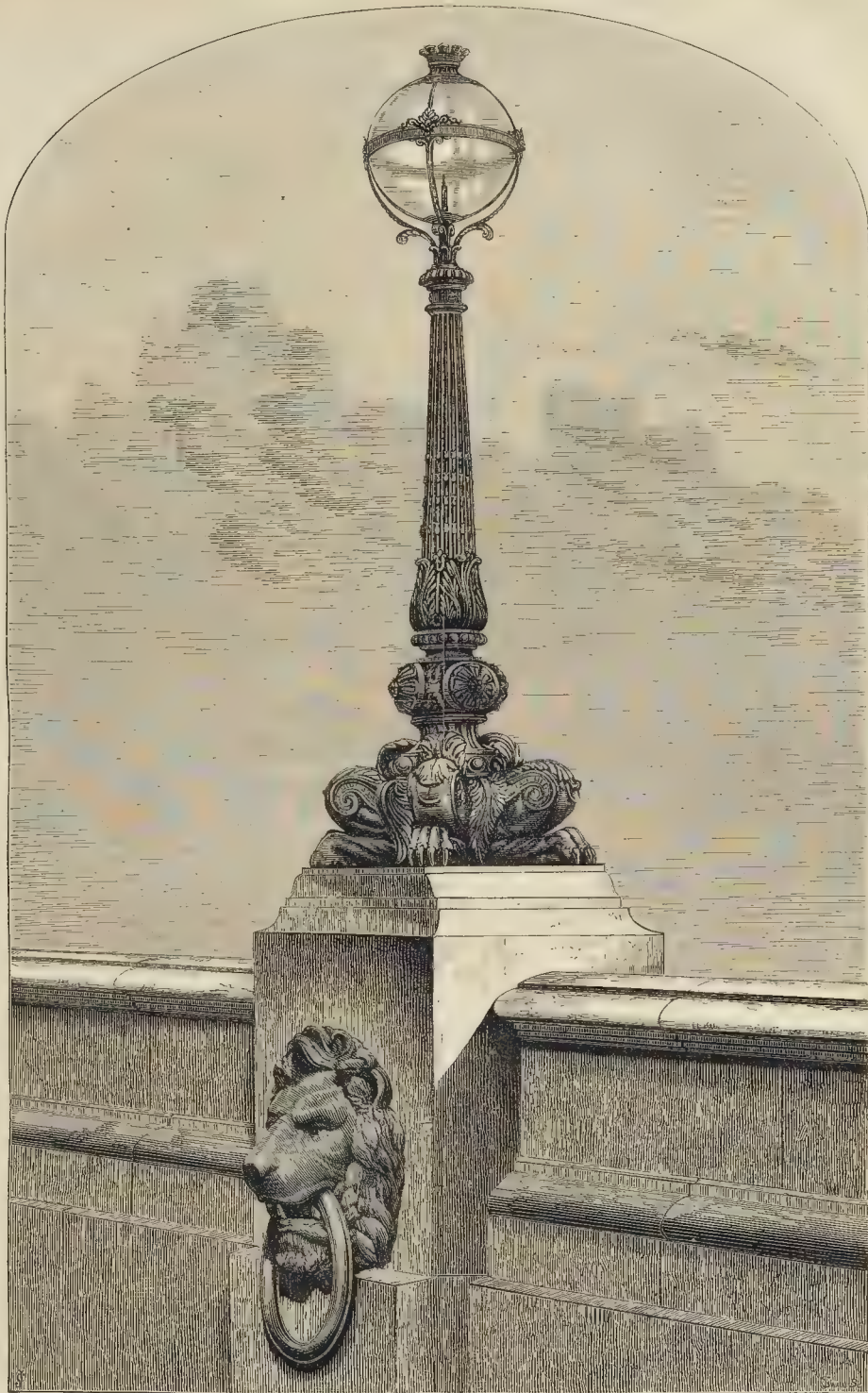
The chapel is lighted by three circular pendants and two brackets in the chancel, gas being brought in under the bridge.

The residence for the chaplain comprises 30 ft. of the stern end. The bedrooms are on the main deck, which is divided into three rooms. The fittings of the bed-berth of the captain are preserved in one room, and the others are fitted up in a similar manner; one of the bedrooms serving as a vestry, with a door into the chapel. The bulwarks of the upper deck have been raised to 10 ft., and covered over with a flat roof covered with corrugated iron, and the space divided into four rooms and a water-closet; two of the rooms are fitted as a kitchen and scullery, the water being laid on similarly to the gas. The other rooms are fitted as a sitting-room and study. The bulwarks of the ship being 10 in. thick, and the new framing 3 in., the remaining 7 in. have been taken advantage of in forming closets in the kitchen, scullery, and sitting-room, and bookshelves in the study: all the rooms are lighted by windows hung on pivots, and the staircase and passage with a skylight.

Mr. Lambert, ship-builder, of the Cliff, removed the upper deck, built the roof, and the chaplain's residence and fittings. Mr. Cunnold, builder, did all the interior fittings of the chapel. Mr. Curtis, of the Ship-launch, superintended the alterations and the mooring of the ship; and all the work, which has cost a little over 1,000*l.*, has been carried out from the designs of Mr. H. M. Eyton, architect.



LONDON STREET ARCHITECTURE: OFFICES, THROGMORTON STREET AND AUSTIN FRIARS.
MR. T. CHATFIELD CLARKE, ARCHITECT.



LAMP STANDARD AND LAMP, THAMES EMBANKMENT.

Designed by Mr. Bazalgette; Modelled and Manufactured by Messrs. Turner & Allen.

LAMP STANDARDS FOR THE THAMES EMBANKMENT.

ADJOINING the somewhat elaborate standard designed and modelled by Mr. Butler, to which we referred in our last issue, two other lamp standards have been put up on the Embankment. One, which is merely in plaster, bronzed, has two entwined dolphins around the base of a column-shaft on a spreading pedestal, and carries an over-large lamp. This was designed by Mr. G. Vulliamy, the superintending architect, and produced by Messrs. Mabey. The modelling is anything but satisfactory, and scarcely does the designer justice. The other, designed by Mr. J. W. Bazalgette, and manufactured by Messrs. Turner & Allen, of Upper Thames-street, is in metal. This, it will be seen from our engraving, takes the shape of an antique candelabrum on a claw base; and, as a piece of pure conventional design, well drawn, modelled, and finished, will certainly bear repetition better than either of the others. The proportions of lamp and pillar are good, and the whole looks as if made for the place.

There is considerable merit in Mr. Butler's standard; and although we should be very sorry to see a repetition throughout the Embankment of his two young scamps, who, intended to typify the energy of the British nation, will simply be regarded by the public as vigorous young lamp-lighters, we shall be glad to find the Board using it here and there,—say at the landing-places,—the patterns being first carefully revised and, so far as the central column is concerned, refined.

LONDON STREET ARCHITECTURE: OFFICES, THROGMORTON STREET AND AUSTIN PRIARS.

THE building we illustrate is in the course of execution for Mr. Travers Smith, and has two fronts, one in Throgmorton-street, the other in Austin Friars. The style adopted is Venetian Gothic, somewhat modified in treatment to suit the position. The structure consists of basement, ground, first, second, third, and fourth or attic floors. The basement consists of offices and two double sets of inner and outer fireproof strong rooms, one of the principal inner ones for bullion being lined throughout with steel plates, and the whole being fitted with Chubb's bank fireproof doors.

The ground-floor is planned so as to utilise the light right through, with the addition of a large well-hole in the centre for light and air, the base of it being covered with external and internal iron skylights: the latter is a wrought-iron horizontal light of Gothic design, glazed with embossed glass, adequate provision being made for portions of the light to open with concealed machinery. The whole of the glazed screens and lobbies are executed in wainscot, French polished, of Gothic character, and glazed with embossed plate-glass of diaper pattern.

There are two staircases leading to the first floor; one for the use of a distinct suite of offices on the first floor, the other in the rear being for general use. The first staircase referred to is of oak, with oak handrails and balusters, carved and moulded in Gothic character. The staircase in the rear is of Spinkwell Yorkshire stone, fitted with an iron balustrade.

The whole of the first-floor is separated from the ground-floor by wrought-iron girders on iron columns and stanchions, and sub cast-iron girders, with arches in three and four rings respectively, of Cubitt's tiles, the spandrels being filled in with concrete, with flooring over it, to form an excellent fireproof floor.

The joinery is executed partly in wainscot and partly in deal, slightly stained and varnished. There are marble, Painswick, and inlaid chimney-pieces, and stoves to match in character.

The well-holes are lined with Minton's tiles, and the entrance-lobby is laid with a tile paving supplied by Messrs. Minton, Hollins, & Co. The ground-floor has the flat iron lath revolving shutters made by Messrs. Warren, Hands, & Co.

The exterior in Throgmorton-street is faced throughout with brown Portland stone; the rear front, to the height of the ground-floor, with the same; above which level are white brick-work and stone dressings. The Throgmorton-street front is supplied with polished Peterhead granite columns of red and grey on the ground and first floors respectively, and on the second and third floors with polished red and green serpentine columns. The carving throughout is executed by Mr. F. G. Anstey.

The windows below the stall-rails to each front are prepared for wrought-iron panel-guards, supplied by Messrs. Richardson, Slade, & Co., who have prepared all the iron ornamental work throughout. For ventilation of the offices and rooms, there is a system of fines with gas-fans at their mouths to give an upward current for carrying off the foul air, the fresh air being admitted through brass hit-or-miss gratings placed between the window-cills and floors; the fan-lights, too, are hung to transmit a current of fresh air through the offices.

The ground floor and front portion of the basement are specially planned to suit the requirements of Messrs. Raphael & Co., and are fitted up with wainscot counters and fittings; one set of the strong-rooms in the basement being planned for their requirements.

The contractors are Messrs. George Myers & Sons; the outlay being between 9,000l. and 10,000l. The architect is Mr. Thomas Chaffield Clarke.

PROPOSED RESTORATION OF EXETER CATHEDRAL.

SIR,—In your issue of February 19th, you published the principal portion of a paper read at a quarterly meeting of the Exeter Diocesan Architectural Society, on the 10th of February, the subject of which was "The Adaptation of our ancient Cathedrals to the Usage and Service of the Church of England," and which bore special reference to the plans prepared by Mr. G. G. Scott at the request of the Dean and Chapter of Exeter for the re-arrangement of that cathedral. I have now to request that you will have the goodness to insert in your paper a copy of a memorial addressed to the Dean and Chapter, drawn up in consequence of a resolution passed at that meeting, and which is now being circulated for signature throughout the diocese; and also these few words of explanation as to the causes which have induced this society to take the unusual step of publicly calling in question the action of that venerable body in this matter.

About six or eight months ago it was publicly announced in the local papers that plans for the restoration of the choir of the cathedral, prepared by Mr. G. G. Scott, had been received by the dean and chapter, the principal features of which were the retention of the close rood-screen with the organ placed on it, in its present position; and next, the throwing open of the choir-aisles for congregational purposes by the piercing of the ancient stone parclose screens at the back of the stalls. This was the first public intimation given to the diocese of the intentions of the dean and chapter, although for years past the question of restoration has been occasionally brought up.

No public meeting has been held, nor have any steps been taken to ascertain the feeling of the diocese in such an important matter, and no communication has been held on the subject with the Diocesan Architectural Society, as might naturally have been supposed.

On the announcement being made in the papers of the scheme which the Dean and Chapter had in view, certain members of that society, feeling that one of the first and generally acknowledged principles of ecclesiastical arrangement, that of the proper use of the choir or chancel of a church by the clergy and choristers only, would be set at naught if the barrier caused by the close rood-screen were suffered to remain, called a special meeting of the committee, at which it was resolved that a respectful memorial should be addressed to the Chapter, praying them to take into consideration the importance of maintaining this principle in any plans for re-arrangement that might be made. This memorial was accordingly sent to the Chapter in August of last year, but up to the present time no notice whatever has been taken of it, with the exception of a formal acknowledgment by the chapter-clerk of its receipt, and a statement made by one of the canons in answer to a direct question put to him at a committee meeting of the society some months since, that the memorial should secure the consideration of the chapter.

The society finding, after long delay, that their respectful remonstrance has produced no reply whatever, resolved at the last quarterly meeting to appeal to the diocese at large on a question respecting which it has an undoubted right to express its opinion.

It has lately been ascertained that Mr. Scott has abandoned his idea of piercing the stone

screens at the back of the stalls (which would involve the removal of ancient monuments), but that he still adheres to his purpose of retaining the close rood-screen and organ; thus perpetuating the severance of the building into two distinct halves, in opposition to the arrangement he has adopted at Ely, Lichfield, Hereford, and other cathedrals, and which is wholly at variance with his report on the restoration of the choir of Salisbury Cathedral, just published.

I hope this plain statement of facts may induce some members of the profession to express their opinions on the matter.

PEARSON B. HAYWARD.

The following is the principal part of the memorial:—

"It has been announced in the public prints that our cathedral is about to undergo restoration, and it appears, from the plans which have been prepared by that eminent architect, Mr. G. G. Scott, that the chief features of the proposed restoration are as follow, viz.:—To keep the rood-screen and organ in their present position; to throw open the aisles into the choir by piercing the parclose screens on either side; to introduce new stalls for the choir; to remove the tombs of the ancient bishops and other worthies from the sides of the choir; thus making accommodation for making a large congregation in the choir and its aisles, and filling them to their greatest possible capacity.

In reference to the proposed removal of the tombs, we beg to point out to you that the same plan was adopted by Mr. Wyatt in his restoration of Salisbury Cathedral in 1789, when the ancient tombs in that building were taken from their original sites and placed in the nave; an arrangement which is now universally condemned.

And as to the other part of the proposed restoration, we beg to record our protest against such a mode of arranging the choir of our cathedral. We would see the Mother Church of the diocese so disposed as to be a pattern to her daughters.

And we would, therefore, venture to pray your reverend body to adopt an alternative scheme, an arrangement similar to that carried out with such admirable effect and universal acceptance in the cathedrals of Ely, Lichfield, Hereford, Durham, Gloucester, and Lincoln; where the solid screens have been removed; an arrangement which, while it preserves by open screen-work the ancient and legal divisions between nave and chancel, between congregation and choir, presents no obstacle to sight or sound, renders the whole area of nave and transepts available for the accommodation of a large number of worshippers, and removes the complaint that this part of our cathedral is used as a fashionable lounge during the time of Morning and Evening Prayer."

VILE HOUSES IN MARYLEBONE.

THE medical officer of health, Dr. Whitmore, says in his last report,—

"If I were to report every house in the parish which in my conscience I believe to be unfit for human habitation, and which I also think cannot be rendered habitable by structural repairs, I should probably be considered by many as entertaining extreme opinions in regard to what may be termed sanitary requirements; and yet no one, who will take the trouble to visit the localities in which the more destitute classes are compelled to live, and examine the state of their dark, damp, smoky, low, and badly ventilated dwellings, can come to any other conclusion than that the occupancy of such wretched tenements must necessarily be prejudicial to health. Within the last five or six years a very large amount of sanitary work of a permanent kind has been carried out. . . . But little or nothing has been done to improve the dwellings of the poor; these, under the decaying influences of time, but more particularly owing to the destructive habits of many who occupy them, are year by year becoming more ruinous and dilapidated, and from the growth of population, more densely crowded; the result, therefore, is, and inevitably must be, that the benefit to the health of the poor, which in all probability would follow from the sanitary improvements which I have referred to, is greatly, if not altogether, neutralised."

APPROPRIATION OF THE SITE OF NEWGATE MARKET.

At the last Court of Common Council, a report was brought up from the Markets Improvement Committee that the market-houses, shambles, &c., in Newgate Market had been pulled down and the materials sold. This having been done, the architect had prepared a plan for the appropriation of the vacant space, and the committee recommended that it should be let as building ground. By the architect's plan there would be a block of building with a roadway all round, and two passages 10 ft. wide traversing the building, one from north to south, and the other from east to west. The ground-floor would consist of sixteen shops, averaging 15 ft. wide and 35 ft. deep, and the first and second floors of offices and ware-rooms.

The building leases would be sold, and of the proceeds one-fourth would belong to the Dean and Chapter of St. Paul's, and the remaining three-fourths to the corporation, to purchase out the slaughter-houses and other nuisances in the neighbourhood. The report was adopted.

SIR,—A remarkable report has just been presented by the Markets Improvement Committee to the Common Council of the City of London. It relates to the mode in which the site of Newgate Market should be appropriated to the erection of dwelling-houses or shop or other buildings. It appears that the City architect, pursuant to directions, submitted alternative plans and designs, from which, after examination, the committee have selected the one now issued. The public are fully aware, from the ornamental new meat-market in Smithfield and other works of Mr. Horace Jones, that "Mr. Architect" is capable of making an appropriate design for such a purpose as this; but I venture to say that a more injudicious scheme than that selected could hardly have entered into the mind of any practical man, and it may be inferred that this project is due rather to his masters than himself. The area of the old market measures 145 ft. by 123 ft., and lies in the centre of an open space, 194 ft. by 148 ft., surrounded by buildings, with a pathway all round, of the average width of 12 ft. To the north there is Rose-street, leading out of Newgate-street into the area; and to the south a paved alley, leading from the area into Paternoster-row. One would have thought that the obvious duty of the committee would have been to take this favourable opportunity of making the commencement for a practicable communication from Newgate-street into Paternoster-row (which cannot be said now to exist), with the chance of such communication being eventually continued into St. Paul's Church-yard, there not being at present any such direct carriage thoroughfare. This opportunity is sacrificed; the passage through the block is only 10 ft. wide and 13 ft. high. There is, therefore, no direct light to the inner windows of the block, and the plan otherwise shows utter disregard of sanitary conditions; omnibus privies or W.C.s, one to every four tenements; liability to fire communicating from one part to the other; and complete defiance of the provision of the Building Act, which requires 100 ft. area to each tenement. Can all this be necessary to meet the question of light and air in regard to adjoining premises on east and west sides? Observe, too, the meanness of the "elevations" appended, and do implore the Common Council to ask the committee to reconsider the scheme before it is too late.

AN ARCHITECT.

COMPETITIONS.

Wootton Bassett Cemetery.—The Burial Board have selected the designs sent in by Mr. Thomas S. Lansdown, architect, and have instructed him to proceed to carry out the work. The designs are fourteenth-century Gothic in style, and consist of two chapels, each 30 ft. by 18 ft. internal dimension, having open timbered roofs springing from stone corbels. The entrance to each of the chapels is surmounted by a bell-turret. The curator's house will be placed near the entrance, and will consist of parlour, kitchen, board-room, and offices, and also three good bedrooms. The architect will also lay out the grounds.

"THE LATE MR. W. BURN."

We have received a courteous letter from Mr. W. Colling, who, from a connexion of 25 years, during which Mr. Burn was his "best friend and most excellent master," claims to be able to speak concerning him with accuracy, affirming that, in attributing to him "a wish to avoid criticism," we are "altogether in error." As, however, we received that statement from Mr. Burn's own lips, on more than one occasion, we are contented to abide by what we said. The writer adds that which we are quite willing to believe.—"Whenever Mr. Burn was asked to make designs for a building which did not come within the range of what he diffidently considered to be his limited practice and experience, he invariably recommended the employment of another architect, instead of himself. Moreover, he used the immense personal influence which he possessed to so much effect that, when a question arose as to the rejection of the services of one of his professional brethren, he on many

occasions succeeded in bringing about a decision in favour of their retention. In short, I could point to some very extensive and most important works, which probably would not have borne their present architects' names but for Mr. Burn's exertions on their behalf. I could also mention the names of members of the profession who most undoubtedly owe a considerable part of their practice to his self-abnegation,—nay, I may say, to his absolute and immediate generosity."

THE ARCHITECT AT THE HOUSES OF PARLIAMENT.

A "SUBSCRIBER" writes thus:—

"The First Commissioner of Her Majesty's Works can have but a very faint idea of the routine and practice of the architect when he makes a demand or claim for the architect's designs, working drawings, &c. It is such a proposition as ought to be resisted, for if it were accepted to in the case of the architect to the Houses of Parliament, where is such a claim to end with reference to others engaged in large undertakings of public buildings, restorations of cathedrals, and such like. It is therefore desirable before such a claim is entertained that a meeting of the Royal Institute of British Architects should be convened."

We understand that the council of the Institute met on the 14th inst., and passed a resolution to the effect that by use and custom all drawings of a building belong to the architect. Mr. Cowper-Temple has given notice in the House of Commons that he will move for the correspondence between the First Commissioner and the architect, so that the whole case must now come before Parliament. There seems to be a general feeling that Mr. Ayrton will not be allowed to intrust such a building as the Houses of Parliament to the charge of his subordinates, who are not professionally qualified for such duties.

TAUNTON.

St. James's Tower.—The idea of restoring this fine Perpendicular tower has been abandoned, and an attempt will be made to rebuild it by public subscription. Mr. Houghton Spencer has been entrusted with the work.

Taunton and Somerset Hospital.—It having been considered desirable to add convalescent wards to this hospital, a special meeting of the governors was convened for ventilating the subject, when plans, and a report bearing on the question, by Mr. Spencer, were produced. Considerable differences of opinion being evinced, it was ultimately resolved to abandon the idea of rearing a substantial building, which the funds of the institution would hardly warrant, and to erect instead two detached and inexpensive iron wards, with a connecting corridor, which scheme the medical officers considered, at the best, but a doubtful experiment.

CURIOUS COINCIDENCES FOR OBSERVATION.

SIR,—Recently some notices of an interesting character have appeared in the *Builder* relative to the physical changes now in operation and taking place upon the surface of earth.

I venture to point out that it would be expedient to make some simultaneous observations upon these physical changes in a systematic form, and to note the magnetic disturbances at the same instant, in different parts of the world.

The 18th of March, this year, will present a very curious series of combinations for critical observation, as to their mundane effects, by their simultaneous action; and it would probably be worthy of attention to ascertain the physical peculiarities developed at this date.

Although the combinations happen at the same time, it is quite possible that the effects may be delayed; or, in other words, not coincide with the exact date of their cause, just in the same way that it takes time for light and sound to travel to reach the senses of the observer.

We have yet to identify the influence of the magnetism of the sun, in causing the increase or decrease of the inclination of the axis of the earth, and its consequent effect upon climate, as the inclination of the axis of the earth to the plane of its orbit will never be brought about by the mere operation of gravity; but it is suggested as quite possible by the relative positions of the magnetic forces existing in union simultaneously upon the surface of the sun, and the interior of the earth, that in certain positions of its orbit the inclination of the axis of the earth will be susceptible of remarkable change, and entirely modify the climate, not suddenly, but during the progress of ages. Geological investigations confirm these anticipations as to

"We have repeatedly drawn the attention of geologists to the fact that the angle between the planes of the equator and the equator of the earth is known to have been diminishing slowly from time immemorial until now; and to the capabilities of geological explanations as to the glacial and other eras which this fact affords,

the certainty that very different climates have existed at various periods upon the surface of the earth, and we have yet to learn when the changes will cease.

At noon, on the 18th March, 1870, some curious combinations and coincidences will solicit observation. The daylight and night are absolutely of equal length on that day. The sun is nearly in the equator. The moon, at noon, is in the equator, and at the same time at her nearest distance from the earth.

Under all these favourable circumstances of position it will only be the dynamic effects that will be first observed in the increased height of the tides, which will identify the forces in actual operation as mere mechanical action; the magnetic effects, however, having yet to be ascertained.

ARTHUR GRABING.

SEWAGE IRRIGATION AND DRY SEWAGE MANURE.

SIR,—Mr. Rawlinson's arguments in favour of irrigation, as reported, at a recent meeting of the Society of Arts (see *Builder*, March 6), are not supported by his figures.

Speaking of the Sewage Farm at Aldershot, of 93 acres, he assumes the possibility of obtaining a gross return from the land of 300L per acre by using irrigation, or for the whole farm a gross return of (93 x 300) 28,000L per year.

Now granting this as a possible result, let us see what is the money value of the sewage used to produce it.

The quantity is stated at 200,000 to 400,000 gallons per day: take the mean, 300,000 gallons. This quantity, at 10lb. per gallon, will be equal to 1,343 tons per day, or 490,166 tons per year.

Mr. Rawlinson spoke of sewage as worth 17s. 6d. per ton, but let that pass; he could only have referred to a special sample. My little calculation shows that 490,166 tons of sewage are to produce 18,000L; how much, then, is it worth per ton? Just 9d. (ninespence three-farthings).

I write the sum at length, in order to prevent mistake. But suppose only 50L per acre to be obtained, instead of 300L, and a very good return, too, from an acre of land, what value will the land have extracted from a ton of sewage? Not quite 2d. Surely the dry-sewage manufacturers can do as well as this, although Mr. Rawlinson says that they are attempting the impossible.

At all events, it is clear that irrigation with sewage, even in the "perfect" form in which it appears at Aldershot, is but a poor business affair all.

A LESSEE OF SEWAGE.

COW CROSS CANADIAN EMIGRATION SOCIETY.

SIR,—In Cow-cross, or "Ragged London in the Centre," we have enrolled as members of the above society, four hundred families of able-bodied workmen, not paupers, nor persons of bad character, but steady, hard-working people,—artisans and labourers,—who are now reduced to a state of destitution, misery, and despair. There is no prospect of work for them; they have exhausted their little savings; they have withdrawn their funds from benefit societies; they have sold their furniture, and pawned their tools for food. "We speak what we do know, and testify what we have seen." Emigration is the safety-valve of the free-labour market. The Government of Canada will receive skilled and unskilled labour, but not paupers; 20,000 labourers and artificers would be sure of work over there. Surely, then, if work cannot be brought to where there is labour, we ought to send the labour to where there is work. State aid has been refused. The British and Colonial Fund offer to assist a limited number who can contribute 3L, and upwards (single men, 6L). But how can a penniless man with half a dozen children contribute 20L and upwards? What, then, can my poor people do? Our workhouse is overcrowded. The burthen of poor-rates is becoming intolerable. I can no longer remain silent, and see the people perish without an effort to rescue some. To the benevolent at heart, and the Lord's people in particular, do we now appeal for aid to help the helpless. We have one thousand persons on our eye; 3,000L will enable them to get from the land of despair to the land of hope.

Contributions will be thankfully received by Mr. Alexander Rivington, treasurer, Cow-cross Mission, 52, St. John-square, Clerkenwell; or by your obliged and faithful servant,

WILLIAM CALLEB, Missionary.

PARLIAMENT STREET.

SIR,—Since the appointment of the present Chief Commissioner of Works, the public who take interest in matters connected with that department of Government, have from time to time been startled by the novelty and eccentricity of his proceedings. Many of your readers are no doubt aware that the Government have bought up the Northern "Island of Houses," separating Parliament-street from King-street, Westminster, in order to make a frontage to the new Home and Colonial Office, and at the same time to widen the overcrowded thoroughfare of Parliament-street. The tenants have been heavily compensated for the inconvenience and loss of being heavily taxed out of their shops and offices, and the money is hardly paid when those tenants who have not already removed are told that they may stop two or three years longer, the Chief Commissioner having decided to pull down the back parts only of the houses in question.

It is utterly inconceivable how any economy can arise from such a proceeding; it will only increase the cost of the contractor in building the new offices not to have ample working room; but, as regards the public in general, it will be a serious inconvenience and expense. Parliament-street in the afternoon is now so crowded as to necessitate the services of ten or twelve policemen to regulate the traffic, and by the extraordinary arrangement proposed the whole of the traffic now passing along King-street will be added to the confusion.

A CONSTANT READER.

"The Science of Building."—Under this title Mr. E. Wyndham Tarn, Architect, will shortly publish an elementary treatise on the Principles of Construction, "especially adapted to the requirements of architectural students." It will be illustrated with 47 wood engravings.

Miscellaneous.

The Martyrs' Memorial in Smithfield.—On Friday afternoon, the 11th, the ceremony of unveiling the memorial erected in Smithfield in honour of the martyrs to Protestant truth, and also for the purpose of indicating the precise spot on which they perished, took place. The memorial occupies one of the arched recesses in the external wall at the north-east corner of St. Bartholomew's Hospital, and consists principally of red and grey polished granite, the more ornamental parts having been executed in bronze. The head of the memorial is semi-circular in form, with a large ugly bronze shell in the centre, set off with mouldings. Between them is the text, "Blessed are the dead which die in the Lord." The cornice also consists of mouldings, and bears the text, "The noble army of martyrs praise Thee." This is supported by pilasters, between which there is a panel with the following inscription:—"Within a few feet of this spot John Rogers, John Bradford, John Philpot, and other servants of God, suffered death by fire for the faith of Christ in the years 1555, 1556, and 1557." On the base there is another inscription:—"Near this place is erected a church to the memory of the said martyrs." The whole is protected by a wrought-iron grille. Messrs. Habershon & Pite made and presented the design of the memorial, which has been executed by Messrs. Cox & Son, of Southampton-street.

Tewkesbury Abbey.—There is now every prospect of a thorough restoration of this fine old building. The committee have already received promises of subscriptions to the extent of 3,000*l.*, and a grant of 300*l.* is promised on behalf of the trustees of the Warneford Ecclesiastical Charity, with an intimation that a further grant may be made on the completion of the work. Mr. Scott has made a survey of the building, and he estimates that the following more urgent works may be completed for a sum of 4,850*l.*—The cleaning and repairing of the stonework of the interior; the repairs of the roofs; the refooring and repairing of the parts especially used for service; the removal of the partitions and of the organ, placing the latter upon a new screen or loft in the north transept; the removal of the old stall-work to the choir, with its entire restoration; the addition of canopies to such as require them; the adding of nine new stalls, with canopies, and of desk-fronts, &c., to the whole of the stalls; a new choir-screen, pulpit, lectern, &c.; and the complete seating of the church, so far as needed, and with some addition to the present rector's.

Town Hall, Stone.—The new Town Hall at Stone has been opened by a public dinner. The style of architecture is Italian, and the front of the building is faced with white bricks, Hollington stone being used for the windows and dressings. The chief door is in High-street. The large hall measures 60 ft. by 34 ft. 6 in., and 25 ft. in height. At one end of it is a platform, convertible into an orchestra. There are two brass pendants from the roof, and a third one is to be placed between them rather lower. It is estimated that the saloon will accommodate about 400 persons seated. In the rear of the hall is another entrance, and in proximity to it there are retiring-rooms and offices. Over the waiting-rooms and other parts of the building in the front there is a large library and reading-room, 36 ft. long by 16 ft. wide, a place for the librarian, and a cloak-room, with the usual offices. In the top story there are suitable sleeping and other rooms for the porter. The building has a frontage to the High-street of 50 ft. in length, and about 40 ft. in height, and rising above the parapet in the centre is a stone case for a town clock. The estimated cost of the building, without the fittings, is about 2,500*l.* Mr. Frederick Bakewell, of Nottingham, has been the architect; and Mr. Whitmore, successor to Mr. Espley, of Stafford, the contractor. The site, which cost about 1,000*l.*, is that of the Old Blue Bell, and it would be in extent three-quarters of an acre. Nearly half an acre of ground remains to be used. The building has been erected by public subscription.

Royal Horticultural Society.—The Hyacinth Show, held on Wednesday last, in the Conservatory, in conjunction with Mr. W. Paul's annual show of spring flowers, which latter is continued during the week, was a success, and gave pleasure to a considerable gathering of visitors.

Girdled Trees bearing Fruit.—Our readers have heard of the atrocity of girdling some 1,500 fruit-trees near St. Joseph, Michigan, last spring, says the *Canada Farmer*, and how the neighbourhood turned out in a body and bandaged them up, so as to save them. It will be interesting and gratifying to learn that every one of these trees is living, and that Mr. Green, the owner, has realised an immense crop of fruit from them in the past season. Those wise in such matters explain it by saying that the interception of sap by girdling has caused the production of fruit instead of wood this season, and that the real trial for the life of the trees will come next year. It used to be thought that there was no help for a girdled tree; but that theory is now exploded. In this case the damage was remedied by bandaging the trees with strips of cloth dipped in wax. Mr. Lemel Town, of New Hampshire, we believe, grafted five or six scions as large round as a goose-quill, and long enough to reach over the girdled place into the tree. The live bark is first notched above and below the girdle, the sprouts sprung into place, and the ends fastened with wax. These scions grow rapidly, and in time spread over the whole girdled surface. We have heard before of purposely girdling tree-branches, in order to increase their crop of fruit.

Edinburgh Architectural Association.—At the usual fortnightly meeting of this Association, Mr. Thomas Ross, president, in the chair, the business of the evening was a resolution moved by Mr. Wm. Beattie, architect, and seconded by Mr. Archibald Satter, civil engineer, viz.:—

"That the different methods followed by surveyors in the measurement of work is productive of inconvenience and loss; and that, in the opinion of the Edinburgh Architectural Association, a uniform system of measurement should in future be adopted by all surveyors." Mr. Beattie pointed out the evils resulting from the present want of uniformity, to the architect, the contractor, and the public generally. He advocated a more detailed and analysed system of measurement, and that the old practice of allowances should be entirely discontinued, and not quantities universally adopted. He contrasted the English and Scottish systems of measurement, and stated that the former was more minute and detailed in its dissection of the work. Mr. Ormiston, surveyor, criticised the remarks made by Mr. Beattie, and an animated discussion followed, in which Messrs. Paterson & Ross, architects, and Messrs. Lawrence & Russell, surveyors, took part. The resolution was unanimously adopted, and it was resolved to call a special meeting at an early date to take some practical steps in the matter.

Skilful Workmanship.—The King of Prussia recently visited a needle-manufactory in his kingdom, and was shown a number of superfine needles, thousands of which together did not weigh half an ounce, and marvelled how such minute articles could be pierced with an eye. The eye-borer asked for a hair from the King's head. He placed it under the boring machine, made a hole in it, furnished it with a thread, and then handed the needle to the king. The *Scientific American* says that a curious needle is in the possession of Queen Victoria. It was made at the celebrated needle-manufactory at Medtich, and represents the column of Trajan in miniature. Scenes in the life of the Queen are represented in relief, but so finely cut and so small that it requires a magnifying glass to see them. The Victoria needle, moreover, can be opened. It contains a number of needles of smaller size, which are equally adorned with scenes in relief.

Science, Religion, and Politics.—In our recent article on the Easter Island statues, we quoted the opinion of Professor Unger, of Vienna, at that time one of the greatest of living philosophers: we regret to learn that he has recently been found murdered in his bed at Graz. No trace of the murderer could be found; so a priest at Cilly asserted in the pulpit that the devil himself had probably murdered the professor, whose soul he could justly claim on account of his philosophical writings. M. Raspail, the well-known writer on botanical, agricultural, and chemical subjects, is the same as the "irreconcilable" M. Raspail, the political agitator.

London Corn Exchange Competition.—To the names of architects who were invited and are preparing designs should now be added, we are asked to say, that of Mr. G. Barnes Williams.

Lady Huntingdon's Chapel, Brighton.—The trustees have decided upon rebuilding this chapel upon a new plan; and plans, prepared by Mr. Wimbly, of London, have been selected for the purpose. The new edifice, which is to be surmounted by a spire, is to be considerably higher than it is at present; and, by taking in a piece of ground at the side, the width will be increased by some 6 ft. There will be two Gothic windows, with circular light over, in the north front; and the entrance will be by three archways, provided with sliding shutters. At the south end it is proposed to have a large memorial window of stained glass, in memory of the late pastor, the Rev. Joseph Sortain. The interior of the chapel will be considerably altered and improved. There is to be no gallery, as at present, at the south end, but a small chancel built there, the organ being removed from its present position to the west side of the chancel; and the roof of the building is to be open, with a clerestory. It is thought that 4,500*l.* will cover the entire cost of the alterations, of which sum about 3,000*l.* have been subscribed.

Telegraphic Progress.—Submarine telegraphy is described as the mania of the hour, and, at all events, it competes as such with tramways. Telegraphic lines are being projected in every direction; but the most daring scheme of all is that just put forward for complete telegraphic submarine communication with Canada (double line), Bermuda, West-Indies, Demerara, Ascension, St. Helena, Cape of Good Hope, Natal, Mauritius, Ceylon, India, Australia, Tasmania, and New Zealand, by 24,000 miles of continuous cable, without landing upon the shore of any foreign country. The cost of this modest undertaking is put down at about 4,000,000*l.*, and it is suggested that the Imperial Government and the colonies should guarantee a dividend of 3½ per cent. on that outlay. It is further proposed that this girdle round the earth should be hooked on to the present system of postal telegraphs,—an addition to his present labours which Mr. Scudamore might very fairly be expected to object to—at least until he has fully mastered what he has already undertaken.

The Opening of Kingston Bridge.—On Saturday, in the presence of the Lord Mayor and sheriffs, the lord high steward of the manor (Lord St. Leonards), Sir John Thwaites, chairman of the Metropolitan Board of Works, the members of Parliament and magistrates for the county of Surrey, the mayor, and the rest of the municipal authorities, with many other persons of consideration, the bridge across the Thames at Kingston was opened to the public free of toll, under the provisions of a recent Act of Parliament, by which part of the coal and wine dues levied by the Corporation of London is for a limited time to be applied to the gradual abolition of the tolls payable at the various suburban bridges on the Thames. Great preparations in the town and neighbourhood were made on the occasion, and the whole population for miles round turned out to witness the ceremony. Triumphant arches were erected in different parts of the town, and upon the bridge itself, which was also decked with evergreens and flowers.

Royal Italian Opera.—The Royal Italian Opera, Covent Garden, will open on the 29th, with Mesdames Patti, Lucas, and Titiens, and Messrs. Wachtel, Naudin, Mario, and Graziani amongst its old acquaintances, and a number of promising new engagements. "Esmeralda," the composition of Signor Campana, the libretto being founded on the romance of Victor Hugo; "Medea" (Jason by Dr. Gunz, and Medea by Madlle. Titiens); and "Macbeth," supported by Signor Graziani and Madlle. Titiens, are amongst the novelties promised. Signor Vianesi will be the chief conductor, the orchestra remaining nearly as before. A strong programme has issued from Drury-lane, and the Covent Garden directors will have to keep their eyes open to maintain supremacy.

Society for the Encouragement of the Fine Arts.—On the 10th inst. the second conversation of the season was held in Conduit-street, when, in addition to the attraction of the pictures in the gallery of the Society of Female Artists, there was an exhibition in an adjoining gallery of a considerable collection, amounting to upwards of 200 drawings and sketches of the late Mr. James Holland. After a short address by Mr. S. Solly, F.R.S., in which he paid a tribute to the memory of the artist, a musical entertainment was given, under the direction of Mr. Alfred Gilbert.

Accidents.—A workman, while painting the exterior of No. 31, St. Paul's-churchyard, fell from a scaffold 40 ft. high, smashing his skull completely. He had only that morning applied for and obtained work on the job, and appeared to be in a state of great destitution. The Roman Catholic chapel (St. Mungo's), in Parson-street, Glasgow, has been on fire. The fire-brigade, however, extinguished the flames in a very short time. It appears that the fire had originated in the boiler-room, which is on the ground flat of the building, and is used for raising steam to heat the chapel, while immediately above that is the wardrobe-room. The fire had smouldered for some time, and when the alarm first spread the chapel was filled with smoke. The floor of the wardrobe-room was burned, and the wardrobes destroyed, but fortunately the fire was confined to that apartment. The church is quite new.

The Projected State Railways in India. In the House of Commons, the Under Secretary of State for India, in reply to Sir D. Wedderburn, said that the duty of constructing the railways would be entrusted to the Public Works Department; that there was reason to believe the officers of the Engineer Corps referred to were incompetent; and that the Government of India had a heavy stake in the completion of the works in the best possible manner. Whether the materials would be transmitted through the Store Department was under consideration. In reply to Mr. Roden, Mr. Duff said that not more than 32 millions would be expended in any one year. Up to the present time the Government had no information as to the amount proposed to be expended this year. What number of miles of railway the Government proposed to construct in India he could not say.

The Pollution of the Avon.—The Rivers Commissioners have had an interview with the Bath Local Board of Health upon this subject, a special meeting of the Board having been summoned for the purpose. The commissioners explained that the object of their visit to Bath was to inquire into the state of the river and the extent of the water supply, and expressed their readiness to receive information upon the subject. The Local Board intimated their willingness to assist the commissioners in their inquiry, and instructed the city engineer to afford them all the assistance in his power.

The City Sewers Commission Report.—The report of Mr. Haywood, the engineer and surveyor to the City Sewers Commission, on the works executed during the past year, has been printed. Under the head of Improvements, various useful works, as widening streets, &c., are recorded as either done, partly done, or arranged for. The widening of the Poultry by setting back the front of St. Mildred's Church, is noted as agreed for with the ecclesiastical authorities. The negotiations for widening St. Paul's Churchyard, on the western front of the Cathedral were still in hand. Seven houses in Three-King-court, Minorities, have been demolished as uninhabitable. The site for a mortuary to be erected by the Commission has been obtained.

More Discoveries of Roman Remains near Bath.—In the course of the excavations for the foundations of the new church in West Walcot, some Roman remains have been brought to light. In sinking for the tower, the workmen found on the north side a skeleton, and on the south side some calcined bones, what seemed to be the remains of a child, and the urn in which they were deposited. Beneath these, and at a depth of several feet below the surface, another skeleton, quite perfect, was exhumed, and near what will be the south wall of the church a piece of masonry was exposed to view, which seems to be the external wall of a Roman villa. A piece of stone cut in the shape of a pineapple, probably an ornament of some kind, is also amongst the relics.

Popular Instruction at the Public Museums.—The Working Men's Club and Institute Union have, with permission of the authorities, arranged for a series of visits to the national museums on Saturday afternoons for the members of workmen's clubs. In each case the party will be under the guidance of some gentleman specially qualified to afford instruction in one particular branch of science and art. A party of fifty workmen were thus enabled to pay a visit to the Egyptian Department of the British Museum on Saturday, under the guidance of Mr. Samuel Sharpe.

A Granite Monument in Harrow Church-yard.—Of the monuments recently erected in the churchyard of Harrow-on-the-Hill, the monolith placed upon the Leighton family vault is not the least remarkable, considering its material, great weight, and the quantity of workmanship thereon, apart from its site, and the difficulty of posing it there. It was executed at the works of Messrs. Newall, Dalbeattie, near Dumfries. The design of the monument is spoken of as Mr. Leighton's own. The three gables it was intended to decorate with painted faience, though now it is thought mosaic will be more durable; thus the work will be rendered either at the Vatican works in Rome or in Venice.

A Double Plough.—North-country farmers, who could not afford the expense of the steam-plough, have lately been turning their attention to ploughs drawn by a single team, and managed by one man, but turning over two furrows at a time. There have been two public trials, got up by the farmers of Cumberland, at Whitehaven and Aspatria. No less than a dozen implements were submitted for competition, constructed by several different makers. Nearly all the work was well done, and the success of the double plough was considered as established. The first prize at both trials fell to the lot of Messrs. Howard, of Bedford, for a light and simple implement carried on three wheels.

A Portable Motive Power for Machinery. At the last exhibition of the American Institute, it seems, there was shown an elliptic lockstitch sewing-machine driven by an electric engine small enough to fit into a common hatbox. As described to us, a series of eight magnets are set on the periphery of a circle, and around these revolves an armature of steel which is continuously propelled by the magnetic action, and thus operates the machinery that moves the needle. Connexion with this motor is had by means of a small slide within reach of the operator, at whose will the current may be cut off entirely or the speed of the needle graduated as may be desired.

The Portsmouth Main Drainage.—Contract No. 1 with Mr. F. Furniss has been completed to the entire satisfaction of the corporation, who have passed a vote of thanks to the contractor, and are preparing a testimonial to him under the seal of the corporation, in accordance with the vote passed. The corporation believe that while the contractor has faithfully carried out his contract it has not financially been to him a very good undertaking. The No. 2 contract has been completed and settled up to the extent of 33,000*l.* The sum total of the first contract is 54,728*l.* Mr. Furniss is about to carry out a large contract in connexion with the cattle market at Chichester.

The Tewkesbury Water Supply.—The Cheltenham Waterworks Company decline to supply the town with water on the terms proposed. They say, "In reply, the company desire to remind the inhabitants of the heavy expense which the company have incurred in introducing an abundant supply of water in the borough of Tewkesbury, and the probable inadequate return for many years, at the rates proposed by the company, for the capital expended; and the committee regret that they cannot accede to the views expressed in the resolutions submitted to them."

Prevalence of Fever in Birmingham.—At the last weekly meeting of the Visiting and General Purposes Committee, held at the Work-house, Mr. Bridge presiding, Mr. Walker, chairman of the No. 4 District Committee, drew the attention of the meeting to the prevalence of fever in several streets in that district, including Thomas-street, John-street, London Prentice-street, and Park-street. The relieving officer informed him of the numerous cases of fever in the lodging-houses in some of the streets he had just named. We are not at all surprised.

Science Schools at Rugby.—Recently we gave particulars and illustrations of the new laboratory at Eton. It may be useful to mention that *Nature* of March 10th, contains an interior view of the laboratory at Rugby, with particulars of the science schools generally, and a plan. These schools are part of an extensive block of new buildings erected from the designs of Mr. Butterfield.

A Useful Gift.—Mr. Joseph Pease has presented a steam fire-engine, worth 700*l.*, to the town of Darlington.

Road Locomotives.—Mr. R. W. Thomson, C.E., of Edinburgh, has invented "a road steamer," which possesses the extraordinary power of not only running over any kind of road, whether hard or soft, whether muddy or slippery, but also of dispensing with a road of any kind. It can run with facility over grass fields, ploughed fields, upon ice, through sand, and over frozen snow. It owes this faculty to tires of vulcanized india-rubber on the wheels. The engine runs on three wheels—two large ones of great width, and a smaller one in front; and these wheels are surrounded by very thick bands of india-rubber, which are guarded by flexible shields, formed of open steel bar, to give it a "bite" upon the ground. The shields are removable, and are taken off when the road steamer has to pass over ice, snow, or sand. The performances of these iron elephants are really remarkable. One of them has run out from Edinburgh twelve miles, brought back a load, traversed the narrow streets of the old town while thronged with vehicles, turned all manner of sharp corners, and passed through the gates of a factory.

Institution of Naval Architects.—This institution will open its annual general meeting on Wednesday, the 6th of April, in the Lecture Theatre of the South Kensington Museum, which has been placed at the disposal of the members by the courtesy of the Committee of Council on Education. The remaining three days of the week the institution will meet as usual, through the permission of the Society of Arts, in their Great Hall, in John-street, Adelphi.

Barns's Hovel.—The Globe Inn, Dumfries, which used to be frequented by the poet Burns, and which still contains the chair in which he used to sit, was last week offered for sale by public auction, at the upset price of 700*l.* There were no bidders, and the sale was adjourned for a fortnight. It is thought that it will be purchased before then by private bargain at a lower than the upset figure.

Improved Building Appliances.—Price's Patent Sash-fastening cannot be opened from without, a considerable advantage. The improvement in *Stanbury's Stench Trap* consists in this, that the top or grating is attached to the bell by a hinge, so that although it may be raised to clean out the bell, a careless scullerymaid cannot remove it permanently, and so allow the house to be poisoned with sewer gas.

Institution of Surveyors.—At the ordinary general meeting, held on Monday, March 7th, the adjourned discussion on the paper by Mr. E. P. Squarey, entitled "Farming Covenants," was resumed, and after a lengthy debate was again adjourned to March 21st. On that date, also, a paper will be read by Mr. J. Matthews, entitled "A Plea for Culture in the Profession of a Surveyor."

The Surveyorship to the Lavenham Highway Board.—At the last meeting of this board a motion was made that advertisements be issued for a surveyor, at 22*5*s.** a year. An amendment, however, that a resident surveyor at Lavenham, with a salary of 180*l.*, and an assistant at Boxford with 120*l.*, be advertised for was carried.

Removal of the Royal Mint.—In reply to Mr. J. B. Smith in the Commons, the Chancellor of the Exchequer said the Government hoped to mature a scheme by which the Mint would be removed rather more to the centre of the metropolis, and to dispose of the present site on Tower-hill to great advantage.

A Larger Organ than Ever.—The largest organ in the world, says the *Musical Standard*, will be the organ now building by Willis for the Hall of Arts and Sciences, South Kensington. "It will have 111 sounding stops, independent of 14 couplers,—an absurd multiplication." Why absurd?

Diamonds.—Professor Tyndall has succeeded in igniting a diamond in oxygen by the concentrated rays of the electric light, according to the *Academy*. The professor has no doubt, it seems, of his ability to ignite the diamond by the invisible rays from the same source.

Fire in the Palace at Peking.—A wing of the Emperor's Palace in Peking has been burned, containing the imperial printing-office, with large stores of books and block-types. The books printed at the imperial cost for the last two centuries have issued from this office.

[illegible]

ST. PANCRAS IRON WORK COMPANY,

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THE MEDALS OF ENGLAND AND FRANCE,

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SHOULD BE ADOPTED FOR THE FOLLOWING REASONS, viz.:-

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The whole of which, except the Rack, being enamelled, can be kept as clean as a DINNER PLATE.

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Gentleman, who has served his articles with an Architect and
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Nine years in the profession. Excellent references. Salary in arrears.
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A large stock on hand, to which attention is invited.
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VOL. XXVIII.—No. 1416.

*The Arts in the Middle Ages
and in the Renaissance.**

N Paris, twenty years ago, a costly French work, in five quarto volumes, on the Middle Ages and the Renaissance, made its appearance, under the auspices of M. Lacroix, who was assisted in its production by several French writers and artists of reputation. From this handsome work the same author has recently selected the sections relating to the arts; and these he has published in one brilliantly illustrated quarto, under the title of "The Arts in the Middle Ages and at the Period of the Renaissance;" which volume is now translated for the benefit of the English public. And a very attractive, well-

stored, skillfully-prepared volume, thanks to Mr. James Dafforne, the English public will find it to be.

The arts which M. Lacroix discusses in it are many. He divides them into twenty sections, which we will enumerate that our readers may judge at once of the comprehensiveness of the contents of his work. Beginning with furniture, he next treats of tapestry, then of ceramic art, arms and armour, carriages and saddlery, gold and silver work, horology, musical instruments, playing-cards, glass-painting, fresco-painting, painting on wood, canvas, &c., engraving, sculpture, architecture, parchment and paper, manuscripts, miniatures in manuscripts, bookbinding, till he arrives, finally, at printing. The order of this review of the arts is somewhat curious; but it is adopted, we presume, to bring into sequence those arts that have evolved into others, with their respective developments. The fact that the work was first published twenty years ago detracts only from its freshness. Views advanced in it, and information then furnished for the first time, have in the interval found very general acceptance. But they are none the less valuable on that account; and this new form will enable many to consider them to whom the five French quartos would be only as so many sealed vessels. In one instance, at least, an addition has been made to the original stock of facts, for among the illustrations is a reproduction of M. Viollet-le-Duc's representation of a nobleman's chamber in the fourteenth century, in his "Dictionnaire Mobilier," a work published subsequently to that of M. Lacroix. In another, however, a recent discovery that might well have been engrained, has either been overlooked, or has not yet come to the knowledge of the author. We allude to the unravelling of the secret of the seat and source of the scarce Oiron faience, mentioned by M. Barty in his work on the "Chefs-d'œuvre de l'Industrie Art," and detailed in

these columns in our notice of Mr. Chaffers's translation of that work. But, take it "all in all," the merits outweigh drawbacks; and those wistful of a dignified introduction to the circle of the industrial arts will do well to avail themselves of M. Lacroix's presentation.

The fourth century is fixed upon as the commencement of the period to be illustrated. Relics of this date are scarce; which fact is not so surprising as that there are any at all, perhaps; though we are apt to consider that we ought to account for it, when we remember the comparative profusion of Greek and Roman remains of an earlier time. The miniatures, too, in manuscripts, that furnish us with so many examples of ancient forms in furniture further on, are still scarcer at this date, two or three only being in existence. In the item of chairs, for instance, it is difficult to cite many specimens before the days of Charlemagne. St. Eloi, the celebrated bishop and worker in metals, is recorded to have manufactured two gold state chairs for Clovis, and a gold throne for Dagobert. This last is supposed to be identical with the curule chair, called the Fautenil de Dagobert, in gilt bronze, now in the Musée des Souverains, which was originally a folding-seat, to which the Abbé Suger, in the twelfth century, added a back and arms. M. Lacroix gives an illustration of it. For a second early example, he is driven to a miniature of the ninth or tenth century. In tables, there is the same dearth. Miniatures of the last-mentioned date are the earliest authority. But the first example in the work before us shows the round table of King Artus of Brittany, from one of the fourteenth century, preserved in the Imperial Library, Paris. This table is not round, in our acceptance of the term; for though of a circular circumference, it has a circular space in the centre, in which the pages stood and waited upon the guests; and for access to this centre there was, necessarily, a passage-way left in the circumference. The seats surrounding it appear to be fixtures, divided only from one another by elbow-pieces. Eleven figures are seated at the banquet represented, of whom five wear crowns, and a sixth has some ornamentation round his neck that looks exceedingly like another. Notwithstanding this display of regal magnificence, a knife each is the only accommodation provided with which to partake of the meal; and the presence of two dogs, one of which is gnawing a bone, is another suggestive indication of rough manners. In kitchen contrivances and implements, too, there is a scarcity till we come to the thirteenth century. Nevertheless, with selections from examples of this and succeeding centuries, and notes of casual mention of articles of furniture by the early historians, poets, and romancers, a goodly group of facts is got together.

The chapter on tapestry is well written and well illustrated. The association of this art with dames of the highest rank in all ages, gives it an additional interest. M. Lacroix brings forward instances in which the production of tapestry and embroidered hangings was also carried on in ecclesiastical establishments, for the decoration of the churches attached to them. But here, again, though we know that from the days of Minerva, downwards, the heroines of Homer and Roman ladies employed themselves on this work, the earliest specimens presented for our examination are three portions of the Bayeux tapestry, traditionally supposed to be the production of Queen Matilda, wife of William the Conqueror. The credit of this piece of workmanship,—which, though only 19 in. in height, is scarcely less, it will be remembered, than 212 ft. in length, and contains 530 figures,—is, however, transferred in the account of it to Leviet, one of the queen's female embroiderers. We have a strong impression ourselves, founded on internal evidence, that the borders, at any rate, are not the work of women. Two

specimens of fifteenth-century work, one from Berne and the other from Beauvais, are given with much brilliancy of colour, and an indentation of paper that produces an excellent representation of needlework. We quote a short passage from the historian of the monastery of St. Florent, at Saumur, which shows that tapestry, in the tenth century, was looked upon in the same light as painting and sculpture as a means of the internal decoration of churches:—"In the time of the abbot Robert III. the vestry of the cloister was further enriched by magnificent paintings and pieces of sculpture, accompanied by legends in verse. The above-mentioned abbot, who was passionately devoted to similar works, sought for and purchased a considerable quantity of magnificent ornaments, embroidered with various devices. Among other objects he caused to be made two pieces of tapestry, of large size and admirable quality, representing elephants; and these two pieces were joined together with a rare kind of silk by hired workers in tapestry. He also ordered two dorsettes in wool to be manufactured." English embroiderers, we must add, occupied a high place in those days, and great store was set by *opus Anglicanum*.

We pass over the chapters on ceramic art, armour, and saddlery,—not because they are less attractively written than those we are about to speak of more especially, but merely on account of the impossibility of noticing all. Those interested in the subjects we omit will be charmed with the care taken in the treatment of them, and with the profusion of examples with which they are illustrated. We turn to the account of works in silver and gold, because at the present day these are occupying a conspicuous rank in English endeavours to keep pace, if not to keep a-head, of European progress. The modern goldsmith is, or should be, an artist. Hear what his predecessor was in Medieval times. The monk Theophilus, whose Latin treatise on the industrial arts of the twelfth century shows us so many pictures of art-workmen in the days of old, tells us that a goldsmith was a modeller, sculptor, smelter, enameller, jewel-mounter, and inlay-worker, or an expert in arts now divided into six distinct occupations. "He had to cast his own models in wax, as well as to labour with his hammer, or embellish with his own graver; he had to make the chalice, the vases, and the pyx, for the metropolitan churches, on which were lavished all the resources of art; and to produce, by the ordinary process of punching, the open-work, or the designs of copper, intended to ornament the books of the poor." The goldsmiths of yore had both the patronage and the opposition of the church. Whilst one set of ecclesiastics spent all their oratory in tirades against luxury and riches of every description, another beautified the services with the greatest wealth they could accumulate. Though St. Boniface said bitterly and reproachfully, "Once golden priests used wooden chalices, now, on the contrary, wooden priests use golden chalices," there were abbots, who, like Abbot Suger, of St. Denis, patronised the craftsmen who produced the golden chalices, and protected the more ornamental of the industrial arts till they were past all danger of being extinguished by disregard. St. Eloi, the bishop and goldsmith, who was prime-minister to Dagobert I., whilst he worked incessantly for him, "assisted by his servant Thillon," at the production of gold vases, enriched with precious stones, laid the foundation for the esteem in which the art was held in subsequent centuries. He decreed that goldsmiths should be of two orders,—religious and secular; so that objects destined for the church should not be made by the same hands that formed those intended only for worldly purposes. The greatest integrity was called for, and generally speaking practised by the craft; for the material in which they wrought was required to be of a legal and authenticated value; and all attempts

* "The Arts in the Middle Ages, and at the Period of the Renaissance." By Paul Lacroix. Illustrated with nineteen chromolithographic prints by F. Kellerhoven, and upwards of four hundred engravings on wood. London: Chapman & Hall, 1870.

to depreciate it by unqualified practitioners were jealously exposed and punished. By virtue of the honourable position they enjoyed, they occupied the first place in the processions of the trades; and in the wealthy Flemish cities even dictated the laws of the corporations. In Paris they clustered round the residence of St. Eloi, turning it into a *quartier*. They were exempt from the watch and all other feudal services; and had the custody of all the gold and silver plate used by the city when its magistrates entertained illustrious guests, besides the privileges of carrying the canopy over the king's heads on their accessions, and of walking, crowned with roses, as the shrine-bearers of St. Geneviève, when her relics were used for miraculous purposes. Fine gold crosses, studded with gems of seventeenth-century workmanship, are illustrated. The votive crown of Saintin, king of the Visigoths from 621 to 631; the sword and diadem of Charlemagne, preserved in the Imperial treasury at Vienna; a Byzantine reliquary brought from Mount Athos; the altar of gold presented to the cathedral of Basle by the Emperor Henry II.; and an enamelled shrine in Limoges work, are further early specimens of the art shown. Specimens of the skill of St. Eloi, Benvenuto Cellini, and Pierre Raymond are also given. The author of this interesting section makes the remark that Claude Ballin, the inventor of silver furniture, was the last goldsmith; and Pierre de Montarsy, who gave special attention to the cutting and mounting of precious stones, was the first jeweller.

Sundials, water-clocks, hour-glasses, and then water-clocks with the addition of clogged wheels, are so many steps that bring us out of the old uncounted time to the court of Charlemagne, at which a present of a clock from a no less personage than Aron-al-Baschid made a great sensation, for it was almost as wonderful as an Arabian night's tale. Eginhard says it was brass, "damasked with gold, and marked the hours on a dial. At the end of each hour an equal number of small iron bells fell on a bell, and made it sound as many times as the hour indicated by the needle. Twelve windows immediately opened, out of which were seen to proceed the same number of horsemen armed cap-à-pie, who, after performing divers evolutions, withdrew into the interior of the mechanism, and then the windows closed." The earliest mention of a striking clock occurs in the "Usages de l'Ordre de Cîteaux" of the twelfth century, in which the sacristan is instructed to regulate the clock in such a manner that it may sound and awake him before matins; and in another passage the lecture is ordered to be prolonged till "the clock strikes," and from this point we are carefully conveyed through notes of most of the curious clocks that ancient ingenuity manufactured, and descriptions of the successive improvements that, like the "Nuremberg eggs" of Peter Hele, have resulted in so much convenience for all of us. Scarcely less curious than the celebrated Strasbourg clock is that which Henry II. had constructed for the château of Anet. At the recurrence of each hour a stag darts out of the mechanism, followed by a pack of hounds, but suddenly the hunt comes to a stop, and the stag strikes the hour with one of its feet.

To these curiosities succeed musical instruments, with names that set us thinking of the Lament of Charlemagne and similar far-off and long-ago misadventures. We know the lyre, the harp, the lute, and the guitar; but how can we tell in their Medival guise the *cithern*, the *rabble*, the *crode*, the *rote*, the *rygue*, the *viola*, and *monochord*? Yet these are the instruments in the hands of kings and angels in miniatures, sculptures, and frescoes; and not to know them is to be cut off from many pleasant associations of ideas. And thus it is we see, as in scores of other instances, how necessary it is that an artist, though he may occupy himself only with one art, should have a knowledge of all; and, looking further, how exceedingly useful a work of the comprehensive character of that under notice is likely to be to almost any one who may take it up.

Then we come to playing-cards, elevated into objects of great interest through their connections, engraving and printing. Our author thinks it settled now, by deductions made from investigations carried out by antiquarian scholars (though we do not), that playing-cards existed in India in the twelfth century; that the ancients played at games in which figures and numbers were represented on dice or tablets; and that the games of cards and chess of modern times possess striking affinities

which prove their common origin, the one being associated with painting, the other with sculpture. The playing-cards of India were in fact but a transposition of the game of chess, the details differing, but the idea of war, carried on by stratagems and combinations, being dominant. St. Bernard inveighed against cards as he did against luxuries of every description. A card-maker came to him one day, after he had stirred up a great concourse of hearers to a pitch of zeal that induced them to bring their dice, chess, and cards, and burn them before his eyes, and, crying bitterly, told the austere re-generator that by putting an end to his trade he would reduce him to starvation. "If painting is all you are capable of," replied the preacher, "paint this picture." And he placed in his hand a radiated sun with the monogram "I.H.S." in the centre, which the card-maker copied to his satisfaction. The legend adds that this sign made his fortune, for St. Bernard adopted it as his device, and an immense number of copies of it were required. The transitions by which the present conventional figures on playing-cards have got their footing are gradual as well as curious; and are agreeably illustrated. There is disputable matter in this section, but we may not go into it.

In the account of glass-painting, we perceive M. Lacroix gives Albert Dürer credit for twenty windows in the church of the Old Temple in Paris, most unreservedly. He says,—"The celebrated German did not work alone, other artists assisted him; and notwithstanding the devastations which took place during the Revolution, in many a church and mansion, traces of these skilful masters may still be found; their compositions, which are generally as well arranged as they are executed, are marked with a tinge of German simplicity very suitable to the pious nature of the subjects they represent." The chromolithograph of this section is a portion of a window in the church of St. Gudule, Brussels, representing Francis I. and Eleanor at their devotions: very telling, touching, and resplendent.

As a *chef-d'œuvre* of fresco painting, we are treated to a reproduction of the fresh bright greens and soft blues of "The Dream of Life," from the Campo Santa of Pisa, that sunny picture of earthly happiness represented by youth, gaiety, rich vestments, love-songs, musical instruments, falcons, dogs, and such accessories, which death is always threatening with a sweep of his wing. There are eight other frescoes illustrated in woodcuts selected with judgment. Paintings on canvas and wood are treated of; and the various schools shown in eleven woodcuts. The painting attributed to Margaret Van Eyck, representing St. Catherine and St. Agnes, against a background lighted up with a sunset, is glowingly chromolithographed. In speaking of engraving the author combats the impression that engraving on metal was derived from engraving on wood. No one, he says, who has any professional knowledge of the subject could believe this to be the case, because the processes are quite distinct, and must have been the result of two independent inventions. Whether the art was of Chinese or Egyptian invention he does not decide, but takes it up at its appearance in Western Europe in the first half of the fifteenth century. Among other illustrations of this subject is one of the scarce pieces by Bernard Minet. Only six specimens of this engraver's peculiar manner are known. He used neither lines nor cross hatching; but on a black ground made a powdering of white dots, varying in size according to the degree of light required. He is generally called the "Master with the dotted backgrounds." M. Lacroix throws a fiery brand into the circle of collectors by declaring that it is only by an error that Albert Dürer, Lucas van Leyden, and Lucas van Cranach, are counted engravers. There are engravings with their names attached, because they drew their drawings on the wood and signed them, and the engraver merely engraved these signatures as they did the rest of the pencilling. We must recommend him to the mercies of Received Opinion in this matter.

But if we have found it difficult not to linger by the way as we have looked down the vistas that each section of the arts places before our eyes, we find it still more so when we come to the history of Mediaeval sculpture. From the day that Constantine was baptised by Sylvester in the porphyry font, with its watercourse and surrounding figures of silver, sculpture never rested. And here we may read of its vigour, originality, powers of acceptance and expression on all subsequent centuries. Take the tomb of Dagobert, executed by order of St. Louis, in the

Abbey Church of St. Denis.* Could aught in music or poetry exceed its delicacy and fancy? On the tomb lies the dead king, crowned and robed, his eyes closed, his hands folded in instant prayer. At his head and at his feet stand two crowned and gracefully-draped figures, on eternal guard. Filling the wall space of the arched superstructure, is a panel with three tiers of sculpture representing the king, dead and nude, carried away by demons in an infernal bark on an infernal sea, and his rescue by angels and the fathers of the Church. Is not this a portraiture of Christian hope and fear deftly modelled by Imagination? Benign and beautiful, too, is a representation of St. Eloi, as patron of goldsmiths and farriers, in the Church of Notre Dame d'Armançon, at Semur, Burgundy, another illustration. And while all deserves praise, more praiseworthy still is Jean Cousin's alabaster statue of Philip Chabot, Admiral of France, with his war-gear by his side, on his coach. It is another advantage of a work of an international character like that before us, that specimens of art are brought from out-of-the-way places before us, which, otherwise, many would probably never see.

The same reflection occurs to us as we turn over the pages devoted to architecture. Many traverse France from Calais to Marseilles a score of times, and never go off their route, to visit the generous, mellow, storied, sculptured church of Notre Dame la Grande of Poitiers. But here they may scrutinise it; its carved arches, with their low soft curves; its tiers of niches, with a figure in each; its short scaled and cone-shaped roofs. We may contrast its marvellous crumbling richness with the plainness, or bareness, of the Rhenish Norman style of Mayence Cathedral, where the turrets are tall and attenuated; the doorways taciturn and barren; the windows blank; but where additional height and size tell of power and grasp.† And in the fac-simile of a miniature drawn with the pen, taken from a Bible of the eleventh century, in the Imperial Library, Paris, we may see the Norman masons at work upon them, all bareheaded, in short tunics, lifting the stones, ascertaining the level of a course, and using both mallet and trowel. Thus, not only may we transport ourselves into remote places, but into remote times, by the simple process of turning over a page.

Twelfth and thirteenth century architecture is illustrated by Notre Dame, Paris, and Amiens Cathedral; that of the fourteenth century not so happily by the "saloon of the schools, Oxford." In the ancient castle of Marcoussis, near Rambouillet, we are shown one of those square edifices with circular towers with peaked caps at the angles, rising out of a deep moat that the tapestry-workers loved to depicture. For further illustrations of French castellated architecture, there are the Castle of Concy in its ancient state from a thirteenth-century miniature; the Castle of Vincennes, in the seventeenth century; the Tour de Nesle, that formerly occupied the site of the Exchange in Paris, and the fortified gates of Moret and Provins. There are two buildings that must always appear in all works of architecture, and they are hers,—St. Peter's, Rome, and the Alhambra, Granada. The thoroughly French buildings, châteaux, are represented by that of Chambord, with its ancient moat, a truly kingly pile. It is refreshing to read, in these days of contracts and cheap schemes, of such a decree as the following, issued by the magistrates of Florence, in 1294:—"Forasmuch as it is in the highest degree prudent for a people of illustrious origin to proceed in their affairs in such manner that their public works may cause their grandeur and wisdom to be acknowledged, the order is given to Arnolfo, master-architect of our town, to make plans for repairing the Church of Santa Maria, with the greatest and most lavish magnificence, so that the skill and prudence of men may never invent, nor ever be able to undertake, anything more important or more beautiful." Alas! for the shortness of human life. Though the master-architect designed such an unsurpassable restoration, it was not given to him to be able to carry it out; nor to his successor, Giotto; nor to his successor, Orcagna; not until a fourth master, Brunelleschi, had taken the task in hand was it accomplished. Alas!

"The work of the copyist" (we are quoting Aloisius, by way of introduction to a word or two about manuscripts) "is a meritorious work which is profitable to the soul; while the work of the ploughman is profitable only to the belly."

* See p. 249.

† See p. 246.

And the monks copied and copied with Christian zeal. Those who could not write occupying themselves with binding. Only middle-aged men, trustworthy and careful, were approved as copyists of the Gospels, Psalter, and Missal, for fear of verbal errors; and the greatest of the great considered copying a privilege. Charlemagne copied Origen's work, and introduced as he wrote, his genius cropping out even in this particular, those useful signs, the comma and full-stop. Religious sentiment and writing were so blended that a saying took wing, "To write like an angel." The different characters used, shown in fac-similes from pale and precious manuscripts, cover eight pages. We must pass on to the miniatures with which some of them are adorned. As we have said, those previous to the eighth century are exceedingly rare. One is shown from the Virgil in the library of the Vatican, of the third or fourth century; another Virgil, presented to the pope, constitutes probably the only other specimen of this early date. The capital letters only were embellished by calligraphy in the sixth and seventh centuries. In the eighth and ninth centuries these were painted, and formed of combinations of birds, fishes, beasts, and foliage. A book of the Gospels, said to have belonged to Charlemagne, now in the library of the Louvre, furnishes the first attractive miniature; and the Commentaries of Gregory Nazianus the second, wherein is represented the consecration of a bishop. As well as good examples, the writer has shown one base one. Nothing could be devised more absurd and laughter-moving than a barbarous miniature of the beginning of the eleventh century, representing the solemn scene of the crucifixion, which is removed, as he declares, even from the instinct of drawing. On the other hand, few art-objects could be more minutely clever and dainty than a later miniature, taken from Froissart's chronicles, rendering the coronation of Charles V., of France. Borders from French and Italian MSS. furnish many curious combinations; but, perhaps, the greatest curiosity shown us in this collection is a miniature, painted by Giulio Clovio, taken from Dante's "Paradise," representing the poet and Beatrice transported to the moon, the abode of women devoted to chastity. There is the moon, full, pale, and placid; and across its large and gentle features walk Dante and Beatrice to meet a group of sweet-faced women waiting to welcome them on one of its round soft cheeks. The "Hours" of Anne de Bretagne furnish a beautiful Annunciation, in which a white-winged and white-robed angel appears to Mary, also white-robed, in a gallery of grey and chocolate set off with scarlet.

In 1299, there were, in all Paris, but seventeen bookbinders by trade. The reason of this small number was that copyists bound their own books, or had them bound in their own monasteries. Trithemius said of his monks:—"Let that one fasten the leaves together, and bind the book with boards. You, prepare those boards; you, dress the leather; you, the metal plates which are to adorn the binding." Thus it came to pass that there was but little occupation for bookbinders beyond the walls of the convent, till after the invention of the printing-press. The inventories of the libraries of the dukes of Burgundy and the kings of France tell of volumes bound in leather, velvet, silk, and camelot. And though we have come to the extent of our limits, we must note a small book, as a sample of many others, with a binding ornamented with gold and fifty-eight large pearls, which was kept by its dual owners, of the House of Burgundy, in a camelot case embellished with one large pearl and a cluster of small ones. In those days, too, some books were furnished with "a little silver-gilt instrument for turning over the leaves." They were weighty leaves, we must remember. One of Petrarch's books, of his own copying, was so ponderously bound that it frequently fell out of his hand on to his leg; which it injured so seriously that it was feared he would have to have it amputated. Another poet has asked,—

"For how shall he know what comes after, who knoweth not what went before?"

With this question we close our recommendation of this volume, so pleasantly filled with word of what has been before; and therefore with suggestions of what may be done hereafter.

Art-Union of London.—It will be seen from our advertising columns that the subscription-list of the Art-Union closes on Thursday next.

GLASGOW, SANITARY AND SOCIAL: A GLANCE.*

RESUMING our observations, we would particularly direct the attention of the civic authorities of Glasgow to another noted but neglected quarter of the town. Drygate is well known by name. The Necropolis overlooks it, and there is a cold, damp sweat upon its tiles and pavements. Verily this quarter is on its way to the sepulchre, and a funeral moan is in the voice of its inhabitants. The Drygate is rather a damp gate, and were it not for its long undulating base, which accelerates its drainage, Drygate would be a wet place indeed. A bad road and footpaths are here; houses are propped, and the property does not seem to be very valuable. Yet there are good houses about, but they are in bad company. A lodging-letting colony are squatted down here, and their cipher certificates of authority are nailed like "Notices to Quit" on their door. These numerals tell of the number of cubic feet of air within, but they are silent about its density. As they comply with the local Act as to space, they stand upon their right to drive a coach-and-six through other clauses. But hold. They are poor, and they are struggling hard for a living. Why does not the Corporation help them to ply their calling with decency, by keeping their neighbourhood clean?

We wind round by Lady's Well, and its houses are on a par with the last-named. Here, in an angle, niched into the churchyard-wall, a fountain, in shape like a sepulchral urn, is seen. The fount of inspiration, however, is dry here. Nothing wells forth, as far as we can see. An inscription above tells us, in pretensions wording, that "The Lady's Well" was erected, in pursuance of the request of the citizens of Glasgow, in 1833. How long its waters contributed to their health we do not know; but this we do know, that the angle of a churchyard wall, above which rise several feet of dripping clay, and over which peep sundry and several tombstones, was not a very moist spot for a public fountain. The old rivulet that sweeps between the High Kirk and the Necropolis dashes its muddy waters onward here, utilised by millers and others, and catching in its course many slimy and slughish sewers, reeking with filth. No improvement is discernible here; not a bit. The sides of this streamlet, which could be embanked, are jagged, broken, and loathsome to the sight. It could be made a pleasure to look upon; but far better that this running sink should be now covered over. It disappears under the Gallowgate, and finally empties itself in the Clyde.

Not far off from the quarters we have been describing we examined some houses in course of construction. They are on a par with the improved dwellings we have already described in the beginning of this article.

Some of the "flats" are apportioned into six rooms; a room and kitchen for each separate family, with a water-closet for the use of every three families. Some of the flats here have a one-room accommodation for families, with the usual partitioned niche in the corner for the bed.

The character of the carpentry or joiners' work of these four or five story flats needs no description. It might have been executed by an amateur casual. The mason and the plasterer do the principal work, and when the sashes are hung, the doors hinged, and the painter has put on the priming, the flats are ready for their victims. Ere their final finishing, their first tenant often pays nature's debt and the poor-rate together.

What we would advocate for the working and middling classes of Glasgow is a number of self-contained houses—houses built to accommodate one or two families at most. There should at least be three rooms for each family, two rooms and a kitchen, with washhouse, privy, ashpit, and so on. These could be cheaply built in or about Glasgow, and the material might be either brick or concrete.

For building with the latter material Glasgow affords rare facilities because of the number of its foundries and iron works, which have any amount of waste in the form of calcined cinder or shingle. It is as hard as granite, and admirably adapted for the purpose of concrete dwellings. We throw out the hint, and would be glad to see the waste of smelting-houses and furnaces utilised for some good end.

Improved dwellings for the poor are a necessity, and they will have to be erected if Glasgow wishes to escape a serious epidemic some day or other.

* See p. 218, ante.

No excuse at all can exist for not having a thorough system of drainage in operation in Glasgow. No engineering difficulty exists to prevent the accomplishment of that and the continuance of a perfect and unfailing water supply. The city railways are pushing forward, and it will not be very long before they are connected at both sides of the river, with all the existing lines. A central station will be in Dunlop-street, on the site of the old Theatre Royal; and the old Glasgow University, in the High-street, will be another terminus.

The new bridge at the Jail-square, leading from the Saltmarket to the south side, has not progressed much as yet. The abutment pier, on the north side, is in course of erection. The removal of the old bridge occupied considerable time. A temporary one of timber supplies the place of the demolished bridge. A little lower down the river, the Union Railway crosses the Clyde. It is an iron lattice bridge, supported on six pairs of columns, the lower half being iron, the upper half granite. There is little beauty about the design, but it is constructed sufficiently strong to serve its useful purpose.

"Paddy's Market," a series of clothes-stalls that formerly existed off the Saltmarket and opposite to the Jail-square, is now upon the square, or, rather, should we say, it is on a portion of Glasgow-green. A wooden enclosure, within which are sheds with a number of central and side stalls, now constitutes the famous "Paddy's Market." Here may be seen for exhibition and sale the cast-off garments of the British and Continental public. The man who, short of cash and circumscribed in income, could not pick up a second-hand suit here, "quite as good as new," must be hard to please. Here are pants, knickerbockers, knee breeches, molasses, corduroys, tweeds, black cloth, blue and iron grey; inexpressibles of every shape, size, and twill; and, as for coats, there are whiteones, kerseymere, Irish friezes, Meltons, alpaca, Highland plaid, shooting, fishing, walking, riding, eating, and drinking coats,—and last, though not least, some of the identical swallow-tail pattern, with brass buttons, which the immortal Paddy himself is said to have worn on the memorable occasion "when he took it off" and dragged it through Donnybrook fair, daring the dearsly Sassenach to tread on the tail of it. Paddy's Market in Glasgow is a study. Petticoat-lane in London is noways like it. It stands alone, unequalled and unexampled, as a rendezvous for the pawned, pilfered, and cast-off rags of the world.

We are almost tempted to say that, after a careful consideration of the sights and scenes we witnessed in many parts of Glasgow, it out-Herods all other cities and towns in Great Britain for the terrible sin of chronic and sordid drunkenness. Liverpool is the only English town which can bear any approach, comparatively speaking, with Glasgow. You can scarcely pass at night through the High-street or the Saltmarket, or even Argyll-street or the Cross, without being stumbled against by a drunken man or a raving woman, whom drink has transformed into a maniac. It would be difficult to decide, of the two classes of the labouring population of Glasgow, which, whether the low Scottish element or the low Irish element, is the worst. The former drinks more to himself,—muddles more; the latter is gregarious, and he likes a little excitement, call it noise or fun if you will.

To the most common observer a look into the faces of the working population in the low quarters of Glasgow will exhibit the effects of the evil we are describing. Pallid, pinched, and cadaverous looks, bent forms, sunken eyes, a trembling gait, an absence of all manly spirit and animation,—this is a true picture of what may be read in the faces of many of the working folk and others in the low quarters of Glasgow. It is nowise overdrawn; it is a real, not an ideal, picture; and we would wish, for various reasons, we could honestly say otherwise.

We will adduce an instance in corroboration of what we write about the drunkenness of Glasgow. We have it from a police official. From one court alone in Glasgow, within a week, there were upwards of 171. paid in fines in police-court cases; and perhaps we overstate the fact if we say that in this particular court there are twenty families. Think of what 171 might have done for the well-being of these wretched families, husbands, and wives, and children. Is it not a fact known to all men of the world that bad and wretched homes are often the cause of driving men into the public-

house for the sake of company, and temporary heat and comfort? Few like to sit down in narrow, darksome rooms, amid squalling infants and often squalid misery, while the price of the pot of ale or glass of whiskey can be squeezed out of the weekly board. There are some of our working men who will satisfy the craving for drink, though they should run the risk of feeling the pinch of hunger.

Improve their dwellings, say we; build them homes fit to live in, give them proper breathing spaces, and a plentiful supply of pure water and pure air, and we venture to say the number of drunkards will be less.

Confining our remarks to Glasgow, and looking upon its present state, one is almost tempted to say that the institution of a number of hospitals for the reclamation and cure of drunkards would be a very laudable undertaking. With all her temperance societies, temperance hotels, and temperance lecturers, Glasgow, as we have already said in other words, is the most intemperate city under the English crown.

A few words now about what more intimately concerns our constituency. Glasgow is growing rapidly within as well as without. House-building is going on; the University is being erected; and public works as well as private are being projected. Capital and labour are again in contact, and as the demand increases for the former, the workman is seizing his opportunity, and turning to his advantage for the moment. The employer has his hands full, and so much work has to be executed in Glasgow this year, that something must be sacrificed on the score of expediency. The ship-building business on the Clyde is pretty brisk, and there is always something to be done in this line on the river.

In our rapid survey of Glasgow, sanitary and social, we have endeavoured to note faithfully what we saw and observed, as well as what we had already known by experience. In corroboration of our remarks, the criminal statistics of Glasgow will tell a social tale in sad and unerring figures. By these social data Glasgow's sanitary state is illustrated; and we but bring our few sparks of light to make the picture stronger, and to hasten, if it may be, the efforts that should be attempted to reverse it. "Let Glasgow flourish!" But that she may do so, Glasgow must be cleansed.

Glasgow at this moment is bearing the criminal burden of about 700 professional thieves, in addition to those of her own indigenous population, who ply that trade wherever and wherever they can. This datum we have from an official of the detective department. The law that is in force in England, which gives power to arrest suspects who are known to profess the thieves' calling, and to question them as to their modes of life and labour, does not apply to Scotland at present. The consequence is, that an exodus of the thieving fraternity has taken place from the sister kingdom, and thieves ply their trade here with impunity so long as they are undetected, though known to the police as swell-mobsmen and evildoers. Add to these facts the number of 30,000 who get drunk, or go to bed drunk, every Saturday night in Glasgow, and we have an appalling statement of the social and sanitary condition of the great commercial city on the banks of the Clyde. The death-rate of the city, has swelled to such enormous proportions that a panic is beginning to seize on the mind of the sober-minded citizens, and has spurred them at last to the necessity of public meetings to draw attention to, and to take steps to remedy, this terrible evil.

PROFESSOR SCOTT ON ARCHITECTURE, AT THE ROYAL ACADEMY.

LECTURE III.*

My last lecture brought the subject of vaulting to its full functional development,—that which contains all elements whose origin can be traced to the demands of utility, but none which have been introduced purely for decorative purposes. In my present lecture I must supplement what I then treated of with some cases of its application which I had not then time to detail, and then proceed to carry on my subject into its more distinctly decorative developments.

Before, however, I proceed further, it may be advantageous—though construction does not, perhaps, come within the range of lectures in this Academy, excepting so far as it exercises an influence upon form—to say a few words on cer-

tain practical points which are necessary to the full understanding, even of the artistic portion of the subject we are considering.

In the earlier forms of vaulting, the entire strength lay in the continuous arched surface, which was constructed of brick or of stone, or of rubble bonded at intervals with brick or stone; the rubble or stone being often of the cellular material called tufa, which was much used by the early builders on account of its lightness as well as the tenacity with which it united itself to the cement.

Transverse ribs were next introduced at intervals to strengthen the wider spaces; and, at a later period, the angles were similarly fortified.

These ribs, in early examples, sprang distinctly as separate arches from the impost, the vaulting passing over them. At a later period—even in round-arched vaulting—we find the practice coming into vogue of uniting the ribs, and even the springers of the vaulting itself by cutting them at the base out of the same blocks of stone. We see an early specimen of this in St. Bartholomew's Church.

When the ribs became more numerous it often occurred that five or even eight of them had to spring from one group of capitals; and at times three at least (and subsequently more) from a single capital. It is clear that in such cases the three or more distinct forms could scarcely retain their separate existence, but that they must be united in their lower portions in a single block, and that their forms would, more or less, die one into another. Though we can trace this process in Norman work, it was not completely established till some time later.

It will be better understood by means of a figure, in which a transverse rib, two diagonal ribs, and two wall ribs meet at their common springing line, and so intersect and unite one with another as to produce a section at the base composed of portions of them all. Now, a drawing of this group of ribs will at once show that their combined and united form must extend to some considerable height above the springing; and so far as it reaches, which is often some 8 ft. or 10 ft. in height, they cannot possess an individual existence. To this height, then, it is customary to build the group of ribs in horizontal courses, and only to commence the radiating arch-joints where the ribs clear themselves one from another, which usually occurs at one level, though in vaults of great irregularity one rib often clears itself at a lower level than another.

In setting out the relative position of the ribs upon the common springing level, great skill and judgment are requisite, or they will clear themselves one of another so irregularly as to cause great difficulty and needless twisting in the filling in of the vaulting surface. If you set out on plan the side lines of two ribs, and lay down the true position of the mouldings of one of them, it is clear that, if the curvature of both were equal, the second rib should be set out with its back line at an equal distance from the points at which the plans of the adjoining lines would intersect; for, in following the curve, both would at a given height reach a point vertically over that intersection, and so the filling in would have a proper starting-point, which would not be the case if they reached that vertical line at different heights. As, however, the diagonal rib (where the ridges are level) has to travel farther to reach a given height, its springing section has to be set further back to make it reach the vertical line over this point of intersection at an equal level with the transverse rib. The wall rib in a square vault would be similarly placed with the transverse rib; but in an oblong vault, as it would travel a less distance to reach a given level, its springing section must be placed forwarder than that of the transverse rib, and, of course, greatly forwarder than the diagonal. This is easily adjusted by drawing the curve of the back of the rib, whose position is first determined, drawing against it the vertical line of its intersection with the next rib, and then, from the apex point of the adjoining rib, to draw its curve through the point of intersection, which will give on the springing line the distance backward or forward at which the springing section of that rib should be placed.

The ribs of all vaulting of early date are square and flat at the back; the vaulting, which is often very thick, passing over and resting upon their backs. In later works the ribs were usually deeper from intrados to extrados, and were notched, or as it is technically called, "rebated,"

to receive the vaulting, or at least the lower part of its thickness; for where the surface was not intended to be plastered, the wrought stone-work was often a thin casing covered over above by a thicker mass of rough work. The curvature of the courses of wrought stone enabled them to be set without the use of continuous timber centering, and this inner facing, once finished, would itself form a substantial centering for the outer rough vault.

At a later period this outer thickness was dispensed with as a superfluous load. In all cases the hollow space against the wall behind was filled in solid to a certain height to strengthen the haunches of the vault.

The ribs now became beautifully moulded, and sometimes decorated with carving. In early works, as at St. Cross, St. Peter's, Oxford, St. Joseph's Chapel at Glastonbury, and in the aisles at Canterbury, the old Norman chevron was continued in the ribs. The meetings and intersections of the ribs at their apex were usually ornamented with bosses, and beautifully carved. These bosses assumed many varieties of form—sometimes a small rosette, or a little tuft of foliage, merely to decorate the centre of the intersection without covering the mouldings; sometimes the mouldings themselves return round a central opening, with or without foliage; sometimes a head of part of a figure was added to the last-named form in each angle, nearly at the plane of vaulting; sometimes beneath such moulded boss a disk was attached with or without foliage, as if to form a cover to the central opening; indeed, it was occasionally actually the movable cover of such an opening. In England the usual form is a group of foliage covering the intersection, and frequently containing figure sculpture. Westminster Abbey furnishes admirable examples both of the foliated and sculptured bosses of which I exhibit some casts.

As regards the intermediate surface of the vaulting, a curious difference is found to obtain between the methods adopted in France and in England.

In France the courses of stone run parallel to the ridges, as would naturally suggest itself from the original intersecting vaults; while in England they take an irregular direction, as if suggested by placing them at right angles to an imaginary centre line of each triangular space, though really deviating much and irregularly from such a rule.

The French seem much offended by the appearance of the English system; and I remember feeling in the same way when I first saw the French method. The latter seems to throw undue pressure on the diagonal ribs, while the English mode appears to throw it more equally on all the ribs; throwing it, in fact, down into the direction of their meeting point.

I will now describe a form of vaulting which, though it originated during the round-arched period, seems more properly to belong to that now under consideration. We have seen that the arches of churches were frequently arranged in pairs; the piers alternating in size and design. Supposing each arch to be about half the width of the nave, each pair of arches would form a square on the plan; and, though such a square space may be, and often was, divided into two oblongs in the vaulting, it is equally natural to vault it as a single square. As, however, this leaves the alternate piers unrepresented in the vaulting, it became frequent to carry across from this intermediate pier a single transverse rib crossing the diagonals at their point of intersection, and between it and those diagonals to introduce oblique vaulting cells, whose ridges strike from the centres of the half-bays to the point of intersection.

Dr. Whewell, followed by Professor Willis, has given this the name of "*seespartige*" vaulting, ordinary vaulting being *quadrupartite*, as having four cells. It is obvious that, in a square building of two bays on each of its sides, this may be carried out on all four sides, and thus become an *octopartite* vault; or, as in the aisles of Lincoln Cathedral, it may be adopted on one side only, and so be *quingupartite*.

These forms of vaulting were most frequent during the transitional period; that is to say, during the latter part of the twelfth century. Thus it is used in the work of William of Sens, at Canterbury, and by Bishop Hugh at Lincoln, and preparations were made for it at St. David's. It was, however, continued at Lincoln in the great transept, and in the aisles of the nave, which are of later date; and we have a beautiful instance of it at Westminster, as late as 1250, in the Chapel of St. Faith.

* See p. 224, ante.

The same principle was applied, in a varied form, at the east end of the Priory Church at Tynemouth, where, though the bays have ordinary vaulting, the eastern wall is divided into three parts, corresponding with the windows, over which cells of vaulting are formed, converging to the intersecting point of the compartment.

Curiously enough, we find the same arrangement repeated a century and a quarter later in the crypt of St. Stephen's Chapel, in the Palace of Westminster.

In the Lady Chapel at Auxerre the same idea is carried out still further, the vaulting, square in plan, having two of its sides divided into two cells each, as on the sexpartite principle, and the other two into three each, as those above referred to, making in all a *decapartite* vault. If all sides had the threefold division, it would have become a *dodecapartite*, or a vault of twelve cells.

M. Viollet Le Duc gives a curious instance of sexpartite or septipartite vaulting united with another form, for which I know no definite name, but which is itself a union of the groined vault with what I have elsewhere called the square dome.

I will describe the last-named vault by a comparison between those of two corresponding chapels near the west end of Lincoln Cathedral, to the right and left of the nave.

The two chapels are alike in plan,—an oblong, each side of which is divided into two arches. They only differ in that one has a central pillar and the other has none. The one is simply divided into four groined vaults on the most customary principle. The other is similarly vaulted up to the line of the square, the angles of which would be represented by the four bosses of the first-named vaults; but from thence the diagonal ribs, instead of returning downwards on to a central pillar, continue to rise till they meet in the middle point of the chapel. This upper portion, therefore, is the top of a square dome; and the whole vault may be described as a square dome penetrated on each side by two Welsh groined cross-vaults. This combination is common in the vaulting under central towers, as at Lincoln and York; though in these cases the central portion is bounded by a strongly-marked horizontal line defining the boundary of the half-groins below, and the square dome above. In the chapel I have been describing there is no such boundary line, but the groining compartments continue till they meet in a point at the top. This system may be carried out with any number of bays; and we have in the chapter-house at York an instance of its application to an octagon. The plan of the vaulting there is identical with that of Westminster or Salisbury, but the portion inclosed within the inner octagon, instead of turning down to the central pillar, runs up to the point at which all the arched lines would meet in the centre.

The relation between the vaulting of the chapter-houses of York and Westminster is, in fact, the same as that between the two chapels at Lincoln just described. In each case we see how similar forms may be covered over with vaulting nearly identical in plan—with or without a central pillar at pleasure.

There is a parallel case in the crypt of Glasgow Cathedral, in which the compartment is divided on three of its sides into two, and on the other into three arches.

This crypt is a work in which the architect would appear to have revelled in self-sought perplexities, and to have solved them, one after another, with singular success.

The portion of the crypt which represents the choir overhead is really one of the most lively and amusing pieces of vaulting I know. It consists of ten bays; and, as the east end is necessarily divided into two bays for the support of those above, nothing would have been more natural than to have placed an intermediate row of columns down the centre, dividing the whole into two ordinary ranges of vaulting. But no, the architect would have lost his fun by any such common-place scheme, and we should have lost a very pretty and instructive puzzle.

Beginning at the east end, he first cut off a space two bays long, then a second of three bays long, then a single bay, then another space of three bays; and, finally a single bay at the west end; while to each of his groups of three bays, he gave a central column, and repeated the three-fold division on its east and west sides. These square spaces, then, each of whose sides is divided into three, became the key-notes of his scheme, and most ingeniously and beautifully

he vaulted them. The principle followed is really, however, nothing more than an adaptation of the ordinary mode of dividing a square into four smaller squares of groining to a space whose sides are divided into three instead of two. The central square resting on the column remains unaltered, but the sides have each three cells, the transverse ribs from the central column being bi-furcated as its apex, and instead of going across to an opposite pillar, spreading, right and left, to the two pillars; and while the main diagonal ribs remain unaltered. These are met at their apex by half-diagonals coming obliquely from the same pillars in the sides. The result is a star-like arrangement of an exceedingly pleasing, though at first sight intricate character.

Adjoining one of these beautiful squares comes the compartment first alluded to. It is a very parallel case to that last described. On three sides it is the same as the Lincoln chapel, with a portion of a square dome instead of a central column (excepting only that this has the boundary line), while the fourth side, having three divisions instead of two, is dealt with precisely as has been described in the preceding case. Amongst these intricate compartments are alternated single bays, each divided transversely into three squares of ordinary groining; and the perplexity of the effect of the crypt arises not so much from the difficulty of any of the forms of vaulting, as from the constant change from one form to another, no two adjoining divisions being alike. The whole is carried out with excellent detail, and forms a most beautiful and interesting interior.

The subject of puzzles in vaulting suggests a notice of that of the choir at Lincoln, where the architect (De Noyes) seems to have put himself out of the way to make an easy matter difficult; for, instead of groining his oblong bays in the usual way, he has made each cell strike obliquely to points dividing the central ridge of the bay into three equal parts; so that neither the cells nor the diagonal ribs from either side ever meet one another, but each cell is met by an intermediate or an oblique transverse rib from the opposite side. Professor Willis, in his peripatetic lecture there in 1848, called the architect "a crazy Frenchman," it being then thought that he had been brought over by Bishop Hugh of Burgundy; but it has since been discovered that he was a member of a Norman family long settled in Lincolnshire; and the beauty of his work is such that we may well excuse this freak of eccentricity, and wish that this form of craziness was more prevalent amongst ourselves!

A curious effect is produced by carrying vaulting out accurately in a circular aisle or corridor, where it gives the diagonal ribs a twisted line, bending them out of the vertical plane. This is well seen in the apsidal aisle in the Cathedral at Bourges, both in the church itself and the crypt.

I will only notice two or three more varieties of this stage of vaulting, and those of a miscellaneous character.

The chapter-house at Lichfield is an elongated octagon, one of its sides on either hand being double the length of the others, and divided into two bays. The vaulting is a curious elongation of that of the regular octagonal chapter-house: a cell on either hand being interpolated, and the ribs all converging obliquely to the central pillar.

At Caudebec, in Normandy, we have, though of much later date, a hexagon vaulted much as our own chapter-houses, but with a pendant substituted for the central pillar, and ingeniously suspended by a long stone from a constructional vault above.

At Durham, in the octagonal kitchen of the monastery, we have a curious piece of vaulting planned with a view to a central ventilating lantern. The ribs run from every corner at right angles to the side of the octagon, and consequently meet the third angle from that from which they set out, and their intersections leave an octagonal opening equal in diameter to one side of the original octagon in the centre, and this is strong enough to support the required lantern or louvre.

The vaulting of the Lady Chapel at Salisbury is remarkable for the extraordinary slenderness of the columns which support it, being thin Purbeck marble shafts of great height, reducing the width of the chapel by cutting off a very narrow range of vaulting from either side. Somewhat similar in cell is the vaulting of the crypt beneath the Sainte C. Chapelle at Paris,

where, to avoid the segmental vaulting which would be the natural result of its limited height, the span is reduced by a range on either side of small pillars;—in this case so near the wall as to necessitate a great amount of stiling, and the introduction of a kind of tracery beneath the transverse ribs to give abutment to the central vault.

I should, in passing, mention that segmental vaulting is very frequent at this period, where the height is limited; and that, even where the main arches are not so, the diagonal ribs frequently assumed that form; indeed, it became necessary wherever the length of a diagonal exceeded double the height of its arch.

Taking this stage of the history of vaulting as a whole, we have peculiarly favourable opportunities of studying it here in London: possessing, as we do, excellent examples of all its most leading varieties.

In the Temple Church we have the curious circular aisle already described, being a specimen of the earliest era of true pointed-arched vaulting; while in the eastern portion, dating some forty or fifty years later, we have the most typical specimen conceivable of vaulting, all springing from a given level, and with level ridges. It is rendered the more marked in character by the division of the three ranges of vaulting by means of the pier-arches, which, coming close under the vaulting, assume the character of enlarged ribs.

Very similar to the last-named is the vaulting of the Lady Chapel of St. Saviour (or St. Mary Overie's), Southwark. The only striking difference being the number of spans and the absence of pier-arches, so that it assumes the form of a space divided into twelve equal and square compartments, and carried by six similar columns.

In the choir of the same church we have an excellent specimen of clearstory vaulting, with oblong compartments and stilted side-cells, worked in a manner somewhat different from the usual ploughshare system.

In the eastern half of Westminster Abbey, including the transepts, we have the vaulting of the oblong space (with ploughshare side cells), and of the square space, and of the four-sided space of all degrees of irregularity; we have apses of two dimensions, viz., the great apse of the Sanctuary and those of the radiating chapels, which are as beautiful specimens of the apse vault as can be found; we have, in the Chapter House, the vaulted octagon, with central pillar carried out in noble proportions and with excellent detail; while in the crypt below is a repetition of the same vaulting, of depressed proportions, and carried out with the severest simplicity.

We have in its inner vestibule two oblong vaults placed side by side, one apparently the square, and the other of the narrowest proportions; and in the outer vestibule beautiful miniature vaulting, on minute columns, and with the segmental arch; while in St. Faith's Chapel, hard by, we have an excellent example of the sexpartite vault. Parts of the aisles, too, are remarkable for the subdivision of their bays by transverse arches of the double orders of mouldings, giving a great nobleness and strength to their effect; and all these varieties are carried out with admirable detail and studied art.

It would lead me into too great length if I were to go into the moulding of the ribs; their combinations where grouping and intersecting one another in the springers, and the mode in which the shafts are arranged for their support. My illustrations will, however, do much to explain this. I must not, however, omit to mention that in French buildings, and frequently in the earlier English specimens, the plans of the abaci of these shafts assume both forms and positions indicating the general section and the directions of the ribs they carry; and that this is even shared by the bases; showing that the vaulting was the very first thing thought of and designed; and that, from the very floor of the building, it influenced the general design. This was lost in England by the introduction of the circular abacus.*

New Market Hall for Rugeley.—It has been resolved at a numerous meeting of tradesmen and other residents that a new market-hall should be erected. A committee, comprising the members of the Local Board, parish officers, and the chairman of the meeting, was appointed to promote and carry out the object of the meeting.

* To be continued.

SURFACE DECORATION.

A PAPER on this subject was read by Mr. William Pitman at the Society of Arts on the 18th inst., and was illustrated with a large number of decorations of various sorts lent by manufacturers and others. These included specimens of old leather hangings from Mr. George, brocade and embossed gold papers from Messrs. Corbiere & Son, other specimens of brocade from Messrs. Walters & Son, painted decorations by Mr. Earle, parquet floors from Messrs. Arrowmith, painted flock papers from Messrs. Scott, Clutterbuck, & Co., good stencilling patterns by Mr. Pitman, French caricature papers from Mr. Pearce, and imitation leather hangings from Messrs. Wooliams & Co.

In the course of the discussion which followed the paper,

Mr. Hyde Clarke commented on an observation made by Mr. Pitman to the effect that they ought never to have carpets in which they trod roses under foot. He could not but remember that in the East at this season of the year it was scarcely possible to move one's foot without flower after flower being crushed. It seemed to him by no means unnatural to tread upon flowers and herbage; indeed, more natural by far than treading upon artificial tessellated pavements. This remark applied with reference to carrying the principle of adherence to nature too far; for, in fact, on looking round the room at the various specimens brought forward as the original productions of decorative art, there was very little adherence to nature in any of them. As to the carpets and mural decorations of the East, he had before observed in that room that the school of art in Eastern countries was kept up by the dervishes, or monastic orders, in the same way that similar arts were fostered by the monastic orders of Europe in the Middle Ages. With regard to panelling, he should like to make one observation, because decorators did not always in this respect emulate their predecessors; for it was but too common, on going into a drawing-room of the present day decorated in panels, to find that they were so arranged as to make it appear that the doors and windows of the room had been put in afterwards. On looking at the older examples of this kind of work, it was very rarely that anything of this kind was found. This was a matter not depending on the study of nature, but on the cultivation of taste; and he hoped, as more progress was made in the study of nature, so also they should not forget to develop good taste.

Mr. Craze said there was one topic, that of encaustic painting, upon which he should like to say a word. In his opinion it had entirely failed in this country, and the reason of it, he believed, was not difficult to ascertain. It had not only failed in this country, but the man who had most zealously brought it forward in another country, Kaulbach, had found it was not a safe medium for painting. Encaustic required the use of wax as one of the chief ingredients; and when it became dirty, as it very soon did, and required cleaning, that operation was like cleaning a wax candle, the more you cleaned it the dirtier it became. It was also apt to peel and crack, and, on the whole, he saw no advantage in its use. A mixture of turpentine and varnish would produce quite as good an effect as any encaustic painting, without any of its disadvantages. With regard to what had been said by Mr. Hyde Clarke about carpets, he was rather inclined to agree with the lecturer. On one occasion, some time ago, he recollected that the cause of flowers on carpets was very warmly advocated by Mr. Ruskin; but on that occasion, he believed, it was proved that flowers in relief upon the ground were exceedingly confusing, and that it was much more pleasant and agreeable, as well as in better taste, to have a perfectly flat surface under the feet. As to the remarks which had been made about panelling, it had been said before that you should not criticise what was done by incompetent workmen, but rather go to the work of those who understood their subjects, and sought to carry out the true principles of their art.

Mr. Peter Graham fully concurred in the opinion expressed with regard to the great improvement of taste which had been shown in this country within the last twenty years. In point of fact, the most influential teachers and those who had most conducted to that end were those who formed the establishment at Marlborough House which was called the "chamber of horrors," where they found at once what should be avoided and what should be followed.

About the same time Mr. Owen Jones read a paper in that room on "The Principle of Colouring, said on Form in Decoration." It was a most valuable paper, and, as he could testify, had had, with the "Grammar of Ornament," great influence. He (Mr. Graham) was not one of those who thought that there was any superiority of natural taste in the French, but he must admit that they had a much larger number of workmen capable of executing with facility artistic works. In this respect the English were far behind them, although they were steadily, and he hoped rapidly, improving; in proof of which he might mention the various Exhibitions which had taken place since 1851, the productions in which had surprised our French neighbours. He especially mentioned South Kensington, for he believed the French set even a higher value upon that establishment than they did. With regard to style, he was of opinion that they might be very catholic in admitting varieties of style; and, although, in the case of carpets, floral decorations should be treated as flatly as possible, still a very beautiful effect might be produced with them if they were kept in harmony with the decorations of the room and the furniture by which they were surrounded. Of course he condemned large floral devices, but where the carpet was made in imitation of what might be seen in nature, small flowers on a neutral ground, the effect produced would be exceedingly beautiful and pleasing.

Mr. J. M. Blashfield, after referring to the early efforts of Owen Jones, Minton, Pugin, and others, said with reference to the decoration of walls, he might mention, in respect to what had been said by Mr. Pitman on the subject of ground-work for fresco-painting, that he had the honour of making several experiments for Sir Charles Barry, with reference to the best mixture of lime for fresco-painting in the Houses of Parliament. He found the difficulty chiefly arose from the bricks. London stock bricks were generally made partly of ashes, decayed vegetable matter, common mould, and an indifferent quality of clay, containing sometimes a quantity of chalk; and these bricks were very seldom sufficiently vitrified,—only just enough to form imperfect silicates and salts of an absorbent character. These salts by degrees worked their way up to the surface, and would sometimes affect even the strongest mortar,—as strong as Roman cement,—and these decreascent salts would impair the lime, however well prepared, and destroy the colour put upon the surface. On the other hand, a better description of bricks with the same description of lime did not produce the same result; and it had been found by some experiments recently referred to at a meeting of the Institute of British Architects, that abroad tiles were now being made free from the impurities which had been referred to, and perfectly burnt, which, when covered with lime, were quite successful. If they were sufficiently vitrified, and striated upon the surface, so as to hold the plaster, there would be no difficulty, even in this climate, he believed. With regard to ceiling decoration, he might state that there were some remarkably fine examples amongst our English mansions. For instance, Burleigh House hardly contained an apartment on the principal floor the ceiling of which did not afford an example of modelling which any one would be proud to study and imitate.

Mr. Laing said he believed the chief cause of the failure of encaustic painting in England, which was indispensable, was the moisture of the climate. The makers of French paper-hangings said that their ordinary gold-papers would retain their brilliancy anywhere except in Holland and England, where it was found necessary to have some protection from the atmosphere.

Mr. J. D. Craze said there was one thing which every decorator who took an interest in his art must much regret, and that was, that hardly any artists of high standing could be found to make a decorative use of their genius; and if by chance they were entangled into painting what was called a fresco, they were as much afraid of the surface around it being decorated as if it would infallibly destroy the picture, forgetting apparently that almost every fresco of any importance in Italy was surrounded by decoration in the richest lines, though admirably adjusted to each other. The artist should not be alarmed at the proximity of colour to his work, but should rather strive to so arrange the surrounding decoration that all should form a harmonious whole. Perhaps the most striking instance of this was the

chamber at Rome, in which was the famous Raffaele fresco, "The School of Athens." The chamber was not only decorated in the richest colouring, but it had been done by another hand for itself. Raffaele had too much good sense, as well as generosity, to destroy the magnificent ceiling of his predecessor, Sodoma, for fear it should injure the effect of his fresco.

The Chairman (Professor H. Taylor Lewis) said all seemed to agree in the main principles enunciated by Mr. Pitman; as, for instance, that a ceiling should not be a plain white surface; that very bright carpets, chosen because they were pretty in themselves, without any reference to their surroundings, were to be avoided, and in nine cases out of ten it would happen that such a carpet would kill anything else in the room. He could also agree in the denunciation of the marble shams which were too common in halls and staircases; but on some points he must differ from Mr. Pitman. For instance, as to mosaics, he believed that in a climate like that of England mosaics with gold backgrounds, especially where large surfaces were to be covered, were by far the most valuable kind of decoration possible. He had seen much of this sort of work on the Continent, and could not but contrast the grand old specimens in which the gold ground-work was in the glass itself, with the modern imitations, such as that in St. Boniface at Munich, where the background was made simply of gold-leaf put on in the ordinary way. There could be no question that the old mosaic work, done, if not in the time of Constantine, very shortly afterwards, was infinitely superior to any other kind of decoration whatever for large surfaces, which required to be seen from a distance. A good deal had been said as to the imitation of nature, with which he had no desire to quarrel; but, on looking round the room, he saw no single specimen which could in any way be said to be a copy of nature, and in fact the minute copy of details was hardly to be desired, but rather an imitation of the several principles. He had paid much attention to this subject, and had found that in nature there was hardly such a thing to be found as a pure tint; occasionally a bright spot would be found in flowers, particularly in the tropics, but it was always in the flower itself, never in the foliage, which formed by far the larger portion of the vegetable world; all this was a strong neutral tint. It must also be remembered, in decorating rooms, that the space at command was limited; that the carpets and wall decorations had to be contrasted with tables, chairs, and other things, which did not occur in nature. The rule, therefore, seemed to be, to follow the general principle of nature in having a predominant neutral tint, relieved by bright spots or places; and in order to do this effectually and well, nature must be studied a great deal more closely than he feared people were in the habit of doing. He believed the plan which had been followed by the best decorators in past times had been this,—to make the flooring of comparatively neutral tint as a groundwork, then to put in the walls of a deeper tone, and to lavish the grandest efforts on or near the ceiling.

RAILWAY ABANDONMENTS.

THE last stream-tide of speculation, or of enterprise, which sought its exercise and indulgence in connexion with schemes requiring legislative sanction, reached its highest point in 1866, when 633 private bills were petitioned for, and 392 bills received the Royal assent. The collapse came in 1867, and since that year the number of bills petitioned for in each successive session has been much smaller. Not only so, but the character of the bills brought forward in diminished numbers in these later sessions differs considerably from those promoted in the earlier years. In 1866, of the 633 bills petitioned for, 450 involved the deposit of plans, implying that the bills provided for the construction of new works. In the current session, 240 bills appear on the general list, and 139 sets of plans and sections have been lodged at the private bill office in connexion with them, of which twenty-five are for street and road tramways. Since 1867, inclusive, an increased proportion of the bills petitioned for have been for legislative sanction to the abandonment of works authorised in former sessions, for extension of time, financial arrangements, and for additional and various powers. It has been charged against the Legislature, and not without cause, that the procedure in relation to railways has been unwise,

hap-hazard, and has involved extravagant costs. In one direction, the Legislature seems now to be adopting a definite policy, which is calculated to prevent in the future a profligate waste of money in connexion with any new lines that may be projected,—a waste with which railway companies have been, in the past, in many instances, directly and exclusively chargeable. Parliament has sanctioned the abandonment of a number of small and comparatively unimportant lines, but the course of legislation with respect to this matter seems to be the rejection of petitions for abandonment, except upon one or other of two grounds,—the proved insolvency of the responsible party, or agreement and mutual consent among landowners, the inhabitants of the locality concerned, and the promoters.

An important precedent has just been established in the Brighton Company's bill, which has been inquired into by a committee of five peers, presided over by the Earl of Derby. Although an omnibus bill, its backbone and chief provision was for the abandonment of the Surrey and Sussex Junction line, which was originally promoted by an independent company, but eventually adopted by the Brighton Company, with the view, as has been alleged, of enabling them to secure better terms in their traffic agreement with the South-Eastern. The line is above half-made; it would be about twenty-two miles in length, and would give the Brighton a direct route to Tunbridge Wells. The contest in the case of this bill has not been, as many others are, one between powerful railway companies, but between the Brighton Company on the one hand, and a firm phalanx of landowners and inhabitants of the district on the other, who made out a strong case against the proposed abandonment. The Brighton Company had, of their own freewill and voluntary motion, adopted the line: many landowners had been indifferent or opposed to its construction, but had been persuaded into acquiescence, and portions of their property, which they had not desired to part with, had been appropriated by the company, and their estates were now disfigured by the partially completed works which it was proposed to abandon.

It is quite consistent with the declared policy of Mr. Laing, the able chairman of the Brighton Company, that this line should be abandoned if the company can get rid of the obligation. It seems hard that a company should be compelled to complete a line that they know will be worked at a loss. This may be quite true, but the Legislature properly says to companies in effect, "Count the cost before you come for a bill to make a new line; when you have got the powers you ask for, you will be held bound to exercise them; and you must not suppose that you are at liberty to play fast and loose with Parliament and the public in getting and giving up lines to serve your own purposes. It is quite time that land and property holders and the public should have the assurance that when the project of a new railway is agitated, promoted, and sanctioned, it is also settled that the scheme is a reality, and not a time-serving sham." In accordance with such views, the bill was rejected by Lord Derby's committee.

CHICHESTER.

It is in contemplation to restore the Lady Chapel at Chichester Cathedral as a memorial of the late bishop, Dr. Gilbert. It is not a little singular that the erection of the chapel itself, which forms the extreme east end of the cathedral fabric, and which most probably dates from the thirteenth century, is attributed by many writers to another Bishop Gilbert (called also De St. Letard), who held the see of Chichester from A.D. 1288 to A.D. 1305.

The projected cattle-market has now so far advanced, that a general description of it may be given. The principal entrance will be from Eastgate-square. A new road, 30 ft. in width, is to be formed. The boundary wall will be composed principally of flint, and generally 6 ft. 9 in. high. Nearly the whole of the roads will have a surface of asphalt. The ironwork of the gates at the entrance to the market are not comprised within the contract. The rails of the pens and cattle-standings will be formed of solid round wrought iron, and will consist of four for pens of sheep, except in the case of one row, which will have five; the pens for pigs and lean calves will have five. The whole of the rings will be built into the wall at the expense of the corporation, the contractors only

being required to paint them. Indicators for alleys and number-plates for pens, consisting of Willing & Co.'s patent enamelled wrought-iron, will be placed in conspicuous positions, and all the wrought and cast iron work will have a finishing coat of paint of a chocolate colour. The channels connected with the pens of sheep, pigs, and lean calves, and also between the standings for store cattle, will be lined with Staffordshire vitrified blue plain channel bricks, which it is expected will be obtained from the Albion Blue Brick Works, West Bromwich. The channels in other parts of the market, for fat cattle, will have grooved bricks. The stone used will be Portland—that of a whitish grey colour, with the best fresh and thoroughly burned Glynde lime and White's Portland cement. The brickwork will, it is believed, come from Fareham. The market must be completed by the 31st of December, 1870. Mr. Hawkey is the engineer, and Messrs. Cliffs & Co., contractors.

THE ANCIENT MAP OF THE WORLD IN HEREFORD CATHEDRAL.

THE celebrated Hereford *Mappa Mundi*, the work of Richard de Haldingham, who held a stall in Hereford Cathedral A.D. 1290 to 1310, is about to be published, and we would make the fact known. The map itself is the largest, and most quaintly and elaborately finished, of all the known *Mappa Mundi*, and is, indeed, a literary and archaeological gem of the first water. It is being published by a sub-committee of the Woolhope Club, and no effort is spared to get it out with the utmost accuracy. It is not done for profit, but simply as an object of the highest interest, and to ensure the maintenance of perfect copies of the map, before the original gets too disfigured by time to allow of its being copied, or lest anything should happen to it. Its size is 6 ft. by 3 ft., and to bring out the *fac-simile* will require thirty-six lithographic stones of the largest size. The strict accuracy of this *fac-simile* will be guaranteed, and may be tested by every purchaser; for in the 4to. book of descriptive letterpress which will accompany it, will be four large photographs from the map itself, embracing the whole of it (of 15 in. diam. size), and a glass would, of course, at once show any fault, if it exist, by comparing with the lithograph. It is offered at the cost price of its reproduction, and, indeed, the number published will be determined by the cost, when further experience has partially tested the estimates. It is far advanced in preparation, and it is hoped that sufficient subscribers may be got to enable it to be issued by the end of this year. It is rather a more serious item as to cost than the sub-committee had thought; but they have decided that it shall be done well. The Rev. F. Havergal, of the College, Hereford, the College librarian, is the general editor.

THE PROGRESS OF DONCASTER IN 1869.

THE town of Doncaster is generally looked upon as a town which approaches something like a finished state. Its rich corporation and its St. Leger are more vivid characteristics of its prosperity than its manufacturing or commercial industries. The town, always noted for its cleanly and well-managed streets, continues to make progress. Several of the streets have been flagged during the year; these include the east side of Marsh-gate, in Cleveland-street, and the east side of Cartwright-street. The Causeway in front of the Grammar School and Bass-terrace has been widened. A large plot of land, which was lately occupied by Mr. W. L. Crowther as a nursery-garden, has been sold by the Town Council, by the sanction of the Lords of the Treasury, for building purposes, for the sum of 3,560*l.* 12*s.* 8*d.* A street 45 ft. wide has been formed. The frontage-ground to St. James-street to the depth of 6 ft., and to the new street to the depth of 9 ft., is to be kept open, and not to be built upon. In addition to the above, a more direct route between the railway-station and the markets is in contemplation. The proposed street is to cross the river Cheswold. It is proposed to fill up the bed of the stream, on which to form the road. The proposed new road would greatly relieve the traffic between the station and the market on busy days. A number of houses have been built during the year. Mr. C. Vorty has erected four

of ten semi-detached houses, at St. George's-terrace, on the Thorne-road. They are all of brick, with pierced stone balconies and string-cornice on the top of a white moulded string-course. Messrs. Lister & Son have made plans for the erection of large business premises in the Magdalens, on the property of Mr. Somerset. The front is of an ornamental character, faced with white bricks, and relieved with stone dressings and coloured brick bands. Several other houses of an ornamental character have been erected in the town and its vicinity during the past year.

APPROACHING INTERNATIONAL EXHIBITION.

THE first of the series of Annual International Exhibitions of Selected Works of Fine and Industrial Art and Scientific Inventions will be opened at South Kensington, London, on Monday, the 1st of May, 1871, and closed on Saturday, the 30th of September, 1871. The exhibitions, as our readers know, will take place in permanent buildings, now being erected, adjoining the Royal Horticultural Gardens. The productions of all nations will be admitted, subject to their obtaining the certificate of competent judges that they are of sufficient excellence to be worthy of exhibition.

The first exhibition will consist of objects in the following divisions:—

Fine Arts applied or not applied to Works of Utility.

Manufactures, Machinery, and Raw Materials, including Woollen and Worsted Fabrics, and Educational Works and Appliances.

Scientific Inventions and New Discoveries of all kinds.

Horticulture.

The attention of artists and manufacturers is especially called to Division No. 1. Hitherto the exhibition of works of fine art has been too much limited to the display of pictures and sculpture, disassociated from purposes of utility. Every work in which fine art is a dominant feature will find proper provision made for its display. Painting, on whatever surface, or in any method; sculpture in every description of material; engravings of all kinds; architectural design as a fine art; every description of textile fabric of which fine art is a characteristic feature; in short, every work, whether of utility or pleasure, which is entitled to be considered a work of excellence from the artistic point of view, may be displayed in the exhibitions under the division of Fine Art. Every artist workman, moreover, will be able to exhibit a work of merit by himself as his own production.

PROPOSED IMPROVEMENT OF ST. PAUL'S CHURCHYARD AND LUDGATE-HILL.

AT the last meeting of the Metropolitan Board of Works, Mr. H. L. Taylor presented a communication from the Commissioners of Sewers for the City of London, informing the Board of the proposal of the Dean and Chapter, and stating that they were prepared to accept the proposal and carry out the improvement, if the Metropolitan Board of Works would contribute towards the cost of it. Mr. Taylor said the corporation of the City had been engaged for the last eighteen years in endeavouring to accomplish this improvement, and had now got the consent of the Dean and Chapter on the payment of 20,000*l.* The corporation had tried to get a carriage-way on the north side, but he was afraid they had no chance of success, as the north side was very narrow, and it would be difficult to form a carriage-way without removing the railings. It should be recollected that the authorities were willing to bear all the expenses connected with carrying out the improvement at the Ludgate-hill end of the cathedral, including the pulling-down the old railings, and erecting, probably at a cost of some thousands of pounds, a handsome set of railings which would be a credit to the cathedral; and the Dean and Chapter pledged themselves, in case of there being any profit out of the 20,000*l.*, to lay it out in the adornment of the interior. After a discussion, the communication was referred to the Works and General Purposes Committee for consideration and report.

Meantime, we may add, the barriers at the north side have been removed and the south side closed, in order to carry out the arrangement for improvement; and it is to be hoped the barriers will never be replaced.

NEW GLAZING MATERIAL.

In out-door glazing, whatever amount of care and attention may be exercised, it is occasionally a matter of much difficulty to ensure sound work. This uncertainty arises from various causes; for instance, the non-adherence of the paint-priming to the framework by reason of an interposing film of grease, size, &c.; the different rates of expansion between the glass and the framework in which it has been imbedded; and the action of the sun on exposed portions while a contiguous portion is shaded. In the latter case, large sheets of glass that have been imbedded in deep recesses, or sahes, or stonework, are often broken; but the greatest difficulty in keeping work sound while the glass remains unbroken is found with contiguous and extended metal sash-work, such as that on the roofs of Paxton construction, railway sheds, and conservatories. A more elastic medium than ordinary putty has long been a desideratum, and we learn from a paper recently read before the Civil and Mechanical Engineers' Society, by Mr. R. M. Bancroft, that a new compound of this kind is being manufactured by Sir W. A. Rose & Co., of London, under the name of *Thermo-Plastic Putty*. It has been used on the new large roof of the Great Northern Railway, King's-cross, and other extensive works, and has been severely tested. This putty, we are told, speedily sets hard, retaining a certain amount of elasticity; but when exposed to heat it becomes soft and more elastic, returning to its former hardness and position on cooling, thereby allowing for the unequal expansion of the glass and its frame, insuring sound work for a long period. The cost is not great.

MOVEMENT IN RAILWAYS.

A new arrangement for railways will shortly come before the public under the title of the *Panther system*. A single row of piles carries a continuous girder on which the train runs, the carriages hanging down on each side to within a very short distance of the ground. The carriages are so arranged that inequality of weight on one side to the extent of a ton will not affect the action. The small quantity of land required, cheapness of construction, and speed, are advantages claimed for it. Mr. Samuel, C.E., has taken the invention in hand, and we shall doubtless soon hear more of it. Extensions and alterations are going on which will place Edinburgh within six hours of London. A scheme has been proposed by means of which, it is asserted, Manchester will be reached by Londoners in two hours. If we understand the proposition rightly, the carriages would pass over rollers kept in motion by turbines. The wind is rising, and we may look to see enterprises launched.

IMPROVEMENT ON COMMON STAIRS IN EDINBURGH.

We have recently said so much on the disgusting condition of the Edinburgh common stairs, that we conceive it to be a duty, as it is certainly a pleasure, to refer to some substantial efforts we observe being made in the shape of reform. Most of these staircases are so planned, as our readers will remember, as to have the water-closets, occasionally for no less than twelve families, communicating with them and ventilating into them; and hence it sometimes happens, as in the case of a choked or defective soil-pipe, or a deficient supply of water, that the results are so horrible as to pass the bounds of description. As we have already said, these common stairs are nothing but a common nuisance, and are, no doubt, responsible for a great proportion of the very high death-rate which is at present predominant in the capital of Scotland. It is therefore with pleasure we observe that in the plans for a new block of houses in Inverleith-terrace,—

"Every modern convenience is introduced. It is specially worthy of notice that care has been taken to secure proper sanitary conditions. A ventilating shaft, with a sectional area of 12 ft., is carried up through the tenement, communicating with the open air at top and bottom, and accessible from each house by means of a trap-door. Into this shaft every water-closet has an opening,—an arrangement greatly preferable to the common one of ventilating such places from the common stair. All the soil-pipes are carried down through the shaft; so that, in the event of any repairs being required, the necessary work can be executed without occasioning domestic inconvenience."

Commending this wholesome sanitary practice to the Scottish architects generally as a praiseworthy attempt to get rid of a national nuisance, we may at the same time remind our

readers that it is many years since we first directed public attention to the subject. The architect concerned in the block mentioned is not the first, however, who has adopted the ventilating shaft in Edinburgh. Councillor James Gowans has already adopted it as a leading feature of the internal construction of his ornate range of tenements which has been recently erected at the south corner of the Castle-terrace.

THE SANITARY STATE OF WHITEHAVEN.

TYPHUS fever still prevails at Whitehaven. During the last four months there have been, out of a population of 19,000, from 360 to 370 cases in the town, and one patient out of every six died, the total number of deaths having been sixty. This state of matters has attracted the attention of the Medical Department of the Privy Council, who have addressed a letter to the Whitehaven trustees, asking for information respecting the outbreak, and for an account of the steps which the trustees had recently taken to diminish the prevalence of the disease. The reply of the trustees sets forth the extent of the disease, its probable causes, and the nature of the remedial measures which have been adopted. The predisposing causes are described as being the want of a proper system of household drainage, the want of closet accommodation, the over-crowded, over-built, and badly-paved state of many parts of the town, and the dissipated and irregular habits of the bulk of the lower classes residing in the lowest parts of the town, and amongst whom the disease had been almost entirely confined.

INSTITUTION OF SURVEYORS.

At the ordinary meeting of this Institution, Mr. John Clatton in the chair, a *Plea for Culture* in the Profession of a Surveyor was read by Mr. Jeremiah Matthews, to which we shall return. This paper was preceded by the adjourned discussion on the paper by Mr. E. P. Squarey, entitled "*Farming Covenants*," which was concluded, after an animated debate in which many members took part.

The next meeting will be held on Monday evening, April 4th, when the paper by Mr. J. Matthews will be discussed.

NEWCASTLE-UPON-TYNE.

St. Nicholas's Steeple.—The restoration of this vast pile of masonry is fast approaching completion. The scaffolding has been entirely removed, and, with the exception of the south-west angle buttress, the building, although patched, has the appearance of once more setting time at defiance. The buttress mentioned, octagonal on plan, is being rebuilt to project some few inches beyond its predecessor's original face, thereby lending great additional strength to the weaker side of the tower. The task must have been an arduous one both to the architect, and to Mr. Walter Scott, the builder.

National and Provincial Bank of England.—Within the last few weeks a block of property situate at the corner of Mosley and Dean streets, and consisting of four large shops, together with offices, warehouses, &c., has been razed to the ground. The site, naturally a large one, has become the property of the National and Provincial Banking Co., who are about to build themselves new and commodious premises. Mr. John Gibson, of Great Queen-street, Westminster, is, we understand, preparing the plans, and as the corner referred to is openly situated in the principal and most fashionable part of the town, there is a good opportunity for display of skill.

VALUE OF SEWAGE.

SIR,—There are some observations at page 231 in the *Builder*, 19th inst., relative to my remarks on sewage, made at the Society of Arts February 25th, on Mr. Hope's paper. On looking at the report, I see that I stands for 100: this is of course a mistake. The value of 100 tons of sewage has been estimated as worth 17s. 6d., or about 2d. per ton. This is the chemist's value and not the farmer's. Sewage, the year round, would not be worth more than 1d. per ton chemist's value. No farmer, would, however, pay such sum for sewage in bulk.

I said 200l. gross per acre had been received by growing cabbages; but I did not ask the meeting to credit that such sum could be ob-

tained generally: I named 20l. and 25l. per acre. The Edinburgh sewage meadows let at rates from 25l. up to 45l. per Scotch acre per annum. Four Scotch acres are about five statute acres. The "*Lessee of Sewage*" may learn my views if he will read the appendix to my report on the pollution of the river Thames at Barking, page 10. This report has just been presented to Parliament, and is therefore to be purchased from Mr. King, 34, Parliament-street. In this appendix I give the titles of official reports issued on this sewage question, and your correspondent may read and learn more than he knows at present.

ROBERT RAWLINSON.

ARCHITECTURE IN THE ROYAL ACADEMY EXHIBITION.

At the last meeting of the Institute, a letter was read from Mr. Smirke, R.A., in reply to one which had been addressed to that gentleman on the advisability of leaving to the architect members of the Royal Academy the selection of drawings sent to the Royal Academy for exhibition. In this Mr. Smirke stated, that the attention of the Royal Academy council had been called to the subject, but that, although the opinion of architect members of the Royal Academy would much influence the judgment of the council on the subject referred to, the council of the Royal Academy could see no reason for altering their existing regulations in respect to the choice and arrangement of works sent for exhibition.

SAFE FOR A YEAR.

SIR,—At a recent meeting of the Neath Highway Board it was stated that the surveyor "had examined the Glynneath Bridge over the river, and found the work now in excellent condition; and that it would stand for twelve or eighteen months, or for a longer period, with occasional repairs and carefully watching." (The *Times* are mine; I quote from the report.)

A bridge to be in an "excellent condition" (with regard to strength, I suppose), and yet to be considered safe for "twelve or eighteen months" only, and then requiring patching and "carefully watching," appears to me rather paradoxical. Supposing it should last "twelve or eighteen months," would it be safe for general road traffic after that time, even if the patching and watching were continued? I commend these few remarks to the notice of the said highway board, and to the public using this wonderful structure.

J. D.

AS TO THE IDENTITY OF INTERESTS BETWEEN EMPLOYERS AND EMPLOYED.

SOCIAL SCIENCE ASSOCIATION.

RECENTLY, in the meeting-room of the Society of Arts, Mr. Godwin in the chair, Mr. Frederic Hill read a paper "On the Identity of Interests between the Employers and the Employed." Mr. Hill commenced by saying that although many persons would even now assert that instead of the interests of employers and work-people being identical they were antagonistic, it should be remembered that ideas which were now on all hands admitted to be fallacies had been considered to be self-evident truths. No one now doubted that the interests of England and Scotland were identical, yet a few centuries since they were believed to be antagonistic, and an Englishman and a Scotchman were stated to be natural enemies. It was not so long since it was held that the interests of England were opposed to those of her colonies. In the same way, the speculators, who were now admitted to be the best friends of the consumer, and who stored, for their own advantage, no doubt, but also for that of the consumer, corn and provisions till the important time of scarcity, were punished by our laws of a century ago as forestallers and regraters. It was the interest of the employer that the workman should be paid sufficient to enable him to live in comfort, so that he should be induced to continue to labour for him; and it was likewise the interest of the workman that the employer should have his labour at a price which would enable him to compete with others, and, therefore, to continue to afford employment and wages to the workman. It would be as well to consider the points on which their interests were most generally supposed to be antagonistic. First, was the labour and the mode of estimating its value; second, working overtime; third, the employment of apprentices; fourth, the employment of females; fifth, the mode of paying the

wages; and sixth, wages and the hours of labour. On the first point he contended, with reference especially to task-work, that it was the fairest mode of estimating the value of labour, and was as beneficial to the workman as to the employer. Working overtime was, in the same way, a benefit to both parties. The employment of apprentices and of females would, to some extent, cheapen the cost of production, and stimulate to a similar extent the consumption of the manufactured article, thus being advantageous to both parties. As to the mode of paying the wages, he was in favour of payment in kind, or, at least, of permitting the workman to make an agreement to receive such payment with his employer. He had seen excellent results from the system in the iron country, where he had seen the men's wives obtaining various goods at the store, and the men admitted they were more comfortable under the system; but they, nevertheless, thought it should be changed, for they considered a man should have the spending of his own earnings. In Scotland, too, it was most usual for farm servants to be paid partly in kind, and the plan worked very well. The plan had, moreover, the advantage of cheapening the cost of production, and was thus for the benefit of both parties. With respect to wages and the hours of labour, it was for the interest of both parties that a fair day's labour should be given for a fair day's wages, for the reasons above stated.

At the conclusion of the paper, the chairman having invited discussion,

Mr. Paterson said he had listened to the paper with a great deal of pleasure; but, however much all might desire to see harmony and peace, it was not safe to ignore facts. Though he agreed with Mr. Hill that the smaller and more immediate interests were merely in apparent opposition, this could not be so clearly seen on the great points of wages and the hours of labour. If it were Mr. Hill's idea that workmen were never to combine or to strike for an advance of wages, he did not agree with him. How was an accurate understanding to be arrived at? Would the selfishness of men and the similarity of interests, when balanced, produce harmony by the measure of the resolution of forces? The masters were certainly looking after their own interests, and if the men did not look after theirs, the selfishness of the masters would be more powerful. It was the selfishness of the masters that was the greatest bar to the profitable employment of women, for they had to obtain their work at lower prices. If a woman produced a piece of work as well as a man, why was she not paid as well? A woman and two children could earn only about 4s. a week making lucifer-match boxes; those who could earn 7s. a week were exceptions. The women who made clothes for the shop-shops were paid much too little, and were at the mercy of the capitalists, because they had never combined. The employers were able to obtain their work for what they chose to give. Cheapness of production might arise from an abnormal cause,—not the abundance of the means of living, but the abundance of those who worked. It was said that every reduction of wages came back, and in proportion to the articles consumed; but this was not proved. If a carpenter earning 30s. a week had his wages reduced 25 per cent., he would not have a corresponding reduction of rent because his wages were but one element in the price of the house. Ground-rent and other charges entered into the calculation; in fact, the wages formed only 40 per cent. of the cost. If it were the interest of the employer to give a fair rate of wages for a reasonable number of hours, how was it that the journeyman bakers had to work seventeen or eighteen hours a day, while the better class of bakers did not always give better wages or exact less work? It was absolutely essential that men should combine and resist the employers. An employer might be himself willing to give fair wages, but if he had other masters on each side of him who ground their men down to the lowest rate they could induce or compel them to accept, the good employer would be compelled to pay the same rate or be driven out of the market. He was obliged to admit that there had been imprudent strikes, and strikes not by any means justifiable, but it was nevertheless the case that the employers had entirely ignored the fact of the identity of interests.

Mr. Briggs could endorse every word in the paper of Mr. Hill on this very difficult question. He had been himself an apprentice, a journeyman, and an employer, having commenced work fifty years ago, and had had to deal with men

and things since then. He thought trade-unions pests of society. He did not mean to say that they could not co-exist with society, but, as they were at present, they were the real pests of society. If they combined themselves to form co-operative or industrial associations he would not object to them. They ought not to combine with benefit societies or with funds for the relief of the sick. A friend of his in Liverpool, who employed 2,000 or 3,000 men, had had a dispute with his hands, and some of them who had been with him for forty years came back and begged he would try to employ them back and begged unless they struck with the others they would lose the benefits of the fund they had been subscribing to for forty years. In his business they had had disputes about inferior hands, and inferior workmen had been left out and left upon the poor-rates because the trade-unions would not allow them to accept a lower rate of wages; but an understanding had been come to that these men should be allowed to take their own prices.

Mr. May said, it was mostly allowed that labour was regulated by the laws of supply and demand, a law which he thought most monstrous. If he understood trade-unions, their object was to obtain for the working man an equitable share in the profits. The more labour there was in the market the cheaper the employer would get it, and the possessor of machinery would thus become more wealthy, while the poor would remain poor. If there were a proper division of the people on the land, there would be no occasion for ladies to work. He had been in a colony, and if he were a working man he would not stay in this country if he could escape from it.

Mr. Ford could remember when mechanics had 4s. 6d. and labourers 2s. 6d. a day, and were not paid sometimes till nine o'clock in the evening on Saturdays, and sometimes on Sunday mornings. Those were the times when they did not understand union; but as the number of the trade societies increased, the condition of the working men had risen, as well as the rate of wages. He objected strongly to payments in kind, and instanced the excavators, whom he used to pay monthly, when making the line from Potter's Bar to Hatfield, who used to have very little money to receive, having taken so much at the chandlers' shops. The men who earned the money were the persons to spend it as they thought proper, and he had managed to let them have their money. Many of them had then sent their wives to the market to buy their goods. Another evil of the truck system was, that the men had to trust to the judgment of one man for the quality of a large variety of things, such as one man could not be expected to understand. He had seen an instance of this at the Co-operative Tailors' Society, in the Westminster Bridge-road, where he had dealt; for, though an employer of workmen, he was greatly in favour of co-operative societies. He had bought socks there for 1s. 7½d. a pair, and had been laughed at at home, for they were such as might have been had elsewhere for about 7½d. He had no doubt the managers had had an honest desire to act fairly, but had been taken in in the City as to an article which they did not understand. In the town where he was engineer the wages of mechanics were at first only 9s. a week, but before he left they were earning 14s.—from the men beginning to understand their own value, which they could only learn from a union with their fellows. He contended that there was no shirking of work by a skilled mechanic, and that better work was done in the shops now than fifty years ago.

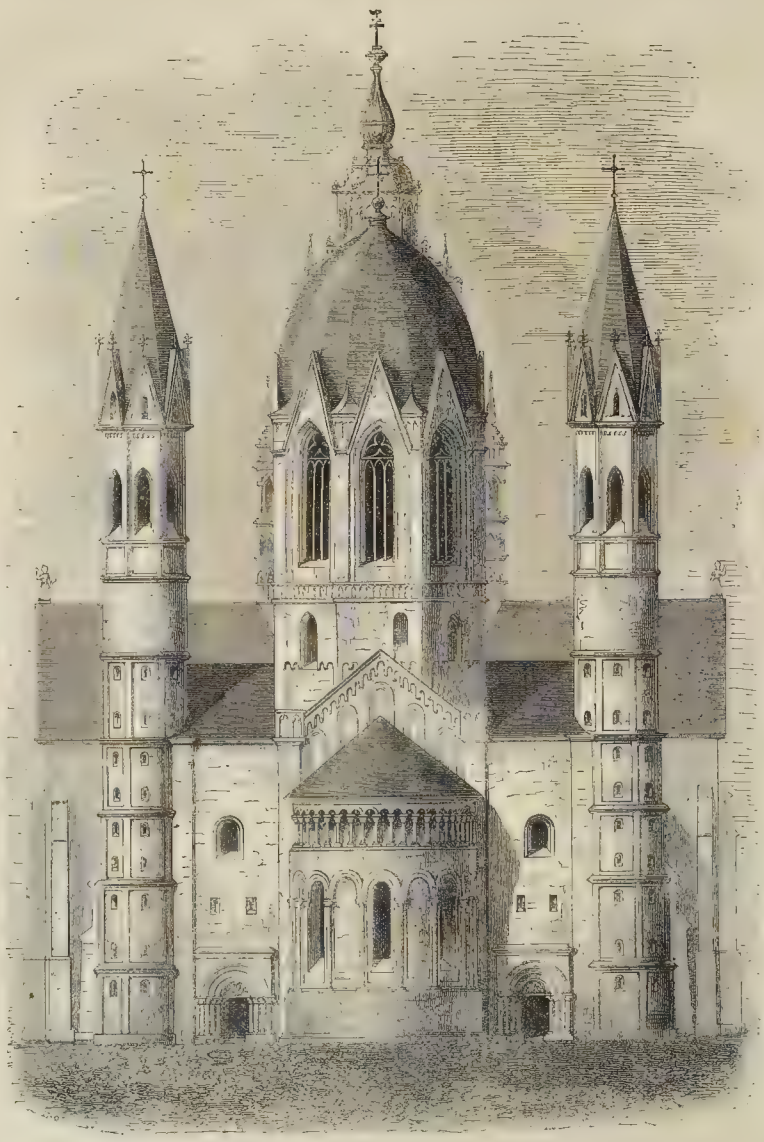
Mr. Vickstone had done work from a very early age, and did not think there had been any very great change in the character of the work so far as the workman was concerned. There was no doubt that machinery was much better, and articles made by machinery were made more rapidly and were better finished than formerly. But he thought the workman did his work less earnestly than he did forty years ago, though he received higher wages. He had had 1,000 people in his employment for fifteen or twenty years, and he thought workmen sought more for the end of the day than they did fifty years ago, when they received less wages. He did not agree with Mr. Hill as to paying wages in kind. Piecework was opposed in the building trades, and if it were opposed in the cotton trades, and in other manufactures, we should be unable to compete with other countries. This subject was a large one. He thought that a man receiving

6s. or 8s. a day ought to give the nation the worth of his wages in work done. He agreed that we must go in the direction of interesting the workman in his business by giving him a share in its profits. An employer from America had said that men did not give their heart to the labour. What was wanted was to enlist the hearts of the workmen, and unless we succeeded in that we should leave ourselves much behind the position we ought to hold in the year 1880. He did not care where door or window frames were made; let them be made durable, they would be done cheapest and best. Why should not the Belgian make something that he was adapted to make? The unerring law of Providence would be sure to have its way. The workman feared too much, and he lost himself when he tried to lessen the amount of work which he put into the day. A few years ago the cry was a fair day's wage for a fair day's work, but it was now how to get a fair day's work for the wages.

Mr. Botley, Mr. Bryan, Mr. Creed, and Mr. B. Wilson having made some observations,

Dr. Hodgson said as to the truck system, it was not free trade, but monopoly under the pressure of the employer. It might be a violation of free trade for the Legislature to say that in no case shall the employer effect an exchange with the employed. A very suitable objection had been raised to the system that it led to one person purchasing all kinds of goods, of many of which he could not be a judge. He was surprised at the remark of Mr. Paterson, as to the reduction of wages not causing a corresponding reduction in commodities, for he ought to know that he could not argue on the reduction of the wages of a carpenter merely, but upon a general reduction in the price of labour: 99 per cent. of the value of all the materials in a house consisted of the value of the labour expended on them. As to the increase in ground-rent alluded to, he would resist his desire to go into the question of how far a man who had done nothing to increase the value of his property should be allowed to enjoy that increase. If we allowed the utmost possible scope to trade-unions, their sphere must still be limited, for there must be a point beyond which they could not go. When masters and men met and settled that the price of a certain piece of work should be 3½d., why should they not have made it 7d.? What was the point beyond which they could not go? Allowing a certain margin, there must be something to regulate it. The gentleman who had immediately preceded him had made some very valuable and some very valueless remarks, but of the former was that by which he called the attention of the working men to the fact that they have in themselves a great amount of capital. Working men complain that they cannot save money, yet they boast of the trade-unions having two or three hundred thousand pounds. Why were these means lying idle? The sooner they took up this point the better.

The Chairman moved a vote of thanks to Mr. Hill, and said the inquiry was one of enormous importance at the present moment. He thought the paper had been a little misunderstood—he had heard nothing in it condemnatory of trade-unions; its object was to show that the true interests of employers and employed were identical, and so he believed they were to a great extent, though not wholly. Probably there had never been so many building operatives out of employ as there were at present, and he thought this was partly due to differences between the capitalists and the workmen. A good deal of foreign carpentry and ironwork was now being used, and the foreign carpentry was very little cheaper than that made at home, if any. He thought there were many wrong points in the rules of trade-unions. With regard to overtime, it seemed to him a suicidal policy to forbid it. Preventing men from doing this was preventing them from entering into the class of employers. In every profession advancement was scarcely possible without working overtime at one period of life. Great lawyers had attained eminence by working fourteen, sixteen, or eighteen hours in the day; and what rising lawyer would listen to the dictation which would forbid him to work when he would? And why should artisans prevent their brother artisans from working? Ask those masters who had risen from the ranks how they had done it, and they would say by piecework and overtime. With regard to apprentices, it seemed to him that they were also wrong. He had heard distressing statements from fathers of families who had



MAYENCE CATHEDRAL.—TWELFTH AND THIRTEENTH CENTURIES.

(See p. 238, ante.)

been prevented from bringing up their sons to their own trades. If a bricklayer was prevented bringing up his son to his own trade, and went to the plasterers, he found the rules there prevented him as effectually. An improved education was of the utmost importance, and on it the success of co-operation must mainly depend. How were these boys to get their education? As to the effect of trade-unions on the work, he feared it had been to lessen the number of really skilled workmen. He could not resist the opportunity, he said, in the hope that it might reach the Government, to urge on them the necessity of immediately going on with some of those large works for which they had the sites, and for which money had been provided, and, by so doing, bringing into employment a number of men. He thought they might put away the

fear of strikes, which he knew they felt, and he thought the workmen might do something to meet the times by concession. He concluded by moving a vote of thanks to Mr. Hill.

The vote of thanks was put and carried unanimously.

Mr. Hill, in the course of his reply, said there was not one word in his paper condemnatory of trade-unions. He was a member of the committee on labour and capital appointed by the Social Science Association, which had lately promulgated some resolutions as to the principles on which legislation should be based with regard to trade-unions, and, as an association, they had declared their opinion that not the slightest legislative obstacle should be put in the way of combinations so long as they respected the freedom of others, and exercised no coercion over them.

He had no wish whatever to interfere with them at all. As to the truck system, he differed from the views of Dr. Hodgson. Though he felt great satisfaction that upon the whole he had had so much encouragement, he was not surprised that on this point there was a difference. He might be wrong, and he was not so fallible as to suppose himself infallible; but if he were in error, it was error in which he had indulged for many years. Dr. Hodgson said that in the matter of payment in kind, there should be perfect freedom of action between the employer and the workman. Would it not be an interference with freedom if we prevented him from making a bargain that the labour shall be paid for wholly or in part in kind? The law now prevented such a bargain being made, and he thought it an interference with freedom.

PROPOSED BUILDING FOR REFORM CLUB, MANCHESTER.—MESSRS. STOKES & JONES, ARCHITECTS.





TOMB OF DAGOBERT, EXECUTED BY ORDER OF ST. LOUIS, IN THE ABBEY CHURCH OF ST DENIS.

It represents the King carried away by Demons, after his Death, and received by Angels and Fathers of the Church.

Thirteenth Century.

See p. 233, ante.

MANCHESTER REFORM CLUB.

WE give a view of the Club-house now in course of erection in Manchester. The basement is to be let as stores, the ground-floor as offices; the Club, starting from the first floor, is approached by a grand central hall and staircase. The hall and ante-hall are to be groined, and the walls decorated with terra-cotta and marble columns. The staircase is to be of oak, with carved balusters, inlaid with various kinds of wood. On the first floor is a large dining-room, 80 ft. long by 32 ft. wide, with panelled oak and pitch-pine ceiling, decorated with gilding. The doors and dado are of carved oak. On the floor are also strangers' dining-rooms, coffee-room, &c. On the second floor is a large billiard-room, to hold four full-sized tables, card-room, smoking-room, and so forth.

The front and side elevations are to be of ashlar work, and with polished granite columns, red and grey, and different coloured polished

marbles. The contract is taken by Mr. Nield, builder, Manchester, for 20,000*l*. The architects are Messrs. E. Salomons and J. P. Jones, of Manchester and London.

EXISTING SCIENCE CLASSES FOR WORKMEN.

ED.—The people of this country seem now to be thoroughly aroused by the Education question. Efforts are being made by all classes to place the British workman in, at least, as good a position as his Continental neighbour, both as regards primary and technical knowledge, by opening up new sources of instruction.* This is as it should be. Let it not be overlooked, however, that it is just possible that the old means by which many of us have gained our knowledge, may be capable of improvement; and it is in the earnest desire that this may be effected, that I wish to call your attention to one particular source of education, the Science Schools in connexion with the department at South Kensington.

I am an old workman-student in these schools, and, as

* *En passant*, the British Workman must also put his own shoulder to the wheel, and help himself.—ED.

a successful one, received, after the examination last year, a list of all the students who passed a stage, together with a statement of the total who failed; that is, who were in fact "plucked." On comparing these together, I was astounded at the relative largeness of the latter, compared with the former, and was inevitably drawn to the conclusion that there must be something wrong somewhere. Take, for example, the three cognate subjects of inorganic chemistry, magnetism and electricity, and sound, light, and heat. In the first subject, of 2,074 examined, 1,298 passed, and 776 failed. In the second, of 2,608 examined, 1,460 passed, and 1,148 failed; and in the third, of 1,352 examined, 985 passed, and 367 fail d. How is this to be accounted for? In the first place, it appears to me to arise to some extent from the insecurity of the reward. The teachers receive for their services a reward, which, though depending entirely upon results (that is, no pass, no pay), yet may be cut down at any time by "My Lords," as witness the late minute, issued in the middle of this session, which not only reduces the pay, but abolishes entirely the lowest class in each subject, which was really the one which paid the best. The teachers are consequently disheartened; they know very well that the number of those who will fail at the next examination will, by this arrangement, be largely increased. Their reward is also further lessened by the reduction of the fees to be paid for the successful students. I cannot fail to observe the want of interest in the classes manifested by the teachers since the issue of the minute, and predict a very unsatisfactory examination in May next in consequence.

Another cause of the non-success of many of the students arises from the want of proper instruments and apparatus to illustrate the lessons of the various subjects above mentioned, a great deal of apparatus is necessary, and the Department,—very generously, in my opinion,—engaged to bear a considerable proportion of the cost of this, provided the local committee pay the remainder. This, in many instances, they neglect to do, and hence failure in teaching. I have in my mind's eye a case in point. In a large seaport town in the North of England a school of science is established, with a local committee of some thirty gentlemen, most of them wealthy and occupying influential positions. Several subjects are taught by competent teachers, certified by the Department, one of whom is very experienced, and holds a very distinguished university position. Yet this school is so ill-provided for, that the value of all the apparatus they possess is under £50. No wonder if failure results. But it may be asked, "Why do not this committee subscribe and call upon the townspeople to subscribe to furnish the school properly?" Well, the committee have contributed, and the townspeople have contributed, to the extent at least of 400*l.*, which the committee have invested, not in the purchase of instruments and apparatus, but in a 400*l.* bond, the interest of which, some 1*l.* a year, they apply to the payment of current expenses, which is in no case considerable, as by the favour of a private establishment, and other arrangements, they have a sufficient rent not taxes to pay.

If the conduct of this committee, who, by the bye, have a rule that five form a quorum, and only about that number attend, so that the committee is virtually reduced to that extent, I say if the conduct of this committee is at all sample of that of other local committees of Schools of Science, I do not at all wonder at the non-success of the students. I say if the conduct of this committee is at all sample of that of other local committees of Schools of Science, I do not at all wonder at the non-success of the students. I say if the conduct of this committee is at all sample of that of other local committees of Schools of Science, I do not at all wonder at the non-success of the students.

Another thing I may remark here is, that formerly it was the practice, for one or another of the local committees to attend every lecture to enter the names of the students present. Sometimes two or three came, and showed by their presence at least, that they took a lively interest in the success of the school. This rule has somehow become relaxed, as in the school which I attend no committee-man has put in an appearance this session as yet, and one only attended once or twice last session. I say that men, who are not interested in their fair earnings, and as a consequence, take less interest in our success.

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THE PALACE OF WESTMINSTER.

MR. W. H. GREGORY said the First Commissioner of Works whether he had indicated his intention of placing in the hands of his own department all the work of the Palace of Westminster which had hitherto been under the supervision of an architect; and, if so, whether he would inform the House of the name of the gentleman connected with the Office of Works to whom these professional duties were to be entrusted.

MR. AYLTON said the question involved some misapprehension of the facts connected with this subject. The amalgamation to come into effect at the commencement of the present financial year would be that the Palace of Westminster would be placed, in the same manner as the other palaces of his Majesty, under the charge of Mr. Taylor, one of the assistant surveyors. His office was not well described by its title, because it involved duties of very considerable importance. The ordinary works were carried on under his immediate direction, and whenever any extraordinary works arose they were carried on by those who were specially employed for the purpose,—for painting, an artist; for sculpture, a sculptor; and for architectural work, an architect. He would perform his functions under the new system, under the supervision of another officer recently established in the Board of Works, called the Director of Works. Her Majesty's Government had selected a gentleman of well-known high position, namely, Mr. Douglas Galtion.

ARCHITECTS' RIGHTS.

SIR,—Apropos of your recent remarks on the demand made by the Department of Works on Mr. Edward Barry, that he should surrender up all the drawings and other documents prepared by himself and father for the Houses of Parliament, allow me to observe that, should he unfortunately be compelled to yield to this arbitrary and unprofessional demand, the document issued under the great seal of the Institute professing to be a statement of the "professional practice and charges of architects" may as well at once be set down as mere moonshine, as it clearly specifies that the "architect is paid only for the use of the several drawings," and that they remain his property.

I am sorry to say that the conduct of the Institute Council with reference to this very document of theirs since its publication rather favours the view that it is a mere dead letter, as will appear from the following:—

The writer had once the misfortune to have to try the question of the truthfulness or otherwise of this document in a court of law. In doing so he was supported by four architects of eminence, who all depose to its being, what it professes to be, a fair statement of the charges, &c., "now usually and properly made." The other side, however, had no difficulty in finding two architects of some note, one being a Fellow of the Institute, to come forward and swear that the terms of the Institute paper were not either usual or proper, and, as might be expected, the jury disagreed, and the matter remains undecided up to the present.

Let Mr. Barry therefore be prepared, if he should have to contest his question with the Government, to find the Fellows of the Institute ready to oppose him, and to give any evidence against him that may be required on the

subject of professional usage, however contrary to what has been hitherto recognised, damaging to a professional brother or other, or in the case of the profession. Doubtless the member who on the occasion above mentioned contributed so effectually to bring the rules he had himself subscribed into disrepute, is equally ready to do so still, and is available, should the Department of Works need any evidence, to rebut what may be adduced on the side of Mr. Barry.

I was simple enough to imagine that conduct such as this would be met by some rigorous measures on the part of the Institute Council, elected for the purpose of "promoting uniformity and respectability of architectural practice;" and accordingly brought the matter as one before it, in the hope that something would be done to prevent the recurrence of similar unprofessional conduct in future; but all the notice taken of my complaint was a general resolution to the effect "that a member of the Institute ought to support the Institute scale;" and on my further remonstrance as to the inefficiency of such generalisation, I was informed that the paper in question was only "recommended, and could not be enforced, nor could any member be called to account relative to it."

However, were I in Mr. Barry's position, *malgré* the sympathy displayed by the Institute, I should most certainly refuse to part with a single document; and, fortunately for him, being in possession, he has a ground of advantage over the department, which I hope he will not surrender. As to another important element in his case, the entrance to dismis or supersede him, it may be of some importance to observe that Mr. Keeling having courageously tried this question out with the directors of a local company some years ago, the ruling of Chief Justice Gifford was to the effect, that "an architect once employed for a particular work, cannot be dismissed till the work is complete."

WM. FOXEY, F.R.I.B.A.

THE SPIRIT OF ART.

The mightiest courts and empires sank

In the surging waves of time,

But Art clung fast to the saving plank,

Where it laid up its Ark sublime.

Babel, upraised, was broken by God,

And Babylon swam and fell,

And Carthage and Nineveh felt the rod,

As their works of Art still tell.

The Spirit of Art o'er many lands

Diffused an inspiring taste;

Pyramids sprang from the arid sands

Of Egypt's desolate waste.

And Greece arose with a joy elate,

Unclenching her glorious grasp;

And turn'd the end of a school still great

In the classic fields of Art.

Then Rome of the Tribunes, Eagan Rome,

Next plumed her wings for a flight;

To go with her valiant Art,

She claim'd o'er the world a right:

Tribute and spoil from every source,

Were taken to deck her domes;

Till Art and empire, in death's curse,

Collapsed in the catacombs.

Not lost, but like the fabled bird,

From out its ashes new,

Reborn Art, unseemingly

Both Classic and Christian too,

Walks through the world with a stately mien,

Despite of the Vandals' ban,

The good and virtuous

Of the gifted mind of man.

Oh! hallow'd Spirit of ancient Greece,

Though ages have pass'd and gone,

The glory that's yours shall increase,

Though to dust drop the Parthenon;

And Rome, when thy Coliseum falls

(Now Rome, after Pontiff's heart),

You'll still live on in your marble walls

And sculptured works of Art.

Nor will we pass here by default

The grand and glorious page,

Of tower and chancel, aisle and vault,

Of arch and buttress, and of gable and roof;

Last, though not least, the Goths have raised

To heaven, as things apart,

Temples unequal'd, and be praised!

In the greatest fields of Art.

THE PROPOSED NEW STREET FROM THE NEW MEAT MARKET TO OLD STREET.

IN a great city like London, where all the commercial world do congregate, where representatives from every colony and foreign State assemble for trading intercommunication, and in face of the fact that the commerce of the world's metropolis doubles itself every seven or eight years, the necessity for adequate traffic accommodation, and the provision of means for easy ingress and egress between the New Meat Market and other provision and colonial produce markets to the other densely populated suburbs of London, and so forth, is a self-evident fact, as is universally acknowledged and self-evident, as to need no comment. The recent improvements in the City have already provided us with three great trunk-roads, running north and south, and east and west; but, in the east, though a wide and commodious thoroughfare is already provided as far as Old-street, yet, in the most crowded and important section of the City proper, there is no outlet to the New Meat Market to the south and western thoroughfares, but by a few narrow and ill-conditioned streets, which, during the first half of the day, are in a state of perpetual block. The present scheme is designed to effectually mitigate the continuance of such an obstacle.

The proposed connecting street would be 400 yards in length, at a distance of 100 yards from the present line of purchase of property, &c.; but from its position it would save 300 yards each way to every vehicle traversing that route; and also, connecting as it would, at the north-western end of the New Meat Market, to the fourth and completing trunk-road to and from the provision markets of the City. The project has been already submitted to the several vestries of the metropolis and its suburbs, to the Metropolitan Board of Works, and the Court of Common Council, and met with their favourable

consideration and approval. The only course remaining for the citizens and public generally is to give their individual support to a scheme so obviously beneficial to the interests of the traders and inhabitants of the entire metropolis.

A CITIZEN AND RATEPAYER.

BUILDERS' TENDERS.

SIR,—I sometimes see in the *Builder* about specimens of tendering. The following in a small way is a fair sample of what is occasionally done in this town (Leicester):—

For painting the outside of Messrs. Evans and Stafford's warehouses, Campbell-street:—

Stephenson	£38	0	0
Widdowson	47	0	0
Dunn	33	0	0
Whitmore	29	0	0
A. Knight	21	0	0

R.

DANGERS OF KITCHEN BOILERS.

AN article in the *Builder* of March 12th, p. 209, points out the great danger that exists in all closed kitchen boilers that are not provided with adequate safety-valves, whenever a frost occurs severe enough to freeze the water in the communication-pipes; but the article takes no notice of the danger of explosion from another source, which by most people would be quite unsuspected,—as it was, in fact, by me. I refer to the partial or complete stoppage of the pipes from a deposit of iron in the form of very hard concretions adhering most firmly all along the bore.

Finding the action of my apparatus (which consists of a closed boiler supplying a bath about 13 ft. above) I unsatisfactorily after being in use five or six years, I took it down, and found the pipes lined throughout with a solid iron concretion. Very fortunate it was for me that I did examine into the matter, for the concretions had in parts so nearly closed the bore of the pipes that if I had continued the use of the apparatus a year or two longer I am convinced the stoppage would have become complete, and an explosion inevitable.

The water used is remarkably pure, containing no appreciable quantity of lime or iron, so that the concretions must have been derived from the boiler and pipes. That a deposit should take place might have been expected, but its extreme hardness and solidity did surprise me.

It may be observed that such boilers supplied with calcareous water must be liable to the same danger, though I am not aware that any instances have been recorded.

One object in writing is to inquire how the report of the "Manchester Steam Users' Association" may be obtained? As I observe your article quotes from their chief engineer a promise of entering on the subject of safety-valves for such boilers.

P. P. C.

CHURCH-BUILDING NEWS.

Aveton Gifford, Devon.—The ancient church of this parish has lately been re-opened, after undergoing renovation and repair. The building consists of nave, chancel, north and south transepts, and north and south aisles adjoining the chancel only. The ground plan of the church was originally in the form of a Latin cross, a low and massive tower being placed at the intersection of the arms. The main entrance is on the north side, protected by a porch, with parvise over. The style of the building generally is Early Decorated. The works that have been executed comprise new roofs throughout; new copings and finials to gables; new stone windows, glazed with cathedral tinted glass; open seats of pitch pine; new pulpit and other fittings of oak; tiled floors by Minton; &c.; and the whole has been carried out by Mr. J. Willocks, of Aveton Gifford, under the direction of Mr. H. Elliott, of Plymouth, architect. The total cost of the work is about 2,500*l.*

Bristol.—The site of the proposed new "Green Bank" Cemetery, Stapleton-road, is now in the hands of the contractor, Mr. William Brock, of Temple Meads. The site selected is elevated, and may be seen from the Midland Railway, and from many parts of the city; it is undulating, and the soil a compact sandy marl. The quantity of ground purchased by the Burial Board is about 20 acres, 12 of which will be first appropriated for interments. The works under contract by Mr. Brock and by Mr. Nelson, of St. Michael's Hill, comprise Episcopalian and Non-conformist chapels, vestries, keeper's lodge and office, mortuary, boundary walls, entrance-gates, roads, paths, and planting. The tenders for the works sent in by fifteen firms, according to a

notice already given in the *Builder*, ranged from 4,662*l.* to 6,143*l.* The works have been designed and will be carried out under the direction of Mr. Henry Masters, architect and surveyor, Bristol, and are expected to be completed by the end of this year.

Littleton.—The little church of North and Middle Littleton, near Evesham, is about to be restored, at an estimated cost of 1,200*l.*, towards which 850*l.* have been already raised. Mr. Freedy is the architect engaged; the builder has not yet been fixed upon. The restoration will involve new roofs throughout, the chancel arch will be raised and widened, also the arch of the north transept, and a new vestry will be built. It is feared that some of the walls may require rebuilding, new windows must be inserted, and several old ones restored. New seats, pavements, and doors are required, besides other fittings: and the masonry of the tower will have to be looked after. There are many relics in the building which it is hoped will be preserved, including the sanctus-bell cot, a squint, the entrance to the rood-loft, Norman font, piscina, &c. South Littleton Church also stands in much need of restoration, but nothing can be done to it at present.

South Lynn.—A reredos has just been completed in All Saints' Church. It consists of a centre, having three large panels with smaller ones between them, carved canopies, and pinnacles. The panels are polished alabaster, inlaid with a cross in gold mosaic, and the sacred monogram in red marble. Each side of the wall, as high as the window sill, is faced with stone, with incised patterns upon it, finished with a panelled and carved cornice. Above this, the whole of the east wall has been painted and diapered, relieved by two medallions of St. Peter and St. Paul, painted on a gold background. Two goss standards, the work of Messrs. Hardman & Co., Birmingham, have been placed within the altar-rails. The painted decoration of the east wall was designed and executed by Messrs. Lavers, Barrand, & Westlake, of London; and the reredos was carried out by Mr. William Brown, of South Lynn, from the design of the architect, Mr. William Smith, of London.

Newbury.—The erection of Highclere New Church has proceeded satisfactorily, and the building is now roofed in. It is being built at the cost of the Earl of Carnarvon, and will probably be consecrated in June by the Bishop of Winchester. The architect is Mr. G. G. Scott, and the work is carried on by the contractors under the supervision of Mr. Blackie, who holds the appointment of clerk of the works on Lord Carnarvon's estate.

Pontypool.—A new church is about to be erected at Tow-hill, Pontypool. The edifice, which has been designed by Mr. W. Adams, Newport, will comprise porch, nave, and chancel, with a vestry on the east side. The chancel and altar are to lie towards the north, and the porch to be affixed to the south end. The nave, which is to be fitted with movable wooden seats, is to be 53 ft. long, and 21 ft. wide. The chancel will be 18 ft. by 19 ft. 6 in. wide. On the south of the nave roof is to be a pointed bell-turret. The south front will contain above the porch two large windows, a double lancet surmounted by a circle, with small single-light windows above. The north window will consist of a triple lancet, and two circles. The windows in the sides will be of corresponding pattern. The material for the external walls will be blue Pennant stone, relieved by ornamental courses of red bricks.

Huddersfield.—During the last year the interior of St. Thomas's Church has been considerably improved and beautified by the remodelling of the organ and decorating of the chancel. The organ, which (on account of its great elevation) had hitherto been an obstruction to a circular window in the apse at the east end of the south aisle, and was also played from a gallery, is now so arranged that the player sits in the chancel, and in a line with the choir stalls. These improvements, and the decoration of the organ pipes, have been executed by Messrs. Connacher & Co. The decorations, which have been executed by J. W. Knowles, of York, comprise the powdering of the panels of the roof, picking out the ribs and bosses with gold and colours; diapering the walls, on the east end of which are painted the Agnus Dei, Pelican, and emblems of the four Evangelists; on the side walls, the Creed, Lord's Prayer, and Commandments have been illuminated. Under the painted decoration, and in a line with the top of the reredos, the walls have been covered with majolica and

painted tiles, the south side of which has been pierced for the reception of a credence niche: a moulding of Caen stone (corresponding with the one on the reredos) divides the tiles from the painted work. The reredos, pulpit, and marble work, have been cleaned, and the marble repolished, by Mr. Cole, of York, sculptor, who likewise carved the credence niche and mouldings. The circular window over the organ has been filled in with stained glass, by Mr. J. W. Knowles, representing King David playing on a harp. This glass is the gift of Mr. L. R. Starkey.

Hessle, near Hull.—All Saints' Church, Hessle, has been re-opened. The church has been nearly rebuilt. The chancel was taken down, and built up again further back, care being taken in the rebuilding so that stone by stone was placed as before. By this means the nave received additional length. Increased width was also gained by adding to the side aisles, and in carrying out the enlargement the different character of the masonry is preserved as indicating the several dates of the workmanship. In the nave the whole of the modern seats have been removed, and will shortly be replaced by open pew benches of pitch pine. The roofing is open-timbered work, varnished. The clearstory has been rebuilt, and the windows of it are opened for ventilation by a contrivance concealed by the moulded string-course running over the arcade. The west doorway has been opened out, and draughts are prevented by curtains hanging within all the doors. Two painted windows have been placed in the south aisle, one by Mr. C. L. Ringrose (subject, the Resurrection), and the other by Messrs. H. & J. B. Barkworth (subject, the Ascension). The west window has also been restored. The heating apparatus has been supplied by Messrs. Rimmington & Sons. The middle chancel has been entirely rebuilt by Lieut.-Col. Pease. The seating is of grained oak. The bench ends are filled with tracery and surmounted with poppy-heads. The fronts of the seats are ornamented with linen patterns. The roof is similar to that over the nave, but more ornamented. A reredos, sedilia, and credence have been executed in Caen stone. The reredos consists of seven divisions, separated by buttresses and pinnacles, and covered with ogee-shaped heads, small cornice, and carved cresting. The panels of the buttresses are filled with pale green marble. The three centre compartments of the reredos are filled with Venetian mosaics, by Dr. Salviati, representing the cross, the pelican and young, and the paschal lamb. Above this rises the east window of painted glass, representing Christ sitting in majesty, surrounded by saints, patriarchs, apostles, angels, &c. The chancel is divided from the aisles by wrought-iron screens or grilles, and the sanctuary is enclosed by wrought-iron work, and railings of oak mounted with brass. The encaustic pavements are various in design, the principal colours being red with black bands, gradually growing richer in detail towards the east. Previously to the restoration, the whole of the internal stone-work was covered with several thick coats of paint and whitewash. These have been entirely removed by the use of Messrs. Naesaire & Co.'s solution, thereby avoiding the "tooling" usually adopted for the removal of paint-work from stone. In clearing away this paint, several remains of old ornament have been discovered on the caps and arches of the arcades. These have been preserved as far as possible. The organ has, according to the present custom, been placed in the north aisle as much out of sight as possible. It is a small instrument by Forster & Andrews, but will ultimately have to give place to a larger instrument. The entire work of restoration and enlargement has been carried out from the designs and under the superintendence of Mr. R. G. Smith, of Hall, architect. Messrs. Simpson & Malone have been the builders; the other contractors being, for iron-work, Messrs. Hart, Son, Peard, & Co., London; for painted glass, Messrs. Hardman & Co., Birmingham; for encaustic tiles, Messrs. Mann & Co., Broseley; and for church furniture, Messrs. Frank Smith & Co., London. Messrs. Simpson & Malone's contract was for 5,500*l.*

Tardbegg.—The new church of ease for the parish of Tardbegg, at Webbeath, has been consecrated by the Bishop of Worcester. The late Baroness Windsor erected and endowed the church, the site being given by Mr. R. Hemming, of Bentley Manor. The edifice is dedicated to St. Philip, and has been erected from designs by Mr. Freedy, architect, London, by Messrs. McCann & Everitt, builders, Malvern. The building is of red and

grey stone from Howell and Tunstall quarries, with Bath stone dressings and decorations. It consists of nave and chancel, with porch, vestry, and bell gable. The style is Early English. The sitting accommodation is for 200, and all the seats are free and unappropriated. In the chancel, over the altar, is a stained glass window in three compartments, representing the Crucifixion, Abraham offering up his son Isaac, and Moses lifting up the Brazen Serpent.

Runkhill.—The church of this parish has been re-opened, after repairs and partial restoration. The buttresses have been rebuilt in cement, the walls have been repaired, and the simplest possible roof, supported by posts from the ground, and stiffened by longitudinal and transverse curved braces, has been made to relieve the side walls from pressure, and to give to the ugly square-looking room of late years the appearance of a church, with nave and side aisles, a treatment which is found in the ancient church of Winterton, in this county. The restoration of the chancel being found impracticable, a raised dais, paved with tiles, for the Holy Table, with singers' seats on either side, has been placed at the east end; the remaining space has been provided with open benches of deal, and the tower has been made available for a vestry. The porch, the stone and glass of the windows, and the tower sounding-windows have been patched up as much as the funds would admit of, and these, with the chancel, invite the labour of future church restorers. The contract was undertaken by Mr. Hubbard, of East Dereham, who carried out the works under the architect, Mr. Edward J. Tarver, of London. During the progress of the work, crocketed fragments of the ogee-headed niche in the east wall were discovered, built up in a recess between the two north windows, and there were found above and around the east wall niche, powderings of the monogram S. K., as well as the remains of a fresco figure on the eastern jamb of the adjacent window. They have reference, probably to the altar of St. Catherine, before which Margaret, widow of Robert de Berne, knight, was buried in 1410, and to which she gave a picture of St. Catherine.

Poole.—The Bishop of Salisbury has consecrated St. Mark's Church, near Poole, in Dorset. The edifice, which cost 5,000*l.*, was the gift of Miss Georgina Talbot, who laid the foundation-stone some two years ago. This lady, who erected a large number of almshouses in the neighbourhood, did not live to see the church completed. Her remains have been buried in the churchyard of St. Mark, which has also been consecrated.

Brighouse.—St. James's Church has been consecrated by the Bishop of Ripon. The church is in the Early English Gothic style. It consists of nave, chancel, aisles, organ-chamber, &c., and in place of the usual tower and spire, which it was intended should adorn the structure, a little bell-turret rises at the western end. The nave is 69 ft. in length, 22 ft. in width, and to the apex of the open-timbered roof, 48 ft. in height. The aisles are 10 ft. 3 in. wide. The chancel is 28 ft. long, 18 ft. wide, and 39 ft. high. On the south side of the nave there are five bays, with the columns circular and the pointed arches moulded. On the north side there are only four bays, the remaining space having been appropriated for a porch. The chancel-arch springs from carved capitals. Along the aisles the windows have triple lights and tracery, and in the clearstory the windows are alternately cinquefoil and polyfoil. At the western end the window has four lights and tracery, and has been filled with stained glass. Medallions are introduced with full-sized heads of the four Evangelists and the four major Prophets. The eastern window has not yet been enriched with stained glass. The seats are of deal, stained and varnished, and open. Sitting accommodation is provided for 600. Messrs. Mallinson & Barber, of Halifax, were the architects. The total cost has been 3,800*l.*: 600*l.* were paid for the site.

Hartlepool.—St. Hilda's Church has been re-opened for divine service. The entire chancel has been rebuilt, in conformity with its original design, and the church will now seat 120 additional persons. The east window is of great size, and is the gift of Mr. Emerson, of Pooner, Cheshire; and another in the south aisle has been put in by Miss Dixon, of Seaton. Mr. Pritchett, of Darlington, was the architect, the total cost of the work is 1,600*l.*

Birstal.—The foundation-stone of a new church has been laid at Brownhill, a district contiguous

to the parish and town of Birstal, but which is situate in the borough of Batley. The church, which is expected to be completed by the beginning of November next, is from the designs of Messrs. Sheard & Hanstork, of Batley, architects; and the following are the contractors for the several works required in the erection—Mr. Jas. Booth, of Batley, mason's work; Mr. Joe Willans, of Birstal, joiner's; Messrs. Hill & Nelson, of Wakefield, and Thos. Armitage, of Birstal, plumber's. The edifice will be Early English, the total length, including the chancel, being 90 ft., and the width, including the aisles, will be 48 ft. It will consist of nave, chancel, and vestry, with open-timbered roofs; and, as soon as the funds will permit, a tower and spire will be added to the building, and the baptistery will be placed beneath the latter. The total cost of the building, exclusive of the tower, is estimated at 1,700l., and the site has been presented to the committee by the Earl Wilton.

STAINED GLASS.

Emmanuel Church, Weston-super-Mare.—A window has been erected in the west end of this church to the memory of Mr. Henry Davies, a gentleman who was well known in the locality, and who died from an accident about two years since. The window has been designed and executed by Messrs. Clayton & Bell, of London, and contains full-length figures of Abraham, Moses, David, and Elijah, with cartoons underneath the figures, severally representing Abraham offering his son upon the altar; the passage of the Red Sea; David beheading Goliath; and the sacrifice on Mount Carmel. In the upright piercings of the tracery in the upper part of the window, there are also figures of small dimension of Enoch and Samuel, Isaiah, Jeremiah, Ezekiel, and Daniel. The cost of this work, we understand, is about 150l.

St. Mary Redcliff.—A window in memory of Edward Colston, the great Bristol citizen, is about to be placed in the north transept of this church. The top or first row of lights will be filled with four designs illustrative of receiving the stranger, visiting the prisoner, teaching the ignorant, and leading the blind. A corresponding series, consisting of feeding the hungry, giving drink to the thirsty, clothing the naked, and visiting the sick, occupies the lowest row. The centre lights illustrate the parable of the good Samaritan. In the first we have the priest and Levite passing by; in the next, the good Samaritan succouring the wounded man; in the third, the journey to the inn; while the fourth represents the payment at the inn. At each corner at the foot are the Colston arms. The tracery will be filled with coloured glass. The execution of the work is in the hands of Messrs. Clayton & Bell, of London. It is expected that the Colston window will be ready by the 21st of April, on which day the Canynge festival is to be held. The estimated cost is over 450l.; 40l. of which remain to be collected.

Bushbury Church.—A memorial window has been erected at the west end of the south aisle of this church. Messrs. A. & W. H. O'Connor, of London, were the artists. The entire design, which is of four lights, symbolizes the one thought of the Resurrection; and the subjects are:—1. The Setting of the Seal upon the Sepulchre, after our Lord was placed in the Tomb; 2. The risen Saviour appearing to St. Mary Magdalen in the Garden; 3. Our Lord walks with his two Disciples to Emmaus; and 4. Our Lord shows Himself to His Apostles before His Ascension. These subjects are enclosed in ornamental framing, bearing half-figures of the four greater Prophets and their emblems, and the half-figures above of the four Evangelists and their emblems. In the tracery is seen the Saviour risen, with Angels in adoration.

St. Oliver's, York.—A stained-glass window, the gift of Mrs. Dixon, of York, has been erected on the south side of this church. The subject is the Ascension of our Lord; and the work is from the studio of Mr. J. W. Knowles, of York.

Norton Church, near Sheffield.—The east window of the south chapel of this church has recently been fitted with stained glass. The subject in the centre is the "Ecce Homo." The panel is placed on a coloured ground, relieved by the passion-flowers and vine ornamentation, with the initial medallions and arms of the Cammell family introduced. Two south aisle windows, erected by Mr. Chas. Cammell, of Norton Hall, have also been filled by the same artist, Mr. T. W. Camm, of Smethwick, near Birmingham.

St. Thomas's, Dudley.—A memorial window has recently been erected in the south aisle of this church. The subject is the Ascension of our Lord, which occupies three of the five lights. The window glass was executed by Mr. T. W. Camm, of Smethwick, near Birmingham, who is also entrusted with the Great Memorial for St. Edmund's Church, Dudley.

Tamworth Church.—The general committee have accepted the design sent in by Mr. Wailes, of Newcastle, for a testimonial window to Dr. Millar. The design consists of the figures of the twelve Apostles, bearing appropriate symbols. Above and below are angels bearing scrolls. The glass for the painted window will cost 270l., and the necessary repairs to the stonework of the window, and other expenses, about 80l. We may also state that a painted window, which will cost about 150l., is to be placed in the south transept, to the memory of the late Rev. F. Bick, for about forty years vicar of the parish. This church is now undergoing internal restoration, and, it is hoped, will be enriched with other stained windows.

Nayland Church.—This church has just been adorned by a new east window, the work of Mr. H. Baker, of Colchester, which has been filled with painted glass, by Messrs. Baillie & Mayer, of London. The window is of the Decorated period, and contains five lower compartments, with tracery lights. In the centre opening are two groups under canopies, one of which is "The Trial of St. Stephen" and the other "The Stoning of St. Stephen." The four side openings each contain a group in medallion-shape on geometrical and mosaic back-grounds, enclosed within borders of purple and green flowers. The groups on the north side are "The Nativity," and "Christ bearing the Cross;" on the left side "The Entombment," and "The Ascension." In addition to this window, a new stone step to the communion-table, with encaustic tiles, has been laid, and the walls have been re-stuccoed.

St. Edmund's, Salisbury.—Three windows in the south chancel aisle of this church have been filled with stained glass, the gift of the Rev. T. H. Tooke, formerly rector of the parish. The work has been executed by Messrs. Clayton & Bell, of London. The glass represents scenes in the life of Jesus, illustrating incidents of childhood; the aisle having been built for the use of Sunday-school children.

St. Mary's, Bloxham.—The new east window in the chancel of this church, the work of Messrs. Morris & Co., London, was not finished till late on Christmas Eve. In the large quatrefoil at the top of the window is a figure of our Lord, as the King of Glory, seated on a rainbow, surrounded by the angelic host, some of whom are holding a screen of curtains behind him. Immediately below, on a deep blue ground, is a seraph with six wings, of a rather dull ruby. On the north and south sides respectively are angels with bright ruby wings, holding in their hands the sun and the moon. Below these are four angels with white wings on a blue ground like the rest, two playing on stringed instruments, one on pipes, and the remaining one singing from a scroll of music; ornaments in yellow stain are on all the draperies. In the cusps of the lower lights, dividing the tracery from the lower part of the window, are the four gates of the Celestial City, the New Jerusalem, with an angel over each gate. The walls are alike all round, and the dome in the centre, but variety is obtained in the grouping of the buildings, turrets, and trees. The four lights in the lower part of the window are divided half-way down, thus making eight compartments, each of which is occupied by two figures of angels, archangels, apostles, and prophets in the upper half, and martyrs, kings, bishops, and virgins in the lower. This is a memorial window to some members of the Davis family. The cost of the window has exceeded 350l., and has been defrayed out of the donation of 1,000l. presented to the church last year by Mr. John Hale, of Germans, Chesham, whose wife is a member of the Davis family.

The Northern Architectural Students' Society.—On the 15th the members of this society held their annual fortnightly meeting. Mr. W. L. Newcombe, president, occupied the chair. Mr. Joseph Oswald read a paper upon "Domestic Architecture," with special reference to villa and suburban residences. The discussion which followed was introduced by Mr. J. H. Morton and the chairman.

Books Received.

Ernest George's Sketches, German and Swiss. London: W. M. Thompson, Pall-mall, 1870.

HAVING completed a number of water-colour drawings during a sketching tour, the artist, an architect, made pen-and-ink sketches from them, and, with the aid of Cowell's anastatic process, now publishes actual transfers of them, forty-five in number, with brief descriptions. The views taken are in Aix-la-Chapelle, Nuremberg, Cologne, Würzburg, Coblenz, Prague, Bâle, Lucerne, Thunne, Berne, Lausanne, Chillon, and elsewhere; and if not particularly novel, are very picturesque and pleasing. Mr. George is evidently a ready sketcher, and has a good eye for the choice of a point of view. The sketches are too slight, but they make a pretty table-book, which will serve to illustrate and recall the German journey of many an ordinary tourist, and suggest to others how interesting they would find a similar trip.

English Country Houses: Forty-five Views and Plans of recently-erected Mansions, Private Residences, Townscape Houses, &c., with a Practical Treatise on House Building. By WILLIAM WILKINSON, Architect. London and Oxford: James Parker & Co. 1870.

THE object the author had in view in putting together these forty-five examples of Domestic Architecture was, he says, chiefly to assist those who may propose to build in determining the style and character of the proposed edifice, in deciding upon the materials to be employed, and the mode of executing the work, and as suggestive of various matters that deserve consideration. The buildings here represented, and which have all been executed from the designs of the author, range from residences costing 5,000l. or 6,000l. each, to cottages 300l. the pair. Plans accompany each view, and some sensible and useful suggestions for persons not within reach of an architect, precede the illustrations. The elevations, though they have a strong family likeness, present considerable diversities, and serve to show how many combinations may be produced with a few gables, flat copings, moulded chimney-shafts, and mulioned windows.

A valuable feature of the book is that the actual cost of the majority of the buildings is given, together with what is found to be the price per foot cube, the cubical contents being calculated from midway between the floor line and the bottom of foundation, to midway between the plate and ridge of roof. Thus Wootton House, Oxfordshire, exclusive of the value of the walling stones, dug on the estate, comes to 512d. per foot cube; Bignell House, being county, 6d. per foot, the walling stones being dug and the lime burnt on the estate. A residence on Norham Manor, Oxford, walls of local red bricks and freestone dressings, comes out at 6d. per foot cube; and a smaller residence on Walton Manor, 5d. per foot. A farmhouse at Upton, the wall stones being quarried near the site, cost 4½d. per foot; and two other farmhouses and outbuildings, with walling of red bricks, 5d. per foot. The views have been drawn by Mr. J. W. Hallam, and, if a little crude, have the advantage of showing exactly what the architect means, Mr. Hallam being himself an architect.

Miscellaneous.

Public Works in India.—In the House of Commons Mr. Kinnaird asked whether the Viceroy of India had issued orders to stop further expenditure on public works, and whether such orders had been approved by the Home Government. Mr. G. Duff said no such orders had been issued. Last autumn the Government of India discovered that it had communicated to the Home Government too sanguine a view of its immediate financial position, and it found it necessary to make reductions in various branches, and among others that known as public works ordinary, meaning works which the Government paid for out of the annual income. Mr. Duff then read an extract from a despatch, from which it appeared that the works to be paid for out of revenue would be four millions and a half; out of sums proposed to be borrowed, three millions and a half; and for railways guaranteed by the Government, two millions; making in all upwards of ten millions.

Water Supply.—The Slough Waterworks have been opened. Owing to want of a proper system of drainage, a want which may also shortly be supplied, the water-supply of Slough has hitherto been contaminated to such an extent as to seriously affect the health of the locality. The resident engineer of the new waterworks is Mr. Edward Secker, under whom the whole of the works have been carried out. The only outward visible sign of the progress of the works has been the erection of a tower at the rear of the Slough Police-station, some 75 ft. in height, with water-tank at the summit, capable of containing 40,000 gallons, which would meet the wants of a much larger town than Slough, as the tank can be pumped full in twenty-five minutes, and the daily consumption would probably be considerably under 100,000 gallons. The water is, of course, at high pressure, and in case of fire it could easily be thrown over the highest building in Slough. The water is soft and pure. The cost of the works has been about 14,000*l.*, including the mains, which have already been laid throughout the town. The well from which the water is drawn has been sunk into the chalk formation 114 ft. below the surface. Some of the sinking work was done by a diver 55 ft. under water.—The Liverpool Water Committee, after hearing a report from their engineer, have decided that in future the supply of water shall be limited to ten hours daily, by which it is expected that a large annual saving will be effected.

Oxford Architectural Society.—The members of this society have, during the present term, made a series of excursions to various places of interest in the neighbourhood of Oxford; and on Saturday last a party of nearly fifty in number walked to Wytham, where they were hospitably received by the Rev. H. O. Cox, who conducted them over the church, &c. They then proceeded to the site where British remains have lately been discovered, and where the different graves, pits, &c., were pointed out by Dr. Rolleston, who explained the circumstances attending these discoveries. The party then proceeded, by the ruins of Godstow Nunnery, to Woolvercott. An evening meeting of the society was held in the Taylor Building, on Tuesday last, when Professor Westwood gave an account of some Russian ecclesiastical objects, which he exhibited, and Mr. R. F. Biggs-Wither, M.A., read a paper "On Iconography in Russia," in which he developed the history of the rise of the various schools of sacred art in that country, illustrated by a number of icons, Russo-Greek crosses, and various forms of the portable iconostasis, photographs of vestments, coloured and photographic views of the exterior and interior of remarkable churches and icons.

Southampton Workhouse.—The proverbial white elephant of Siam could scarcely have been more troublesome to the king of that country than the new Poorhouse has been to the ratepayers of Southampton, says the local *Independent*. First, there was a contest whether there was a necessity for a new building. Then there was a sharp war as to whether the old circumscribed site should be retained. Then a contest, issuing in law, ensued as to who should be the architect. A second architect having been fixed upon, and the first compensated for his disappointment, the services of more lawyers were needed upon the point whether the builders were liable under their contract to do certain work, and it was decided by arbitration that they were not so liable. At last, through much tribulation, the building is obtained; but, behold, before it is paid for, we are gravely informed by the Commissioners in Lunacy that, despite all the approvals and disapprovals of the Poor-law Board, the lunatic wards are unfortunately placed and badly arranged, the yards attached being very small, and quite inadequate for the purposes of exercise, and not capable of enlargement.

Proposed Public Park at Sheffield.—The town trustees of Sheffield have under consideration a scheme for the provision of a public park, the funds for the establishment of which shall be derived from the large sum of money left to the town by the late Mr. Samuel Bailey. It is expected that the amount of Mr. Bailey's bequest will reach about 110,000*l.* at least, and of this it is proposed to spend 30,000*l.* on the purchase and endowment of a considerable portion of land belonging to the Sheffield Water Company, and situate close by their supply reservoirs, just outside the town, in a very pleasant and convenient neighbourhood.

The New National Gallery.—In the House of Lords Viscount Hardinge, in moving for a copy of the correspondence between the Office of Works and the architect respecting the designs of the new building, said he had heard a report that Mr. Ayrton had *congratulated* Mr. Barry, and that he was contemplating a re-arrangement of the existing building. He trusted no attempt would be made to patch up or tinker the existing edifice. Earl Granville believed that the Chief Commissioner of Works only intended to make a few minor alterations. The Earl of Kimberley said he thought it unlikely that there would be any objection to lay the correspondence on the table when it was completed. Lord Redesdale hoped that before pulling down any more buildings the Government would cover those sites which had already been cleared. As far as he could learn, very little progress was making with the new Public Offices. Earl Granville said that the Government at present occupied a great number of houses in the best parts of London; but that plan was both costly and inconvenient.

The New Abattoirs for Bradford.—The slaughter-houses about to be erected by the Bradford Corporation, and the works for which have been let, will stand at the north-west corner of the ground now being laid out as a cattle-market, near Leeds-road. The architects are Messrs. Lockwood & Mawson. The general plan embodies the principle of sections, each complete in itself, each of good working size, and containing all the appliances and requisites of the trade, while affording such suitable accommodation as will ensure humane treatment for the animals to be slaughtered. Each section will be 28 ft. in width, and will run from north to south. Entrances for cattle are provided in Egbert-street and Carroll-street. The arrangements may be doubled by the erection of a corresponding building on the east side of Carroll-street. The estimated cost of the four sections now about to be erected was 6,600*l.*, but the tenders have been let for 6,143*l.*

Hungerford.—It is finally settled to have a new Corn Exchange and Town-hall, and the old one will come down. A committee has been formed to obtain subscriptions, and Mr. Speen's hamland has subscribed 500*l.* Other sums have been promised or subscribed. The exchange will be built by shares. The new buildings are to cost 2,500*l.* It is intended to raise as much as possible by subscription, and to borrow the remainder, the fees for making themselves responsible for the money borrowed. Architects have been requested to send in plans for the approval of the committee.—A vote of 1,000*l.* has been accorded at the meeting of the shareholders of the Great Western Railway Company, for the erection of a new station at Hungerford. And at the same time a vote of 5,000*l.* for new sidings at Swindon station, and of 4,212*l.* for carriage sheds at Swindon, was granted.

Public Buildings in London.—The Council of the Society of Arts have appointed a committee to confer with the Chief Commissioner of Public Works, the Lord Mayor of London, and the Chairman of the Metropolitan Board of Works, with the view of establishing such harmonious action between the several authorities they represent, as may prevent the creation of public or quasi-public buildings which shall disfigure the metropolis.—Lord Elcho, in the House of Commons, has given notice that on going into committee of supply on the Civil Service estimates, he will move a resolution in accordance with the recommendation of the select committee of last year as to new public buildings in the metropolis, and requiring the deposit of plans and elevations, models and designs, at the office of the Commissioner of Works, in the same manner as railway companies are now compelled to deposit with the Board of Trade, and to move the necessary alterations in the standing orders.

Superiority of Ancient Architecture.—That was a triumphant appeal of an Irishman, a lover of antiquity, who, in urging the superiority of the old architecture over the new, said:—"Where will you find any modern building that has lasted so long as the ancient?" And it is not such a ball as it looks.

Carlisle Bridge, Dublin.—We are glad to learn that there is now a fair prospect of the corporation taking up Mr. Geoghagan's admirable plan for the widening of Carlisle Bridge, and of thus conferring, at a trifling expense, a most valuable boon, to the citizens of Dublin.

Railway Sleeping Carriages.—Mr. Howlison, of Glasgow, proposes to make use of the existing compartments of railway-carriages, his arrangement permitting them to be used either for sitting or sleeping, at the will of the passengers. Unless when used for sleeping, the compartments will present almost exactly their present appearance, and the sleeping arrangement will consist, in first-class carriages of one shelf, in second-class carriages of two shelves, placed at equal distances above the present seats, of equal breadth with them, and extending in the same direction. The arrangement is, in short, similar to that of berths in ships; and the railway berths may be made equally, if not more, commodious. Under this system a first-class compartment could hold only four, and a second-class six, passengers.

Projected Cathedral in Liverpool.—The proposal to erect a cathedral in Liverpool has just been revived there. At the select vestry, the chairman, Mr. Churchwarden Turner said:—"If the rector would waive his claim to 5,500*l.*, now in Chancery, it was the intention of himself and his colleagues to propose at the next Easter vestry that the money be kept as a sort of nucleus of a fund for building a new parish church on the site of St. Peter's, and he had no doubt that the wealthy people of Liverpool would come out handsomely, and that they should have a church worthy of the town. He believed a movement was on foot to separate Liverpool from the diocese of Chester, and if it was successful they should have a Bishop of Liverpool as well as a bishop in Liverpool.

The New Church of St. Mark, Leicester. The tender of Messrs. Osborne, Brothers, masons and builders, Leicester, having been accepted for the completion of the works connected with the building of the new church of St. Mark, in Belgrave-gate, they will be commenced forthwith. It is expected that the ceremony of laying the memorial stone of this church, and also that of St. Paul, now in the course of erection on the Dane Hills, by the same contractors, will be performed in a short period on the same day, by the Bishop of Peterborough. The contract for St. Mark's Church is about 11,000*l.*, and that for St. Paul's about 4,500*l.* The funds being somewhat low for carrying out the architect's design for the latter-mentioned church, the erection of the spire is not included in the contract. The two churches when complete will afford sittings for upwards of 1,600 persons.

An Extensive Foundry.—The block of buildings recently erected on the banks of the river at Bedford, and adjoining the Britannia Works, has been opened. Owing to the growth of Messrs. Howard's business, they were for a long time unable to produce a sufficient quantity of castings. They therefore determined to devote the present large foundry to the fitting and wrought-iron department, and to erect a new foundry on a much larger scale by the side of the old one. There are 35,000 square feet on the ground floor. There are four cupolas or furnaces capable of melting 300 tons per week and which are expected to be very shortly in full work. The internal and general arrangements were planned by Mr. James Howard, M.P., the erection being under the direction of Mr. Usher, architect, Bedford.

The Sewage of Dumfries.—An application has been made by a London company to the town council of Dumfries, through Provost Harkness, for a concession of the sewage of the town for conversion into manure. The proposal is that, so soon as the new sewerage is completed, the whole sewage of the town be conceded to the company for thirty years, on the following conditions:—That the sewage be treated by the process of the Native Guano Company; that the town receive 5 per cent. of the profits in the event of the experiment proving successful; and that if unsuccessful within six months after commencing the said process, the agreement cease and determine. The matter has been remitted to a committee.

Monumental.—The commission for the Faraday memorial statue to be erected in the hall of the British Museum, has been placed in the hands of Mr. Foley.—The proposed memorial over the remains of Daniel De Foe, to be placed in Bunhill-fields burial-ground, will be of marble, and the memento itself will be 3 ft. square at the base, tapering to a height of 15 ft. It is being executed by Mr. Horner, the sculptor, and will be ready for fixture in May.

Building Speculations.—The case of Mr. Daniel Tidy came before the New Bankruptcy Court on Thursday. This was an application to pass the last examination. The bankrupt had filed his accounts, and there was no opposition. The accounts showed liabilities to secured creditors, 341,136l. 1s. 6d.; to unsecured creditors, 20,578l. 7s. The surplus on secured property was estimated at 267,000l., consisting of finished and unfinished houses, all of a very large class; but the mortgagees, with the fact before them that it would cost thousands of pounds to complete the buildings, did not consider their security to be of more value than the amounts lent. The available assets consist of 2,200l., and 500l. mortgage on fixtures. No opposition being offered, the bankrupt was allowed to pass.

Increased Value of Property near Sheffield.—An application has been made before Vice-Chancellor Malins to effect the sale of the lease of the Grange Villa Estate, Ecclesall, situate near the Chesterfield and Sheffield Railway, and now being administered in Chancery. It was stated that the property consisted of fifty acres of agricultural land, from which the owners got 180l. per annum; but since the new railway had been made, its value had increased as building land to 1,500l. per annum, the lease, according to the custom of Sheffield, being for 800 years. Affidavits were read in support of this statement; and the Vice-Chancellor sanctioned the petition for leasing the land accordingly.

Sewage Irrigation in India.—We hear that a sewage farm has been established in the vicinity of Madras. The total area is thirty-seven acres, but about two acres only have been put under cultivation. Various crops have been tried on the sewage area. Guinea grass succeeds so well that its yield is at the rate of eighty-eight tons of fresh grass, or twenty-nine tons of hay per acre. The value is 58l. per acre. The report states that the results to health have been satisfactory, and that one great source of disease has been removed.

Hull—Proposed New Bridge over the River Hull.—At a recent meeting of the works committee, a sub-committee's report was adopted, recommending the carrying out of a plan by the board's surveyor for a new bridge over the river Hull, between Sonleatock and Groves districts, at a probable cost of 8,700l. The surveyor was instructed to obtain offers for the land required to form the approaches, and the Parliamentary committee were asked to prepare the necessary Parliamentary notices, subject to confirmation by the board.

Progress of the New Lunatic Asylum, Hereford.—At the county sessions, the committee of visiting justices have reported that they have inspected the works in company with the architect; and have found that they are being carried on by the contractor, Mr. J. Clatterbuck, in a most satisfactory manner. The architect has been instructed to prepare a plan and estimate for a gasometer; and fifty acres of adjoining ground have been purchased.

A Church to be Built by the Dowager Marchioness of Westminster.—The foundation-stone of a new church has been laid at Hindon, Wilts, by Lady Theodora Grosvenor, youngest sister of the Marquis of Westminster. The building will cost about 4,000l., and the entire cost will be borne by the Dowager Marchioness of Westminster. Mr. T. H. Wyatt, of London, is the architect; and Mr. Mills, of Shaftesbury, the builder.

Fever in the Metropolis.—Fever has broken out in several of the poorer establishments in the metropolis. At the school recently built at Highgate, several children have died, owing, it is thought by the medical men, from overcrowding.

A School of Art for Belfast.—At a preliminary meeting held in the Royal Academical Institution, Belfast, it has been resolved to establish a School of Art in this town, and a provisional committee has been formed. A general meeting is to be convened.

The South Metropolitan Tramway.—The new line of tramroad from Brixton Church to the old toll-gate at Kennington is now nearly completed; some few yards at either end require paving, and the line to be swept, and the metals will be ready for traffic.

New Buildings at South Kensington Museum.—A model, showing the proposed mode of completing the buildings for the South Kensington Museum, has been deposited in the library of the House of Commons for general inspection.

The Fen Drainage.—The Drainage of the Middle Level district of the Fens has been effected satisfactorily during the winter, the siphons and works continuing in an efficient condition.

TENDERS.

For completing two houses at Lavender-hill, Wandsworth-road, for Mr. Edward Pannou:—
M'Lachlan..... 2338 0 0
Lathey Brothers..... 2323 0 0
Martin..... 307 0 0

For new schools, Seasalter, Whitstable. Mr. J. Clarke, architect:—
Cornelius..... 2538 0 0
Porter..... 837 0 0
Harnett..... 529 0 0
Foad..... 459 0 0
Lawson, junr..... 465 0 0

For footbridge over London and North Western Railway, from Shendish Park, exclusive of ironwork. Mr. J. Clarke, architect:—
Robt..... 2465 0 0
Bell & Sons..... 455 0 0
Dunkley, including iron girders..... 511 0 0

For the completion of the works (the foundations have been put in by Mr. Fins) connected with the erection of the Church of St. Marks, Leicester. Mr. A. Christian, architect. Quantities furnished:—
Williams..... 216,750 0 0
Hulley & Co..... 13,900 0 0
Griffiths..... 13,278 0 0
Jackson & Shaw..... 12,400 0 0
Taylor..... 12,670 7 0
Finn..... 11,768 0 0
Law & Son..... 11,750 0 0
Osborn Brothers*..... 11,946 0 0

* Accepted, subject to certain modifications in the specification and the estimate.

For alterations to 144, Edgeware-road, for Mr. W. Kenzie. Mr. W. Seckham Witherington, architect:—
Mellville..... 2375 0 0
Mark..... 321 0 0

Accepted for the hospital at Skinningrove, for the Earl of Zealand. Mr. John Ross, architect:—
Bosomworth..... 12,341 6 0

For villa for Mr. C. Janson, Darlington. Mr. John Ross, architect:—

Brick, Stone, Plaster, and Slate Work.
Simpson..... 2731 15 0
Carpenter and Joiner's Work.

Plumbing and Glazing.
Martin..... 360 0 0

Painting.
Johnson..... 200 2 0
Davison & Son..... 18 0 0

Accepted for two villas, Whiby, for Mr. Benjamin Pearson. Mr. John Ross, architect:—
White..... 62,288 10 0

For farm buildings and cottages at Morton Carr Farm, for Mr. J. W. Pease, M.P. 1,887 John Ross, architect:—
Brick, Stone, Plaster, Slate, and Joiner's Work.
John Johnson..... 5322 15 0

Plumbing and Glazing.
Thomas Johnson..... 23 13 0

Painting.
Hornby & Roberts..... 12 0 0

For the first section of a new church at Brightbridge, Kent. Mr. Theodore K. Green, architect:—

Extra Extra
Boarding Plastering
to roof. to roof.
Myers & Sons..... 52,104 478 453
Sharpling and Cole..... 1,577 97 83
Walker..... 1,897 97 82
Anscomb..... 1,730 87 80
Dove Brothers..... 1,765 45 75
Wilkinson & Oakley
(accepted)..... 1,895 65 87

For Bow Presbyterian Church. Mr. Alexander Peebles, architect:—

Extra for
Stone Spire.
Barnett..... 28,638 2161
Bishop..... 5,493 370
Hill, Kedwell, & Waldram..... 5,468 530
Pek..... 5,259 243
Mortar..... 5,269 499
Patman & Fotheringham..... 6,250 275
Adamson & Sons..... 6,243 321
Sawyer..... 6,221 372
Hill & Son..... 5,230 310
Myers & Sons..... 5,199 280
Dove Brothers..... 6,155 250
Hume..... 5,147 442
Hume..... 5,068 284
Manley & Rogers..... 5,021 260
Nightingale..... 4,946 350

For finishing hotel and pair of cottages at Aldershot. Mr. Henry Peak, architect:—
Martin, Wells, & Datchelor (accepted)..... 2539 18 0

For stabling, &c., to Mr. Holland's new house at Farmhouse, Surrey. Mr. Henry Peak, architect:—
Goddard & Son (accepted)..... 4315 0 0

For stabling, &c., at Farmhouse, Surrey, for Mr. G. J. Hull. Mr. Henry Peak, architect:—
Wilkes..... 2903 0 0
Pebham & Tigwell..... 860 0 0
Jennings..... 212 0 0
Nye..... 231 10 0
Moon & Son (accepted)..... 227 10 0

For building two houses and shops on Station-hill, Basingstoke, for Mr. H. Smith. Mr. G. B. Musselwhite, architect:—
Wilkes..... 2903 0 0
Pebham & Tigwell..... 860 0 0
Jennings..... 212 0 0
Nye..... 231 10 0
Moon & Son (accepted)..... 227 10 0

For alterations to houses, 11, Grafton-street, W. Mr. Henry T. Gordon, architect:—
Taverner..... 2887 0 0
Browne (accepted)..... 797 0 0

For forming and draining new roads, Berovs Town, Southampton. Mr. James Lemon, borough surveyor:—
Sibsey..... 438 13 11
Bull & Sons..... 397 0 0
Cor (accepted)..... 225 0 0

For an iron shed and an office at the New Cattle Market, Southampton. Mr. James Lemon, borough surveyor:—

Stone & Grace..... 2237 0 0
Stevens..... 239 0 0
Lanckester & Son..... 219 0 0
Morton & Son..... 1271 0 0
Sanders..... 208 0 0
Bull & Sons..... 195 0 0
Sibsey..... 189 12 8
Pearce..... 1297 17 1
Crook (accepted)..... 1814 10 0

For the new School of Art in connexion with the Hartley Institute, Southampton. Mr. James Lemons, architect:—

Taylor..... 21,500 11 6 1/2
Norman & Co..... 1,853 10 0
Barnes..... 1,300 0 0
Bostock..... 1,371 0 0
Ward..... 1,250 0 0
Britton & Bone..... 1,250 0 0
Phillips..... 1,237 17 1
Sanders..... 1,225 0 0
Sibsey..... 1,200 0 0
Crook..... 1,199 0 0
Leaver & Son..... 1,119 0 0
R. & C. Light..... 1,150 0 0
Pearce..... 1,140 0 0
Quick..... 1,125 0 0
Stevens..... 1,119 0 0
Martin & Son..... 1,605 0 0
Gambling..... 1,650 0 0
Bull & Sons (accepted)..... 1,684 0 0
Smith..... 1,634 0 0

For alterations to offices, John-street, Backfiars, for St. Saviour's Union. Messrs. Henry Jarvis & Son, architects:—

Deards..... 2298 0 0
Marshall & Son..... 264 0 0
Tarrant..... 270 0 0
Bagley..... 285 0 0

For alterations to Southwark Chapel, Long-lane, Bermondsey. Messrs. Henry Jarvis & Son, architects:—

Hight..... 21,077 0 0 1/2
Thompson..... 973 0 0
Henshaw..... 72 0 0
Wicks, Bangs, & Co..... 745 0 0
Tarrant..... 734 0 0
Rider & Son..... 696 0 0
Downs..... 536 0 0 1/2

For the erection of Christ Church Boys' National School, Rochester, Surrey. Mr. James Clench, architect. Quantities not supplied:—

Ladstone & Son..... 21,088 0 0
Emery & Co..... 1,050 0 0
Deavin..... 957 0 0
Stevens..... 933 0 0
Sawyer..... 933 0 0
Pitner..... 939 0 0
Hirett..... 938 0 0
Nightingale..... 922 0 0
Blake..... 888 0 0
Machin..... 852 11 6
Lammie & Co..... 808 0 0
Harrison & Edwards..... 845 0 0
Winship..... 847 0 0
Sarker..... 828 0 0
Shirley & Horne..... 818 0 0
Bevors..... 790 0 0
Wright..... 778 15 0
Kraut..... 775 0 0
Ladd..... 745 0 0
Daniel..... 733 5 6
Wilson..... 730 0 0
Gordon..... 699 0 0
Hughesdon (accepted)..... 693 0 0
Gardner & Co..... 683 0 0
Jones..... 669 0 0

For sheds at St. Luke's Stone Yard. Mr. H. Saxon Sney, architect:—

Bridgman & Nathall..... 2123 0 0
Pek..... 108 10 0
Fabry & Sons..... 106 0 0
Eblage..... 116 0 0
Perry Brothers..... 103 0 0
Smith (accepted)..... 95 10 0

The Builder.

VOL. XXVIII.—No. 1417.

Our Communication
with the Continent.

O METHOD of bringing a scientific question before the tribunal of enlightened public opinion can be more thoroughly respectable than a lecture at the Royal Institution. Not only may it be regarded as a fair and open challenge to the intellectual chivalry of the day,—a learned tournament, graced with the presence of "store of ladies, whose bright eyes rain influence," if they do not "judge the prize";—but it may further be taken as evidence that the lecturer has so far made out a *prima facie* claim to respect as to have been awarded the privilege of occupying one of the most select of the theatres of Science. His bill has passed the grand jury of

the Institution; and he comes forward, not to open the pleadings, but to speak to evidence, and to claim a verdict.

The lecturer, however, does not hold a position of unequivocal advantage. He shares the dangerous temporary immunity of the preacher. He is not exposed to the cross-fire of debate. He thus becomes liable to a temptation, which frequently proves irresistible, to rely on what is telling, rather than on what is true. Safe from any oral criticism, he may presume too much on a security which proves delusive when his arguments are reviewed with the impartial investigation of leisurely criticism. The applauses of the theatre of the Institution are at once more transient, and of far less substantial value, than the deliberate assent of the scientific press.

We make these remarks with the intention of conceding to Mr. Bateman the largest tribute of respect that is consistent with a mature conviction of the entire impracticability of his scheme for crossing the Straits of Dover by means of a built iron tube laid on the floor of the Channel. That he has given much attention to the subject, that ingenuity of a high order has been displayed, that many obstacles have been foreseen, and, to a great extent, grappled with,—all this we fully admit; but as to the substantial merit of the scheme, we are compelled to come to the conclusion, not merely that it is not proven, but that the result of the trial can only be a non-suit.

Stimulated, most probably, by the unexpected and very gratifying success of Mr. Barlow's miniature subway under the Thames, more than one engineer of skill and of more or less experience has turned his attention, during the

present slack tide of professional occupation, to a revision of the various schemes for bridging the Straits of Dover.

With regard to one of these schemes, which, during the past year, was put forward as a sort of forlorn hope, we fear that we must plead guilty to the charge of having exploded the magazine. To our first examination of the subject, in the *Builder* of September 18th, 1869, the engineer replied in a letter to the *Times*, which laid him open to so complete a sifting of the subject, in our number for September 25th, 1869, that the scheme seems to have faded from the public mind, and made its way to that limbo which is peopled by the innumerable ghosts of still-born inventions.

We hold the present state of our communication with the Continent of Europe to partake of the nature of a scandal, both to our scientific acquirements and to our commercial energy. Men fully acquainted with the engineering of America consider that so imperfect a mode of intercourse would not be endured for six months by the active and foreseeing race which has so recently bridged the desert with an iron roadway. And, regarding our own experience alone, it is inexplicable why the sixty-four miles' passage from Holyhead to Dublin should have attracted so much more successful scientific effort, and should, at the present moment, be in a state so much more worthy of a great postal line of communication, than the twenty-two to twenty-six miles of water-way between Dover harbour and Cape Griznez.

Numerous projects, more or less serious in their form, have been suggested from time to time for the improvement of our communication with France. A French engineer, M. Mathieu, submitted a plan for a tunnel to Napoleon Buonaparte, when first consul. In 1856 a scheme was formed for the piercing of a tunnel, to be worked from shafts opened in thirteen artificial islands, with which it was proposed to encumber the Channel. Mr. Low proposed, and Mr. Hawkshaw supported, a scheme for a tunnel through the grey or lower chalk, from a spot half a mile west of the high light of the South Foreland, to one about four miles west of Calais. The upper surface of the grey chalk is about 175 ft. below high water on the English coast, and about 100 ft. lower on the French shore. The sub-marine distance of the line selected was to be about twenty-two miles, without any intermediate shaft.

Mr. Remington, in 1865, published a yet more formidable plan. With the view of avoiding the danger of faults and springs in the chalk, he proposed to pierce the Wealden beds lying between Dungeness and Cape Griznez. The length actually beneath the water, according to his idea, would be 26 miles, but it was contemplated that an intermediate or insular shaft should be put down on the shoal or submerged island, called the Ridge. The cross section of this tunnel was to be 25 ft. by 30 ft. The above-named schemes for what may properly be termed tunnelling the Channel are the only two in which any serious degree of attention has been paid to the geological indications which science can as yet grasp; and the conclusions arrived at are, as will be observed, contradictory.

With the aim of avoiding on the one hand the practical mining dangers natural to operations in the chalk below the sea, and of shunning on the other hand the increased cost, both of depth and of length, involved by attempting to follow the level of the Wealden, suggestions have from time to time been thrown out for the fabrication of a metallic tube, either of wrought or of cast iron, or of iron lined with brickwork.

A curious instance of the freaks which fancy will play, even in the case of men by no means unacquainted with the practical manipulation of iron, is afforded by a little pamphlet on an "International Floating Tunnel," which was published

last year by Mr. E. W. Young. A tube of boiler plate, $\frac{3}{4}$ in. thick, "lined outside" (it would seem that the projector is an Irishman) with a layer of concrete 1 ft. 6 in. thick, and "furnished with ribs encircling it at every 6 ft. in length," in order to "give stiffness, and serve to prevent the concrete from breaking away," was to be formed "in short sections of, say, from 200 ft. to 300 ft. in length." These were to be floated into position, and lowered "into place at a certain depth below the surface of the water, where, the joints being made good by divers, they would form one continuous tube across the Channel."

"The tube being buoyant, would be held down to the required depth by mooring cables of iron attached to blocks of *béton* of sufficient weight. Its buoyancy would be such that the passage of heavy trains would have no effect upon its position. The tube would be fixed at such a depth below the surface as to be practically unaffected by the waves." It is not clearly stated what resistance it would oppose to the set and run of the great tidal movement. "It could not be raised vertically without lifting the anchors, or breaking the mooring-cables, nor depressed without overcoming its buoyancy. It could not move laterally without breaking away from the inclined mooring-cables, and therefore it would be stable under all circumstances."

This wonderful modernisation of the old idea of Mahommed's coffin would have the further advantage that "ventilation would be secured by means of lighthouses placed half a mile apart along the tube. These lighthouses would be supported from the bottom of the sea by piers formed of clusters of cylinders filled with concrete." They would, no doubt, be taken under the special protection of the Admiralty, and would be objects of loving reverence to all those who went down to this part of the sea in ships. They might also be furnished with life-buoys, and the watchmen who tended the lights would be able to communicate freely with one another by an electric telegraph through the tube!

Mr. Young has unfortunately omitted to state how it is that certain objections, which he rightly perceives to be fatal to the schemes of several of his brother projectors, have no force against his own. Thus he tells us, in italics, that a tube if laid at the bottom of the Channel, "in case of accident, could not be repaired." The facility of repairs in the case of a floating tube would scarcely seem to be much greater; while the liability to accident is certainly more obvious in mid-channel than on the bottom of the sea. Again, Mr. Young objects to the extreme difficulty of laying a sub-aqueous tube, because divers cannot work with safety at a depth of above eleven or twelve fathoms, while the Straits are thirty fathoms deep in parts. How the mooring-anchors, or blocks of *béton*, are to be satisfactorily fixed and attached to the tube in those deeper portions of the sea, or indeed how the diving process is to be carried on at all, *en pleine mer*, we are not told. We regret not to have time to linger longer with Mr. Young, as we confess to thinking his company more amusing than that of some of his competitors. He only asks for nine millions and a quarter sterling for 21 $\frac{1}{2}$ miles of tube.

While Mr. Young would persuade his tube to float at "a certain depth," Mr. Chalmers would have his to crawl, like a hermit crab, over the floor of the Channel. He proposed, in 1866, to construct two strong iron tubes, cased with timber and lined with brick, from shore to shore on the bottom of the Channel. Three ventilating-shafts were to be provided, one in mid-channel and one about a mile from either shore. The tubes were to be made in 300 ft. or 400 ft. lengths, and united under water. It was the expectation of Mr. Chalmers that the set of the tide would cause such a deposit as to bury his tube when in place, under an embankment 40 ft. high, and from 40 ft. to 120 ft. below low-water level.

Mr. Chalmers only asked for three years of time, and for twelve millions of money.

Mr. Marsden proposed, in April last (probably on the first day of that month), a somewhat similar scheme. He gave up, however, the idea of marine shafts, and contemplated ventilation by means of air-pumps. He also proposed to form a trough at the bottom of the Channel, by the agency of divers, and to puddle the same with clay, for the more comfortable bedding of the tube. Mr. Marsden's plan would, no doubt, present many advantages, if he could hit upon a convenient method of pumping the Channel dry during the laying and puddling of his tube; an operation which can hardly be supposed to be covered by the exact and modest estimate of £12,500,000.

Mr. Bateman, realising the immense practical difficulties attendant on submarine work in the open sea, and at depths involving a pressure of six atmospheres, has proposed the construction of a tube which shall be elongated and fixed entirely from within. It is this project to which we refer as having been recently brought forward at the Royal Institution.

The colleague of Mr. Bateman in this scheme, and the projector of the method which it proposes to adopt, is M. Julian J. Révy, an Austrian engineer. The original idea of Sir M. I. Brunel, that of an iron shield, under the protection of which the main work of the tunnel should be carried on, is adopted by these engineers under the name of a "bell." This bell is a chamber of cast iron, 8 in. thick, 80 ft. long, and 18 ft. in internal diameter. The interior of this bell is to be bored true, like a steam cylinder. A smaller tube, 4 in. thick, and 13 ft. in clear internal diameter, is to be built together in segments within this shield. External flanges on this permanent tube are to be constructed so as to fit with air-tight accuracy in the interior of the bell. These diaphragms will be at such distance apart that always three, and occasionally four, will be contained within the 80 ft. chamber. As each ring is completed, the shield is to be pushed ahead by means of hydraulic presses. It is estimated that the resistance will average about 1,500 tons, and that the propulsive force will amount to 4,000 tons. Thus the bell is expected to slide over the other closely-fitting diaphragms, and length after length is to be fitted, under protection of the movable chamber, till the whole width of the Channel is crept under by an impervious tube.

It is proposed to work the hydraulic machinery at the face from accumulators on shore. Fresh air is to be supplied to the workmen by steam-pumping apparatus, also fixed on the shore. As to the mechanical difficulty of transmitting either hydraulic or pneumatic pressure for a distance of twenty miles through a series of pipes, laid within the one permanent 13-ft. tube, through which the workmen will have to be carried backwards and forwards, and the water accumulating from condensation and from leakage must be carried off—it is obvious that we have little or no experience to guide us. The maintenance of a constant strain of such formidable magnitude, transmitted through a series of jointed pipes gradually increasing in length to the whole distance, is a dynamical problem as to the solution of which we may be said to be entirely without precedent. The mere statement of the conditions is alarming.

It is the less necessary, however, to enter into the details of a discussion which is altogether beyond the limits of practice,—as far, at all events, as the past and the present are concerned,—because there is one simple consideration which, to any prudent man, is wholly conclusive on the subject. Let us admit that Mr. Bateman could succeed, for eight millions of money, in pushing forward his blind bell over all intervening obstacles. Let us suppose that each of the 1,000 annular diaphragms performs faithfully its allotted work, allowing the well-bored chamber to slide steadily forward, and to leave behind it joint after joint in perfect order. Let us admit that each of the same number of stuffing-boxes is equally perfect in its fitting, and that the screw piles which pass through each go down with will, and nail the lengthening tunnel, joint after joint, firmly to the bottom of the Channel. Let us suppose that the hydraulic mains and junctions hold their own; that the pneumatic apparatus works at fifteen or twenty miles' distance from the shore as well as at the end of so many hundred feet; that all goes forward like a dream; and that the miners come out into open air on French territory. Still there remains the undeniable fact that the

whole of this enormous toil lies at every moment, and will lie at every moment, at the mercy of a few barrels of gunpowder. A torpedo of explosive power sufficient to blow to pieces a cast-iron tube of 4 in. thick, could at any moment knock the whole affair on the head! War, mischief, even what people call accident, might at any moment induce the destruction of a portion of the submerged pipe; and with one effectual blast all the work would be rendered useless. Who would find twelve millions of money, or even eight millions of money, in face of such a risk as this?

It is, perhaps, unnecessary, after what we have already said, to enter any further into the question of continuous submarine railway communication with the Continent. We come naturally to the next suggestion—that of a steam ferry. The practicability and the advisability of such an arrangement had been accepted, in our judgment, long before the scheme was hatched by Mr. Fowler. That engineer has brought to bear upon it large experience, great shrewdness, and abundance of practical common sense. It would be difficult to select, among living engineers, a more sagacious adviser. But we are far from being prepared to admit that in the drawings and descriptions which have recently been published, we can have the matured scheme of Mr. Fowler, or the satisfactory outcome of the engineering science of the day. We must refer to one or two details to explain our meaning.

The unit of Mr. Fowler's plan, or of any plan for a steam ferry, must be the ferry-boat. The size of this will be the main determining element of the cost of the scheme. Depth and area of basins, length of piers, position and means of access to harbours, all will be modified in conformity with the dimensions of the steamers. Not only will the cost of this part of the system vary with their size, but the cost of every detail of port and harbour will be directly affected by the same condition. The engineer, therefore, has every inducement to make his boats as small as he possibly can while securing satisfactory results.

On the other hand, the one main desideratum of the passage is the avoidance of sea sickness. Even speed is a secondary consideration. Looking at the total distance between London and Paris, the saving of half an hour or of an hour in the actual transit of the Channel is by no means a vital point. If the present possible ten hours can be shortened into nine, it would, of course, be desirable to make the improvement; if the cost of so doing were not disproportionate. But whether this saving be effected by land, or by sea, or by greater facility of transhipping, matters little to the passenger. What does matter to him, is to avoid the disagreeable effects of finding himself afloat, and to avoid the abominable discomfort of turning out of a snug carriage, exposing himself to the inclemencies of the weather, perhaps in the middle of the night, and scrambling down a wet platform to enter an intolerably-smelling vessel. This is what ninety-nine passengers out of a hundred dread.

Now two methods of effecting this ready and comfortable communication are practicable. One is to build such a class of steamers (somewhat similar to those on the Holyhead station), and to arrange such basins and stages, on either side of the Channel, as shall allow the feeblest and most timid passengers to step, by a few yards of covered way, from the carriage in which they left London, to the deck of the steamer, and from the deck of the steamer to the carriage bound for Paris. A slip roof, to cover both the steamer and the stage, and a hydraulic lift, to give independence of the tide, are the main requisites of this method, and the boats would be most available if built to cut through the water at extreme speed.

The other method, which we do not doubt will one day or another be adopted, is to construct ferry-boats capable of taking a portion of the train on board, so that passengers, for a small extra charge, would have the choice of not leaving the carriage at all. This is the plan contemplated by Mr. Fowler.

In this case, however, we think that speed of passage must to some extent be sacrificed to stability and freedom from movement in the vessel. We do not think that a beam of 57 ft., which is the dimension proposed by Mr. Fowler, will be adequate to free the boats from a very unpleasant rolling motion in the Channel. They will have to contend there with a beam-sea. In the more formidable troughs of the Atlantic the rolling of the *Great Eastern*, in spite of her extreme width of 80 ft., was painfully felt, although

the pitching motion was almost entirely counteracted by her length of some 680 ft. For a vessel built not to cut through, but to stride over, the waves of the Channel, it would be necessary to allow a height from the water-line to the top of the bulwarks of 24 ft. or 25 ft., and this would seem to involve a beam of upwards of 70 ft. Again, the vessels at present contemplated are shown without keels, or any distinct apparatus for steering. As the double skin of iron is distinctly drawn in section, the flat bottom can hardly be a mere oversight. The large roofs which are shown as covering the berth of the steamer, form an item of expense which is hardly requisite if the train is to be run on board. We cannot, therefore, avoid the conclusion that the vessels at present proposed are neither one thing nor the other. They are not built to cleave the sea, like an arrow or an ank, as on the Holyhead passage. They are not large enough to glide over the surface of the angry sea, as the *Great Eastern* might do in the Channel, but as even she is too narrow to do in the Atlantic. And as all the details of harbourage must be calculated after the dimensions of the ferry-boats, we are of opinion that the scheme of Mr. Fowler demands much careful revision before we can accord it that approval which we consider that it may ultimately claim.

With regard, then, to the construction of any continuous railway communication with France either over, under, or through the sea, we cannot admit that a serious question has yet arisen.

That from eight to twelve millions of money should be forthcoming in order to attempt the construction of a work which would be hazardous alike in execution, in maintenance, and in operation, is more than improbable. In the present state of the public mind, it is only necessary to refer to some of the most obvious practical objections to such a project. More minute investigation may be deferred until some chance of the grave discussion of the subject shall actually occur.

For the alternative plans of rapid passenger-boats, or of steady, nonrolling ferry-boats, there is room for much more discussion. The immediate adoption of the former would not necessarily exclude the subsequent completion of the latter. But the essential point is, that no very large outlay should be encountered until the subject is thoroughly wrought out. If we build rapid passenger-boats, we can always make use of them in one place or another; but if we build large ferry-boats, with piers, basins, stages, and roofs to fit, and then find that they do not give us what we require, we shall waste both our time and our resources. We are far from saying that the province of the civil engineer terminates with the end of a pier; but yet, nautical experience is a distinct branch of knowledge. Steadiness of beam and instant obedience to the helm are qualities more necessary for the Channel ferry than actual speed. We have the means, provided by the large expenditure on the *Great Eastern* and other vessels, of obtaining very definite information on these essential points. It is of great importance that we should avail ourselves of these facilities for actual experiment. Let us first decide on the requisite details of the ferry-boat. Let us put on the station a vessel that, with railway-carriages actually on board, will ply backwards and forwards over the Straits of Dover independently of weather. When we have once done this, the shore part of the communication can be adjusted without risk. No hesitation will be felt as to the providing of the money. The million of passengers that even now annually cross the Channel are enough to pay for a very perfect and costly accommodation; our only fear is, that if we do not fulfil the main requisites of the case in the first instance, the cost will be indefinitely increased. Let us not commence a permanent international work without having our eyes open, and being certain as to what we are about.

Proposed Bridges at Grimsby.—The plans of a proposed scheme of the Grimsby Corporation for connecting old and new Grimsby, which are divided by the railway, by a foot-bridge over the line from Railway-street to New Market-place, and for continuing that line of communication to the corporation estate in the West Marsh, by a bridge for general traffic over the old dock at the Freeport-wharf, have been laid before a full meeting of the council in committee by Mr. Sané, engineer to the Manchester, Sheffield, and Lincolnshire Railway Company.

AUTOGRAPH DRAWINGS OF THE GREAT MASTERS OF ARCHITECTURE.

The paper by Professor Donaldson, "On Autograph Drawings of the Great Masters of Architecture, preserved in the Libraries, &c., of Italy and other Countries," lately read at the Institute of Architects, is one of considerable value. We quote portions relating to drawings in England:—

When we notice the grand works executed by the masters of our art, we are anxious to dive into the secret of those inspirations by which their minds were influenced, and to probe the workings of their genius, so as to ascertain by what means their ideas attained the perfection visible in their productions. This is a curious inquiry, and occasionally it may be a valuable and instructive one; for frequently we may mark the gradual development of a thought, originally crude, containing the germs of a fine project, progressively worked out in arrangement, proportions, and details, so as to become a creation worthy of its author. This may be the result of one mind, as in St. Paul's, London, where the first idea of Sir Christopher Wren underwent many modifications, as is obvious in his drawings preserved at Oxford and in the Soane Museum. It was the case also of St. Martin's Church, London; for we see in the collection of drawings preserved in the Radcliffe Library, Oxford, the steps by which James Gibbs gradually improved his original, and, one might almost say, ungainly, design, until it assumed the imposing mass which it now presents in Trafalgar-square. Or the final monument may be the fruit of more than a century and a half, as was the case in St. Peter's at Rome, where the first notion of Bramante's fruitful genius, in 1605, was modified, reduced, and finally enlarged by the genius of Raffaele, the Sangalli, Baldassare Peruzzi, Michelangelo, Buonarroti, Vignola, Giacomo della Porta, and at length completed, about 1650, by the stupendous circular colonnades of the imaginative Bernini.

LONDON.—The print-room of the British Museum is very rich in illustrations of Greek buildings. It is, however, to be regretted that they are not yet regularly classified and kept together, and that no special proper catalogue exists of them. I had occasion, in 1830, to consult those then possessed by the Museum through Lord Elgin, and gave a list of the drawings in the note to my description of the subterranean chamber at Mycenæ, p. 28 in the fifth or supplementary volume to Stuart's "Athens." Besides those, I now find that important additions have been since made by the Dilettanti Society, and others. There are eighty-one drawings by W. Pars, 1764-1767, twenty-three of the views being mounted on boards, and fifty-eight in a volume; also one volume of sixty-one drawings of sculptures of the Parthenon, tinted in sepia; one volume of the original drawings for the Ionian Antiquities, published by the Dilettanti Society; one volume of copies of the forty-four drawings originally made by Carrey (who died in 1726, aged eighty years), by order of M. Nointel, the French ambassador at the Porte, before the Parthenon on the Acropolis was damaged by the bomb of the Venetians. They are executed in red chalk and black-lead pencil, and are very precious, as showing many exquisite figures of the pediments, which then existed and now are lost. There are also three drawings by Wolfenbuterg. There is one folio of twelve plans, elevations, and details to a large scale, beautifully made out of the Parthenon and other buildings in the Acropolis and Sicily—I presume by Lusieri, or his assistants; one volume of eighty-four loose sketches by Ittar of Catania, who was employed by Lord Elgin; one box containing thirteen volumes and a parcel of loose sketches of Sir W. Gell, principally in Greece, but also some of other places through which he passed. The views are of towns, ruins, landscapes, inscriptions, mixed up with some few by other hands; one is a very fine sketch by Gropius, the Austrian Consul at Athens, consisting of a group of priests and Greeks in the court of a house. One of the volumes relates to the Alhambra, many of which are by other artists. Sir William Gell was an indefatigable worker; while his architects or companions were employed upon the buildings, he sketched the scenery around or special features, and took the bearings of the prominent elevations of mountains, and bits of walling, &c. Some are in mere outline, others carefully shaded in lines. Although by no means

a brilliant artist, he was a very pains-taking exact draughtsman, and employed the camera lucida to a great extent. His vast stores of knowledge were at the service of every traveller and inquirer. *Amicus vale!* Among all these drawings there are many containing authentic original matter, which has never been published.

In the department of Oriental antiquities, under the care of Mr. Birch, are six volumes of the fine original drawings of Assyrian antiquities, prepared for Layard's noble work on this subject, by himself, Boucher, and other artists, exquisitely rendered; and one smaller volume of illustrations, ably drawn by Churchill. In the department of Greek and Roman antiquities are the drawings prepared for Sir C. Fellows's work on Lycia, Caria, and Lydia, by Soharf. Being thus distributed through various departments of the establishment, these precious treasures of art escape the researches of many, however great may be the courtesy of the keepers of these records to show them, *when asked for.*

I owe to the intelligent and kind suggestion of Mr. Wyatt Papworth the knowledge of the fact, that there is a vast mass of very important and valuable drawings, prints, &c., of a topographical and structural character in the book department of the British Museum, and which I have examined. The titles of the subjects are given in the special "Catalogue of the MS. Maps, Charts, and Plans of the Topographical Drawings of the B. M.," 8vo. London, 1842, 2 vols. They are classified topographically, according to counties, towns, and parishes; but it is to be regretted that there is no index of the names of the artists and draughtsmen, which is indispensable for those whose researches are primarily directed to the persons. London is very richly illustrated, as, e.g., complete series of drawings of Hawkesmoor's churches—Limehouse, Bloomsbury, Spitalfields, St. Mary's Woolnoth, and of Filicoff's St. Giles. There are drawings by T. Sandby, Nash, D. Alexander, architect; and the Rev. Thos. Kerrioh, who appears to have been as indefatigable a sketcher as our late lamented hon. member the Rev. Mr. Pettit. And the counties have the like useful records. With a nominal index this catalogue would have its usefulness vastly increased, and it is to be hoped the principal librarian will have that prepared, as it can now be done with little difficulty.

THE SOANE MUSEUM, in Lincoln's-inn-fields, has a very fine collection of original architectural drawings of buildings in every country on the globe, and which I have been enabled to examine thoroughly, through the courteous kindness of its curator, Mr. Joseph Bonomi. In fact, there are about one hundred volumes of drawings, besides those contained in portfolios. I shall commence my notice by reference to three volumes of sketches and exquisitely finished drawings in outline, collected for publication by the late Mr. E. Dodwell, the well-known traveller, archaeologist, and author. They were presented through the late Sir A. or Lady Crichton to Sir John Soane, in 1834; some bear the date of 1809, and others of 1831. Various of the free-hand sketches seem to have been made by Mr. Dodwell himself, and the rest are by Italian artists employed by him. Most are by the Signor Vespiagnani, the distinguished architect of the present Pope, and honorary and corresponding member of this Institute. Two of the volumes illustrate Cyclopean walling principally in Italy, and also Etruscan edifices, as tombs, city gates, &c.; and the third has very fine coloured representations of the buildings of Pompeii and the regions about Naples, and in Calabria. After Mr. Dodwell's death, a volume of Cyclopean or Pelasgic remains was published without text; it is now out of print. Those were by another Italian artist, and consist of views only, freely treated, but very accurate. The original drawings of these do not appear. One volume contains illustrations of the Trajan and Antonine columns, with the sculptures drawn and shadowed in sepia, by Caldari, otherwise called Polidoro Caravaggio. One volume of thirty-six drawings of the Theatre Tor di Nona, Rome, by the Cavalière Fontana, with his signature attached to each; and another of drawings of the Coliseum, with plan, elevation, section, and its restoration by Fontana, and design for a chapel and cloister to occupy the whole of the arena. Drawings by Vasari, Panini, Bibiena, and by Fr. Piranesi of temples at Paestum. Fifty-five volumes of original drawings by the Adams brothers, and the artists employed by them, and containing designs for the Law Courts, Palaces, Houses of Parliament,

and other buildings, and particularly for erections on the east side of Lincoln's-inn-fields: some ceilings by Richardson and Manocci, designed or drawn by Italian artists for the Adams, and details of plate, furniture, &c. One volume, by James Gibbs. Several packets of different parts of Somerset House, by Sir W. Chambers. One volume has fine plans, elevations, and sections of Hampton Court, with original designs thereof, attributed to Wren, and drawings of Greenwich Hospital, as originally designed by I. Jones, and enlarged and added to by Wren; and original project for St. Paul's Cathedral, by Sir Christopher Wren, many containing his autograph notes and dimensions. There is also the court order-book of Sir Christopher, with various documents, bills, and accounts, to which his signatures are attached; but whether they are original or copied it is difficult to decide. One volume by Hawkesmoor, and one by G. Dance and his father, with miscellaneous drawings of the Mansion House in the City; a volume of J. Thorpe; two volumes by Thomas Sandby; drawings by Tatham and Playfair; also a volume of Mexican antiquities, prepared by Mühlendorff for publication. Besides a numberless mass of drawings made for Sir John Soane himself by his pupils, Joseph Gandy, G. Bassvi, G. Bailey, and other artists of his own buildings and projects, there are four large folios containing drawings of the Bank of England, and which are very fine and effective. In fact, there is a profuse mass of striking matter and authentic documents in this collection; most of it unpublished, and much that deserves to be more known. It is to be hoped that the trustees will, without further delay, publish a catalogue, and thus render these treasures more available for public inspection and study. From want of this they are at present unappreciated and seldom alluded to.

The Dilettanti Society of London possess a valuable series of the beautiful original drawings of Greek buildings, made for them by P. Gandy Deering and Bedford, afterwards engraved in their volumes of antiquities. There are also numberless sketches by their colleague, Sir W. Gell, and more recent drawings by Mr. Pullan, of the Temple of Teos. It is to be regretted that these fine productions of artistic skill are not more carefully arranged and bound up together, and deposited in the library of the British Museum, to complete the series already there,—the gift of this enlightened society, who, by their researches and publications, have rendered such essential service to architecture, and at great outlay have carried out most important researches in Asia Minor and Grecia propria.

I must also call attention to the very important series of paintings, drawings, photographs, and models of buildings in our Eastern possessions, preserved in the India Office, Downing-street, and to which very important accessions are being constantly made by the enlightened policy of the Secretaries of State for India, the Council and their officers, who afford every facility for their inspection.

In the Duke of Devonshire's Palladian Villa at Chiswick, there is the most interesting collection, made by Lord Burlington, of Palladio's drawings; a catalogue of which, drawn up by Mr. A. Poynter and myself, is in the library of this Institute, dated 17th November, 1845.

OXFORD.—There are, at Worcester College, fifteen drawings, mounted on rollers, and thirteen on sheets, of Inigo Jones's design for Whitehall Palace. And at All Souls' College, three volumes of Sir Christopher Wren's drawings, a catalogue of which was drawn up by Mr. James Elmes. And in the Radcliffe Library there are many original drawings by Gibbs of St. Martin's Church, and of his other buildings. A catalogue of these collections is at Oxford, and a copy exists in the library of this Institute, drawn up by Mr. G. Gutch, Fellow, and dated 6th February, 1836.

I cannot conclude this imperfect summary without calling the attention of our members to the valuable series of admirable original drawings existing in our own library, and too generally unknown, although they are briefly noted at the end of our catalogue, page 159. There are original sketches of Chambers and his pupil Yenn; A. Leclère's series of the portico of the Pantheon at Rome; J. M. Lockyer's forty inimitable coloured drawings of mosaics, floors, and marble inlays; Henry Parker's masterly drawings of Egyptian, Grecian, and Sicilian buildings, measured from the monuments themselves; Athenian Stuart's Sketch-book; Joseph Wood's twenty-eight original drawings in France

Italy, &c., and series by D. Mocatta; and of plans, elevations, sections, and details of Turkish and Early Christian buildings by M. Texier; others by J. J. Scoles, Jas. Savage, H. L. Elmes, Pugin, Thos. Little, &c. Our diligent librarian is now engaged in arranging them, and we may expect to be furnished ere long with a complete catalogue.

In the course of the discussion which followed, mention was made of the collection of drawings, by Mr. George Scharf's father, of old buildings in London. These comprise illustrations of the topography of London in all directions, and record numbers of buildings and aspects of streets which are every day disappearing. Further, that the Institute possesses a volume of original drawings, by Italian architects, of considerable interest. Amongst them are some valuable drawings attributed to Bernini, Bibiena, Borromini, and other clever and facile Italian architects and designers. In the portfolios, too, there are many of the works of the Italian draughtsmen who drew ornaments for Adams and Chambers.

A BIT OF OXFORD.

IF Dr. Waagen really said, as we have seen it reported of him, that the High-street at Oxford had not its equal, as a street, in any town in Europe, he probably viewed that famous thoroughfare through a pleasanter medium than the driving snow and sleet which spoiled its ensemble, and the temper of the spectator at the same time, on an early day in the past month. Under such circumstances, when "the windings of that glorious street" had become "stream-like" in a sense not intended by the poet, scarcely even could the sight of "domes and towers, gardens and groves" overpower that "sobriety of reason" which counselled a speedy retreat from the contemplation of this architectural and picturesque effect to the "collegiate shelter" of one of the "sacred nurseries" standing in hospitable proximity. Yet, although to the eye of the strict architectural critic there may be little to give entire satisfaction, and making every allowance, too, for historical and archaeological associations, there remains sufficient of genuine charm in the aspect of the High-street to justify the enthusiasm alike of the poet and art-critic—a charm derived, however, not from any conscious or intentional striving after effect in the grouping of the various buildings which flank the street, but from the unexpected and irregular opening of one object of interest after another, from the University Church, with its grand though not very refined spire and picturesquely inconsistent Italian porch with twisted columns, down to where the well-known Magdalen Tower looks over the cloistered court of the college, and the broad meadows and deer-park beyond. The tower stands, with a not unpleasant effect, at a slightly oblique angle with the main quadrangle of the college. Beyond this, too, is "Addison's Walk," so assigned by tradition as the favourite promenade of "the Spectator,"—a long straight alley between hedges and low trees, looking bleak and desolate enough at the time of our last visit, but which, under a milder summer sky, might seem no uncongenial resort for one whose genius was, both figuratively and literally, that of a man

"That in trim gardens takes his pleasure."

Of new buildings at present in progress there are not many, so far as we were able to ascertain. A gap in the line of the High-street marks the site of what was, if we remember rightly, the Angel Hotel, but where now the new "Schools" are to be erected, to supersede the old classical building wherein the mixture of the different "orders" excited the wrath and contempt of Mr. Jonathan Oldbuck. Crossing over to "the Parks," on the outskirts of the city (so termed as marking the former position of some "parks of artillery" maintained there at the time of a certain struggle between the King and the Commons of this realm), we find the additional wing in progress as an adjunct to the now well-known museum buildings of Messrs. Deane & Woodward, which have been the occasion of so much sharp criticism and extravagant laudation. The new building, lately illustrated in our pages, and which is in the same style as the older portion, stands at a little distance from the latter, from which access will be provided to it by a covered passage of communication; it is intended for the pursuit of certain special branches of scientific investigation. In the main building a large amount of carving, in the

shape of caps and bases, &c., remains to be done internally; and, when this is accomplished, the internal aspect of the staircases and gallery may perhaps have less of true monastic sternness and discomfort than it now presents; though no such amelioration can altogether atone for the unsatisfactory design, or want of design, in the iron roof, where a mass of girders and ribs, twisted in shapes supposed to be in keeping with Pointed architecture, spring from attenuated columns, with ragged iron foliated capitals of a design quite out of keeping with the material. A museum better and more systematically arranged, as to classification of the various specimens in the readiest manner for comparison and reference, we do not remember to have visited.

Not far from the museum the new "Keble College" is in progress, in the most approved "holy zebra" style of brickwork with many stripes; and we heard of, but did not see, two churches recently built in the town. These, and whatever other new buildings may be in progress, we may characterise in detail on a future occasion and under circumstances more favourable for observation. But it would be an unpardonable omission not to bestow a word of hearty appreciation upon one new building which every one who has an eye for what is quietly picturesque in architecture will see with pleasure; we allude to the new portion of Balliol College facing Broad-street, recently built from the designs of Mr. Waterhouse. This line of building, with its solid but not heavy square centre tower, its corbelled oriels at each end, and happily treated intermediate windows, seen at present in the bloom and freshness of newly-hewn stone, forms as pleasant an episode in modern street architecture of the Gothic type as we remember to have seen of late, and is perhaps more thoroughly successful than some of the larger works with which its architect's name has been connected.

A rainy afternoon at Oxford, however, will scarcely be regretted, if it lead the visitor to spend a good portion thereof in the Bodleian Library. Externally, by the way, the architectural student may obtain a hint, in the two or three acres of panelling which cover the inner wall towards the quadrangle, as to one way of treating wall-space where no windows are admissible. Internally, it is scarcely necessary to say, the interest is of a varied nature. There are those who will find the memories and associations suggested by such a place sufficient food for thought, without taking account of details. There are more curious spirits who will be keen to investigate the rich collection of illuminated MSS. and autograph letters and documents. The fine panelled oak ceiling in one portion of the rooms will not escape the notice of the architect, and is, perhaps, the one feature which will present much interest for him professionally. Persons of realistic tendencies may derive pleasure from the inspection of the Goy Fawkes lantern, affirmed to be undoubtedly genuine; a pleasure which we, however, do not profess to comprehend: and there are others to whom there will be much that is eminently suggestive in the mere sight of the silent multitude of books, fraught with useful or useless learning, from the more modern and manageable-looking octavos to those mightier tomes of an age when books were fewer than at present, and erudition moved with a slow and solemn pace, and was laboriously stored under

"That weight of wood, with leathern coat o'erlaid,
Those ample clasps of solid metal made;
The close-pressed leaves, unopened for many an age,
The dull red edging of the well-filled page;
On the broad back the stubborn ridges roll'd,
Where yet the title stands in tarnish'd gold."

But with all sympathy for Dr. Johnson's views as to the advantage to be derived from an occasional study of the backs of books, perhaps we may say that the mere spectator in the Bodleian will turn with most interest to the portraits ranged upon the walls,—interest historical with regard to the persons represented, artistic in regard to the names of the painters who executed the likenesses. Among those that are likely to stand out predominant in the memory may be mentioned the "Henry VIII." of Holbein, and the "Charles II." of Vandyck, both so full of character and originality as at once to induce a strong presumption of their truthfulness, the latter especially in its hard repulsive lines standing as a notable comment on the effect ascribed by Burns to the indulgence of licentious

passion,—"it hardens a' within, and petrifies he feeling." An equally remarkable portrait is Holbein's "Mary Queen of Scots," a youthful face of almost infantine roundness and softness, and which in its sensuous but exquisite beauty gives a better idea than any other likenesses we have seen of the kind of power which its possessor must have exercised over the hearts of weak fellow-mortals. Not far from this, and in strong contrast to it, the half-length likeness of Flora Macdonald meets us; a fine energetic face, with very strongly-marked Scottish features, and certainly not of that type of beauty which most readers of *Waverley* have been accustomed to figure to themselves. Reynolds's portrait of Payne, the architect, and his son, is one of those in which the artistic interest surpasses the historical; while in the likeness of the chivalrous Falkland, and in the thin studious face of Erasmus (the latter a Holbein) the two forms of interest are about evenly blended. No visitor can pass without noticing a portrait bust placed in one of the windows, of a head of such splendid perfection of feature as might have been designed to represent an Apollo, and the noble and dignified expression of which seems to coincide but ill with some of the traits history has left us touching Chrochill, Duke of Marlborough. Another bust, which might be passed over by a hasty visitor, "A Bacchante," by the Hon. Mrs. Damer, is well worth attention for the delicate modelling of the features, and the truly Greek expression of sensuous beauty, without thought or contemplation, which has been imparted to it, and as the work of the most distinguished of our very few female sculptors. On a pedestal apart stands another portrait bust bearing the name of W. E. Gladstone, which will have an interest not only for the present, but for a good many future generations, and which shows features less worn and furrowed by hard work and responsibility than those which are just now familiar to us.

These are but a few of the objects of interest that are to be seen in the Bodleian Library; but we have said enough to indicate that there are attractions there for other than literary students.

Among recent buildings, the interior of Exeter College chapel should not be passed over, including Salviati's mosaics in the chancel, satisfactory in general effect as a durable means of mural decoration, highly unsatisfactory aesthetically to those who do not wish to see all ecclesiastical decoration assume an archaic form. If the visitor to Oxford, however, wishes to see mural decoration in its noblest form, he will certainly go to the room of the Union Debating Society. Who was responsible for the well-known "frescoes" here we could not ascertain, nor could any one tell us their meaning, or what they were all about. Suffice it to say, that the wall of the room, over the strangers' gallery, is covered with sundry wild-looking paintings of apparently allegorical figures larger than life, and drawn with a sublime disregard to the fact that the wall is pierced here with circular foliated clearest windows, which cut into the sides, shoulders, and heads of the figures indiscriminately. Anything more absurd and purposeless-looking in the way of decoration can scarcely be found in a modern building.

If from the sublime to the ridiculous is but a step, from luxury to the reverse is sometimes, even in these civilised days, but a short cab-drive. A greater contrast there could scarcely be, under the circumstances, than is experienced in leaving the roomy, well-furnished, comfortable Randolph Hotel (built from the plans of Mr. Wilkinson, whose new laboratory at Eton we engraved the other day), for the mean, dirty, ill-kept railway station which the Great Western Railway Company consider sufficient to meet the traffic of such a town as Oxford. On the morning of our departure, those who, while waiting for a tardy train, wished for some shelter from the cutting wind which drove through the station, found the "first-class waiting-room" represented by two chairs placed before the booking-office fire, in the draught between two doors permanently open; and everything about the so-called "station" is on a similar scale of comfort and convenience. In our relations to our tyrants of the iron roads, we English are certainly in the main a long-suffering race of people. "We" ourselves have long resented this sort of ill-usage, and it is with a very hearty and sincere grumble at the meanness and false economy of railway companies in general that we for the present bid adieu to the spires of Oxford.

FRENCH SUBURBAN VILLAS.

UNDER this title Mr. W. H. Picton recently read a paper at the Liverpool Architectural Association, suggested, as he said, by Mons. César Daly's "Architecture Privée sous Napoléon III."

Mr. Picton said at starting,—No branch of the architect's profession excites more interest amongst the public at large than the planning and designing of residences. For one person who would watch with interest the progress of a great public building, fifty would study the arrangements of a new house and criticise minutely all its details. Everybody has a word to say here. The patron complains, after sternly limiting the cost, if he does not get everything in the way of accommodation which he has set his heart on; the lady upbraids if her beautiful in the number of pantries and closets is not provided, and even the servants take your name in vain for every smoky chimney and defective drain, while for some of these matters the architect is as innocent as a babe unborn. Seeing that such is the case, it seriously behoves all architects who wish to achieve success in this department of our art to welcome every hint which may be derived from any source, and amongst others from a study of the houses of our Continental friends.

I am quite aware that the conditions which govern the designs of residences in France are different in many respects from what they are in England. But making all due allowance for differences of climate and habit, I think there will still be much remaining that we may learn.

The lecturer then reviewed a number of the designs which were before the meeting. Speaking of one wherein the architect had shown no anxiety to keep his work in accordance with any given style, he said,—

The detached chimney stalks have a very weak effect, jutting up as they do from the cornice and not indicated in any way below. Amongst the many hints derived from the Gothic, it is strange that the architect did not think of expressing them more distinctly. These drawbacks apart, there is very considerable merit in the design, and now for what is excellent about it. The wings have buttresses at the angles, starting under the string-course, and carried down with one set-off only to the ground. I can see no reason whatever why our Gothic friends should monopolise this useful feature. In this case it gives stability to the corner of the wing, and also widens out the side of the building to receive the conservatory, to which it also gives a finish. Looking generally over the front, it will be seen that while the pediments over the centre and turret windows, the main cornice and round-arched windows are Italian in style, the coupled windows, the dormers in the centre of front, and the eaves above the strings, and many of the mouldings, are perfectly Gothic in feeling. On the whole I submit that the fusion has not been unsuccessful. Our French brethren display more courage than we in the architectural struggle after beauty. Why is this? It is certainly not because they do not understand the styles in their purity, for no nation in Europe has produced finer examples of representative buildings in all the known types of the art. It is not that they are careless about harmony in such matters, and do not care how heterogeneous the elements are which they heap together, provided only they create an effect; for all the details of their buildings show the most careful and scrupulous study which will stand the test of minute examination. I suspect that there is a deeper and a better cause than either of the above. I believe that their art education has been carried to such a high pitch that they have become thoroughly grounded in the principles of beauty; and, having reached a higher level in the art, they breathe more freely the liberal air. They refuse any longer to be tyrannised over by any style, and their art for them

"Has centre everywhere,
Nor cares to fix itself to form."

The following were the suggestions arrived at:—

1. I would impress upon our student members the great importance of careful planning. The minutest matters become great in the arrangements of a dwelling.

2. In the laying out of land, kitchen gardens and planting grounds should be worked in harmoniously with the general design.

3. There should in every dining-room be a window at the head of the table.

4. Play-rooms and school-rooms for children

are better separate from the house in detached buildings, where this can be managed.

5. Hints derived from the Gothic and Classic styles can be successfully combined by careful study.

6. Our great object should be, not so much to act on the principles of any one style as on the general principles of beauty.

7. Our art must satisfy the imagination as well as the reason.

8. A conservatory may be made valuable as a communication between apartments.

9. There is a rule of three in our art as well as in arithmetic, and equally important, as we shall find on examination.

10. The stone balcony and iron balustrade are worthy of imitation and use, to relieve the flatness of our house fronts.

11. Window-heads and string-courses may be made mutually to assist each other, by an avoidance of harsh contrast and close contact.

A CHÂTEAU OF WILLIAM THE CONQUEROR.

THE quiet little Normandy village of Touques very rarely, I should think, sees the face of an Englishman. The light of a British countenance must be still more rare at Bonneville, a microscopical hamlet away amongst the fields, a couple of miles beyond Touques, and far from any high road. Yet at Bonneville there is an object of great interest to Englishmen. It is one of the favourite châteaux of William the Conqueror, as well as of some of his successors, and of his ancestors, back to the days of Robert le Diable, and Rollo himself, who is said to have first built it. It is a rare old ruin almost buried in verdure, and though it was once a proud and mighty stronghold, it is now like a grey, worn-out, and somnolent patriarch slowly disappearing from the earth.

Knowing that the locality is out of the beaten track of visitors to France, and probably entirely unknown to more than a very few Englishmen, it appeared to me desirable to send a short account of the old castle to the *Builder*. Touques, to begin with, is far from all railway communication, and although only a few kilometres from Trouville, the latter fashionable and admirable watering-place is not so well known to Englishmen as it deserves to be, although much resorted to by people from all parts of the continent, and even America. Bonneville, it may fairly be assumed, is therefore a perfect *terra incognita* to Britons.

These places are all in the department of Calvados, and in a district which, in respect to Anglo-Norman history, is superlatively interesting. In and close to the department of Calvados, perhaps more than in any other part of Normandy, events occurred which have had the greatest influence on the destinies of England and her people. The chronicles of Falaise, Lisieux, Bayeux, Caen, Honfleur, Harfleur, Barfleur, St. Valery, &c., should contain records of events which make all the difference between England as she has been and England as she might have been. There is hardly a village, a stream, a rock, a castle, or a church in this region that has not some event connected with it which greatly influenced the fate and fortunes of England, whether that event was a birth or a death, a warlike muster, a battle, a shipwreck, a treaty, a marriage, or an imprisonment. The most ignorant peasant of the locality is prompt to remind the wandering Englishman that "we Normans conquered England." The comparatively modern name of Calvados is also associated with English history, for it was borrowed from a great Spanish ship of Philip's "Invincible Armada," wrecked on this coast.

Turning his back on Trouville, passing Touques, with a glance at its massive and magnificent old Norman church (in a sad state of dilapidation), the pedestrian works his way amongst bye-roads and country lanes to the hamlet of Bonneville. As he approaches it he sees before him, on an abrupt, commanding eminence, the ivy-clad and weather-worn ruins of an ancient Norman castle, perched aloft like an abandoned eyrie. If he is fortunate enough to meet with a passing peasant he will learn that it is the Château of Guillaume Conquerant.

I must make a humiliating confession to a good deal of ignorance of this castle. I had never heard of it, was not aware of its existence, had not the slightest intention of visiting it, and merely came upon it by accident in the course of

an idle summer-day's ramble from Trouville. I was therefore at the mercy of some doubtful recollections of early Norman history, and the exaggerations of a very civil guide, who, in addition to conducting you over the ruins of the castle for the very moderate fee of cinquante centimes, tells you all he knows or has ever heard about the old place, and perhaps a good deal more. With him every vault (where probably the ancient lords of the castle stored munitions and provender), every cellar (strongly suggestive of casks of Burgundy of other days) were so many dungeons in which "les malheureux d'autrefois" were cast to pine away and die.

Exaggeration is the tendency of all guides, and it is as well to be on your guard with respect to what they say, especially if you have not "read up" for your visit. In this case I was assured that here was "the Tower of Rollo," there "the Tower of Robert le Diable," that "the Tower of King John," and so on. Yonder was the window at which Queen Matilda worked a portion of the Bayeux tapestry; that gloomy little chamber, hollowed out in the thickness of the wall, was the cell in which the blinded Count de Talvas was confined for the miserable remainder of his life. Many other highly curious and interesting chambers and structures had their special and sensational histories.

Yet with all this mistrust of my guide's veracity and the accuracy of his statements, there could be no doubt of the great antiquity of the château, or that it must have been the scene of many remarkable events. That was always a consolation in the midst of one's doubts and suspicions. If it was not easy to believe (as my guide asserted) that the ceremony of swearing in Harold, over the box of holy relics, to support the pretensions of Duke William as successor to Edward the Confessor, took place in that little chamber, and not at Rouen, it was certain that the chamber was there at the time, and William and Harold, and perhaps three or four others, might have managed to squeeze themselves into it had they been so minded. The possibility of Matilda working at her many yards of tapestry in a bower of the dimensions pointed out might in like manner be dubious, but certain it is that the bower existed contemporaneously with her, and perhaps she may have sat in it, and embroidered something of the size of a pocket-handkerchief, or have contemplated from the window the magnificent prospect of hill and valley, sea and shore, beneath.

Thus none of my guide's stories were absolutely impossible, though a good many of them were improbable. The part of the structure attributed to Rollo was most likely built by him. It was evidently of far earlier date than the rest of the ruin, and its great stones were worn and honeycombed in an extraordinary manner by the wasting action of a thousand years of storm and rain, heat and cold. Subsequent Dukes of Normandy added to this original edifice (little more than a simple tower in itself), and made a strong and important fortification covering a large extent of ground. The outer walls, with strong towers at intervals, rise from the edge of a deep fosse,—in fact, they look down upon a precipice all round their circumference. Advantage was taken, obviously, of a position naturally strong and precipitous, and this was improved by scarping the hill-side where necessary. In its day the château must have been all but impregnable.

There appeared to be no reason either to doubt the statement of the guide that in former times the sea, which is now a considerable distance from the locality, originally came close to the foot of the hill on which the castle stands. The broad and flat valley, running inland a considerable distance, which the château overlooks, was in all probability an arm of the sea in olden times.

The ocean is still receding along this coast, and a flourishing town (Dunville) has been founded amongst the sand-hills by the late Duc de Morney, where a few years ago the waters held undisputed sway.

The little river Dive flows through the valley in question, and it is recorded in history that it was from the mouth of that river that William's fleet sailed for the conquest of England. The high probabilities, therefore, are, that the local tradition which asserts that the Norman fleet assembled in the estuary of the Dive (now the flat valley I have mentioned) is quite correct. Neither is it unlikely that it was from this castle of Bonneville (as the guide alleged) that William embarked for the conquest of England, while

Matilda waved her good wishes for the success of the expedition from the battlements.

The great arched gateway which spans the main entrance to the castle is a splendid specimen of early architecture, all ruinous as it is. It is a broad pointed arch, and around it are traces of the original flutings and other ornamental efforts. It looks towards the sea, and is nearly, if not quite, due west. The large area within it, enclosed by the walls of the castle, contains a handsome modern mansion, extensive lawn, pleasure-grounds, &c., belonging to the present proprietor of the ruins. Everywhere beneath the house and grounds old foundations and fragments of massive masonry exist, the external shell of walls and towers alone remaining above ground. Near the main gateway the guide led me down a long and precipitous flight of narrow stone steps into a gloomy subterranean passage, which can be traversed for some distance. Further progress along it is prevented by a mass of *débris* and fallen rubbish. The local tradition holds it that the passage in question originally ran as far as the forest of Touques, nearly a mile distant. On the other side of the château there is a similar passage, blocked in a like manner, and also supposed to be of great length. The utility of such passages in olden times is obvious enough.

Undoubtedly this château of the Dukes of Normandy must have been an important place, and it is a splendid and interesting old ruin. The most careless observer cannot fail to be impressed by its massive remains. It has not been fairly used, or much more of it would be in existence. Former proprietors were wont, it seems, to turn an honest penny by treating it as a sort of quarry, and selling the stones. It is satisfactory to know that the place is no longer in the hands of those Vandals, the present proprietor being a man of antiquarian tastes, and he does everything in his power to preserve what remains of the old structure.

As already intimated, portions of the outer walls and towers, together with the donjon keep, now alone remain in ruinous grandeur, and they bear ample testimony to the sordid avarice of the Vandal proprietors of past times. There are considerable remains of five towers, and the remains of a sixth are just traceable above ground. The (so-called) Matilda's chamber and Harold's Chapel, the donjon keep, a deep well in the thickness of the wall, the vastness of that thickness in some parts, and a number of small and gloomy cells, constitute the most interesting features of the ruin.

The donjon keep is in a comparatively good state of preservation. It is built up from very deep-laid foundations, and until recently much of its area below the level of the ground was filled up with rubbish. The present proprietor has caused most of this accumulation to be cleared out. The walls are of enormous thickness, and very little light is able to struggle through the few and narrow loopholes.

We stood on a sort of rough floor or platform formed of planks, about level with the ground, while examining the interior of this structure. The depth below us was dark and profound, and there was a great space above and around. Altogether it was a gloomy, vast, and terrible place, although now no more than a harmless ruin. In the thickness of its wall several small chambers or cells were scooped out, only too suggestive of their use in former days. Woe to the unhappy wretches (*d'autrefois*, thank Heaven!) who were cast into these holes by the cruel lords of those days! Even the most privileged of them could only enjoy the air and light of heaven through a narrow, deep, and heavily-grated opening.

In one of these latter cells Duke Robert (so said my guide) was for a time detained a prisoner, after his unnatural brother, Henry I. had deprived him of his sight, and before he had been finally transferred to Cardiff Castle, to pine away in darkness and silence the remaining years of his once wild, gay, and chivalric life. Amid such associations it was not difficult to conjure up the figure of the unhappy knight standing at that narrow loophole, with his pale, scarred, eyesless face turned up to catch the fresh air, as it blew through the grating, silently picturing to himself the aspect of the glorious but invisible landscape before him, with which he was once so familiar! Blessings on thy active tongue, thou very magpie of a guide, for that incessant, "*d'autrefois! monsieur, d'autrefois!*" for it reminds me that such cruelties are done with for ever!

The present proprietor of the ruin was, I

understood at the time of my visit, preparing a much-needed guide-book to the château. He has done much for the preservation and partial restoration of the castle. Several of the old vaults, passages, &c., have been more or less cleared out at his expense, and the decay and downfall of other parts of the edifice arrested. In the course of these operations some time ago, the workmen discovered in a corner of the grounds, near the outer walls, a large quantity of human remains. The spot is supposed to have been a sort of private burial-ground of the château. A multitude of objects in stone, metal, pottery, have been turned up from time to time—bits of helmets, sword-blades, spear-heads, domestic utensils, articles connected with religious worship, including a mutilated stone statue of the Virgin and Child.

The funds at the disposal of the proprietor for clearing out and restoring the ruins appear to be (as might be supposed from the vastness of the work), very inadequate; and I learned that he was negotiating with some English "mildor," with a view to securing the wherewithal to accomplish the excellent object he has in view. Any one who has seen those interesting ruins can have only one wish in the matter, and that is that he may be entirely successful in his negotiations. J. D. D.

THE NATIONAL PORTRAIT GALLERY.

The pictures constituting the National Portrait Gallery, are now hung in part of the 1892 Exhibition building, South Kensington, above the Mayrick arms and armor, and for the first time the full value of the collection already made becomes apparent. Cross-screens to receive the pictures have been set up, as on the occasion of the recent portrait exhibitions, only on this present occasion the screens proceed from the front wall, containing the windows, and the continuous passage is next the back wall, against which, on a shelf, are disposed the busts, somewhat too high up, with a few paintings below them. The portraits are now 295 in number, of which eighty-six have been presented, and they occupy the whole available space. Under the direction of the able secretary and keeper, Mr. George Scharf, a chronological order, the death-year being taken, has been attempted, and to a considerable extent maintained. Fresh arrivals, the inequalities in size, and various other matters, however, interfere, and thus make it more difficult than might be supposed. The first portrait on the first screen is that of King Richard III. (supposed to be the earliest in the collection), but before reaching it the visitor must pass a full-length portrait of the lamented Prince Consort (Winterhalter), and some other pictures of our own time. We must offer thanks for the complete way in which the collection is labelled. No catalogue is necessary (though a list of the portraits is very properly printed and given away), and the visitor may here obtain with very little trouble a large amount of instruction as well as pleasure. One query for the sake of clearness. Pictures painted in the manner or by the follower of a certain master, say Vandycck, are described, when the actual painter is unknown, as "painted in the school of Vandycck." This is not a good phrase, and should be re-considered. Taken as English, it asserts what is not the case.

We have to thank all who have been concerned in rescuing the portraits from the holes and corners of Great George-street, and setting them forth in a manner which admits of their being fully appreciated and enjoyed.

TOWER SUBWAY.

In so far as the completion of the iron-cased tube through the London clay, under the bed of the Thames, between Tower-hill and Tooley-street is concerned, the work was practically finished some months since. Six weeks ago placards were publicly exhibited, announcing the opening of the communication upon an early day; but the perfecting of the mechanical arrangements appears to have proved almost as formidable an affair as the part of the work that might have been thought most serious. For five or six weeks the engineer and the contractors have been constantly and anxiously at work in the completion of the waiting-rooms and engines, but especially in endeavouring to get the life and the hauling apparatus into smooth, swift, and safe working order. During the week a large number of visitors, including the Duke of

Sutherland and bevy of ladies, with many less highly-distinguished personages, have visited the subway, and taken experimental trips from one end to the other, by the compact iron omnibuses in which the passengers are to be conveyed. An announcement appeared in the morning papers that the subway would be opened for traffic on Wednesday last; the opening was again postponed till Thursday; but from a visit we paid to the works on Tuesday last we took the impression that a good deal still remained to be done before the traffic could be conducted with comfort and celerity. As regards safety, there is no ground for fear. Mr. Barlow's new brake, applied to the lift, seems to be admirably adapted to arrest the descent of the cage in the event of the suspending chain breaking. While the chain remains intact, two pairs of jaws are held in a certain position clear of the guide rods. If the chain snaps, these jaws are released and gradually grip the rods on each side. But this precautionary tackle is almost superfluous, as no serious accident would be likely to result from the drop of the lift from top to bottom of the shaft, which is something under 60 ft. deep, at each end. It rests at the bottom upon, and is stopped at the top by, strong bars of elastic steel, with a number of properly-adjusted blocks of india-rubber in three thick layers. The effect of the sudden descent of the lift, as ascertained accidentally already, has been that it reaches the bottom in about six seconds, instead of twenty to twenty-five, and rebounds a few feet upwards on striking the steel bars at the bottom. Six passengers are the complement of the lift. The great iron block which balances it is an equiptise for the empty chamber, and it is loaded, in addition, as for three passengers, so that the margin can never be wide between the weight of the two, nor the power great that needs to be exercised to raise or lower the lift. There are now two small engines at the bottom of each shaft, one for haulage of the omnibus, the other for raising and lowering its lifts. The entrances at each end from the streets show square chambers of about 9 ft. on the side, covered by pavilion roofs with wide projections round the eaves. The omnibus is roomy as regards width, but low in head room, the hat catching uncomfortably the arched roof. An efficient system of signals, from one shaft to the other, seemed to us a desideratum still remaining to be supplied; but we have no doubt that this and all other necessary and finishing touches will be successfully applied. From our latest inquiries we are led to conclude that the subway will be opened for public traffic on Monday, April 4th, certainly not sooner; the erroneous statements that have been made during the week in the morning papers have caused much disappointment and inconvenience.

RESTORATION OF A SPIRE VANE AT HEREFORD.

A STEEPLE-CLIMBER, Mr. Frith, of Coventry, has been employed to examine the vane and spire of All Saints Church, Hereford, and take down and replace the weathercock, for 15l. The height to the capstone is 212 ft. 4 in., and to the top of the vane 220 ft.

Mr. Frith, with a pupil, commenced operations, as usual, by flying a kite, of silk, about 4 ft. square, with paper tail, a tassel about 50 ft. long, and a double line of cord; and after a good deal of trouble in climbing from the bowling-green, by help of ladders, over houses, the kite was soon moored so as to bring the guide line over the capstone of the spire and against the spindle of the vane, but here some interruption was threatened, as the rope got into a crevice, and Steeple Jack had to make an ascent upon an adjacent building to liberate his lines.

The anchor line having been duly brought over the vane spindle, the kite was gradually drawn down, and its tail fell in an apple-tree in the mayor's garden, a large rope attached to the guide-line having been at the same time drawn up, and both ends eventually brought into Bowell-street, where they were secured underneath the church walls. A third or "counterpoise" rope was then raised with ten stones of iron weights attached to it, as a balance or counterpoise to Steeple Jack when he should find it necessary to ascend. Attached to these ropes was a "cradle" or chair, a very simple apparatus in which the steeple-climber seated himself, a disproportion in the balance formed by his body and the iron weights being produced by the use of his feet, with which he paddled or urged him-

self up and down this inclined plane just as he desired.

It was found necessary to order out a large body of police to prevent persons from traversing those streets into which loose stones from the ribs of the steeple might, and in fact did, tumble when disturbed by the feet of the climber. He went up and stood upon the cap of the stonework and beside the vane, which is 220 ft. from the ground, in three minutes.

Having descended for tools, he remounted the spire, and proceeded (by clipping the spindle with his legs) to use both his hands in dislodging the tail of the bird, to which he attached a cord and swung it in the air amidst the cheers of the multitude. Finding that the implements used were not fitted to remove the ferrule on which the cock was placed, he again descended for a hammer and cold chisel. Armed with these implements he was again in about a minute or two up the ropes, and cutting at the brass ferrule until he was able to lift the body of the bird off the spindle. Within an hour and two minutes of the time of his ascent he had brought the vane into the vestry of the church, where it was found to weigh about 26 lb., was 4 ft. 6 in. from head to end of tail, and bore upon the comb of the bird the following inscription:—"G. Collier, fecit 1787." When repaired, the steeple-climber will replace it. Mr. Frith is about to do a similar job at Worcester.

The wind blew stiffly, but the climber chose the right side for his ascent.

A PLEA FOR CULTURE IN THE PROFESSION OF A SURVEYOR.*

THE landmarks of the professions have been broken up in consequence of the sub-division of labour. Take our own profession as an example, and consider how it has grown up. We have a recognised existence; we have grown into an institution. In the beginning of the career of many of us the modern surveyor was unknown. The owners of property had for the most part legal professional men as their confidential advisers, who collected their rents and managed their estates, generally, in a very inefficient manner. The surveyor occupied a simply subordinate position—generally employed by the professional man, and without any particular training, except what he acquired by his own practical experience. But now, stimulated by the vast improvements in agriculture, by the rapid development of our mineral wealth, by the immense extension of railways, and by other causes, the surveyor has gradually acquired an independent position: he is now himself the confidential adviser of owners of property, instead of being dependent on other professional men for employment.

It is well for us to be reminded of this gradual continued increase in the importance of our profession, in order that we may be more impressed with the necessity for a simultaneous expansion of our education and culture.

To what, then, has our profession grown, and for the fulfilment of what duties should we seek to qualify ourselves? We must have a thorough knowledge of the agricultural value of land, and should therefore be practical farmers. For the general management and improvement of an estate we must know something about building and architecture; about draining, surveying, levelling, and the cultivation of timber. We must know, too, the mineral resources of the properties with which we deal, which in itself opens up a vast field of knowledge; we must be familiar with manufacturing and commercial properties; we must be good accountants (not so simple an acquirement as some seem to imagine); and we should at any rate be able to solve *ab initio* those problems in annuities, life interests, reversions, and other subjects, the solutions of which we are in the habit of extruding mechanically from published tables.

This certainly seems a long list of acquirements; but something still more important is demanded from him who would excel in our profession. He must be qualified to act as witness, arbitrator, or umpire, three qualifications which demand the most careful training. As a witness he must have clear opinions and clear reasons for holding them, and these opinions he must be able to express in concise and lucid language. As an arbitrator he should have the qualities of an advocate, discriminating those points most

favourable to his own case and lucidly enforcing them. As an umpire he should have the qualities of a judge, skill and judgment in weighing evidence on both sides, and in selecting only the material points, not stubbornly clinging to a preconceived opinion, but open to the reasons and arguments on each side, and possessing ability to sift them.

The surveyor should also have a literary and logical culture, in which I am bound to say we are, for the most part, deficient, which will enable him, in the reports he has so constantly to make, to arrange his arguments and opinions in the most concise and logical form; and, finally, he must above all things have tact in dealing with his fellow-men; for, as he must advise the wise and the foolish, the learned and the unlearned, he must have the skill to enter into the minds of those he comes in contact with, and to see things from their points of view, in order that he may know what kind of arguments will be most likely to convince them.

Now a thorough knowledge of most of the acquirements I have mentioned would require the experience of years. A surveyor cannot be so good a farmer as a man with as good an education and ability who spends his life in nothing else; he cannot be as good an accountant as a professional one; he cannot know as much about building as an architect; he cannot weigh evidence like a judge. Nevertheless, our work is not at present so subdivided that many of the gentlemen I am addressing would shrink from giving an opinion on most of these subjects, or occupying any of the positions I have described. A surveyor then, who would excel in his profession, should aim in the first place at acquiring a sound knowledge of the rudiments of each of his branches, and then a perfect knowledge of as many as he is capable of mastering; and this is in fact a limited form of my general theory of education, viz., that a man should know one thing perfectly and know something of everything else. I do not mean that he should have a superficial knowledge of other things, but a knowledge which is real in its character though it may be elementary and limited in its extent.

With this view I consider the best preparation for our profession to be a high general education, because I believe that a mind thus trained may be made capable of acquiring its technical details with a comparatively small expenditure of time and labour.

Let us see what branches of learning are included in such an education, and what influence direct or indirect they would be likely to have on our profession.

For the sake of simplicity we may class them under three heads,—science, mathematics, and literature and logic.

The direct value of scientific knowledge, especially that of chemistry, botany, and geology, is obvious.

We learn from chemistry the component parts of our various soils and of the plants we grow upon them. We therefore know what elements of the soil a particular plant will assimilate, and hence what we must replace there in order to continue the cultivation of such a plant; in other words, we learn the science of manuring.

Again, a botanist, from his knowledge of plants, will see at a glance the nature of the soil on which particular plants are growing, whether it is barren or productive, wet or dry, light or heavy, so that starting with this knowledge, a valuer, with a comparatively short practice, will be able to give a reasonable opinion on the agricultural value of land. The same may be said of the geologist, but, independently of the value of geology, in an agricultural point of view, to the surveyor who has anything to do with the immense mineral properties of this country, a deep knowledge of this science is indispensable.

The knowledge of mathematics, even of a high order, is of direct benefit. Including the more elementary knowledge of figures in this subject, it is of course essential that we should have a thorough knowledge of bookkeeping, of the best methods of keeping our farm, estate, and other accounts. Questions of life interests and reversions, &c., require a considerable knowledge of mathematics for solution; and, though we are supplied with tables which solve most of such questions without our thought or trouble, yet cases often arise in which our tables are not applicable, and it is therefore on all accounts desirable that we should be able to solve all such questions by the light of our own knowledge.

But, independently of the direct practical bearing of science and mathematics, their indi-

rect value in training and disciplining the mind is incalculable. It is a man's great interest, all through life, to find out the truth about those things, no matter of what kind, with which he is concerned. To do this he must be able to judge correctly of the facts which come before him,—an ability which constitutes one of the greatest distinctions between one man and another, and to do which with effect needs all the resources which the most perfect system of intellectual training can command. For this purpose the value of the study of mathematics and science is essential.

Mathematics teaches us the method of arriving at truth from reasoning; it obliges us to lay down with exactness and precision all the premises from which we mean to argue, to keep each step in one argument distinct and separate from every other step, and thus to cultivate a habit of mind necessary to the elucidation of truth.

Science shows us how truth can be arrived at from observation. We do not all profess to reason, but we all of us profess to draw inferences from observation, and I may safely say that no man who is not a student of science can form an idea of what the difficulty of reasoning from experiment or observation really is, or how cautious it is necessary to be, if we would avoid false inferences.

I might speak at some length on the bearing of literature and logic, both directly and indirectly on our profession, but by so doing I fear that I should exceed my proper limit. I will merely observe that one of the greatest wants in our education is the power of expressing our thoughts and opinions in graceful, logical, and grammatical language. We may have arrived at a correct conclusion, either by sound reasoning or by a correct judgment of evidence; but few of us have the art of writing down, or expressing clearly, the way in which we have arrived at it, laying down, when necessary, first the premises from which we start; then the various steps of our argument, arranged without confusion, and stated without prolixity, so that our conclusion may be at once natural and convincing.

This art can certainly be best acquired by a study of literature and logic.

From these remarks you will understand that I recommend for our own education, before we seek to acquire the knowledge of the technicalities of our profession, a wide mental culture such as is generally thought necessary in the older established professions. It is needless for me to enlarge on the indirect advantages of such a training,—I mean, those advantages which are independent of our profession. We all of us have our times of leisure, but we do not all know how to use them best; and this culture must certainly teach us how to employ our leisure with the greatest pleasure to ourselves, and the greatest benefit to our fellow-men.

ACCIDENTS.

THE roof of a house, No. 31, Horse Fair, Wolverhampton, has suddenly fallen in. The agent for the owner of the property had been informed some days previously of the dilapidated state of the house, and he sent a builder to examine it, and do what was necessary, but the builder reported that the house was quite safe. Two women narrowly escaped with life, as they were in bed when the roof gave way.

While three men were engaged in digging a bed for a waterwheel on a farm at Newdeer, Aberdeenshire, the sides gave way, and they were buried alive. Three other men were injured.

A gas explosion has occurred at Penrith, Cumberland. There had, during the night, been an escape of gas at the residence of Mr. J. Stoddart, Larkhall. When the servant came down she noticed it, and having *shut* the windows, *struck* a light. Nearly all the windows of the house were blown out; the furniture and paintings were partially destroyed; the walls became insecure; and the servant and a charwoman were set on fire, and are so sadly injured that there are doubts as to their recovery. The poor woman must have misunderstood the usual advice given in such cases to *open* the windows, and *not* to strike a light.

Mr. Williams, station-master of Tenby, has been killed while writing in the Telegraph-office, by a large stone from the Leemstone Quarry, where blasting operations were going on.

A terrible conflagration has occurred at

* From paper by Mr. Jeremiah Matthews, mentioned in our last (p. 244).

Compta, Bombay. Two hundred houses and 6,000 durras of cotton, equal to 2,500 bales, were burnt, leaving a stock of only 4,000 durras. The loss is estimated at 25 lacs of rupees (250,000).

BROWN'S HOSPITAL, STAMFORD.

Str.—The interesting description of this hospital in the *Builder* of the 19th ult., seems to call for some explanation of what is being done in the restoration.

The desire for the careful conservation of every old feature of the building is closely in accordance with the plans and instructions of the architect, Mr. James Fowler. No portion of the old work is to be touched,—except where monstrous settlement has necessitated it,—and it is then to be reinstated, with its weather face, stone for stone.

The new warden's house is in harmony with the long line of the old building, so well known in Stamford. The chapel walls have been taken down so far only as they were unsound; the stained glass, *missers* stalls, and other fittings being carefully removed, to be replaced intact. The monument-room partition is to be removed, and an oaken gallery, open to the chapel,—as of old,—formed above the groining of the beautiful screen.

Westward, where the subsidence of the foundations, noted by your correspondent, has caused great dilapidation; the entrance porch and a portion of the south wall will be taken down, the stones marked, and rebuilt.

The quaint, but somewhat unsanitary, cells of the bedesmen will be removed, and the space thus obtained utilised as an ante-chapel and library, open to the chapel screen, and communicating with the sunny south terrace in Broad-street, and the western cloister.

The chapel and ante-chapel will be warmed with hot air: the latter will be a comfortable meeting-place "for old, or poor, or weak, and men unhealed." This tablet, and the alms-box mentioned in the *Builder*, with other antiquities, are in the care of the warden, the Rev. C. Nevins.

The western cloister, of three bays of two pointed and intersecting arches, will be extended three bays further northward. The quadrangle thus formed will extend the whole length of the present building, and be bounded on the north by the bede-houses, which are raised upon a terrace, necessitated by the great rise of the ground from south to north. The bede-houses are ten in number: each house has living-room, 14 ft. by 10 ft., with chamber over, and staircase and pantry to each. Spacious laundries and offices are provided. A covered way in front of the bede-houses connects them with the cloister and ante-chapel.

The stone from the old buildings on the site is re-used, with its lichen face, and every ancient feature is carefully retained and re-used in the new work: in fact, I think the most scrupulous antiquary could not object, in any way, to what we are doing; and from what I know of Mr. Fowler's practice, I do not suppose the work could have been placed in more careful hands. The audit-room is to remain as at present, its fine oak roof being recovered with oak boarding and lead, and a new clock-turret built at the south-west angle; the monument-room will be over the entrance porch. The contractors for the work are Messrs. Halliday & Cave, of Greet-ham.

WM. G. OSBORNE, Clerk of the Works.

THE TRADES MOVEMENT.

London.—An adjourned meeting of delegates of the carpenters' and joiners' societies has been held at the Duke of York Tavern, York-street, Lambeth, in furtherance of the nine-hours movement. From the reports given in by the delegates it appeared that during the week large meetings had taken place in various metropolitan districts, at all of which resolutions have been unanimously adopted, declaring the great benefit that would accrue to the trade, in its present depressed condition, from a reduction in the hours of labour, and also in favour of the new code of working rules to be mutually agreed upon between employers and workmen. Arrangements were then made for the holding of other district meetings.

Plymouth.—Several Plymouth builders complain of having received threatening letters bidding them prepare for death for employing men from the workhouses, although, as they allege, they are being paid the value of their

work. The relieving officer has also been threatened.

Edinburgh.—A meeting of the Operative Painters of Edinburgh and Leith has been held in the Phoenix Hall. There was a good attendance of the trade. The chair was occupied by Mr. O'Brien, and on the platform were delegates from the Trades Council. The chairman introduced the business by stating that a memorial had been presented to the master painters complaining of the excessive number of apprentices, and the introduction of unskilled labourers, who, the memorialists stated, were employed to do the work of regular journeymen at a cheaper rate. The following resolutions were carried unanimously after some discussion:—

"That we, the house-painters of Edinburgh, Leith, and vicinity, use our utmost endeavour to rid the trade of the ruinous system of employing unskilled labour, so prevalent in our trade."

"That, considering the many grievances which exist in our trade, it is absolutely necessary that the house-painters of Edinburgh, Leith, and vicinity, should become thoroughly united, and that this meeting pledge itself to support the same."

The delegates from the Trades Council spoke in support of both resolutions.

Perth.—In pursuance of a resolution come to at a general meeting, the masons in connexion with the Perth branch of the United Operative Masons' Association of Scotland have struck work. Upwards of three months ago the men intimated to the masters in Perth, that if the wages were not raised before the middle of the present month from 53d. to 61d. per hour, a strike would take place. The masters, with one exception, refused to agree to the demands of the men; hence the present turn-out. Most of the men who are not members of the Masons' Association have also struck work. It is asserted that, as the building trade is not brisk, the principal employers will firmly refuse to give at present the 1d. additional per hour sought by the Operatives' Association.

Glasgow.—The operative joiners, at present on strike, have had a meeting in the Prince of Wales Hall, Buchanan-street. Some discussion ensued as to the present aspect of the struggle, after which it was agreed:—

"That, with a view to the satisfactory settlement of the present dispute, from this date,—21st March, 1870,—until such time as, working regulations and bye-laws for the trade are mutually agreed upon, we consider it binding upon employers and employed that the present rate of wages, 61d. per hour, should not be departed from without three months' notice from either party; and that the present working hours,—from 6 a.m. to 9 a.m., from 10 a.m. to 1 p.m., and from 2 p.m. to 5 p.m., for five days of the week; and on Saturday, from 6 a.m. to 9 a.m., and from 10 a.m. to 1 p.m.; in all, fifty-one hours,—shall not be departed from without six months' notice from either party; and that a copy of this resolution be printed and submitted to those employers who have acceded or are likely to accede to our present demands, for their mutual agreement."

"That in consequence of the non-acceptance of the conference offered by us to our employers, for the purpose of mutually arranging a code of bye-laws for the trade, we offer them another opportunity of so doing. Should such not be accepted within three days, we will print our revised code of bye-laws, and submit them to the trade for mutual agreement, before we concede to any settlement of the present dispute."

The Liverpool carpenters and joiners have resolved to support the Glasgow joiners in their movement.

RAILWAY MATTERS.

Bow.—The new railway station of the North London Company at Bow has been opened for public traffic. The main building fronts the Bow-road, and over the booking and other offices there is a room, or hall, nearly 100 ft. in length, with an arched roof. The platforms and approaches are somewhat similar to those at Dalton Junction. The cost of the new station exceeds, it is stated, 25,000l.

Bath.—The Midland goods-station in Sydenham-field approaches completion. It is built of blue lias, with Box stone dressings. The roof is supported on a light framework of iron, and has rough thick glass in the centre. The offices are at the east end of the station. Sydenham-field being separated from the city by the river, a bridge is being constructed to form a communication between Seymour-street and the goods-station. The bridge will be of cast iron, and in most respects similar to the existing one, with which it will be parallel, at a distance of about 100 yards. It will, however, have no pillars supporting it in the centre. The bridge will have a clear span of 150 ft., while its width will be 24 ft. The abutments on the Seymour-street side of the river are now in course of construction. The works are being carried out by Mr. Humphreys, of Derby, and his manager, Mr.

Green, from the plans of Messrs. Allport, jun., & Wilson, the engineers, and the architect, Mr. Saunders.

Sparks.—In the Court of Session, Edinburgh, an action has been brought by Mr. John Murdoch, jun., Castle Douglas, for damages occasioned by a fire which originated through a stream of sparks from an engine on the defendants' line falling on his premises. The damages were laid at 1,018l.; the jury awarded 755l.

English-built Locomotives Abroad.—The number of locomotives ordered thus far in England for Russian railways is about 350. Of these, 111 have been ordered of Messrs. Sharpe, Stewart, & Co., of Manchester; 15 of the Worcester Engine Company; 22 of Messrs. Neilson, of Glasgow; 78 of Messrs. Beyer, Peacock, & Co., of Manchester; 56 of Messrs. Kitson, of Leeds; and 69 of the Yorkshire Engine Company. A considerable number of these engines are already delivered: others are still on hand.

BERKSHIRE, READING, AND NEWBURY LUNATIC ASYLUM.

The subject of the accompanying illustration is the newly-erected asylum for the reception of the insane poor of the county of Berks and boroughs of Reading and Newbury. The site is favourably situated on the banks of the Thames at Choley, near to the Moulton Station on the Great Western Railway. The land slopes gently southwards to the river, and is bounded on the north by the turnpike-road to Wallingford. The general outline of the plan affords uninterrupted views of the surrounding country, free access to sun and air, and is so arranged as to give the day-rooms a good aspect. There is no road nor building on the south side, which is appropriated entirely to the use of the patients, and will be laid out for them as gardens and airing-grounds.

The accommodation for male and female patients is kept quite distinct on either side of the centre, and the kitchen and stores are so placed that the service on each side shall also be separate.

The working patients who are engaged in the laundry and workshops are placed in the north block (the one illustrated), in the centre of which are the superintendent's office, porter's room, reception and waiting rooms, visiting justices' room, and steward's apartments. A residence is provided for the superintendent on the west side of the north block, with the front windows commanding the high road and the entrance to the asylum. It is connected by a circular corridor with his office.

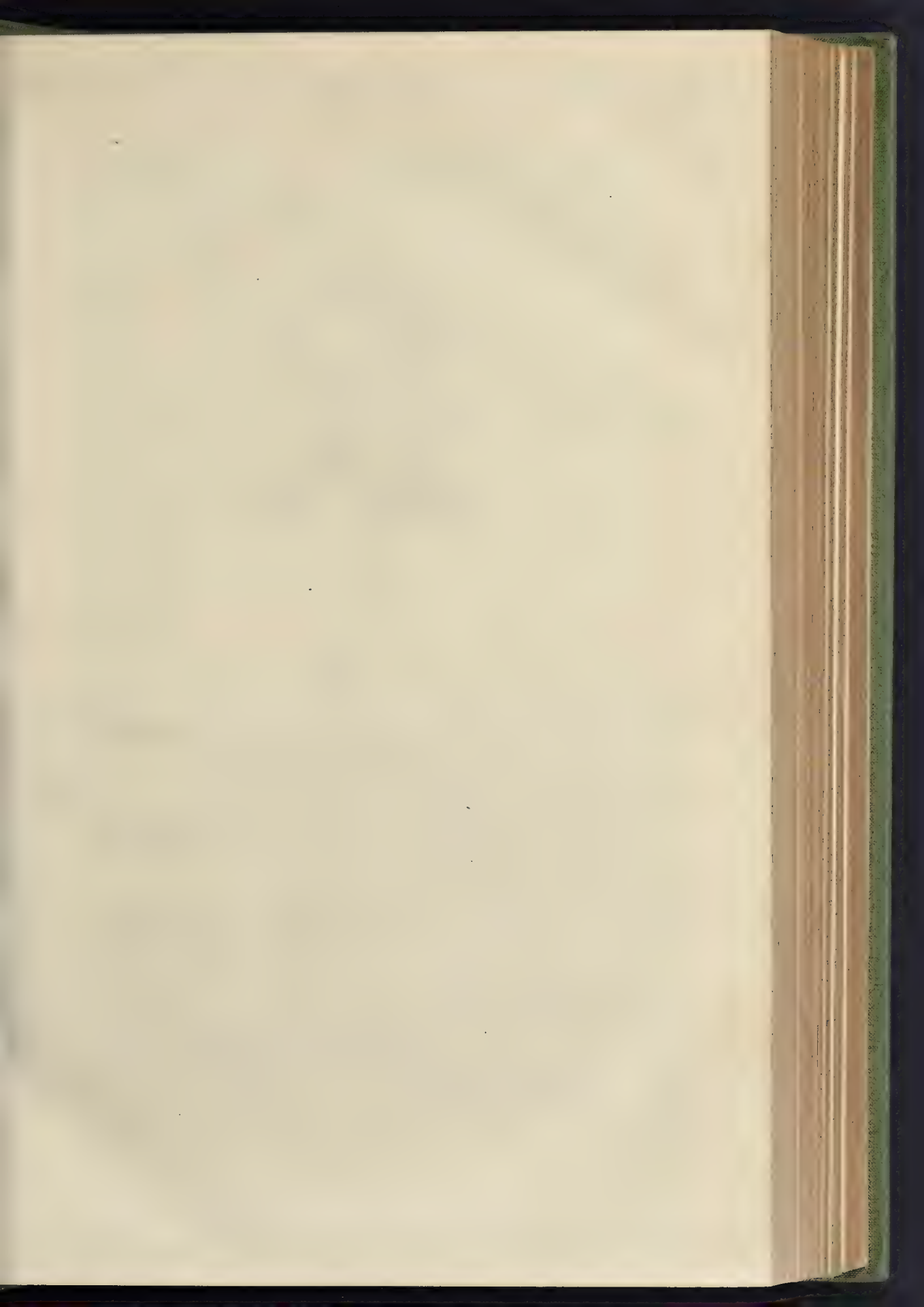
The wards for acute and recent cases, with a large dining-hall, form the south block, and the infirmaries the east and west wings. They are in a quiet position at a distance from the other wards, and where they cannot be used as a thoroughfare to any other part of the establishment. In the centre between the north and south blocks are the administration offices, including kitchen, scullery, larders, cellars, stores, dispensary, rooms for servants, engine and boiler house, pump-house, laundry, wash-houses, and workshops for tailors, matmakers, shoemakers, and others.

The day-rooms, and patients' corridors, and staircases, besides open fireplaces, will be warmed by Haden's hot-water apparatus. Rain-water will be stored in large tanks, and spring water pumped up into cisterns in the tower. All the buildings will be lighted by gas made at works erected for the purposes on the ground.

The estate, which covers an area of sixty acres, will be laid out and partly cultivated by the patients. The sewage will be applied to the land. There are farm buildings, including stabling for horses, cow-house, piggeries, root-house, &c., and cottages for the farm bailiff and engineer, as well as an entrance lodge and cottage adjoining.

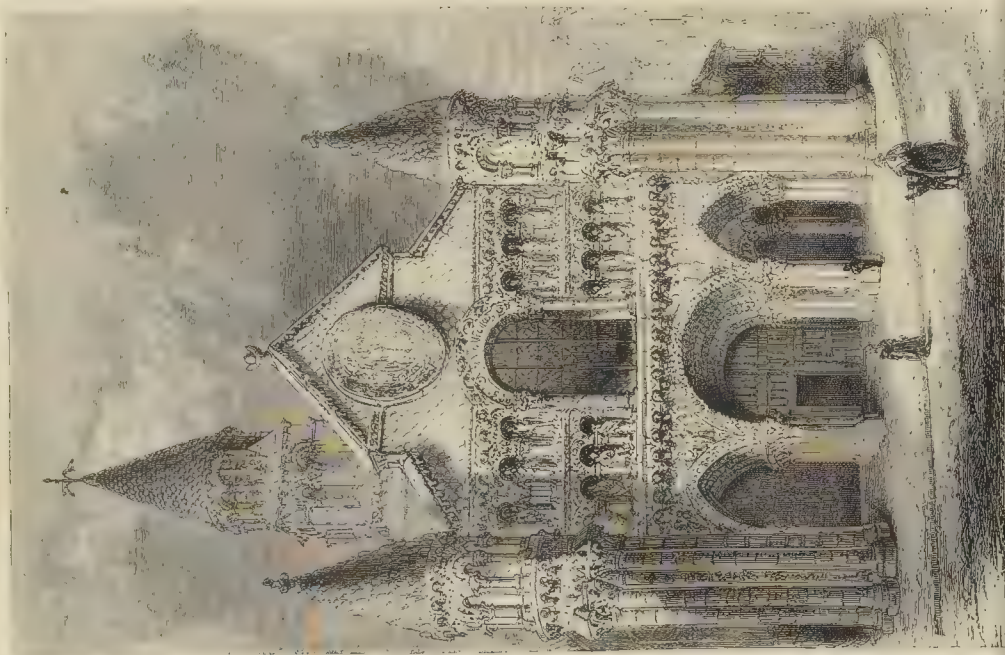
The patients' chapel is at a little distance from the main building, so as to give the inmates the opportunity of a walk to and from the services. The nave is 51 ft. by 25 ft., and the chancel, which has a semi-circular apse, measures 24 ft. by 20 ft.

The buildings are constructed of red brick-work, slightly relieved with stone and coloured brick dressings, and have been erected by Messrs. Mansfield & Price, of London, under the direction of Mr. C. H. Howell, of Lancaster-place, Strand, the architect of the New Surrey and East Riding Asylums.





MR. JOHN GIBSON,
Architect of Dromy Castle, Fribourg.



THE CHURCH OF NOTRE DAME. POITIERS, FRANCE.



BERKSHIRE, READING, AND NEWBURY LUNATIC ASYLUM.—MR. C. H. HOWELL, ARCHITECT.

"THE ARTS IN THE MIDDLE AGES."

In our review of M. Paul Lacroix's work,* we mentioned the facsimile of a miniature, drawn with a pen, taken from a Bible of the eleventh century now in the Imperial Library, Paris. Although rude and showing the decadence that the art of drawing the human figure had fallen into, it is curious in several respects, and we reproduce it. We see the masons using the pick, the trowel, and the plumb-bob, as still employed: the entasis of the central column is also noticeable.

We are enabled to reproduce, too, the view of the entrance front of that remarkable church, Notre Dame la Grande, of Poitiers (France), with its multitudinous sculptured figures, borders, and scrolls, and where on each side of the semicircular-headed central doorway the pointed arch appears, probably induced by desire to render the side arches more nearly of the height of the central archway. Many years have passed since we saw this building, but we remember distinctly the interest with which it was viewed as an extreme elaboration of the plainer kind of what we call Norman work,—a phase of the style then new to us as a student. At the time we visited the building it had been long untouched, and was nearly black; and in place of the two columns that carry the arch of the great window in the centre, there were two interpolated canopied niches. These have been removed, and other work has been done. M. Lacroix puts under his view of the front "Twelfth Century." The body of the church belongs to the end of the eleventh, or beginning of the twelfth century, but the front in question we have reason to believe is scarcely older than the commencement of the thirteenth. Of the sculpture we wrote at the time,—“The spandrels beneath the first cornice and corbels contain a series of bas-reliefs, representing on the left-hand side of the spectator Adam and Eve, Nebuchadnezzar, some of the prophets, and an angel announcing to Mary the dignity of her coming child; and on the other side the meeting of the Virgin and Elizabeth, and the birth of the Saviour. Over the doorway is a circular-headed window, with a canopied niche

on either side, which is an interpolation of later times. The figures in the arcades represent the apostles and two bishops. The lower part of the gable is inlaid with a series of small circular discs, and the upper part of it with squares placed diagonally: in the centre of the two parts is sculptured a large *vesica piscis*, containing a figure of Christ, and symbols of the four evangelists, namely, the bull, the angel, the eagle, and the lion.”*

CONSTRUCTION OF THE WOLF ROCK LIGHTHOUSE.

INSTITUTION OF CIVIL ENGINEERS.

ON March 1st, Mr. C. B. Vignoles, F.R.S., president, in the chair, the paper read was “On the Wolf Rock Lighthouse,” by Mr. Jas. N. Douglass.

Before entering upon the immediate subject of the paper, the author noticed briefly some other works which had been executed from time to time in the same neighbourhood, and with which it was intimately connected. These included a lighthouse on the Longships Rock, built of granite in 1795, and from which a catoptric fixed light was exhibited. Owing to the terrific seas to which it was exposed, the lantern, with its centre at an elevation of 79 ft. above high water of spring tides, was so much under water during stormy weather, that the character of the light could not be determined with accuracy. In its stead a granite column 110 ft. high was now being erected, to be surmounted by a first order dioptric light. In the same year, 1795, beacons were erected on the Wolf and the Rundestone Rocks. These works were described, as well as a second beacon erected on the Rundestone during the years 1841-3, the mast of which was on several occasions carried away and had to be re-instated. The dangers of the Rundestone had since been marked by a bell buoy. An iron beacon was also erected on the Wolf Rock during the years 1836-40, and during these five years it was only possible to work on

the rock for thirty and a quarter days of ten hours each. The mast of this had likewise to be renewed several times. The ironwork of this beacon, after an exposure of thirty years to the corrosive action of sea water, was in a good state of preservation, having been protected by a coat of red lead paint, renewed annually.

The Wolf Rock was stated to be composed of a hard, dark, felspathic porphyry. Its highest part was 17 ft. above low water of spring tides, which had a rise of 19 ft. The surface was rugged, rendering a landing upon it difficult. The depth of the water close to the rock was twenty fathoms, excepting on the south-east side, where a shoal extended for a considerable distance. In the year 1860, the late Mr. Walker was instructed to furnish a design for, and an approximate estimate of the cost of, the work. These having been approved, the author, who was then completing the Smalls Lighthouse, was appointed to carry out the work as resident engineer. The form and dimensions of the tower differed but little from those of the Bishop, the Smalls, and the Hancnis. Its exact height was 116 ft. 4½ in., its diameter at the base was 41 ft. 8 in., and near the top, at the springing of the curve of the cavetto under the lantern gallery, the diameter was 17 ft. For a height of 39 ft. 4½ in. from the base the work was solid, with the exception of a space forming a tank for fresh water. At the level of the entrance door the walls were 7 ft. 9½ in. thick, whence they gradually decreased throughout the whole height of the shaft to 2 ft. 3 in. at the thinnest part near the top. The shaft of the lower was a concave elliptic frustum, the generating curve of which had a major axis of 236 ft., and a minor axis of 40 ft. It contained 41,506 cubic feet of granite, weighing about 3,296½ tons; and its centre of gravity was 36 ft. 2½ in. above the base. In consideration of the exposed position of the work, it was determined to dovetail each face stone vertically and horizontally, in accordance with the system suggested by the author's father, and first adopted at the Hancnis Lighthouse. This method consisted in having a raised dovetailed band, 3 in. in height, on the top bed and one end joint of each stone. A corresponding dovetailed recess was cut in the bottom bed and end joint of the adjoining stones, with just sufficient clearance for the raised band to enter it freely in setting. From experiments made upon blocks of granite put together in this manner with Portland cement, it was found that the work was so homogeneous as to be as nearly as possible equal in strength to solid granite. In addition to increased strength, this system of dovetailing afforded great protection to both the horizontal and the vertical joints, against the wash of the sea when the work was first set. As an additional precaution, each stone of the first twenty courses was also secured by two bolts to the course below. The masonry, to the level of high water spring tides, was set in fresh Medina Roman cement, part of which was supplied from the Government Stores at Chatham, and part was manufactured by Messrs. Francis & Co., from whom the Portland cement was obtained for setting the work above high water. All the cement used in the work was mixed with an equal portion of clean, sharp, granitic sand, obtained from the stamps refuse of the Balleswidden Tin Mine, near Penzance. This sand was of excellent quality for such work, every grain in it being hard, angular, and rough. Salt-water was used for mixing all the cement required for the landing platform and for the solid portion of the tower; above this fresh water was used. The step ladders for ascending from floor to floor, and the partitions between the rooms and staircase, were of cast iron, and precaution had been taken to limit the use of wood for the fittings as much as possible, in case of fire. The doors, windows, and storm shutters were of gun-metal. The windows of the watch or service room, immediately under the lantern, were specially arranged for admitting air to the lantern, and for regulating the ventilation, in all ordinary weather. The supply of air was admitted by a valve at the upper part of the window, so as to pass above the head of the light-keeper on duty, and upwards through an iron grating surrounding the lantern floor.

The lantern was one of the cylindrical helically-framed type, designed by the author, and adopted by the Trinity House.

The total cost of the undertaking, including the lantern, the illuminating apparatus, cost of workyard at Penzance, vessels, and all incidental expenses, might be taken at 62,726l.

* “Pen and Pencil Sketches of Poitiers and Angoulême, with some Remarks on Early Architecture.” By George Gölwin.

* See p. 238, ante.



THE OPERA HOUSES.

Covent Garden.—Mlle. Sessi, who appeared on the opening night in "Lucia di Lammermoor," achieved considerable success, and promises an important future.

Drury Lane.—The auditorium of "Old Drury" is about to undergo a complete transformation to adapt it for the requirements of the New Opera Company, which, under the direction of Mr. Geo. Wood, starts as a rival to the Mapleson-Gye Company at Covent Garden. Drawings have been prepared by Messrs. Marsh Nelson & Harvey, architects; and the works placed in the hands of Messrs. W. Bruncher & Son, who remodelled the house under the same architects for Mr. Mapleson, after the destruction of Her Majesty's Theatre in 1868.

ARCHITECTURE AT THE BIRMINGHAM SPRING EXHIBITION.

THERE are now two Exhibitions in the year in Birmingham. The spring show has just commenced, and appears a very good one. Turner, Cattermole, Calcott, Harding, Prout, and other eminent artists are well represented, and the local artists have likewise done very well. There is also an attempt at architectural drawing, but it is a feeble one. Four designs only are sent, and they are certainly not of extraordinary merit. Mr. E. Bindley sends his drawing for West Bromwich Schools, but it is poor Elizabethan, and makes one wonder how it came to obtain the commission. Mr. F. T. Proud's design for cottages is a superior production altogether, and is a pleasing specimen of Domestic Gothic, showing how a good effect may be obtained in skilful hands and by simple means. Mr. J. S. Davis's redos is a flaming piece of composition. It cannot be complimented on any great success, though there are indications that he might do better if he were to take more pains. He has some idea of colour, but his figure-drawing is defective. I should certainly advise him to study figure-drawing for some time. His cathedral front is tame and commonplace. I fancy it would be a good thing if some local architect would deliver a course of lectures on architecture. I do not see why that art should be so neglected, and so many architects, too, as it is in Birmingham. T. G.

FALL OF HUSTINGS AT BRISTOL.

On Saturday last the nomination of a member in Parliament for the city took place before the returning-officer, Mr. T. Proctor, high sheriff, upon hustings erected in the Corn Exchange. There was a large and very noisy gathering. While one of the candidates was speaking, the hustings upon which were the officials, candidates, and some hundred or more gentlemen, suddenly gave way, and a panic ensued. The candidates were thrown into each other's arms, and the reporters and other gentlemen fell amongst the shattered timber. One or two fainted and were carried off, and three or four received severe bruises. Many, of course, were much shaken, but happily none were seriously hurt. The accident is said to have arisen from the breaking of an iron bar. A large number of the corn merchants' desk-stands being under the hustings, the descent of the framework was checked, so preventing the consequences from being more serious. We are constantly urging the necessity for proper supervision by public officers of such constructions.

STATE OF EDUCATION IN THE GREAT TOWNS.

Two important reports have just been presented to Parliament, prepared for the Education Department by Mr. J. G. Fitch and Mr. D. R. Fearon, on the education of the poorer classes of children in Birmingham, Leeds, Liverpool, and Manchester. It appears by the report of the former gentleman that in Birmingham, the population from 3 to 13 is 83,125; the average attendance in inspected schools, 16,053; the number in attendance in other schools, 10,783. In Leeds, the population for 3 to 13 is 58,307; the average attendance at inspected schools, 12,422; and the attendance at other schools, 7,070. Thus the existing system of State aid, administered through the agency of the religious bodies, reaches 28,475 out of 141,432, or 20 per cent. of the total population of school age.

Mr. Fearon, in reporting on Manchester, speaks most unfavourably of the uninspected schools, pronouncing 37 out of 81 as unfit. And as to Liverpool, he states that it is still worse. Mr. Fitch, in his report, describes the private schools in a similar way. "Too much religion" in the other schools seems to have been given by parents as a reason for patronising private schools. The reports are not so much intended to summarise the actual work done in the inspected or aided schools, as to show the character and quality of the instruction given in the uninspected and private schools for the poor. The reports are accompanied with maps of the four towns, showing by symbols the geographical distribution of the various classes of schools.

STEAM ROAD ROLLER FOR MAIDSTONE.

The Local Board for Maidstone, who have been for some time considering the feasibility of having a steam road-roller for use on the roads of that town, have at last decided to purchase a 15-ton one of Messrs. Aveling & Porter, of Rochester. At the meeting of the Paving Committee, held on the 7th ult., the borough surveyor submitted a report on the steam-roller hired from Messrs. Aveling with the view of purchase, and which has been working on the roads of Maidstone for some weeks. From the calculation made by the committee, it appears that the cost of the roller, including a sinking fund to cover depreciation, will be about 80*l.* a year. The cost of stones spread by the Board on the Maidstone roads is about 1,500*l.* per annum; consequently, if the roller saves only 6 per cent. of the material used (and it is expected that it will save considerably more), then there will be a direct saving to the ratepayers by the purchase of the roller, independently of the indirect saving by the improved surface of the roads, and consequent reduction in draught, wear and tear of horses, carriage, and harness, with great increase of comfort to persons riding in carriages. It was stated by the surveyor that the total cost of working the 15-ton steam-roller per day was 15*s.* 6*d.*, and the cost of working a 5-ton horse roller, with four horses, was 28*sh.*, or nearly double for the horse power alone.

COMPETITIONS.

New Workhouse, Cardiff.—We understand that Mr. T. E. Knightley, of London, by the request of the guardians, has examined and reported upon the competition designs sent, in January last, by thirteen architects, for a new workhouse in the above union, capable of accommodating 500 inmates. The referee's report will be considered by the guardians at their next meeting.

New Mechanics' Institute, Thornton.—In a limited competition, the designs submitted by Mr. Geo. Smith, of Bradford and Keighley, architect, have been accepted by the committee for the proposed new Mechanics' Institute and Working Men's Club, Thornton. The building comprises a reading-room, 22 ft. by 20 ft.; refreshment-room, 22 ft. by 22 ft.; library, 19 ft. by 18 ft.; and curator's house, on ground-floor; and two class-rooms and conversation-room on first floor. A lecture-hall will be placed in the rear, capable of seating 500 persons. The estimated cost is about 2,200*l.*, but it is intended to leave the lecture-hall out of the scheme at present, and proceed with the rooms most urgently required.

LAMBETH WORKHOUSE COMPETITION.

The Board having called in Mr. H. Currey to assist them in their selection, have awarded the first premium to Mr. Parris; the second to Messrs. Giles & Biven and C. Foulsham; and the third to Mr. R. E. Tyler.

ST. PANCRAS PARISH AND THE METROPOLITAN BOARD OF WORKS.

Sir,—Will you favour me with a little space to dilate upon a grievance which casts a slur upon that all-important, I may say omnipotent,—body who hold supreme sway over this vast metropolis, viz. the governing power at Spring Gardens. For the better information of your readers, I may observe that a certain locality known as "Gospel Oak Fields," Kenish Town, in the northern part of St. Pancras, well built upon, and possessing, in close proximity, two railway stations, a church, chapel, schools, &c., and other requisites for a populous neighbourhood, is to be seen a plague-spot, a disgrace to civilisation, and an eye-sore, which has obtained the sobriquet of "Mud Island," its name being "Limore-circus," or it is so

called, it being the shape; but its interior is a quagmire, a receptacle for filth and other excrement, to the disgrace of the authorities. It has been ascertained from the collector to the parish that it is no man's land, and comes under the jurisdiction of the higher powers.

I will briefly state for public information what steps have been taken in the matter, and leave all to judge. This neighbourhood has rapidly increased; and by such influx it was deemed expedient, about ten months ago, to memorialise the Metropolitan Board of Works, and a very numerous and signed petition from freeholders, leaseholders, and inhabitants on the subject of the circus was presented to that Board, and received marked attention, and by them in the usual course was referred to the local Board of Works at Edward-street, for that body to take it into their consideration, and report thereon.

This was accordingly done, and the report was brought back to the vestry, with a recommendation that it be referred to the august body at Spring Gardens.

After a lapse of many weeks, and finding no notice had been taken; through the indefatigable exertions of some of the vestrymen, one in particular, it was stated by one of the representatives at the Board of Works for this parish (Mr. Silas Taylor) that it had been referred to the "Parks and Open Spaces Committee," to view the same. Time passed, no view. Again, a little more agitation; and at length, about five weeks back, I understood the Committee did favour this pestiferous spot; but I regret to say no report has yet come to hand.

Now, Sir, St. Pancras contributes largely to all metropolitan improvements,—the parks, the vast City improvements, &c.; yet, for a matter so salutary to the health of a few hundred pounds to improve our parish, in two or three really necessary localities,—to wit, this circus, the bridge crossing the canal near the York and Albany, and the one upon the Chalk Farm-road,—all we get is to be treated with contempt, despite the immense contributions levied upon the ratepayers of this parish.

I beg to apologise for the length of this letter; but as an owner of property, common with many others in this neighbourhood, we are great sufferers through the apparent neglect of the Board; whereas, for a proportion of money, a "Mud Island" would become an oasis, and make the neighbourhood pleasant, healthy, and habitable.

A RATEPAYER.
(Ward No. 1, St. Pancras.)

LANDLORD AND TENANT.

Bowen v. Law.—This case was tried in the Vice-Chancellor's Court before Sir R. Malins.

Mr. Bowen, the plaintiff, is the owner of a mansion-house and grounds at Frickley, near Doncaster, which about on a road called Carlton-terrace. On his acquiring his property by purchase, the vendor, Mr. Alison, entered into a covenant that no buildings except dwelling-houses of not less value than 200*l.* should be built on two parts of land on the other side of Carlton-terrace. These lots were subsequently acquired by Mr. Law, the vicar of Frickley, and thrown into his garden. He built a wall 81 ft. high to inclose it from the road. In one place the wall was raised to 11 ft. high, and a viney with a sloping glass roof put up on the road. This was a suit to obtain a mandatory injunction to compel Mr. Law to remove his wall and his viney as being buildings within the meaning of the covenant.

Mr. Kay, Q.C., and Mr. Dawson appeared for the plaintiff; Mr. Amphlett, Q.C., and Mr. Kekewich for Mr. Law; and Mr. Spencer Butler for Mr. Alison.

The Vice-Chancellor said the wall was not within the covenant, but the viney was; but as it had been built and no substantial injury was incurred by the plaintiff, he should not grant an injunction, but merely declare there to be a breach of the covenant, assess damages at 40*sh.*, and give the plaintiff the costs of the suit.

CASES UNDER METROPOLITAN BUILDING ACT.

RUINOUS BUILDINGS.

Mr. P. De Keyser, the proprietor of the Royal Hotel, Chancery-lane, has been summoned by the Commissioners of Sewers, before Alderman Stone, to show cause why he did not do certain works to his hotel, in order to make the landing safe for the public.

Mr. Under-Sheriff Baylis said that the district surveyor, who was appointed by the Metropolitan Board of Works, had given the Commissioners of Sewers notice that the defendant's building was in a dangerous condition, and required that certain walls should be pulled down and rebuilt in cement. The commissioners had given notice to the defendant to do that work, and he had neglected to comply with their requisition.

Mr. Edward Power, the district surveyor for the northern division of London, said that a policeman, or somebody else, called his attention to the dangerous condition of the defendant's premises, and he surveyed them, and reported to the Commissioners of Sewers that the structure was dangerous, and that the unsafe part should be pulled out and replaced by sound stock bricks. The structure was then and was still in a dangerous state.

In cross-examination he maintained that the structure was dangerous, but he did not know how long it might stand, whether ten, or twenty years.

For the defendant it was contended that the building was in no way dangerous, and that it was under the constant supervision of the Commissioners of the Metropolitan Board of Works, the surveyor of Bridewell Hospital (to whom the property belonged), and Mr. Gruning, the surveyor for Mr. De Keyser; and that every possible precaution was taken to secure the property from any accident. It was true that a crack had shown itself in the house, but it had been there for nine or ten years, and four years ago a fillet of cement had been run round the house to seal it up, and further cement had been placed, but during the whole of that time it had not settled one bit. The whole of these proceedings, it was contended, were malicious on the part of Mr. Power, because Mr. De Keyser had complied with the summons of the Commissioners of Sewers. Mr. Gruning and Mr. Donaldson, surveyors, were examined, and positively denied that the structure was dangerous.

Other evidence was about to be called, but Alderman Stone stopped the case, and said that he was satisfied the building was not a dangerous structure, and that the summons was malicious. He, however, thought the case ought to be inquired into elsewhere.

CHURCH-BUILDING NEWS.

Headingley.—The church here has been reopened, having been closed since August last, in order to permit of alterations and improvements which have been made in the fabric. The alterations and additions are briefly these: a new organ chamber and vestry have been built, and his arrangement has permitted of the organ and choir being brought downstairs; a new oak reredos and communion-rails have been put up; an oak pulpit and oak lectern erected; the chancel has been re-tiled, and the tall pews have been set down. The roof formerly was mainly composed of plaster. This has been removed, and suitable woodwork introduced. A new heating apparatus has been provided, and considerable attention paid to ventilation. The whole of the works have been carried out under the superintendence of Mr. Chas. Fowler, architect, Leeds; and the reredos, pulpit, lectern, &c., have been executed from his designs.

East Horsley.—The parish church of East Horsley, which, for some months past, has been undergoing restoration, has been re-opened by the Bishop of Winchester. On the same day a mausoleum for the family of the Earl of Lovelace was consecrated by his Lordship. The church is an ancient structure, in fact, one of the oldest in the country; and having fallen into a dilapidated condition, the nave and side aisles have been pulled down, with the exception of the north wall, and re-erected as nearly as possible on the original plan. Besides the north wall, in which are inserted several monuments, as well as one or two ancient windows, containing escutcheons in painted glass, the only portion of the building that has not been renovated is the square tower, covered with plaster. The restoration has been carried out by Messrs. Swayne, of Guildford, builders, from designs by Mr. H. Woodyer, architect.

Newark.—At a meeting of the committee appointed to carry out the necessary preliminaries for the proposed church at the north end of the town, the reports from the several collectors were received. The amount promised was sufficient to warrant the committee in proceeding further in the undertaking, and it was determined to accept an offer made by the trustees of the Duke of Newcastle to sell any quantity of land they may require for their purpose in North-gate, now occupied as gardens. The price is to be 3s. per yard, which is below the market value. Architects residing in Nottinghamshire and Lincolnshire will be invited to compete. It is intended to erect a building to accommodate 600 people, and capable of extension at a future time, at a cost, in all, not exceeding 3,000l.

Fulbourn (Cambridgeshire).—The parish church has been re-opened, after having been restored. The church had got into a very dilapidated state. The windows in the tower, which were blocked up, have been re-opened and renewed. In the nave a decorated roof has been placed, almost a copy of the old one. The chancel arch is new. The chancel is 3 ft. wider at the west than at the east; it also leans some inches to the north. The chancel is lighted by lancet windows, which would have an improved appearance if filled in with coloured glass; the east window especially looks very bare. Seats have been retained, but the majority of them have been replaced by oak benches, with carved panels. The roof is entirely new, and the floor is paved with Staffordshire tiles. The total cost of the work has been about 4,000l. Mr. Blomfield, of London, was the architect; and Mr. R. Tooley, of Bury St. Edmund's, the contractor.

Shefford.—The new church of the Holy Innocents has been consecrated. The building is in the Early English style. It is a simple church, without aisles, but with arch dividing the chancel from the nave. On the south side is a vestry. The tracery and door-jambs are of Bath stone, and the exterior of flint, interspersed with stone bands. A bell-cot surmounts the west end, built for two large bells: at present there is but one small one. The whole is finished completely with Bath stone. The chief entrance is at the west end, over which an oak porch is raised, the gift of the Rev. J. L. Randall, rector of Newbury. The chancel is apsidal; at the curve in the interior is an arcade of seven arches, carried upon banded shafts of grey Bath stone. There are in addition a stone sedilia, a piscina on the north side, and credence-table. At present there is no reredos, but arrangements are made for one to be fixed hereafter. The apse is lined with a dado of tiles, from the works of Messrs.

Maw & Co. The chancel floor is laid with fancy tiles, and the body of the church is also paved with tiles throughout. The pulpit, which is scarcely finished, is of oak, and the gift of Mr. Gower. A number of steps between the nave and the chancel give elevation to the holy table at the east end. The nave, in the absence of fixed seats, is supplied with chairs. There is a good deal of carving in the chancel, the caps, shafts, and corbels of the chancel being elaborately worked. The glazing is of rough cathedral glass, and in patterns. At present there is no stained glass. The cost of the work has been about 1,500l. The architect was Mr. C. F. Hayward, of London; and the contractor Mr. T. Wooldridge, of Hungerford.

Brackley.—The newly-restored chapel of St. John and St. James has been re-opened for divine service. During the past twenty-eight years, the building, formerly the chantry of the hospital, has been allowed to fall into decay, and, from some want of harmony between the inhabitants of Brackley and the owners of the property (the president and scholars of Magdalen College, Oxford), nothing was done to restore the ancient edifice to its proper use. Liberal aid, however was given by the college authorities, so that in a short time 2,282l. 2s. were collected from different sources, of which sum 122l. were devoted by Magdalen College (in addition to 200l. for the interior works) to the exterior renovation, which included new west doors (with wrought-iron hinges), new internal rere arch, the metal-work about the walls and roof, drainage, restoration of the tower, and stone crosses to the eastern and western gables. The total also includes a gift of 100l. from the Foffices of the Brackley Charity Estate. The works were placed in the hands of Mr. C. Buckridge, of Oxford and London, architect, and the edifice has been restored to something of its ancient splendour.

Shouldham (Norfolk).—The parish church of Shouldham has been re-opened after restoration, the chancel and vestry being entirely new. The old chancel was almost entirely rebuilt about 1840, in the style of the period. The present erection, which supplies the place of the other, is in the Early Decorated style, the materials employed being flint and Casterton stone. The reredos is carved and coloured, a marble cross being the principal feature in the composition. A low chancel-wall separates the more sacred portion of the building from the nave, and on the south side this is extended outwards, so as to form a pulpit. The vestry is large, and is on the north side. The church is lighted by three coronas, illuminated by the Brighton lamp. The entire cost is 1,807l. 7s. 5d., of which 1,073l. were contributed by Sir Thomas Hare, bart., of Stow Hall, and the remainder by the parish. The architect was Mr. R. J. Withers, of London; and the contractor, Mr. Brown, of Lynn. The decoration of the reredos was done by Messrs. Bell & Almond, of London.

DISSENTING CHURCH-BUILDING NEWS.

Claremont.—The Baptist new chapel on St. George's-road has been opened for divine service. The building is in the Italian style of architecture, and was designed by Mr. George Woodhouse, of Bolton, architect. The principal front is situate in St. George's-road, and is set back 15 ft. from the line of street. The main walls are built of pressed bricks. On each side of the ground-floor story are seven large windows, with arched segmental reveal arches and jambs; the upper windows have semi-circular heads; and at the springing of the arches in front and sides are built bands of black brick forming distinctive horizontal lines. The base course of the walls is built of pitch-faced wall stones, quarried from the neighbourhood, and the dressings are Yorkshire stone. The gallery front and framing has two circular ends, the former with pitch-pine framed elongated panels, with mouldings, cornice, and mahogany book-board. Iron columns, with capitals, support the gallery, which is divided into five pews at each side and aisle. At the north end is a children's gallery, which will seat 200. The framing to the gallery is similar to the body of the chapel, but of common pine. All the woodwork is stained and varnished; all the floors throughout are boarded; and the windows are fitted with sliding sashes for external ventilation. The ceiling is divided into central bays, with plain border and dentil cornice and mouldings. Five sunlights, gilded, are suspended

from the ceiling, and a number smaller in size under the gallery give light to the whole chapel. The great width of the edifice is spanned by a double queen-post roof, and covered with blue Bangor slates. Three vestries are provided at the back part of the ground floor of the chapel, together with a general staircase. The nature of the site has enabled the architect to provide a large and commodious schoolroom, and he has introduced a mezzanine floor and balcony, with sliding sash-front. This arrangement gives to the committee nine separate class-rooms for the teaching of adults. The whole of the rooms are lighted by external windows and the class-rooms are fitted with fireplaces. A fire-proof room is provided, and hot-air heating apparatus has been fixed by Whittaker & Constantine, of Bolton. The chapel and offices will cost about 5,500l. The contractor who has executed the work is Mr. John Robinson, jun., of Hyde.

Normanton.—The new Congregational Chapel at Normanton is now completed and opened. It is seated for about 200 persons, and has in communication with it, by means of sliding shutters, a school-room, capable of accommodating nearly 100 more. It is designed in the Early English style of architecture, the walling being red brick with dressings of Little Eaton stone. The side elevations have trefoil-headed windows arranged in couplets. The end bay on one side is occupied by a timber-framed porch, and on the other by a high-pitched gable with a two-light plate tracery window. The front elevation has a high-pitched gable with a three-light tracery window, and a timber-framed and slated bell-turret. The pewing is open-framed, stained and varnished. The cost has been about 500l. The architect was Mr. Tait, of Leicester.

Leigh.—A new Primitive Methodist Chapel has been opened for divine service in Bradshawgate, instead of the unsightly erection which had formerly served the Primitive Methodists of Leigh to worship in. The new chapel is in the Norman-Gothic style. The original design of Mr. Pritchard, C.E., the architect, was not strictly carried out in all its details, much of the purely ornamental work having to be abandoned. The building is constructed mainly of brick, with dressings of Edge Fold stone, and of coloured bricks for the doors and windows. The front facing Bradshawgate is composed of pressed brick, tuck pointed. In the centre is a large ornamental Gothic window. The form of the interior of the chapel is amphitheatrical, with a semi-chancel at the south end, containing a panelled Gothic rostrum, and also supplying accommodation for the choir. The roof is on the king-post principle, with segmental collars, secured with wrought-iron straps, bolts, and plates, and ornamented with sunk and perforated panels. The acoustic properties of the chapel are said to be good. The chapel is capable of seating between 400 and 500 persons, and underneath is space for a school-room, vestry, and three class-rooms. The plot in front of the building will be planted with shrubs, &c. Enclosing the front space is a railing, which has been prepared from a design of the architect. The entire cost of the building is between 1,600l. and 1,700l. The builder was Mr. Thomas Bethell, of Earlestown.

Grays.—The foundation stone of a new chapel for the Primitive Methodist community in this place has been laid. The building will be situate within easy reach of all parts of the town. It is computed to cost nearly 1,000l., of which about 800l. are yet required; and the builder is Mr. Larkin, of Orsett.

Horncastle.—The new Wesleyan chapel, opened at Horncastle, is built in the Italian style of architecture. Its external dimensions are 96 ft. in length, 58 ft. in width, and 35 ft. in height. The walls are built with brick, in two colours, having Bath stone dressings. There are three entrances in front, with glazed screens in the vestibules. The body of the chapel contains 430 sittings, 125 of which are free. There are four side entrances and staircases leading to the gallery, which is semicircular at each end, and besides an orchestra, contains 532 sittings, 142 of which are free. In the rear of the building there is a band-room, 53 ft. by 17 ft., and five class-rooms and vestries, all warmed by open fires, and lighted with gas. The chapel is warmed by hot-water pipes, and lighted by two large sun-burners, and eight pendants under the gallery. All internal woodwork is stained and varnished, except the pulpit and gallery front, which are painted white and gold. The windows are glazed with enamelled glass, having ornamental coloured borders. The cost will be about 4,500l. Mr. William Waddington, of Burnley,

Lancashire, was the architect; and Messrs. Walter & Hinsman, of Horncastle, were the builders.

Woodgreen (London).—It is proposed by a congregation of Wesleyans, who have hitherto occupied the Mission-room, Woodgreen, to erect another place of worship. The site chosen is situated in the Bounds Green-road, near the Fishmongers' Almshouses. The cost will be about 4,000l., and it will be capable of holding 1,000 persons. The building will contain a large room at the back for Sunday-school purposes. It is intended at first to erect only a portion of these buildings.

Books Received.

The Rosicrucians: their Rites and Mysteries. By HARGRAVE JENNINGS. Illustrated. London: Hotten. 1870.

IN 1858 the author of this book published a work entitled "Curious Things of the Outside World" in which his peculiar views and deductions as to Rosicrucianism were hinted at; but his present work is quite a new one, forming what the author calls "a history of the alchemical philosophers, written with a serious explanatory purpose, and for the first time impartially stated since the days of James I." Mr. Jennings does not wish to commit himself to the strange doctrines of the Rosicrucians, but merely to be held as their historian; and yet he speaks as if he were bound not to reveal their deepest secrets; and, speaking at them, in his preface, as if they were an existent brotherhood, he assures us that "no student of the occult philosophy need fear that we shall not most carefully keep guard—standing sentry, so to speak—over those other and more recondite systems which are connected with our subject;" and assuredly, although he quotes some of their mystical and obscure dicta, he does not reveal to us their meaning,—a fact which admits of more explanations than one. Nevertheless he tells us, as we have said, that his present work is written "with a serious explanatory purpose."

Rosicrucianism is a very curious subject, regarding which, little except, perhaps, what the Count de Gabalis has "revealed," has been written, or is known, in modern times. This work, therefore, cannot but interest many readers. It gives an account of the ancient fire and serpent worship, and attempts to explain "mystic symbols represented in the monuments and talismans of the primeval philosophers." Many of these symbols are very curious; but just as Mr. Jennings takes care to let his readers know that he does not identify himself with the doctrines of the Rosicrucians, which, indeed, he does not reveal, so must we be excused from identifying ourselves with his "serious explanatory purpose," all the more especially in regard to what he says on architectural subjects.

The illustrations are very numerous (upwards of 300, it is said), but not well arranged. They form, together with the text, a very curious volume, the materials of which must have cost Mr. Jennings great and long-continued labour to collect; but it is to be hoped his loyalty to the Rosicrucian or other occult brethren or friends will enable him, in another edition, to digest and arrange his subject more relevantly, and explain himself a little more clearly, than he has yet done.

VARIORUM.

"A Plea for the Compulsory Teaching of the Elements of Physical Education in our National Elementary Schools. By Mathias Roth, M.D. Groombridge & Sons, Paternoster-row." The claims of physical education to rank with reading, writing, and arithmetic are pretty strong,—always, of course, with due respect, we hope, to the poor little brains that are busy in acquiring physical material, as well as physical and all other sort of education. The aim of this pamphlet is to induce the Council of Education to rule that a school shall not be considered efficient unless physical education, including sanitary knowledge, forms part of the regular and daily instruction; and that no Government aid should be given to any school unless the inspector reports sufficient progress in this educational branch.—"The Educational Condition and Requirements of one Square Mile in the East End of London. Bell & Daldy." This Supplement to the Journal of the Society of Arts has been prepared, at the request of the council, by Mr. George C. T. Bartley. It relates to

the district about Bethnal-green, Kingland, and Haggerstone. The district contains 17 schools receiving Government grants; 2 schools inspected by Government, but receiving no grants; 27 schools not inspected by Government; 8 schools proposed to be enlarged; and two proposed new schools. The estimated population of the district is 130,000; number of houses, 17,589; estimated number of children between 3 and 12 years, 30,160; number at school, 10,595, of which number 5,618 are in Government inspected and aided schools. The estimated number of children taught to read, write, and do arithmetic fairly well is, say, 4,000; the estimated number growing up more or less in ignorance, 19,262; the estimated cost of new school buildings and land absolutely necessary if these are to be educated, 60,000l.; and the annual cost of keeping up these schools will be 16,000l. In the district referred to there is a public-house or beer-house for every 53 private houses, and for every 249 adults. In all there are 165 public-houses and 166 beer-houses, and the estimated amount annually spent in them by very poor people is not less than 450,000l. One penny out of every eight in this sum would more than build all the new schools required, and one in twenty-eight would keep them going.—"Registration of Correspondence: a new System applicable to large Offices, &c. By R. W. Lepper, Euston Station. Waterlow." This is an important matter in all large offices, and the improvements here suggested cannot fail to be of interest to all concerned in them. The author says, that under his plan any responsible registering-clerk could easily control half a million of letters per annum, so as to be equal to any emergency.—"The Uses of Plants in Food, Arts, and Commerce. By Ellis A. Davidson. Cassell, Petter, & Galpin." This little book contains a series of useful and interesting reading-lessons for schools, on such subjects as the bread-plants, breakfast-plants, spices, dyes, and so on.

Miscellaneous.

St. Peter's Mission Hall, Worcester.—This building, erected at the sole cost of Mr. J. D. Allcroft, has been opened. The hall is situated in Wild's-lane. The upper room is designed for division into two parts, to furnish a reading-room for working men, and another for the senior scholars of St. Peter's boys' Sunday School; and in this building will be held short-services for the poor, lectures, Bible classes, mothers' meetings, reading-rooms, classes for general instruction, and a night school. The Mission Hall is of Gothic design, three stories high, with three corbelled and coped gables, and carved finials, surmounting the front. Brick and freestone are the materials used. Each story has large windows with stone mullions and transoms, label mouldings and strings, the uppermost tier of windows being pointed, and the centre one traceried. The entrance is a pointed archway. The large room on the ground floor is 45 ft. by 25 ft., and 15 ft. high; those on the first and upper floors are of the same proportions, but the latter is open to the roof, being 25 ft. in height. There are in connection with these apartments class and other rooms. The floors are framed with trussed transverse beams, which divide the ceilings below into panels, having plaster mouldings intersecting with those of the walls. The roof is covered with blue and red tiles, having open metal ridge cresting. Ventilation is provided for by means of hopper casements in the windows, the extractions being through separate wall flues having gratings below the ceilings, and the flues communicating with principal vertical ones constructed in connexion with the chimney shafts. The warming is by open fire-places. The entire cost of the building, including site, was about 4,000l. Mr. Henry Rowe was the architect; Mr. O. Wilson was the contractor; and Mr. Brock the gas-fitter.

The Late George Catermole.—A committee of gentlemen, consisting of Messrs. W. P. Frith, R.A., William Evans, S. C. Hall, Edward Franks, and Tom Taylor, are exerting themselves to procure funds for a monument to the late George Catermole, to be erected in the cemetery at Norwood, where he is buried. They appeal to the art-patrons who possess examples of the artist and appreciate his genius, and to his brother artists "who have been more fortunate than he was."

Society for the Encouragement of the Fine Arts.—On Thursday, 24th ult., Mr. James Dafforne gave a lecture on "The Poetry of the Arts." Mr. W. C. Hazlitt was in the chair. The lecturer said that the poetical art had for its object to interest the feelings by means of form and colour, by graceful and fitting words, so that, whilst satisfying the intelligence, it teemed with life and beauty. High art he had the greatest respect for; but greater for that true art which rendered the artist a connecting link between the living and the dead. After some remarks on Egyptian, Grecian, and Roman art, and on their slow progress towards maturity, Mr. Dafforne proceeded to show how Christianity had revolutionised art, noticing its revival on the establishment of the Papal throne, and the character impressed upon it by Cimabue and Giotto, Michelangelo, Perrugino, and Raffaele. Next advertising to the poetry of the builder's art, with a passing tribute of respect to the labours of the old monkish artists, he eulogised the poetry of the pencil of Turner, Wilkie, and Martin, dwelling on the poetical sentiments evoked by "The Fighting Temeraire," "The Distraint for Rent," and "Belshazzar's Feast;" and he concluded a lecture, poetical as well in subject as in treatment, with some reflections on the intense thought and study required to produce a work of genius, and on the deep sense of gratitude that was due to the artist.

The Health of Eastbourne.—A Government inquiry has been taking place at Eastbourne as to the alleged prevalence of fever there and its causes. Dr. Thorne's report shows that in Eastbourne there are the conditions usually found in towns where typhoid fever prevails; polluted water-supply to parts of the district, water-closets without water, sewers badly ventilated, house cisterns communicating directly with the sewers by means of the waste-pipes. The badness of the ventilation of the drains is the result of endeavouring apparently to cram as much powdered charcoal as possible into the receptacles made to hold it in the ventilators; thus turning it into an effectual stopper of the ventilators. The result must naturally be that the sewer gas makes its escape into the houses. The inspector expresses doubts whether the charcoal ventilators can be safely continued.

Stanley Cottage Hospital.—The cornerstone of a cottage hospital for the thriving mining village of Stanley, situated about three miles from Wakefield, has been laid. The originator of the scheme is due to Mrs. Charlesworth, of Hatfield Hall, but it has met with general support. The site of the hospital is on the Stanley-lane End-road, behind the church, and in close proximity to the schools, and commands a fine view along the valley of the Calder. The proposed building is in the Gothic style of architecture, and is intended to consist of six rooms, besides cellars, but is capable of enlargement. The cost, including furnishing, is estimated at 450l., the whole of which sum has been raised.

Rochester and Chatham.—The arrangement on the part of the Earl of Jersey and the corporation of this city for the lease, by the latter, of the castle and castle grounds for public gardens and parks, has been finally made. The corporation are to expend 2,000l. in laying out the castle gardens and grounds for the purposes of a public park for the use of the citizens. Notices have been served on the tenants in occupation. The plans and specifications for the proposed new corn exchange to be erected by the corporation have been prepared by Messrs. Flockton & Abbott, the architects. The corporation have obtained possession of the whole of the buildings and property adjoining the present corn exchange, on which the new edifice will be erected, and these will shortly be demolished.

Sash-Fasteners.—We spoke recently of a sash-fastener made to prevent the window being surreptitiously opened by a knife, or similar instrument, working between the sash-bars. Messrs. Hobbs & Hart have sent us one which, in addition to effecting this, tightens the sashes for greater security. The sliding of a knife between the sashes to force the catch back, which is now so often practised on the ordinary sash-fasteners, is here prevented by a small underlap covering the joining line. There is a smaller catch to tighten up the locking action of the entire window, as well as to prevent rattling. Of the good effect of the latter part of the arrangement we are not quite sure. The price of the article is 3s.

The Commercial-road Tramway.—Now that the question of tramways for the metropolis is exciting so much interest, attention is again being turned to the granite tramway which has been for forty years in use in the Commercial-road. It extends from the West-India Dock gates to Whitechapel, two miles in length, and has been of great use. The road, however, is a wide one, and there is only a single line of tramway. The granite is now laid on concrete. It was designed and carried out by the late James Walker, F.R.S., at one time president of the Institution of Civil Engineers, but since 1850 it has been under the charge of his assistant and pupil, Mr. J. B. Redman, of Westminster. During the last twenty years it has been twice raised, re-dressed, and re-laid in concrete. Mr. Redman states that the tramway is in as efficient a working state as it was twenty years since. There are several kinds of granite in it; and the result of experience with these is, that an inch of Aberdeen lasts ten years; of Herm, twenty years, Guernsey, forty; and cast iron, cold blast, fifty to sixty. Aberdeen granite requires 700 tons to crush 1 ft. super.; Herm, 900 to 1,000 tons; and Guernsey still more.

Island-making the Order of the Day.—The example of M. Ferdinand de Lesseps in Suez has produced more than one imitator. Every isthmus in the civilised world seems destined to have its throat cut. Panama has long been doomed; Corinth is a mere matter of time; and before long we may have to correct our geographies by describing Spain as an island. The last is a magnificent scheme, and to cost more than did the Isthmus of Suez. The project is for a canal from the Bay of Biscay to the Mediterranean, through 100 locks, the ships being towed by locomotives on the banks at four miles per hour. As for the Isthmus of Corinth scheme, advices from Greece state that the whole kingdom receives with lively satisfaction the plan for cutting through the isthmus; and the initiative taken on the subject by King George is appreciated as one of the happiest ideas that could be realised. The *International*, we may here add, states that the King of Prussia has decided, with the advice of the Council of Ministers, on carrying out the projected canal from the Baltic to the North Sea. The works are to commence next year, and may be finished in 1878.

Towns' Sewage.—A deputation consisting of members of Parliament, mayors and town clerks of boroughs, and other local authorities in England, have waited upon Mr. Bruce, the Home Secretary, to urge upon the Government the necessity for early legislation to protect rivers and streams from pollution by towns' sewage; and, in the event of delay to receive the final report of the Rivers' Commission; then, that a short Bill be introduced to give temporary relief to local authorities executing sewage works, until a general measure be passed for the protection of rivers. The deputation was introduced to the Home Secretary by Col. Arkroyd, M.P. for Halifax. Mr. Bruce assured the deputation that he considered the representations made were most important, and although he could not pledge the Government himself, he would confer with his colleagues, and acquaint the deputation of the result of such conference without delay. Sir William Dennison, the chief of the Rivers Commission, was present during the interview.

The Thames Embankment and its Railway.—A station is to be erected at the bottom of Norfolk-street for the railway. It is expected to be ready for public traffic in less than three months, the whole of the new thoroughfare from the Mansion House to Westminster Bridge to be completed by August. There is to be a station at the end of New Earl-street, and from this point the line passes under the street into Cannon-street, and thence, it is intended, to a City terminus near the Mansion House. Between the Temple Gardens and Blackfriars Bridge the line is close upon the low level sewer, and extraordinary precautions have been found necessary.

Kitchen Boiler Explosions.—Three hot-water engineers have sent us particulars of their several patent arrangements, by means of which they believe explosions are rendered impossible. We must leave them to make their inventions known in the ordinary way.

Proposed New Building Act.—The Metropolitan Building Bill, brought into the House of Commons by Sir W. Tite, has been undergoing some trifling modification, which has delayed the printing of it.

Opening of the Royal Chapels in Westminster Abbey to the Public.—The dean and chapter have resolved, by way of experiment, to set apart every Monday for the free admission of the public, not only on other days to the nave and transepts, but to the Royal chapels, between the hours of service, from 11 a.m. to 3 p.m., and again from 4 p.m. to the closing of the doors at 6 p.m., during that portion of the year when the longer days admit of this arrangement. Stationary guides will be appointed to each of the Royal private chapels, to protect them from injury and explain objects of interest; and if the experiment should succeed, and if persons of means should be disposed to assist the chapter, the free access may be extended to other days. The new arrangements have already come into operation.

Decorations of the House of Commons.—In reply to Col. Sykes, in the Commons, Mr. Ayrton said there was considerable difference of opinion on the subject of the mosaic picture now placed in the Central Hall, some persons thinking it extremely beautiful, while others held a directly opposite opinion. Under these circumstances, a great deal of consideration would be required before any further expenditure would be incurred, and the House would have an opportunity of expressing an opinion before any further works were undertaken. Mr. Poynter was now engaged on the pictures for which he had received commission, but no further works in mosaic would be ordered. As regarded light for the pictures, the question was one that would involve much cost, and therefore required a great deal of consideration.

Sussex Archaeological Society.—A general meeting of the Sussex Archaeological Society was held on the 24th ult., at the Barbican, Lewes Castle, the Rev. H. Campion in the chair, when some amendments were made in the rules whereby the Editorial Committee ceases to exist and the Finance Committee is enlarged. The Rev. E. Turner, of Maresfield, was appointed editor of vol. xxii., and the Rev. W. de St. Croix was appointed secretary of committee, and other officers of the society were re-appointed. It was decided that the annual meeting for the second Thursday in August should be held at Rye, with a visit to Camber Castle. We have not heard if any shame was expressed for the discredit that has been brought on the county by the uncalculated destruction of the original Saxon chancel of Worth Church. The Society on this occasion was found wanting.

The Birkenhead Free Library.—The annual report of this institution has just been issued. It commences with the gratifying statement that "the desire for high-class books, and the anxiety shown by the systematic reading and regular attendance of young people to get knowledge, have been most remarkable." The past year has seen a very considerable increase in the number of books issued. In 1869 the books issued numbered 46,578, against 45,146 in 1868, and 43,360 in 1867. A remarkable feature of the figures is that while there has been an increase in the total number of books given out, the number of works of fiction is considerably less. In 1867, 23,396 such works were issued, while in 1869 there were but 22,611.

Building on Unwholesome Land.—One of the points brought before the Home Secretary by the deputation of medical officers of health which waited upon him with reference to the Metropolitan Building Act, was the practice of erecting buildings upon deeply-excavated ground which had been previously filled in with rubbish containing unwholesome decomposable materials, and to which we have often alluded. It also complained of the practice of building upon wet and undrained land. It was asserted that some of the surveyors of the metropolitan district boards, contenting themselves with the plan for house drainage, took so little further interest in the matter that builders either put no drains in at all, or made a pretence of putting them in without any communication with the sewer, or departed from the plans deposited from motives of economy.

Harbour Works at Alexandria.—The Khedive, as the Egyptian Pacha is now called, has ordered that the harbour works at Alexandria shall be immediately commenced.

Newspaper Press Fund.—The annual dinner will be presided over on the present occasion by Mr. W. H. Smith, M.P.

Destruction of a Glasgow Theatre by Fire.—The Alexandra Theatre, Glasgow, has been burnt down. It was a brick and wooden structure, and was destroyed in an hour. The London Dramatic Company were playing at the time. The damage is estimated at 2,000l. The theatre had been closed at a quarter to eleven. About a quarter past twelve the fire burst out suddenly, and the building in a few seconds became enveloped in flames. The efforts of the fire brigade were mainly directed to prevent the flames from extending to the adjoining buildings. The theatre is stated to have been insured.

Building and Enlarging of Churches and Chapels.—At the last meeting of the incorporated society for promoting the enlargement, building, and repairing of churches and chapels, it was stated that grants amounting to 7,630l. (a sum larger than has been received in the same time), have been made within the year towards the erection of 39 new churches, the rebuilding 20, and the enlarging or otherwise increasing the accommodation in 86 other churches. The easily understood unpopularity of this society amongst architects (not attached to it) continues to increase.

The Look-out on Railways.—Sir: A sad accident lately occurred on one of our metropolitan railways. A guard looking out from his van met his death: his head was dashed to atoms against a bridge. A good look-out could be constantly kept by having a looking-glass near the door: the guard keeping his eye on the glass would have the range of the line. By night as well a night-glass would be useful. Guards would then sit back to the engine, and see all forward free from biting winds, blinding dust, and dangerous bridges.—R. T.

The Art Exhibition, Derby.—The arrangements for the approaching Art Exhibition in Derby, are being pushed forward. The committee are drawing upon available resources for contributions. The "worthies" of the county will be represented. The catalogue will contain a brief notice of each from the pen of Mr. J. J. Briggs. There will also be a collection of drawings by art-students. The committee have decided to admit members of Schools of Art at 2s. 6d. each for the season. A collection of China,—Derby, Derby Chelsea, &c.,—will be brought together.

Southampton Workhouse.—In reference to a statement at a meeting of the local board of guardians, noticed in our issue for 26th ult., Mr. Skelton, of Southampton, the architect of the workhouse, has written to the Board, explaining that he had only to provide a place for the temporary reception of insane persons, and that for this the wards complained of were amply sufficient.

The Subsidence in Turnmill-street.—The falling in of the sewers, caused by flooding of the Old Fleet, is ascertained to be the cause of the sinking of the ground in Turnmill-street, by which some dozens of houses and the wall of the Metropolitan Railway are to a certain extent endangered.

Prizes for Art-Workmen and Manufacturers.—The Council of the Society of Arts having in view the International Exhibition of 1871, have under consideration a scheme of prizes which, we venture to think, will demand the serious attention alike of art-workmen and manufacturers.

Castle Donington, Leicestershire.—A mill for spinning is about to be erected here, adjoining the Lamb Inn, which, it is believed, will prove a great boon to this hitherto depressed place. Mr. Bakewell, of Nottingham, is the architect, and the contract has been let to Mr. J. E. Hall, of the same town, with instructions to proceed at once.

Exhibitions.—The Exhibition by the Society of British Artists (Suffolk-street) will be opened to the public on Monday next, the 4th; as will that of works of the French and Flemish Schools (Pall Mall). The private view in both cases takes place this Saturday, the 2nd.

Garvel Park Graving Dock, Greenock.—We understand that Messrs. Shearer, Smith, & Co., of the Dalbeattie Granite Quarries, are the successful competitors for the supply of the granite for this extensive dock, which we believe will be the first dock on the Clyde entirely constructed of granite.

Chantry's Monument to Kirke White at Cambridge.—A vestry meeting of All Saints parish has, after much discussion, adopted a resolution to the effect that the parish should accede to the wish of the representatives of the family of Kirke White and of the donor, Dr. Booth, of America, that the tablet be placed in the new Chapel of St. John's College, to which Kirke White belonged, on condition that the vicar and churchwardens of All Saints receive from them a legal discharge from all responsibility. While the monument was in private custody, it seems, a sum of 1,000*l.* was offered for it.

Lyons International Exhibition.—It is at last decided that this proposed universal exhibition is to take place next year. The designs for the building are ready, and preliminary measures are just commenced. The exhibition is to be open from the 1st day of May to the end of October.

The Portrait.—The portrait in our present number was produced from a *carte de visite* photograph by the process termed *Dallastype*, an invention which, if not yet fully developed, has in it the germ of usefulness.

TENDERS.

For new chapel, refectory, and dormitory, at St. Stanislaus's College, Beaumont, Messrs. J. A. Hanson & Son, architects.

Myers & Sons (accepted) £6,804 0 0

For restoration of church, at Conington, Cambs. Mr. W. M. Fawcett, architect:—

Bunting & Son (accepted) £382 15 0

For rebuilding the Pine Apple public-house, and two houses adjoining, Heracles buildings, Lambeth. Mr. L. H. Isaacs, architect. Quantities supplied by Mr. L. C. Riddett:—

Palman & Fotheringham £3,015 0 0

Adamson & Sons 4,653 0 0

Holland & Hansen 4,624 0 0

Mansfield, Price, & Co. 1,860 0 0

Phillips 4,555 0 0

At. rd. 4,620 0 0

Brown & Robinson 4,356 0 0

For residence at Rockhills, Sydenham, for Mr. R. Sutton. Mr. J. F. Bently, architect. Quantities by Mr. W. B. Catherwood:—

Residence. Boundary Wall. £2,140

Buck 1,988

Kable 121

Hookham 138

Manley & Rogers 1,817

Cooke & Co. (accepted) 1,730

For the formation of roads and sewers upon an estate, at Hornsey, for the Right Hon. Earl Beauchamp. Messrs. Hammeck & Lambert, surveyors:—

Newman & Mann £11,088 0 0

Capper 8,968 0 0

Anderson & Son 8,903 0 0

Abbott 8,400 0 0

For Asylum of the Angel Pilgrims Friends' Society, at Hornsey Road, Mr. F. Borcham, architect. Quantities not supplied:—

Roberts £11,000 0 0

Perry & Co. 10,148 0 0

Jackson & Shaw 9,988 0 0

Williams & Son 9,907 0 0

Higgs 9,800 0 0

Ellis & Son 8,640 0 0

Hill & Son 8,345 0 0

For new hall and warehouse, in Oak-lane, Noble-street City, for the Coal-land's Company. Mr. F. Chancellor, architect:—

Downs £4,749 0 0

Hill & Son 4,657 0 0

Turner & Son 4,611 0 0

Macey 4,391 0 0

Brass 4,293 0 0

Cooper & Cullum 4,273 0 0

Hordshaw 4,233 0 0

Condr. 4,223 0 0

Colls & Son 3,978 0 0

Brown & Robinson 3,923 0 0

Crabb & Vaughan 3,475 0 0

For a house in Manor Park, Sutton, Surrey. Mr. E. Nash, architect:—

Colls & Son £3,370 0 0

Marsland & Sons 3,695 0 0

Roberts 3,010 0 0

Cuff, Potter, & Co. 2,942 0 0

Woodward 2,640 0 0

Deards (accepted) 2,165 0 0

For villa residence, High Wycombe. Mr. A. Vernon, architect:—

Goddin £1,455 0 0

Silver & Son 1,446 0 0

Reaxell 1,350 0 0

Lacey 1,300 0 0

Wood & Co. 1,289 0 0

Spicer 1,280 0 0

Dover 1,282 0 0

Looseley 1,262 0 0

Woodbridge 1,250 0 0

Ferguson 1,237 0 0

Nightingale 1,234 0 0

Cooper 1,208 0 0

For erecting six cottages and shops at Burgess-hill, Sussex, for Mr. Stephens. Mr. J. Tanner, architect:—

Norman (accepted) £820 0 0

For new wing, Edmonton Workhouse. Mr. Knightley, architect. Quantities prepared by Messrs. Curtis & J. E. Ormes:—

Sansom £3,472 0 0

Howard 3,125 0 0

Crabb & Vaughan 3,120 0 0

Bentley 3,026 0 0

Withers 2,950 0 0

Saunders 2,840 0 0

Nightingale 2,933 0 0

Putman 2,829 0 0

Eaton & Chapman 2,785 0 0

Woods 2,750 0 0

Windship 2,750 0 0

Poenech 2,700 0 0

Bays & Rammage 2,700 0 0

Cook & Green 2,653 0 0

Langett 2,497 0 0

Johns 2,385 0 0

For house at Chertsey, for Mr. Worthington. Mr. T. Womacott, architect:—

Knight & Sons £2,626 0 0

Simpson 2,630 0 0

Nightingale 2,629 0 0

Goddard & Son 2,370 0 0

Martin & Wells 2,345 0 0

For five Brigade station, Epsley-road, Deptford, for Metropolitan Board of Works:—

Harrop & Gould £2,439 0 0

Stockbury 2,162 0 0

Wittick 2,100 0 0

Thompson 2,065 0 0

Sharpington & Cole 1,977 0 0

Nightingale 1,962 0 0

Tongue 1,849 0 0

Blackmore 1,865 0 0

Crockett 1,850 0 0

Harris & Edwards 1,846 0 0

Easter 1,829 0 0

Ball 1,839 0 0

Crabb & Vaughan 1,797 0 0

Knight 1,698 0 0

Hogben 1,683 0 0

Hooper 1,655 0 0

Hutchinson & Walker 1,600 0 0

Atchinson & Walker 1,645 0 0

For school buildings, South Hackney. Messrs. Searle & Son, architects:—

Palman & Fotheringham £875 0 0

Brass 885 0 0

Newman & Mann 829 0 0

Merritt & Ashby 795 0 0

Emor 778 0 0

Dabbs 764 0 0

Higgs 764 0 0

Dean 723 17 1

Favitt 684 0 0

For dwelling-house and stables, Croydon. Messrs. Searle & Son, architects:—

Myers & Sons £3,791 0 0

Palman & Fotheringham 3,420 0 0

Macey 3,378 0 0

Dove, Brothers 3,345 0 0

Newman & Mann 3,336 0 0

Colls & Son 3,329 0 0

Higgs 3,320 0 0

Brass 3,140 0 0

Ward 3,068 0 0

Ellis 2,911 0 0

Hollidge 2,815 0 0

Pollard 2,495 0 0

For restoration of Biggleswade Church, Beds. Messrs. W. G. Habershon & Pite, architects:—

Foster £2,649 0 0

Field 2,616 0 0

Cooper 2,616 0 0

Carey 2,616 0 0

Joy & Co. 2,600 0 0

Turner 2,416 0 0

Twelvecross 2,378 0 0

Nunn & Co. 2,300 0 0

Moore 2,284 0 0

Patterson 2,223 0 0

Carter & Co. 2,117 0 0

Tooly 2,700 0 0

Edey 1,941 0 0

For fifty-six cottages at Kiveton Park Colliery, near Sheffield. Messrs. W. G. Habershon & Pite, architects:—

Patterson £5,770 0 0

Best 4,867 0 0

Dawson 4,800 0 0

Nelson & Co. 4,759 0 0

Maslow 4,427 0 0

Moore 4,375 0 0

Weatherley 4,294 0 0

Hague 4,256 0 0

Stamp 4,217 0 0

Hobson 4,697 0 0

Wade 4,076 0 0

Bonus 3,800 0 0

Kren 3,850 0 0

Cawthorne* 3,787 0 0

* Being £67 12s. 6d. per cottage, all included, with fittings and outbuildings, and stove complete.

For Wesleyan Chapel, Roath, Cardiff. Messrs. W. G. Habershon & Pite, architects:—

Beaver & Son £4,872 0 0

Price 4,462 0 0

Seager 4,460 0 0

Smith & Prigg 4,355 0 0

Stephens 4,300 0 0

Shipton 4,279 0 0

Stude 4,225 0 0

Thomas 4,120 0 0

Franklin 4,055 0 0

For Congregational Chapel, Pembrey, Wales. Messrs. W. G. Habershon & Pite, architects:—

Whitaker £436 0 0

Phillips 433 0 0

Davies 423 0 0

Rowlands 394 0 0

For Congregational Chapel, Mill-street, Newport, Monmouthshire. Messrs. W. G. Habershon & Pite, architects:—

Price £1,150 0 0

Allen 1,132 0 0

Linton 1,070 0 0

Jenkins 1,067 0 0

Little 1,064 0 0

Whitaker 984 0 0

Williams 965 0 0

Jones 791 0 0

Greenman 870 0 0

Bull 900 0 0

Prosser 900 0 0

Thomas 135 0 0

Hayell 149 0 0

Webber 948 0 0

For two villas, Gold Tops, Newport, Monmouthshire. Messrs. W. G. Habershon & Pite, architects:—

Mills £540 0 0

Whitaker 524 0 0

Prosser 516 0 0

Richards 516 0 0

Hayall 472 0 0

Allen 424 0 0

Greenman 410 0 0

Longwood 408 0 0

For restoration of Gayton Church, Stafford. Messrs. W. G. Habershon & Pite, architects:—

Critchlow £1,050 0 0

Slaney 743 0 0

T. & Co. 723 0 0

Ratcliffe 686 0 0

Tuckies 680 0 0

Whitman 641 0 0

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For on Glass—Sir. Will some kind reader inform me, through your paper, how to paint my shop windows so that people cannot look through? I have tried white paint, but in winter it peels off after being on a few months.—J. R.

J. V. (thanks).—T. O. (thanks).—Q. R. D. (electric bells, properly put up, answer well).—Nemo (the fact that we have been aided by architects on two or three occasions in preparing plans of buildings, which, before our engravings were ready, have been illustrated elsewhere, is no reason why we should comply with his request. We decline unconditionally).—H. N. C. (in type).—H. & S. C.—B. H. S. C.—G. M.—B. T.—R. & S. C.—R. T. P.—S. W.—L. Y.—R. D. J. G. T. G.—S. R.—C. O.—F. J. W.—L. O.—S. O.—One of the Throng.—W. R.—C. J. R.—S. R.—J. D.—F. J. M.—J. F.—B. & Son.—F. R.—N. R.—E. N.—H. & P. J. R.—S. R.—S. J. T.—Mr. R.—M. T.—J. E. O.—R. R.—L. P.—B. T.—S. S.

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All statements of facts, lists of Tenders, &c. must be accompanied by the name and address of the sender, and not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

TO SUBSCRIBERS.

GOOD FRIDAY.

NOTICE.—"THE BUILDER," for the week ending APRIL 16th, will be published at ONE p.m. on THURSDAY, 14th inst. Advertisements for insertion in that Number must therefore reach the Office before THREE p.m., on WEDNESDAY, 13th.

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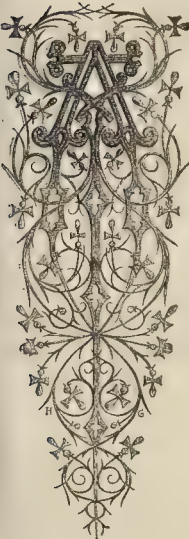
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The Builder.

VOL. XXVIII.—No. 1418.

Picturesque Designs.



DELIBERATE and intentional effort after what is termed "the picturesque" we hold to be, in the main, a very delusive pursuit for any architect to engage in. It is true that our prejudices on this head may have been excited to an unjust extent, by the average published results of such a pursuit. We can call to mind few instances of what are termed picturesque designs for villas, and so forth, which have not literally illustrated the term applied to them,

for that they have been fit for a picture, and for nothing else. The quality of picturesqueness itself is, indeed, as regards architecture, at least, a sort of artistic *ignis fatuus*, indefinable by those who are in chase of it; a fact which is admitted by the author of the volume before us,* who observes at the commencement of his introduction that "the architect usually considers that if his building look well when seen by moonlight, or through the medium of a foggy or dull atmosphere, it is picturesque, and he is satisfied." And though the author professes to elucidate more correctly the theory of the picturesque, and even tells us (p. 24) that "the general principles for obtaining that effect have been pointed out," we do not find ourselves much nearer the mark after reading his introductory essay. His very first example is from the ruins of a Roman temple, which may, no doubt, be "highly picturesque" when time and weather-stains have done their work upon the masonry, and when "the even regular lines of the doors and windows are broken, and through their ivy-fringed openings is displayed, in a highly broken and picturesque manner, that striking image described by Virgil:—

* *Apparet domus intacta, et atria longa patent,
Apparet Primi et veterum penetralia regum.*

But with such picturesque dilapidation, architecture, as we understand the term, has nothing to do; and as to the quotation from Virgil, we have always considered the real charm of that magical passage to lie precisely in the architectural effect of the stately palatial vistas and corridors, suddenly opposed in our fancy to the picturesque glare and confusion of the battle and conflagration outside. Waiving this, however, it may be said in general that picturesque effect, if sought for as a primary object by the architect, is very likely to be gained at the

expense of, and in opposition to, the legitimate architectural desiderata both of construction and design; but that, on the other hand, where truthful and sober architectural design and construction are sought for in the first instance, the result is very likely to include also what most people will admit to be in one sense, picturesque, without too closely defining the term. Indeed, our author confirms this view himself, when he observes (p. 9) that the Gothic style of architecture "is remarkable for its picturesque character, and may fitly be adduced as an example of that quality in the absence of an exact definition of the term:" since there is no style whose main features are more directly the outgrowth of constructional influence and requirements. If, however, Mr. Richardson fails to make us converts to the picturesque school, we can recognise in his book, nevertheless, a substratum of sound common sense in practical matters, with a good deal that is suggestive as to the artistic planning and treatment of domestic edifices.

It is only fair to observe that the author professes to put forth this work rather for the guidance of non-professional than of professional men. Commenting on the fact, familiar to every architect, that a client is in many cases totally unable to explain intelligibly to his architect what it is that he requires, or even to form a conception of it himself, Mr. Richardson thinks, nevertheless, that,—

"When a variety of designs is placed before the eye of any intelligent person the act of selection becomes easy. Although no single plan may succeed, a combination may suggest itself, and the architect can then readily work on something like a sound foundation, and with the hope of success. This work is intended to supply such requirements." (p. 28.)

To this end readers are presented with forty-one designs, accompanied with plans (and in some cases details of ornamentation) for various kinds of erections, including villas of large and small size, summer-houses, bath-houses, garden-seats, stabling, &c., in very varied styles, in some cases somewhat abnormal, and nearly all more or less illustrating the author's predilection for that rather irregular and sometimes fantastic treatment of general designs or of detail which in most minds is associated with the term "picturesque." To some of the best of these justice is scarcely done by the engravings, which (the perspective views especially) show no very great finish of execution; and the author had better have cut out altogether the fanciful frontispiece opposite the title-page, and the view of a "Greek Temple" preceding the introduction; the latter engraving in particular is sufficient to prejudice any architectural reader against the rest of the work. But amongst the multifarious illustrations which follow are some which possess a good deal of novelty and originality. With regard to the first few designs for small lodges, cottages, and houses, the demon of the picturesque has played his usual tricks with the designer, suggesting the employment of unequaled boughs in the place of pillars to porches, and other "gauds" which we are not worthy to denounce. But the arrangement and design of the lodge (No. 10), intended for a triangular site commanding three roads of approach, is simple and ingenious, and the effect (we should judge) pleasing, in spite of the unwhewn posts to the porches. No. 11, for a gateway and lodge in the castellated style, is also pleasing and effective. "The family architect," observes the author, "in such cases, will have to make various sketches before one is selected that gives general satisfaction;" a statement which a good many "family architects" can probably corroborate from sad experience. Few architectural students of the present enlightened epoch will see without a smile the design (No. 12), for a stove bearing the outward form and semblance of a half-length mailed and helmeted figure, though some old

stagers will perhaps find a sort of relief, in these tremendously virtuous days, in coming across a thorough bit of deceptive whimsicality such as this. Passing over some designs calling for no special comment, we come, at No. 21, to a pretty and picturesque idea for a bath-house and summer-room, intended to be erected on a site in a park in Kent, enjoying an extensive prospect.* The ground-floor forms the bath, supplied by a natural spring of water, and a separate entrance leads up to the sitting-room above, corbelled out beyond the line of the lower story. Of this we give a view; the plans have their titles interchanged in the book, by some error. Details also are given on a larger scale in the book, of the panelling, &c.; the whole, though a little thing, is a pleasing specimen of English half-timbered design. A more elaborate production of the same nature is No. 23, "a villa in the old English wooden style," suggested by an elevation given in "John Thorpe's Sketch-Book." This is a tolerably large dwelling-house, in external appearance a timber and plaster erection, although in fact "the timber was merely intended as an appendage to the brickwork. The exterior walls were to have been two bricks and a half thick on the ground-floor, two bricks above. The wooden posts and pans were let into the external half-brick, and well built in; the ornamental woodwork in inch oak, screwed to the wood quartering; the space between them filled with plaster, with an ornamental pattern stamp on it; and the columns and entablature were of oak." A very symmetrical plan gives more soberness and unity than would otherwise belong to the style of decoration employed; and a noteworthy point in the design is the use made of two octagonal cupolas which rise (on the garden front) slightly above the main roof-ridge, as what the author terms "garden-bower" rooms. The roofs of these rooms were to be constructed in iron and glass, and covered internally with wire trellis-work, up which fruit-trees could be grown. The perspective view placed at the commencement of the volume (erroneously entitled an "elevation"), and which we reproduce, gives a good idea of the design; but in this and the elevations it is apparent that the designer has not sufficiently remembered that forms which look well on a small scale in decoration may be quite unsuitable on a larger scale: witness the large scrolls and curls of the ornamental woodwork. A similar defect spoils the best of his designs for a garden-seat (No. 31), which is only hindered from being really pleasing and successful by the Brobdignagian scroll-work at the top, which, besides its inherent clumsiness, reduces the scale of the whole thing. A design (No. 35) for a Riding-house and Stabling is worth attention for its simple plan combined with more of architectural grouping than is always seen in buildings of this class, and an elaborate and grand scheme for a sculptor's villa (No. 29), may prove suggestive to those who have to carry out any such thing on a large scale. This is a plan for a large and almost palatial villa, having a long sculpture-gallery in the centre, between the suites of rooms, occupying the whole height of the building, with an open gallery running round it on the upper floor, the ground floor opening at one end through an ante-room into a spacious circular conservatory; while at the opposite end the vista is terminated by a grand group of sculpture, round which, as a base winds the ornamental staircase leading to the upper gallery.

A scheme to which the author attaches some importance is that described in the course of the chapter on "Queen's Gate Lodge, Hyde Park," for laying out the site between Brompton and Kensington originally purchased at the instance of the late Prince Consort for the erection of a Central Hall of Arts and Sciences, and other

* See p. 289 for illustration.

* "Picturesque Designs for Mansions, Villas, Lodges, &c., with Decorations, internal and external, suitable to each Style." By C. J. Richardson, Architect. London: Atchley & Co.

cognate institutions thereupon. Mr. Richardson thinks it "cannot be supposed that a sum of 340,000*l.* would have been expended by the nation for the purpose of giving the Horticultural Society a perpetual lease of the best portion of the estate purchased. It is already evident that the gardens are not well situated there. . . . In much less than fifty years their grounds will, probably, be the centre of London, and consequently the noble conception of his Royal Highness has still a good chance of being carried into effect." Considering that the term of years proposed for the transformation is one that will, it is to be feared, preclude the idea of our amiable author himself reaping any benefit from it, the interest he evinces in it is, at all events, disinterested; and those who wish to see at once a grand and useful place formed on the site alluded to, may thank him for "stirring up their pure minds by way of remembrance" touching its possibilities, even if they are not satisfied with his scheme. This latter, however, so far as we can judge from a somewhat meagre bird's-eye view (page 105), representing the design "intended to embody the views of his Royal Highness Prince Albert," or rather that portion of it which faces Queen's Gate, would have, if carried out, a sufficiently dignified and architectural effect, besides being arranged (by the author's description) with a commendable attention to convenience and symmetry of plan. The level of the ground on the north at Kensington is about 36 ft. higher than the portion at Brompton—

"By putting the level of the ground floor of the new building about 10 ft. above that of the Kensington-road, a sub-basement would have been obtained, over 30 ft. in height, affording ample space for arranging and storing works of art, as well as for receiving articles to be exhibited, or a great portion of them, from the upper parts of the building, should the latter be wanted for any special purpose. The Hall of Arts and Sciences was to be placed in the centre of the mass of building; a portion of the dome is to be seen in the view at the upper left-hand corner. This room was to be made 300 ft. in length by 180 ft. in width. Two galleries for painting, each 1,000 ft. in length by 80 ft. in breadth, were to be placed on each side of the central hall. The sculptures from the British Museum were to be deposited in the central smaller halls of approach. The various societies were to occupy the side wings, each having its meeting and lecture room, and all necessary offices and apartments. The public were to enter at the portico seen in the view, and the carriages of the professors at the gateways in front."

Let us hope, in regard to this last provision, that all the professors possess carriages (a point which is apparently assumed); in which case this wholesale professorial chariotage would perhaps be one of the finest parts of the show. But the whole scheme, if savouring a little of the spirit of Haussmann as to its grandeur, is one which it is worth while to keep before people's minds.

Our author's practical observations upon points connected with the comfort of houses are many and various, and such as we cannot go into at any length. In ventilation, his principle is that the staircase is the natural ventilator of a dwelling; "from this general opening communications can be made into, and from, each apartment by apertures placed in some convenient position in each room;" the air being warmed and ascending on entering the staircase-well. But care must be taken not to make too wholesale an inlet of air for ventilation, in this climate. A case once came under our notice, in which a gentleman who was determined to have his house systematically warmed and ventilated, had it built with windows permanently closed and air-tight, all air being admitted through large gratings in the basement story, warmed there, and passed up by the staircase-well through the house. But the first gusty day after he went into occupation his ventilating gratings were to be seen stuffed up with straw and matting; the east wind had begun to have its own way all through the house, and he had found that there was such a thing as too much ventilation. In a long chapter on "the Fireplace," and all connected with it, the author replies to the supposed question, "What has a work on picturesque architecture to do with either smoke or sewer gases?" by affirming, with much reason, that buildings never will look picturesque while covered with great patches of soot, nor while stuck over with "tall-boys." These last are, indeed, the bane of the architect; but it was remarked in these pages years ago, that architects in general had come to no conclusion as to how to design chimneys; and we do not seem to be much nearer the mark now. "The public," says Mr. Richardson, "have so long been accustomed to be choked with smoke, and their health afflicted by deleterious gases, that they look upon the proposal of any scheme

to secure pure air as the fond hallucinations of dreamy philosophers or inexperienced Utopians." His schemes for ensuring up-draught and preventing down-draught in chimneys, for collecting the soot before it reaches the external air, preserving and utilising it (one of the means suggested of doing this is to pass the smoke through a light spray of water, by a method illustrated by diagrams, and before now mentioned by us), are worth attention as suggestions, at all events; in these matters, the proof of the pudding is in the eating. With regard to the warming of buildings, there is a description given of the application of the hot-water circulating system, "introduced into his dwelling by one of our most eminent philosophers" which deserves to be noted. The whole length of piping was, by means of a multiple coil, divided into four circulations, any of which could be turned on or off at pleasure. Thus,—

"In winter the hat-room received a portion of piping, so that coats and gloves, even in the dampest weather, were always kept dry. One circulation was sent through the dining-room a short time before it was used; it was after a certain time turned off and sent through the bedrooms and dressing-rooms. The various rooms in winter were kept at different temperatures, the dressing-rooms were a few degrees warmer than were the bedrooms; an inducement for early rising (adroit philosopher!) In the morning, about seven o'clock, the fire was well shaken by means of a lever attached to the base of the grate. Coal or coke was supplied, and the air-valve opened. The stop-cock was then turned on to supply the coils for the library and stairs. At about eight o'clock in the evening the stop-cock was turned to keep the coil of the bath, and at eleven o'clock, fuel having been supplied, the air-valve was completely closed, and the damper if necessary. By these means the fire burned very slowly during the whole of the night, and the bath cistern received the warmth thus generated. These conveniences and luxuries might be more generally applied than they are at present in the dwellings of this country."

In which latter remark most readers will concur; indeed, we may say with Bunyan's Pilgrim that "the hearing of these things is enough to ravish one's heart."

We hope that no non-professional reader who may get hold of Mr. Richardson's book will expect his architect to adopt the suggestions made therein as to the use of encaustic tiles in floor and wall decoration. The short chapter on this subject is by an architect of precisely the recommendation by an architectural taste that we have ever seen. The author speaks with contempt of geometrical tile-patterns, as a stiff conventional decoration; and, by way of making them "more artistic and pleasing," he proposes a sort of realistic design imitative of knots of buds and flowers carried through irregularly from one tile to another; or, in the case of walls, an apparent trellis, with leaves and flowers intertwined, upon a blue ground; "the design would then show a flowered trellis against the sky;" or, in other words, make the wall look like what it is not, and give the appearance of relief where everything should be quite flat. This would be very well for a summer-house in a German tea-garden, but all such permanent mural decoration in a really architectural building should surely partake of a strictly architectural character. Our author, however, is in search not of the architectural, but of the picturesque, and hence these aberrations. With regard to ornament in perforated woodwork, too, of which Mr. Richardson gives us sundry little French specimens as illustrating the superiority of our neighbours in this way, we must say that we have seen far better ornament of this kind out by English workmen from the drawings of English architects. The specimens given by Mr. Richardson are coarse and commonplace in comparison. This sort of ornament requires to be treated with delicacy, and not cut in large or too irregular patterns, or it looks ragged and clumsy. Those who may be tempted, in a search for the picturesque, to make trial of the old-fashioned English timber style, should be cautious so to tie in their fronts to the beams and joisting of the floors as to make the whole one construction, horizontally as well as vertically, otherwise in course of time the front will show a tendency (as some of those in Chester have long done) to hang over and part company with the rest of the building.

Lastly, speaking generally, we may say that though there are in the volume before us things which we do not approve, and which few architects of the younger generation will concur in, the latter may very well pardon a little that is "old fashioned" for the sake of gaining a good many suggestions, especially upon some practical points, characterised by much common sense, and which may stimulate them to give attention to points which they may have been too ready

to consider as secondary and uninteresting. Mr. Richardson is an old labourer in the architectural field, and has done useful work in his time.

There are a good many printer's errors in the book, some so very glaring as to render it evident that circumstances must have interfered with the author's final revision. "French maironettes" for "maisonnettes" (p. 251, and in the index also) and "drainage" for "drain-eye" (p. 357 *et seq.*), are among the worst; and there are some others which will be apparent to the reader.

UNIVERSAL ART INVENTORY.

In a recent number of this journal (p. 117, *ante*), while giving an analysis of the provisions of the Government measure for the general primary education of the country, we incidentally referred to the efforts of the Science and Art Department of the Government for the spread of technical instruction, as being intimately connected with the general educational state of Great Britain, and successful during the brief period covered by their history.

While the definitive plan of our future primary instruction is yet under discussion, the labours of "the Department," have entered on a new, and a very important, phase. If we regard the South Kensington Museum as a great establishment for the education of the workman by the eye,—an object in the attainment of which it is certainly without a rival in the world,—it may yet be objected that the advantages which it offers are confined to the residents or visitors of London, supplemented only by that degree of stimulus which may be given to the Art education of the provinces by the circulation of objects on loan.

To obviate this objection, the attention of the managers of the Institution has been directed to the Literature of Art. We are not now referring to the Art Library itself. Every library is necessarily local in its main utility. But a series of special catalogues, each comprehending an exhaustive description of some minor division of the collection, is now beginning to appear. Several valuable monographs of this nature have been very recently completed, and others are in course of preparation. The results of the whole will be such a complete and classified description of all the costly treasures collected beneath the roof of the museum as will be of the utmost value to students who are unable to visit the spot, and of scarcely less notable service to those who are able, when in the museum, to devote only a limited time to the study of any particular branch of art.

Among these literary products of the museum, five works dated in the present year are now before us. Of these the first, or at all events the most voluminous, is entitled "The First Proofs of the Universal Catalogue of Books on Art compiled for the Use of the National Art Library and the Schools of Art in the United Kingdom. Vol. I., A. to B." Then we have a catalogue of the gems and precious stones bequeathed to the South Kensington Museum by the Rev. Chauncy Hare Townsend, M.A., drawn up by the lucid pen of Mr. James Tennant, F.G.S., Professor of Mineralogy, King's College, London. A descriptive catalogue of the musical instruments, illustrated by eighteen cuts, has been prepared by Carl Engel. A new edition of the "Guide to the Museum" brings down this useful manual to the present date. And an entirely new literary feature has appeared under the startling and ambitious title of a "Universal Art Inventory, consisting of brief Notes of Works of fine and ornamental Art executed before A.D. 1800, chiefly to be found in Europe, especially in connexion with Architecture, and for the most part existing in Ecclesiastical Buildings." This work has been edited by Mr. Cole.

The origin of the Art Inventory was a request addressed by Earl Russell in 1864, on the motion of Earl Granville, the Lord President of the Council at that date, to her Majesty's representatives at Paris, Dresden, Berlin, Munich, Turin, and Rome, that they would forward to London catalogues of the galleries, museums, and collections of objects of art now existing in the chief cities of Continental Europe. It was proposed that the information thus obtained should be arranged in the form of an inventory, which would be of service not only for the United Kingdom, but also for other countries.

The replies to their inquiries were satisfactory in one respect, and in one alone. They distinctly show that, whatever perfection may hereafter be

attained by so admirable a scheme, it is to this country that not only the origination of the idea, but the first blocking out of the plan must be exclusively attributed. However backward we may ourselves have been in preparation of records of the art of the world, we have, at all events, been the first, not only to detect the deficiency, but to take measures for its removal.

Mr. Odo Russell sent to the Foreign Office seven catalogues of public galleries, and five printed and three MS. catalogues of private galleries, in Rome. He observes that the Vatican catalogue of antiquities is unworthy of the collection. That of the Capitoline Museum is out of print. The Lateran Museum, that of the Accademia delle Belle Arti, the Galleries of the Palazzo Rospigliosi, of the Villa Albani, and the frescoes in the public and private palaces of Rome, are uncatalogued. Murray's Handbook is quoted by Mr. Russell, as containing the best account of all the objects of art in Rome.

From Berlin Sir A. Buchanan returns twelve catalogues of pictures, sculpture, and antiquities, and a reference by Dr. Waagen to a German work, "Deutsches Bilder Saal Verzeichniss der in Deutschland vor handenen Gbilder verstorbener Maler," an expected new edition of which was to contain "a notice of all the best catalogues." The "Art Topography" of Germany was also recommended by the Minister of Public Instruction; but "a collection of trustworthy and complete material, in the sense wished by her Majesty's Government," is only regarded by his Excellency as "a work which would take up a great space of time even to persons educated for this purpose." (The English of the communication appears to be that of the Prussian minister.)

The Italian Minister for Foreign Affairs communicated to Sir H. Elliot fifteen printed, and eleven MS., catalogues of paintings and "oggetti d'arte," with the explanation that none of the galleries and public museums of the State possessed complete printed catalogues, and that a detailed description of their treasures would be "a work so colossal and expensive that it cannot be undertaken at present." It may be observed in passing, that no Italian description appears to exist, either of the fine armoury at Turin, or of the interesting collection of paintings in the Palazzo Madama in that city.

From Munich, the information is yet more meagre; being confined to the suggestions of Professor von Heffner Alteneck as to the mode of complying with the wishes of the Committee of Council on Education, and a promise that Baron Schrenk will confer with the Minister of Public Works on the subject.

Thus, in the main, Mr. Murray's hand-books are the only generally available guide for the investigation desired by the Science and Art Department. They have been freely quoted in the compilation of the "Universal Inventory."

Mr. Cole has laboured with characteristic courage and perseverance to fill up the vast blank thus shown to exist. We have now before us Parts I. and II. of the "Inventory," treating respectively of mosaics and of stained glass. "The work," the preface very properly states, "must be considered as a beginning, and is not complete: notices of objects which are omitted, and corrections, will be thankfully received." As it is, it may be considered as an index to the literature of the subject; as an identification, rather than as a description, of the objects named; and, above all, as a guide to the traveller, the tourist, and the local observer and annotator, who may be educated in art, not only as to what to visit, but (which is far more important) what to describe. The series of communications which we trust that the publication of this "Inventory" will provoke may lead, in course of time, to the completion of a really exhaustive catalogue.

The inventory of "Mosaics on Walls, Pavements, Mosaic Encaustic, &c., Cabinets, &c." is preceded by a list of sixty-seven publications which have been consulted for the work. This list, however, is far from including all the authorities referred to in the text. It mentions no catalogues. An addition containing the titles of such of those documents as have been collected would be of great utility. The MS. notes which are cited might also be noticed in the list. On the very first page is a reference to A. Laborde, "Mosaïque d'Italie," a work repeatedly cited, but not to be found in the list, which will, no doubt, be largely supplemented in future editions.

In fact, it is evident that seventy-four clearly printed pages can only contain, as it were, the

first draught of an inventory of known mosaics. The memory of almost every traveller may be expected to furnish him, even at a glance, with additional contributions, that will no doubt be gladly welcomed by Mr. Cole. Thus, we may mention that at Brindisi, which interesting city is not named in the inventory, there exists, or existed in 1856, on the floor of the cathedral, one of the largest pieces of mosaic pavement known in Italy. In that year the Archbishop of Brindisi was proposing to destroy, or to cover this grand relic of ancient art, in order to remove the slight irregularity in the floor caused by the partial subsidence of the mosaic. In many parts of Southern Italy remains of "antichità" are abundant. They are protected by the law, and almost invariably respected by the peasantry—a striking lesson to our own barbarous rustics. Of the famous submerged pavement of the Temple of Neptune, at Sorrento, we are not aware that any account is accessible. The superb mosaic floors of the Roman villa which was discovered in the Piazza Vittoria, at Palermo, in December, 1868, were described in our own columns (*Builder*, No. 1391, p. 779), and should be mentioned in future editions of the inventory. Their omission in the present instance is no doubt due to the fact that the title of the article in which they are described, does not contain the word "Mosaic;" as a very brief notice from our pages of the discovery of a fragment of pavement at Snodland, on the Medway, is extracted with due acknowledgment. The journal of the "Scavi," now in progress at Pompeii, is another work which should be consulted as to mosaics. It is conducted under the able supervision of the Chevalier Fiorelli.

Again, under the head "London," to the mosaics indicated should be added some account of one discovered last year, at the depth of 17 ft., on the line of the new street from the Royal Exchange to Blackfriars. This ancient relic, some 10 ft. square, merits a fuller description than it appears yet to have received.

The pavement in question closely resembles, in some particulars, former examples of Roman mosaic, which may be seen at the Guildhall Museum. In other respects it is peculiar; and in nothing does it so distinctly bear the stamp of a very remote past as in the fact that it is composed partially, if not wholly, of the fragments of buildings older than itself.

The materials of this relic consist of irregular tesserae, of some $\frac{1}{2}$ in. square, of four distinct colours. The darkest of these are formed of portions of a dark grey stone, resembling Welsh slate. Next comes a lighter coloured stone, possibly Kentish Rag. Then we have a white material, apparently chalk. With these natural substances are interspersed portions of pottery or broken tile, not well-shapen, well-burnt tesserae, but broken out by the axe or the hammer, and as rough and irregular in their approach to a square form as are the stone blocks which they accompany. The edges of the pattern, which were probably not exposed to view, are formed of larger sized blocks of stone and of brick, and the rude nature of the work points to its execution by British workmen under Roman direction.

The centre of the pavement was occupied by a circle surrounding a cross. It can not be asserted that this is a positive, undeniable Christian emblem. It closely resembles the five shields which are borne cross-wise in the arms of the kings of Portugal. The centre compartment is of a lighter colour than the four limbs. Still, whether unintentionally or not, it is an actual cross, and the fact is one that has hitherto escaped attention.

Around the cross are rings of the several colours employed in the pavement, depressed heart-shaped figures, and an attempt at the production of a cable pattern, a resemblance to which is to be found on some of the other specimens now in the Guildhall Museum. In the present case, however, the effect is that rather of a series of complicated knots than of a cable. Irregular polygonal figures fill up the pattern. The work, though rough, is solid in execution, and clearly indicated, however rude, in design. Its maximum antiquity it is, of course, easy to fix—its actual date is more doubtful. The rise of the streets of the City over its level to the height of 17 ft. is a very instructive fact.

Twenty pages of the "Universal Art Inventory" are occupied with the mosaics in the Roman States, for which numerous authorities are cited. To these, in the next edition, should be added the "Historical Photographs" of Mr.

John Henry Parker, the third part of which series was published in 1869. A large proportion of the mosaics which they represent are older than the twelfth century, and some of them date from the reign of Constantine. The Paschal candlesticks and tombs of the Cosmati family, enriched with admirable ribbon mosaic, are not to be paralleled out of Italy. The references to an accurate representation of so many of the objects indicated in the "Art Inventory" will hereafter prove a valuable addition to the information which it already furnishes.

The catalogue of stained and painted glass is preceded by a list of works in the Art Library, containing information on the subject, amounting to sixty-six, besides serials. The approaching completion of the Universal Catalogue of Works of Art, which may be expected in May, and which will contain the titles of 70,000 books, will allow of the preparation of exhaustive indexes as to the bibliography of each special branch of the Universal Art Inventory,—a feature that will add immensely to its value. It will be observed that in this first edition the titles of books on mosaics, which are quoted, form a list of those which have been consulted for the formation of the inventory, while the list of works relating to stained glass merely refers to books in the Art Library. No doubt in future all the literary information will be arranged upon the same plan.

Seventy-five pages are occupied with the inventory of stained glass, exclusively in windows. The additions to be made in future editions will be very numerous. The list is, very wisely, so arranged as to include references to the history of famous windows now, unfortunately, destroyed; as in the case of the Chapel of the Abbey of Pontevault, which contained three windows of twelfth-century work no longer existing. Under this head future editions should contain a reference to the blazoned windows of the ancient Chapel of Bourbon l'Archevêque (the cradle of the Royal House of Bourbon), so remarkable from the tradition that on the day of the murder of King Henri III. (1st August, 1589), a flash of lightning struck the glass, and shivered from the coat of arms the bâton forming the heraldic difference of the Bourbon Princes, leaving the arms of France, "pleines," which the blow of the assassin entitled Henri of Navarre to assume.

The ecclesiastical buildings of the Spanish and Italian peninsulas contain a large amount of glass as to which no index is as yet accessible. Batalha, in Portugal, is mentioned as having had its windows for the greater part irreparably injured by the French. In no country has the splendour of art been lavished more freely upon churches and convents than in Portugal, and there must yet be much to repay a conscientious search, in glass no less than in encaustic and inlaid marble. Genoa, too, is unnamed in the inventory. The rich hues of the windows of the great church of the Annunziata cannot readily fade from the memory of the traveller; and there must be much more old glass yet existing in this City of Palaces.

As to English stained glass, the editor will, no doubt, receive numerous contributions towards an enlargement of his catalogue. Not to speak of smaller relics of perished works of value, or of blazonry of various dates, such as are to be found in the Mortuary Chapel of the Dukes of Bedford, at Chenies, in Buckinghamshire (see *Builder* of October 6th, 1866),—of examples of plain old coloured glass, as at Knele—there are English mansions to be added to the inventory which are famous for their ancient windows, as, for instance, Cothelie and Tuddington. This latter noble residence, rebuilt, under the name of an Abbey, by Mr. Hanbury Tracy Leigh (before his elevation to the peerage), is rich in fine old stained glass, brought from Spanish convents, and should hold a place in future editions of the Art Inventory.

The windows of Fairford Church, as to which so much was written in our pages the year before last, are safely said to be from "designs attributed to Albert Dürer, and also to Francesco Francia." Very brief notices are given of the superb windows to be found at Rouen, in the Cathedral, the Churches of St. Ouen, St. Godard, St. Maclou, St. Patrice, and St. Vincent, in the Museum, and in the house of M. Bonissent. No collection of glass, either in France or in England, equals the chronological series, from the thirteenth to the seventeenth century, arranged in the Museum of Rouen.

Twenty-six large stained-glass windows, forming a complete history of Jesus Christ,

beginning from the birth of the Virgin Mary, and dating from 1527 to 1631, now exist in King's College Chapel, Cambridge. Fragments alone of stained glass are to be found in the contemporary Chapel of King Henry VII., at Westminster. Of the third of these richly ornamented efforts of this period of English architecture, St. George's Chapel, Windsor, we find no mention in the Inventory.

The large rose window in the north transept of Lincoln Cathedral is mentioned as the most important example of Early English stained glass now existing in the country. The date is stated to be about A.D. 1200. This window shows, in the central part, a representation of the blessed in heaven, with Christ sitting in the midst. Sixteen circles, each full of allegorical or doctrinal symbolism, form the outer part of the windows, and an angel tossing a thurible is figured in each of the four trefoils at the angles. Much old glass, of very rich colouring, is to be seen in other windows of this cathedral. Canterbury yet contains a window, in the north transept, which was the gift of Edward IV. and his queen; as well as representations of the figure and of the miracles of A'Becket, dating from the twelfth and thirteenth centuries. The great windows of the nave and choir of York are filled with painted glass, by John Thornton, of Coventry, A.D. 1404 to 1409. Early Norman glass, of the twelfth century, is found in the clearstory of the nave. Windows, of the times of Edward III., of Henry IV., Henry V., and Henry VI., are all extant in this noble minster; and the harmonious effect of the *grisaille* will not readily be forgotten by its visitors. In the chapter-house are seven lancet windows, exhibiting the arms of England, the escutcheons of benefactors to the Church, foliage, geometrical forms, armorial badges, saints, prophets, kings, queens, and events of sacred history. The ruby and dark blue tints are especially rich.

The sprawling Crucifixion recently erected in the central east window of St. Paul's is excluded from the "Art Inventory" by its recent date. The glass at Durham does not go back to an earlier date than 1450, and much of it is fragmentary. The glass at Winchester is of the fourteenth and fifteenth century. The great east window of the choir of the cathedral of Gloucester dates in 1345, and is the finest stained glass of the Decorated period in the country, representing a long series of prophets, saints, and Jewish kings, larger than life, and now well restored. The east window is filled with original glass of the fifteenth century, white and yellow being much employed. The ruby glass in the west window of Exeter Cathedral is "said to be some of the latest manufactured in England at the revival of the art." Rochester, which contains a considerable quantity of stained glass, some of which at least is probably old, is not mentioned in the Inventory. Ripon is only spoken of as containing "windows of old stained glass." Bath Abbey, St. Alban's Abbey, St. David's Cathedral, and other religious edifices, which bear traces of very ancient or very elaborate windows, might be referred to with advantage, as, even if no traces are now to be found of the glass, the historic record of its existence or of its destruction is not less interesting than in the case of Fontevault. In fact, an orderly reference to all our cathedrals, minsters, abbeyes, and important and ancient parish churches, even if accompanied only with the note "no stained glass now existing" might advantageously form a feature in future editions of this part of the "Universal Inventory."

It would be desirable, also, that some reference should be made to the windows of the church of San Vitale, [at Ravenna, which M. Lacroix states were filled with stained glass in the time of Justinian. The walls, vaults, and apse of this church, we are informed in the catalogue on mosaics, are covered with work of this description "of the time of Justinian, as fresh as the day they were placed there." Twelve churches in this whilom capital of the world are referred to as rich in mosaics. Can they all be entirely destitute of stained glass?

We feel sure that no one will welcome the hints which have occurred to us on the perusal of this very interesting volume more heartily than the editor himself. The work forms a new claim on public gratitude. That Mr. Cole should have found leisure for its preparation, among all his toils, is in itself a matter for surprise. The attempt to construct such an inventory from the partial and fragmentary information which has hitherto been accessible, is one which

demanda something of the credit due to the leading of a forlorn hope. The future value and importance of the work will be very little affected by the more or less ample fulness of the first edition. The sketch of such a work is in itself no small boon to art. We venture to suggest the preparation of interleaved copies, to be sent to men who are well versed in the several subjects of the successive parts. Their return to 'South Kensington, with annotations and additions, will be a national benefit. As an instance that is not without an amusing point of view, let us suggest that the director of the South Kensington Museum might insert in his own private copy some description of the interesting specimens of ancient glass which are to be seen in that building, including some from the Sainte Chapelle, Paris, of the thirteenth century. No one can accuse the editor either of unacquaintance with the fact of their possession, or of egotism in giving undue prominence to this importance. We trust, moreover, that the plan usually followed in the South Kensington publications, of prefacing each special catalogue with a brief but lucid *précis* of the state of our best information on the subject to which it relates, will not be permanently departed from in the "Universal Art Inventory." We congratulate all concerned on the appearance of the work, and we trust that its reception by the public will be such as to call for the speedy issue of a second and enlarged edition.

THE FRENCH MIND.

BUILDINGS are monuments of mind, and architecture is the truest index of a nation's genius. If English art is free, varied, but often queerly whimsical, it is because the English character loves liberty above all things, even at the expense of wisdom and beauty. If French art, in its timid sameness, has the oneness of massive creation, it is for a psychological reason we here beg leave to explain.

The history of France is the history of centralisation; we might almost say, the history of *leading ideas*. Politics, literature, science, and art have always in France revolved round centres. French military monarchies, the French Academy, and French schools of art, show how readily Frenchmen will sink their individualities in behalf of an idea. Frenchmen, we repeat, are ever hurrying to centres which they prop up with congenial ornaments. Given an object of thought, and a French thinker there and then casts about for some dominant feature whereon to hang bright hints and ingenious speculations. If he be a dramatist, he will select some passion, embody it in a representative being, and, by bringing it to a dazzling climax, strike the spectator home with one resistless impression. Corneille's "Polyeucte," Racine's "Athalie," Molière's "Tartuffe," are all alike in this quality of artistic structure; for each of those plays is the radiation of one idea. But the same characteristic belongs to lyrical and satirical poets, such as La Fontaine and Béranger, to sentimental poets such as Lamartine, and to all French historians, orators, pulpit preachers, and philosophers.

A poem like the *Iliad*, where every hero has his prowess-time, or *apogée*, is utterly abhorrent to French artistic conception; and equally so is Milton's "Paradise Lost," because its golden rays fly parallel into space and converge not. Where is the centre-piece, where the centre-deed of these epics? Objects the French critic. But the *Odyssey* and the *Æneid*, which are centralised in Ulysses and *Æneas* have been imitated by Fénelon and Voltaire. It is, indeed, very characteristic of the English and of the French minds that Homer is the more popular poet in England, and Virgil in France.

The arts of music and painting are also treated by Frenchmen with a view to central effects. The most striking passages in the works of Auber, Gounod, Chopin, and others, are as much the results of a scientific focalising of melody as they are outbursts of inspiration. Again, in painting, the historical school stands foremost in France, because its subjects allow of centre thoughts, *idées mères*, as they are called. If the subject be the bursting of a siege-gun in a redoubt, all the figures thronging the canvass will have an attitude or be doing a work which bespeaks the accident. Every sentry by some act of terror, every stray implement of war by its partial destruction, will tell the tale of the explosion. The general tone of the colouring will be managed so as to set off the flash and

smoke of the bursting cannon. Variety in unity; such will be the French picture.

The French art of war, as understood by Napoleon, is the art of massing troops in one point. Napoleon's concentrating genius is French genius typified by a giant mind.

The Greek mind, which is Tautonic in its poetic exuberance and French in its method, gives us in the Laocoon group a fine sample of the qualities most valued by French sculptors. Laocoon, the central figure, at once arrests the attention of the spectator. Laocoon's sons, writhing in the knotty folds of the serpent, seem to suffer in order more boldly to bring out the anguish of their father. In conception and execution the Laocoon group is the paragon of sculptural centralisation.

Now, architecture, which might be defined as the art of arranging parts, is, of all arts, the most likely to be awayed by the French spirit of centralization; so it occurs that a French building is, as a rule, the organic outgrowth of one idea. Every portion, every ornament of the building,—ay, the very ground it stands on and the gardens which surround it,—subserve that idea, or purpose. If the building be meant for a stable, the body of the building will be so suggestive of a stable that even the most unpractised eye could scarcely fail to recognise the purpose of the erection. The wings of the building and its minutest ornaments will all be in character with the main building.

Again, no Frenchman would ever think of designing a schoolhouse like a Gothic cathedral. Such an adaptation is to him illogical, because on the face of it the schoolhouse would be a cathedral.

French architects, however, though upholding the sanctity of *ensemble*, or unity of design, are fully alive to the organic individuality of details. Vary the parts, they say, but let not the parts be foreign to the whole. Let the architect imitate God the Creator. Let his buildings be like the human body, one in purpose, infinite in useful and beautiful details.

But in order to build an edifice which will, so to say, be explained by its every part, the architect must breathe his conception into the minds of his men. Now, French workmen, true to their national genius, quickly kindle under their master's inspiration, and work up to it. Again, the public, who, in France, encourage artistic effort, will only do so with the sanction of artistic laws. So, in France, masters, men, and public are at one in carrying out with imposing unity the leading ideas of great plans.

In conclusion, English students of French architecture should approach French buildings with a conviction that the architect who has designed them can yield not only an æsthetic but a generic reason for their every part; in other words, that he can defend every detail of his plans on the score not only of individual beauty, but also on that of appropriate beauty, or *beauté raisonnée*. A French architect may err with respect to the end, but seldom fails in the means. There is judgment even in his mistakes, for his mind is a repository of classified ideas. Whosoever wishes to do justice to French architectural thought must consider its errors not as the shortcomings of ignorance, but as sophisms, the upshots of scientific though inaccurate deduction.

LAWRENCE HARVEY.

École des Beaux Arts.

THE FOREIGN GALLERY, PALL-MALL.

THE collection of pictures by French and Flemish artists now exhibiting in the Gallery, 120, Pall-mall, though small (219 pictures) is one of great interest, and includes several pictures of remarkable excellence and beauty. One of the most striking is M. L. Perrault's "The Orphans,"—a work of art full of poetry and pathos, and finished with the most minute care. It shows a group of girls, three in number; the eldest is attired in deep mourning, and surveys her sisters with feelings of extremest sorrow, while in her arms she carries a chubby-faced infant. Upon her shoulder rests the head of her younger sister, and the face, directed upwards, seems searching in hers for some gleam of comfort, while the right arm, thrown carelessly over the shoulder of the third, binds them together in a united family circle. The grief of each, differing in degree until it is lost in the happy repose of the sleeping infant, is admirably told, while the whole effect of the picture is such that it recalls one to again and

again gaze upon it. There are two small works by Meissonnier, one called "Qui va là?" the other a "Halbardier on Guard,"—all life. "A Quiet Spot in the Forest of Fontainebleau," by Rosa Bonheur, displays the haunt of the stag beneath a canopy of foliage, where the earth is a carpet of moss and herbage, and the sunlight steals in, subdued by the intricate screen which nature has wrought with the green leafage. The picture is more truthful than effective. The "Burgomaster's Daughter," by M. C. Bischoff, is a finished study. The light which breaks upon the head of the figure has a marvellous effect. "The Normandy Flower Girl," by M. J. Portals, is also an admirable picture. "The Remedy," by L. Israels, tells its own story. The wife is stricken with disease, the husband, a French fisherman, sits by the bedside, with his daughter between his knees, gazing with earnestness upon the wan face of the patient to ascertain if the drug which the nurse has but just administered can have already worked a cure; while in the foreground a child, unconscious of the sorrow which hangs about the apartment, is sporting with the fishing-tackle that the father has thrown idly by. Of rare beauty is Morle's head of "Veronica." As a piece of manipulation it is not remarkable, but the expression is divine.

There are two small works by Edouard Frère, "Helping Himself," and "The Family Scrap-book." A group of little girls form a circle round the family treasure, and each face is alike expressive of the delight which the picture-book affords. The mother gazes fondly on her infant, by Jourdan, will be understood and appreciated wherever womanly graces and the innocence of children are welcome.

Pictures by Alma Tadema, Henriette Browne, J. Gouglis, G. de Jonghe ("Playing from Memory"), Louis Gallait, J. Bertrand ("Virginia Drowned"), also demand notice; and even now we have omitted mention of two of the most complete works in the gallery, "Nonchalance" and "La Visite," both by Alfred Stevens.

Some water-colour drawings on the first-floor, serve to show what foreign artists are doing in that walk of art.

OWEN'S COLLEGE, MANCHESTER.

The design for the first portion of the new buildings for Owen's College is now complete, and the works themselves will shortly commence.

The site is about a mile to the south of the centre of Manchester, on the west side of Oxford-road. It is bounded on the north by Coupland-street, and on the south by Burlington-street. At its east or Oxford-road end, it is some 120 yards in width.

The original idea was to make the buildings surround a large quadrangle; but this idea has been modified, it being found that the cost of the work would exceed the means at the disposal of the committee; and it was considered by them that the present requirements of the College would be more conveniently met by the erection of a compact range of buildings, with space behind for less sightly, but not less necessary, structures, and in front for others of a more ornamental character, which will, doubtless, soon be required.

The design about to be carried out, and which we have now to describe, has been brought to maturity after long and careful consideration on the part of the committee and professors, in conjunction with their architect, Mr. Alfred Waterhouse. The scheme consists of a main block of varying width, and upwards of 300 ft. in length, set back about 200 ft. from Oxford-road, and running parallel with it. It is intended that this should ultimately form the western side of a quadrangle or court, 200 ft. in length, by 100 ft. in width. The three other sides will not be enclosed at present; but when the entire scheme is carried out, there will be a natural history museum on the south; a library, examination-hall, and other departments on the east (Oxford-road front), where the chief architectural features would be introduced; while to the north there would be space for additional lecture and class rooms, or for the medical school.

At the rear of the main block is a large space of irregular shape, averaging 200 ft. in width, on the south of which (Burlington-street side) the chemical laboratories will also be at once erected in a detached building, hereafter described, while on the north ample space will be left for an extension of the laboratories, if needed, for

various subsidiary building, and for a gymnasium.

The main block, containing as it does the various lecture-rooms, class-rooms, &c., has been planned so as to secure the maximum of the three essentials,—light, quiet, and airiness. Wherever possible the class-rooms turn their back upon Oxford-road, which is always busy and noisy, while a wide corridor of communication runs along the building on that side. On the basement floor this corridor is unbroken; on the upper floor it is cut in twain in the middle by the library, on the first floor, and by a large arts' class-room on the ground-floor.

This division of the corridors has been devised, amongst other reasons, to prevent their being used too freely for general traffic. Each half is approached by a separate staircase entered from a porch on the east side. On special occasions, however, or whenever required, the whole of each floor can be thrown *en suite*.

In arranging the accommodation, one important consideration has been kept constantly in view. Inasmuch as the requirements of the college may vary,—one department needing an increase of space, another requiring less,—the rooms have been so arranged as to be put to different uses, if need be, without any structural alteration whatever being involved. As the full development of the scheme is reserved for the future, some ingenuity has had to be exercised to make temporary provision for wants which will be more adequately met when the whole of the buildings contemplated shall have been erected. Thus, one large arts' class-room, not required as such at present, will be used as a temporary library; another large room in the basement will form a temporary dining-hall.

The slope of the ground has favoured the arrangement of the basement story as planned. On the western side the floor is above the level of the ground; on the eastern side the rooms will look into areas 26 ft. wide, so that the story is practically entirely above ground. On this floor will be placed the engineering workshops and museums, the students' temporary dining-room and common room, the natural philosophy workshops, rooms for students' boxes, lavatories, cloak-rooms, &c.

The southern extremity of the building is devoted, on the basement and ground floors, to the chemical theatre,—a room 66 ft. by 40 ft. The professor's table is at the western end, on the level of the basement floor. The floor of the theatre rises eastwards, until it reaches the level of Oxford-road. This room will be lighted by windows on the south and west sides, all fitted (as well as those of the natural philosophy lecture-room) with iron shutters, to admit of the rooms being darkened at pleasure.

The other principal rooms on the ground-floor will be the engineering drawing-room and lecture-room, natural philosophy rooms, a large arts' class-room, with rising floors; the board-room, and secretary's office.

On the first-floor there are three large arts' class-rooms, professors' rooms (which, for the most part, are common rooms), the temporary natural history museum, temporary library, students' reading-room, and various small arts' class-rooms.

There is considerable accommodation in the roof, for which special uses will, no doubt, soon be found.

The chemical laboratories, in the separate building already mentioned, will form a block 95 ft. square. There are two large laboratories placed side by side, each of them 70 ft. by 30 ft. and 22 ft. in height. There are store-rooms below, and various subsidiary rooms adjoining the laboratories.

The professor's private laboratory is so placed as to command both the others, and there will be direct communication, by a covered corridor, between this laboratory and the table in the lecture theatre.

The dimensions of a few of the other rooms, and of the floors, may be interesting. The stories will be, except in special parts, of the following heights from floor to ceiling:—Basement, 15 ft.; ground-floor, 17 ft.; first-floor, 17 ft. 6 in.; rooms in the roof, 10 ft. The chief exception is the chemical theatre, which averages 23 ft. in height, and some of the large arts' class-rooms, which have been made about 22 ft. high, by a little scheming in the arrangement of the floors.

The four large arts' class-rooms are of the following dimensions:—One of them 40 ft. by 45 ft.; two 40 ft. by 33 ft.; and one 31 ft. by 35 ft.; that devoted temporarily to the library

is 40 ft. by 45 ft. The students' reading-room is 34 ft. by 33 ft.; the engineering drawing-room, 52 ft. by 31 ft.; the board-room, 37 ft. by 30 ft.

There are in the buildings first to be erected 90 rooms in all, of which the chemical department takes 28; the natural philosophy, 9; arts' class-rooms, 9; engineering, 8.

Special care has been bestowed in maturing the scheme for warming and ventilating the buildings. In the sub-basement there will be hot-water boilers and a steam-engine; the latter to drive a fan for forcing fresh air (warmed in winter) into the corridor and lecture theatre. In the ordinary class-rooms there will be openings for ventilation above the doors, and all the windows will be double hung as sashes with a light above, hung on pivots, for summer ventilation, to open diagonally, so as to throw the fresh air upwards towards the ceiling.

The whole of the rooms will be warmed by hot-water pipes, but provision is made for the introduction of fire-places hereafter, if found desirable. Fresh air is also brought into the rooms behind the coils of hot-water pipes wherever practicable.

A special flue for the extraction of vitiated air will be taken from the ceiling of each room into large shafts in the roofs leading to ventilating turrets, in which steam cones will accelerate the draught.

Separate and particular arrangements have been made for warming and ventilating the chemical laboratories. A tower has been carried up above the roof, with large arched openings on each side, behind which a cowl will work, always presenting its mouth to the wind. This tower will bring a constant and ample supply of fresh air to the warming apparatus in the basement of the laboratory building. The smoke from this apparatus will be utilised for increasing the draught in the flue for the extraction of vitiated air. The warming of the laboratories will be effected like that of the other parts of the building, but from their own separate apparatus.

The style of the buildings, as might be presumed, is Gothic, of a collegiate and early type. The walls will be faced throughout with York stone, and the roofs covered with slate. The upper part of the central gable will be devoted to a clock-dial, and over the centre roof will rise a lofty *flèche* to be used for purposes of ventilation. A similar feature, but lower, will rise over the chemical lecture theatre. Square-headed windows are the rule, except in the corridors and staircases, where they are pointed.

Internally, the most interesting architectural features will doubtless be the staircases, which are arranged in large octagonal bays, 33 ft. by 14 ft., and cut off from the corridors by arcades of double columns.

The floors of the buildings throughout will be fireproof on the Dennet-arch principle.

OVERSIGHT IN THE TOWER SUBWAY.

If the Tower subway is to be the prototype, as we are told, of a new class of thoroughfares, it may be hoped it will, nevertheless, remain the only one with either *shafts, lifts, or a change of vehicle*, in so short a journey. To explain the exceedingly small necessity for any of these, let us first add to the quarter-mile of the present subway proper, the two shafts of 50 ft., and we find there are 1,420 ft. of way, all iron-lined, I believe, and about equally large and expensive. Now, suppose that same 1,420 ft., in one uniform tube, making an eighth of a circle, all castings from end to end on one model, the radius of curvature being everywhere 1,808 ft. The chord of this octant, or distance between entry and exit, would be about 1,391 ft.; carrying each, say 12 yards, further from the river than at present. If the river's width be 1,200 ft., the descent under each bank, till getting under water, would be some 36 ft., and the whole descent, to the middle, 139 ft., which would keep all well free from the bed materials, and down in the eocene London clay, and more so the greater the water pressure. Yet the single unchanged omnibus would emerge on a short level terminus *above ground*; and all inconvenience from the tilting to an inclination of 22½° at starting and arrival, would be obviated by making it in three or four separate bodies, each seating four, and hung on trunnions, so as to keep vertical. The utmost utilisation of gravity as motive power would also be made, by simply letting it acquire all the speed and run as far as

i would, which ought, with good wheels and rails, to be full seven eighths of the journey, when it would be caught by a clip, and pulled the remaining eighth by steam-power.

It is well known that without friction or resistance, the quickest way, or "*Brachystochrone*," from any spot to any other, would be part of a cycloid if the second point be lower than the first, or a whole cycloid if on the same level. Now, if you only cut from a cycloid one-eighth at each extremity, the remaining three-fourths contain practically no change of curvature, but so closely approach a *quadrant of a circle*, that the finest workman could hardly distinguish them. But the *brachystochrone allowing for friction*, is always less curved than the cycloid, and still more approximate therefore to a smaller circular arc than this was to a quadrant. Thus it is seen how very near an octant must be to the theoretically very best subway for economy of power.

E. L. G.

THE TRADES MOVEMENT.

London.—Another meeting of the delegates from the carpenters' and joiners' societies in furtherance of the nine-hours movement has been held at the Duke of York Tavern, Lambeth; Mr. Sinclair in the chair. The delegates gave in their reports, showing the rapid progress of the movement. District meetings had been held at Brixton, Chelsea, Paddington, Finsbury, Marylebone, and King's-cross, and the new code of working rules had been well received at each meeting. After the transaction of provincial business, and appointing deputations to attend district meetings, the proceedings concluded. The aggregate meeting will be held shortly after Easter.

Barnsley.—The six months' notice, which was given by four of the master joiners in Barnsley to their men, to work one hour longer per day during the summer months, has expired, and a number of men have left their work. The masters who gave the notice were Mr. John Goodyear, Mr. John Carr, Mr. George England, and Mr. Thos. Jacques. The men up to the 31st of March commenced work at seven o'clock in the morning, and the masters are wishful that they should commence work every morning (except Monday) at six o'clock from the 1st of April to the 30th of September, and at seven o'clock every morning in the winter half of the year, leaving work at four o'clock on Saturdays. Some of the men refused to accept the change, and left work, but others still remain; and, seeing that the trade is anything but active, it is not expected that the dispute will continue long.

Edinburgh.—A correspondence as to the employment of unskilled labour in the painting trade has taken place between the operative painters and their masters. It was commenced by the workmen presenting a petition to the masters, asking them to put a stop to the system of employing unskilled labourers—a system which, in the opinion of the workmen, was the cause of much annoyance both to them and their masters, and was also a source of injustice to the public. It was well known, the memorialists said, that many of the labourers referred to were in the habit of passing themselves off as journeymen, and this they felt did much injury to those who had served a full term of apprenticeship to the trade. To this the masters, through the secretary of their society, answered that they were quite able to manage their own affairs, and that the workmen had no right to interfere with their mode of conducting their businesses. They at the same time took the opportunity of denying that labourers were employed to do skilled work. The workmen, they thought, had themselves very much to blame for the state of matters that existed, they having refused to do certain kinds of work which they considered only suitable for labourers. The secretary of the operative painters, in replying to this communication, said that the workmen had not alleged that skilled labour was done by labourers. What they had said was that labourers were put to do work which painters should do, and which they did not object to do. They denied that they had any wish to interfere with the manner in which the masters conducted their businesses. As yet the masters have made no further communication on the subject.

Glasgow.—A conference meeting of the Glasgow master joiners and operatives has been held in the Religious Institution Rooms. Mr. Walter Bannerman on behalf of the former, and Mr. John Bennett on behalf of the latter,

were appointed co-chairmen. A printed copy of the proposed working bye-laws, made out by the operatives, was handed to each employer present. After a friendly conversation, the employers intimated that they were empowered to propose that the whole matter in dispute should be submitted to an arbitrator appointed by Mr. Henry Glasford Bell, Sheriff of Lanarkshire, and that his decision should be final and binding on both parties. The operatives, on their part, stated that they had no power to refer the matter to arbitration. Mr. Bennett said that it had been spoken of amongst the operatives to reduce the working hours during December and January to eight hours per day, and five hours on Saturday. Each party agreed to submit the result of the conference to their respective bodies, with a view of arriving at an amicable settlement. A meeting of the joiners was held next day. After a long discussion, two resolutions were adopted, the first being:—

"That we consider the offer of arbitration made by our employers unnecessary, so far as our working hours are concerned, our time being our capital, and consequently our private property. No arbitrator has the power to decide against the expressed wish of a man how many hours he shall work. Should our employers find it impossible to arrive at an amicable settlement with regard to wages or other matters connected with the present dispute, we are quite willing to accept arbitration in the way they have indicated."

Stirling.—A meeting of master builders has been held in Stirling for the purpose of considering a demand by the operative masons to have an advance made upon their wages of $\frac{1}{4}$ d. per hour from the 1st of April. All the master builders in the town were present. The circumstances of the trade were fully considered, and, after a discussion, it was unanimously resolved to refuse the demand.

Perth.—A meeting of the master masons has been held, at which it was unanimously resolved not to comply with the demands of the men, numbers of whom are daily leaving the town for other places in search of work. The men assert that the rise of wages sought, from 54d. to 6d. per hour, would only place them on an equal footing with the workmen of other towns. No agreement has yet been made between the masters and journeyman masons with respect to the rate of wages. The masons employed on the Scottish Central section of the Caledonian Railway have resumed work, the railway authorities having raised the wages to 6d. per hour.

Arbroath.—Some months ago the operative masons in Arbroath resolved to begin the nine-hours system on the 1st of March last. Several did so, but as a number of employers declined to act on the new plan, it has been found necessary to return to the ten-hours system. At a meeting held the other evening, the operatives resolved to do this, but at the same time stated that they would renew their claim to have the working-day reduced to nine hours at the first opportunity.

ST. PANCRAS STATION AND ROOF.

IN the course of a paper on this subject, read at the Institution of Civil Engineers, by Mr. W. H. Barlow, Mr. Charles B. Vignoles, President, in the chair, the writer said:—

In arranging for the strength of the roof, as it was required that the arch should be capable of maintaining its own weight, without any intermediate connexions with the tie, it was considered expedient to adopt a low rate of pressure upon the metal, with a large assumed weight acting in addition to the weight of the principal. With this view the arch was designed so as to be capable of bearing an assumed load of 70 lb. per square foot measured on plan, in addition to the weight of the principals, with a stress on the metal not exceeding 3½ tons per square inch; or, what amounted to about the same thing, a load of 56 lb. per square foot, with a stress of 3 tons per square inch. The assumed weight of 70 lb. per square foot on the surface carried by the arched portions of the rib, viz., 7,040 square feet, amounted to 220 tons; and, adding to this the weight of the open part of each arch between the springings, or 35 tons, the total load became 255 tons. The line of pressure formed an angle of 55° with the horizontal at the springing, and therefore the pressures were 155 tons at the springing and 89 tons at the crown. The sectional area of the upper flange of the rib was 23 square inches, and that of the lower flange of the rib also 23 square inches, so that the stress on the metal with the assumed weight of 70 lb. per square foot was 3.37 tons per square inch at the springing, and 1.94 ton per square inch at the crown.

The cost of the roof, as it stood in the finally settled accounts, excluding the screens, was 53,483l. The north screen and gable had cost 7,375l., while a second screen and gable for the southern end, so as to separate the passenger station from the hotel buildings, had cost 8,507l. As the area within the walls measured on plan was 169,400 square feet, it followed that the cost per square of 100 ft. was, for the roof, excluding the screens, 31l. 11s.; for the north screen, 42l. 7s.; and for the extra rib and south screen, 5l.

The brickwork of the substructure of the station, and the whole of the works of the upper and lower lines of railway for a distance of three-quarters of a mile northwards, were let to the Messrs. Waring, and had been carried out under the superintendence of the author's principal assistant, Mr. Campion; while the ironwork of the bridges and of the lower floor of the station was in charge of his assistant, Mr. Grier. For the details of the roof the author was in a great degree indebted to Mr. Orish. The Butterley Company were the contractors for the roofing and for the lower floor, Mr. (now Sir) G. J. N. Alleyne being their manager, and Mr. Clark their foreman on the works.

THE DRAWINGS OF THE HOUSES OF PARLIAMENT.

AT a special meeting of the council of the Royal Institute of British Architects, held on Monday, the 14th March, 1870, it was resolved,—"That it having been referred to this council to advise a member whether he is bound to comply with a requisition to give up all the contract plans and drawings of a building (to which he had acted as architect), and all other papers necessary for affording a complete knowledge of the building, and of the works carried on in connexion therewith; the council express their most decided opinion that the rule and custom of the profession is, that all the drawings and papers of an architect, prepared for the purpose of erecting a building, are, and remain, the sole property of the architect."

In the House of Commons a few nights ago, Mr. Tipping asked the First Commissioner of Works if it was true, as stated in the *Builder*, that he had demanded of the architect the drawings of the Houses of Parliament; and if he was aware that the Royal Institute of British Architects had declared that such a demand was not in accordance with professional custom, according to which such drawings are the property of the architect? Mr. Ayrton is reported to have said it was true that he had asked Mr. Barry to deposit in the Office of the Board of Works certain plans prepared by him for her Majesty's service and paid for by the public. It was also correct—at least he had been so informed—that certain architects had resolved that they were entitled to keep plans which they had prepared for other people who had paid for them. He had referred all the papers to the usual advisers of the Board, in order to ascertain what the rights of the Crown were.

Mr. E. M. Barry has since written:—
"I have just seen that the First Commissioner of Works stated, on Thursday night, in answer to a question, that he had asked Mr. E. M. Barry to deposit in the Office of Works certain plans which were prepared by him for her Majesty's service and paid for by the public, and that he had placed the matter in the hands of his legal advisers."

As I have offered to comply with Mr. Ayrton's request, unusual though it be, to give him my drawings which I have prepared for the Government during an engagement which has now lasted ten years, I imagine some error must have occurred in reporting the above answer. It describes inaccurately the demand that has been made upon me, the nature and extent of which (and the peculiar circumstances under which it has been preferred) will be apparent when the papers which have been moved for on the subject have been laid before Parliament."

Sir,—The following is from the *Echo* of Saturday last:—

"We are heartily with Mr. Ayrton in his conduct with Mr. Barry. The waste of public money by the professional employment of non-official persons has been enormous. The Land Revenues, the Ecclesiastical Commissioners, and the Board of Works accounts are full of disgraceful warnings on this point. Mr. Ayrton has most properly placed the charge of the Houses of Parliament under the care of the salaried officers of the Board of Works, and Mr. Barry, it seems to us, has done himself a sort of hereditary service of the New Palace of Westminster, is offended. But the fight between Mr. Ayrton and Mr. Barry is, as we understand it, over the working drawings of the building. Mr. Barry says, that by the custom of the profession these belong to him, as inherited from his father. Then, we say, the sooner Mr. Ayrton, with the force of law, explodes such a custom, the better. If it is proved that the nation has paid for the work, and

has been charged with the cost of the material of those plans, they surely belong to the people. The constructive drawings of any building, whether they are claimed or not, certainly ought to belong, and by natural principles of equity do belong, to the individual who has satisfied the architect's charges."

I think it would be well for Mr. Barry to contest his right to the working drawings of the Houses of Parliament, now that it is the acknowledged custom, in and out of the profession, to consider the drawings of a building the property of the architect. At the same time I do not think that architects, as a body, should stand by and see Mr. Barry, one of their number, victimised in the way Mr. Ayrton proposes; but they should come forward, and readily, with their money, if necessary, to defend a right long acquired by custom, and approved by the majority of employers. I, for my part, am willing to commence, with half a guinea, a subscription towards a fund for assisting Mr. Barry, should he be advised to defend his right to the drawings bequeathed to him by his father.

If, by the way, "the waste of public money by the employment of non-official persons has been enormous," why was the official Mr. Penne-thorne discharged (as the public take it) to make way for Mr. Fergusson, and the official Mr. Fergusson to make way for Mr. Douglas Galton? This is a system which, I trust, as far as it affects architects' rights, will be withstood to the utmost.

I enclose my card. In case a subscription should be required, I trust some known member of the Institute would take the position of hon. secretary to the fund; should, however, no one be willing to come forward, I would not as hon. secretary *pro tem*. LUDOVICUS.

METROPOLITAN BOARD OF WORKS.

ARCHITECT'S SURVEYOR—ASSISTANT ENGINEER—MUNICIPAL GOVERNMENT.

At their last meeting the Board proceeded to the election of a surveyor in the Superintending Architect's Department, and eight candidates were submitted, from whom the Board were to elect one, and Mr. John Thomas Lepard was the successful candidate for that office.

A report was brought up from the Works and General Purposes Committee, stating that the committee had considered the letter from Mr. E. Cooper, assistant engineer, applying for a retiring allowance, and that they had assented, after conference with the engineer, that it will be unnecessary to fill up the vacancy occasioned by Mr. Cooper's retirement, and recommending that the services of Mr. Cooper be dispensed with, and that a retiring allowance of £300, per annum be granted to him for life.

After a long discussion, in which several amendments were moved, the recommendation was put and agreed to.

A report was presented by the committee to the whole Board on Municipal Bills, stating that, in the opinion of the committee, it is desirable that there should be one central municipal government, with jurisdiction over the whole metropolis; and that there should be a readjustment of the districts into which the metropolis is at present divided for the purposes of local government; recommending that the subject be referred back to the committee for further consideration, and to the details, with authority to communicate with her Majesty's Government thereon; and that the foregoing propositions be considered by the Board at their meeting on the 8th of April.

The report was received and adopted.

COMPETITIVE TRIAL OF STEAM FIRE-ENGINES AT GLASGOW.

An important competitive trial of steam fire-engines took place at Glasgow on the 18th of March. The civic authorities of that city issued an advertisement on the 1st of October last for a steam fire-engine, and two were offered to them, one being from Messrs. Shand, Mason, & Co., and the other from Messrs. Merryweather & Son, both of London. A competitive trial of these engines was then proposed and agreed to, and Mr. Conner, of the Caledonian Railway Company; Mr. More, hydraulic engineer, of Glasgow; and Mr. Bryson, the chief of the Glasgow Fire Brigade, were appointed judges. At the request of several correspondents, we print their report:—

"The engines having been taken from the fire-engine station to the weighing machine, fully equipped, were found to weigh (by certified scales from weights) as follows:—Shand, Mason, & Co.'s engine, 42 cwt. 3 qrs.; Merryweather & Son's engine, 48 cwt. 2 qrs. The engines were then placed in position ready for testing, their main-pipes for drawing water being put in the river Clyde. On each engine was attached 280 ft. of delivery-hose, supplied by their respective makers. The nozzles were—for Shand, Mason, & Co.'s engine, No. 20, equal to 1 1/8 in. Merryweather & Son's engine, No. 21, equal to 1 5/8 in. These branch pipes were then laid upon a frame erected for the purpose, both being at the same angle, and securely lashed to said frame. All being in readiness, the word to commence firing was given at 12 h. 51 min., and in 9 min. 45 sec. Shand, Mason, & Co.'s engine commenced working, with gauge showing 100 lb. pressure of steam per square inch. Merryweather & Son's engine commenced work in 10 min., with steam at 100 lb. pressure per square inch, as indicated by gauge. Both engines were then put under test No. 2, so as to show the greatest distance water could

be thrown horizontally. During this test notes were taken repeatedly and accurately of the distances each engine was throwing the stream of water, and the result was, at the completion of the test (which lasted one hour), that on an average the distance attained by Shand, Mason, & Co.'s engine was 145 ft.—maximum, 149 ft.; Merryweather & Son's engine was 98 ft.—maximum, 112 ft.; the average pressure of steam being, for Shand, Mason, & Co.'s engine, 140 lb. per square inch—maximum, 150 lb.; Merryweather & Son's engine, 87 lb. per square inch—maximum, 101 lb.; and the average water-pressure for Shand, Mason, & Co.'s engine was 115 lb. per square inch—maximum, 135 lb.; Merryweather & Son's engine was 98 lb. per square inch—maximum, 120 lb. The engines were then put under test No. 3, which was to show their action with the branch pipes set vertical; in this trial Merryweather & Son, with consent of Shand, Mason, & Co., altered their nozzle from No. 21 to No. 20 (small, equal to 1 7/8 in.), with the following results:—Shand, Mason, & Co.'s engine showed an average excess of height in the stream of water thrown over that thrown by Merryweather & Son's engine of 12 ft., the maximum being 18 ft. The average steam pressure during this trial (which lasted 20 minutes) being—for Shand, Mason, & Co.'s engine, 140 lb. per square inch—maximum, 150 lb.; Merryweather & Son's engine, 110 lb. per square inch—maximum, 140 lb. Tests 4, 5, and 6 were then combined by general consent, and arrangements made for each engine to throw two jets of water through the Glasgow Fire Brigade hose (four lengths to each jet), fitted with bayonet couplings and joints, the nozzles being all of a uniform size, viz., 1 in. diameter. The engines were then started simultaneously at 3 h. 13 min., but the water pressure was so great that at 3 h. 15 min. (two minutes after starting), one of the hose attached to Shand, Mason, & Co.'s engine burst, and in 15 sec. thereafter Merryweather & Son's engine also burst a hose, thus bringing the trial to a close in 2 min. 15 sec. After these tests had been concluded, we subjected the engines to various tests, as to speed, power, &c., and also allowed the competitors to show the capabilities of their engines to the best advantage, the trials were brought to a conclusion; and we have now to report as follows:—Boilers and fuel: both boilers are strong and well-constructed, admirably adapted for rapid steam raising and maintaining steam at a high pressure, as the foregoing figures indicate. The coal consumed during the trials was, for Shand, Mason, & Co.'s engine, 8 cwt.; Merryweather & Son's engine, 9 cwt. 0 qrs. 2 lb. We may mention, however, that Shand, Mason, & Co.'s had a stoppage for 1 min. 40 sec., which will somewhat reduce the apparent advantage over Merryweather & Son's. As we do not deem it necessary to trouble you with mechanical details, we avoid entering into any description of the respective engines, but in passing may say that Merryweather & Son's has two direct-acting pumps—Shand, Mason, & Co.'s having three. This gives the latter the benefit of a more continuous stream of water, and greater regularity in working; and whilst both engines are good specimens of engineering, we are inclined, in accordance with the results indicated in the former part of this report, to give, after due consideration, our decided preference to Messrs. Shand, Mason, & Co.'s engine."

The Watching and Lighting Committee, to whom this report was made, expressed approval of it, and recommended that the engine of Messrs. Shand, Mason, & Co. should be purchased, and the minute of the committee to this effect was unanimously adopted at the meeting of the Police Board held on Monday last.

THE NEWTON MARKET COMPETITION DESIGNS.

The local board of Newton have selected the designs furnished by Mr. John Chudleigh, of Exeter, bearing the motto of "Perseverance," and by Mr. James Chenhall, of Newton Abbot—"As you like it"—for the premiums of 25l. and 15l., as being the best two designs for the new markets. The whole of the designs sent in have been submitted to public opinion, which was pretty strongly expressed in favour of those furnished by "Common Sense" and "Atlas."

"Perseverance" (Exeter) arranges the buildings in two blocks, the axis of the larger being parallel to the old market buildings. The corn exchange occupies the west end, and the principal entrance into the market is through it, the door having a bell-cot 30 ft. high over it. The walls are to be built with limestone, with granite and Bath stone dressings. The roofs are supported internally on iron columns 12 ft. high. Estimate, from 3,780l. to 4,300l. This obtained the first premium.

"As you like it" (Newton Abbot), second premium, places the corn exchange opposite the Bradley Hotel, and the markets are entered through an adjoining arcade with shops. All the markets are in a block, and open to each other, the fish-stalls being at no great distance from the butchers' stalls. The roofs have iron trusses, covered with slates, and every third principal is supported by an iron column, the intermediate principals being carried on "Warren girders." The ends of the five roofs are filled up with plain flat gables of limestone, on an entablature supported on pilasters, and have a very strange appearance. The new road from Courtenay-street is continued across the Lemon on a bridge, the abutments being built of brick, each abutment having seven counterforts carried up their full size to the top level of the abutment, which is made sufficiently strong to resist the thrust of an arch of 40 ft. span, but sup-

ports seven wrought-iron girders, 17 ft. 1 in. span, and 15 in. deep. The author calculates the cost, including the bridge, at 4,900l.

"Common Sense" (Torquay) supplies a design which has attracted, as already mentioned, attention. The chief elevation faces Market-street, the entrance into the markets being in the centre, with a handsome clock-tower over it. On one side of the entrance is the corn exchange, and on the other three shops. He also gives a perspective view of the great hall, which is 45 ft. in span, and 170 ft. long, and has its roof supported on laminated plank ribs. Estimate, 5,000l., the sum named by the Board.

"Atlas" (London) has taken great pains in getting up his design, which shows a road leading from Market-street to the new approach-road from Courtenay-street, midway through which is an octagonal open space, with the markets ranged around it. The plan could be adapted to the ground by a slight alteration. Estimate, 3,960l.

SIR,—With reference to this competition, I think it right to mention that rumour states the first premium was awarded to the son of a member of the local board (and I believe a pupil in an architect's office); the second to a local man, who also is said to have influence on the board.

ONE OF THE COMPETITORS.

MANAGEMENT OF COMPETITIONS.

MADELEY WORKHOUSE.

The author of the design for the proposed new workhouse in Madeley, Shropshire, placed second, complains that while the instructions pointed out that economy in erection was a point to which the guardians attached special importance, they selected a design, the cost of which was estimated at 600l. or 700l. more than that of any other submitted: further, that, while the instructions said, "one perspective view of the exterior may be sent in tinted only in sepia or Indian ink," the authors of the selected design forwarded "a highly-coloured perspective." The correctness of these statements is denied by the Clerk to the Guardians; but, admitting it to be proved, it is clear to us Mr. Griffiths could not sustain at law any claim for compensation. The guardians by the instructions issued bind themselves to nothing. As to the coloured perspective, they might say it was not looked at. The permission they gave to each competitor to send in one perspective view tinted only in sepia or Indian ink did not compel each competitor to send in such a view, and the coloured perspective not being what was admissible, was turned, they might say, aside. The discredit (we are, of course, supposing the assertion correct) would rest in such a case on the competitor, who, in face of such an intimation, should seek to steal a march by sending in a coloured view. Architects should look to the instructions and stipulations before they compete, and decline to send designs except under proper arrangements. As it is now, they go in on the mere chance of a "toss-up," and often find they do not get even that, the toss having been settled against them before they began the game.

IN PARLIAMENT.

The Government Offices.—In reply to Lord Redesdale,

The Marquis of Lansdowne stated that it was intended to proceed with the buildings in Downing-street this year, and 8,000l. would be voted for the purpose, this amount representing the maximum extent of the buildings which could be erected within that period. There was every desire to push on the work, but it was impossible to complete so large a mass of buildings as that eventually to be completed, in one year. Arrangements had been made for the purchase of the whole of the houses in King-street and Parliament street required for the extension of the public offices, the greater part of the purchase having been already concluded, and 18,000l. which appeared in the estimates this year representing the whole of the outstanding purchases. A design for the extension of the buildings was placed in the library of the House of Commons last session, and would, if the noble lord wished it, be placed in their lordships' library for inspection. With regard to the house fronting St. James's Park (to which a civil suit on had been made), it was built on Crown property, but no additional land had been inclosed. The property of the Crown was bounded by an iron railing, and this had not

been removed. It was under the control, not of the Board of Works, but of the office of Woods and Forests, and it was within their competence to approve designs of buildings, including the projecting bay window to which the noble lord alluded.—Lord Redesdale wished to know whether there was any design for the utilisation of the ground in Charles-street.—The Duke of Argyll said part of this site belonged to the Indian Government, which contemplated the erection of a museum there. The present museum building was very inadequate, and it was increasingly important for the exhibition of the commercial products of India to erect a better one. In the present state of Indian finances, however, no money could be spared for this purpose.

The Wellington Monument.—Earl Cadogan moved for copies of any correspondence which might have recently passed between her Majesty's Chief Commissioner of Works and the surveyor of St. Paul's Cathedral, with reference to the monument to the late Duke of Wellington, in course of erection in that church; a return of copy of agreement entered into between the Board of Works and Mr. Stevens, the artist selected to execute the work; payments made to Mr. Stevens on account of the work itself, or to others for purposes in connexion with it; dates of payment; sum originally voted by Parliament for the erection of the monument; and balance remaining available for the completion of it.—The Marquis of Lansdowne said the Government would not object to the return if the noble lord pressed for it, but it being expected that the work would be completed within a year, and it being probable that the original terms would not be adhered to, it would be better to await its completion before entering on an inquiry into the mode in which it had been carried out. The motion, however, was ultimately agreed to.

The New Refreshment Rooms.—The House of Commons committee met on Wednesday and adopted the Board of Works' plan for the alteration of the rooms adjoining the library (in opposition to that proposed by Mr. Barry), so as to fit them for dining and refreshment rooms for both Houses. The works will be proceeded with in August. Mr. Barry applied to be heard in evidence by the committee, but his offer was declined, on the ground that the committee had to judge of plans, not to hear witnesses.

THE ARTS AND THE INTERNATIONAL EXHIBITION OF 1871.

PRINCE CHRISTIAN presided at a conference of artists, sculptors, decorators, and others interested in the fine arts, held on Wednesday, at the Society of Arts, to consider the representation of the fine arts in the forthcoming series of annual International Exhibitions.

His Royal Highness, in opening the proceedings, said—The special object of these fine arts exhibitions is to show how closely high artistic culture can be connected with works of industry. In modern times we have lost sight of this intimate alliance between art and industry, which was characteristic of Medieval and ancient days; and what we are now aiming at is a revival of this wholesome alliance. We hope that these exhibitions will encourage the education of artistic talent in the direction of objects of utility of every description. Many instances may be quoted from history to show that it was not beneath the dignity of the most illustrious professors to combine the useful with the ornamental. Michelangelo was a sculptor, painter, and architect; so was Raffaele. Leonardo da Vinci was an engraver, an architect, and painter; Francia was a goldsmith, engraver, and painter; Cellini was a goldsmith and sculptor; Holbein an architect, painter, and designer; Albert Durer a painter and engraver. Surely these great examples must stimulate people to the culture of arts in our own days.

Col. Scott explained very fully the details of the arrangements contemplated; and a discussion ensued, in which Mr. Redgrave, R.A., Mr. Millais, R.A., Mr. Henry Cole, Mr. Fahy, Mr. Stevens, Professor Huxley Lewis, Mr. Godwin, Mr. Hyde Clarke, and others, took part. On the motion of Professor Westmacott, R.A., seconded by Mr. Carter Hall, it was resolved—

"That this meeting, after having had explained to it the object of the intended international exhibitions, so far as relates to the section of fine arts, desires cordially to co-operate in carrying into effect the plans proposed."

The Lord Chancellor made an interesting

address, in moving a vote of thanks to the chairman, which was carried unanimously.

We understand that Col. Scott has received a letter from Brussels, in which it is stated that a commission has been formed in Belgium, under the presidency of the Count of Flanders, for the purpose of organising a display of specimens of Belgian handicraft, to be included in the forthcoming International Exhibition to be held in London.

PROPOSED CATHEDRAL, BRITISH COLUMBIA.

STEPS are now being taken for the rebuilding of the cathedral at Victoria, the capital of British Columbia, which cathedral was recently destroyed by fire. The Bishop of Columbia, who is on a visit to England, is endeavouring to raise sufficient funds, in addition to what has already been obtained, in order to commence the cathedral at an early date. The Rev. Percival Ward, rector of Compton Valence, Dorset, a relative of the Bishop of Columbia, has promised to make a donation of the drawings of the proposed cathedral, which are now in course of preparation, by Mr. Ferrey, F.S.A. In plan the edifice, in its entirety, will consist of a nave 96 ft. by 28 ft., with span-roofed aisles, 25 ft. wide; choir, 42 ft. by 26 ft., having twelve stalls. The sacristy, 24 ft. by 16 ft., and the organ-chamber, will be on the north side, and the seats for the governor of the colony in an aisle on the south side of the choir.

Owing to the prevalence of heavy western gales there will be no doors to the west, but the principal entrance will be by a large south porch. The tower, which is intended to be of lofty proportions, will stand at the south-west angle of the nave. When complete the cathedral is intended to afford accommodation to about 1,200 persons. The style adopted will be transitional between Early English and Decorated, sufficiently modified to suit the requirements of the climate.

PROFESSOR SCOTT ON VAULTING, AT THE ROYAL ACADEMY.

LECTURE III.—concluded.*

I HAVE hitherto dwelt wholly upon vaulting which has none but what I have termed functional ribs;—that is to say, such as have a specific utility; as transverse ribs to mark the boundaries of the bays, and to strengthen the vault in its main span; diagonal ribs to fortify the angles of intersection; and wall-ribs to support the vaulting surfaces at their junction with the walls; and occasionally ridge ribs, though these more properly belong to the succeeding stage. The next stage in the history of vaulting is that in which other than merely functional ribs are made use of, intermediate ribs, in fact, to subdivide the spaces between those used during the previous period.

In square vaulting, one such additional rib is usually introduced in each space. In very oblong vaults two, and even three, were often introduced in the side spaces, though only one in the middle spaces. It is clear that this addition necessitates the use of ridge ribs, as, without them, the point at which the intermediate ribs meet at their apex would want abutment. So reasonable, indeed, was this motive, that we often find the ridge rib to have been omitted between the intermediate and wall ribs, because there its use ceases.

One thing which followed the use of these additional ribs was the curious serrated plan of the filling in. The oblique position of these ribs would, if the plan of the filling remained unaltered, cause the fillet or reveal of the rib nearly to vanish on one side, and to become very wide on the other. This led them to change the plan.

On looking at the top surface of vaulting where the ribs are visible, it is at once seen that this was also necessitated by a structural cause, as without it the filling in would not rest well upon the ribs.

No better specimen of this form of vaulting can be referred to than that of the Presbytery at Ely, built about 1240 to 1250, and the four bays immediately to the west of the crossing in Westminster Abbey, erected by Edward I. about 1280 to 1300. The latter is the more perfect, as having level ridges. The former, curiously enough, having ridges to the side cells which rise from the intersection towards the walls. I may mention that it is very common for vaulting with intermediate ribs to have ridges rising rapidly towards the central boss.

The use of these additional ribs became, from the latter part of the thirteenth century, rather the rule than the exception.

I may mention early specimens of it at Chester, both in the Chapter-house and in the Lady Chapel, the latter with raised ridges; but in each the addition being only in the side cells. The Chapter-house at Wells has the intermediate ribs added throughout to those of the more normal examples at Westminster and Salisbury giving its vaulting a peculiarly full and rich, though rather crowded, effect. Bosses are usually introduced at all points of meeting, adding greatly to the richness of the whole.

Though I have called these ribs non-functional such is the case only in a limited sense, for, though not necessary, they nevertheless do their work: they divide and strengthen the vaulting spaces, and tend to do away with the necessity (if such may be supposed to exist) for any great thickness of filling in. They form, in fact, a stone framework or centreing, with frequent supports on which the vaulting permanently rests. Nearly the whole of Exeter Cathedral is groined in this manner, and excellent specimens, though of rather late date, may be seen in the west and south walks of the cloisters of Westminster Abbey, and in the two vestibules through which the cloister is approached. These have the advantage of close proximity to the eye, which enables one to study them with facility.

The next step in the history of vaulting may be said to be wholly decorative in its motive.

It is the addition of short cross ribs between those already described, and arranged in patterns such as stars, &c., round the central bosses, adding much to the complexity and ornamental character of the vault, and making a further increase to the number of the bosses.

Wonderful skill is often evinced in the arrangement of these patterns, which, traversing the changing planes or surfaces of the vaulting, produce in the perspective an extraordinary diversity of effect. These ribs have received from Professor Willis the name of "Lierne," a term given by Philibert de l'Orme to the ridge-ribs (perhaps in common with these), but, as we are short of an English name for these cross-ribs, it comes in conveniently to our aid. The term means, I believe, in carpentry, a short joist or rail, serving as a tie to steady other timbers, which is very appropriate to its use (real or apparent) in vaulting.

We have a few excellent specimens of this class of vaulting in London; more particularly that of the St. Stephen's Crypt, and of a bay of the cloisters opposite the entrance to the chapter-house, both erected in the first half of the fourteenth century.

In the former both the intermediate ribs and the Lierne are very subservient in size to the main ribs; which gives an excellent effect: indeed, I know of no work more studious in design and detail than that piece of vaulting.

The vaulting of three bays of the eastern limb of Ely Cathedral, built by Alan de Walsingham at about the same period, is also of excellent design, as is that of the chancel of Nantwich Church, in Cheshire.

I am imitating the last-named to a certain extent in timber in the vaulting of the nave of Chester Cathedral, where, though the springers exist, the vaulting has never been completed.

Lierne are not placed at right angles to the surface of the vaulting, but in a vertical plane; perhaps from the facility it affords for setting them out on the ground plan.

We find the same cause regulating the geometrical system adopted for setting out the stones forming the bosses, which had also to contain a short piece of the impinging ribs. Professor Willis, in his admirable papers on vaulting, gives in minute detail the method adopted, showing that, to facilitate the operation, they made the upper surface of the boss-stone horizontal, to serve as a sort of drawing-board on which to draw the plan of the intersecting ribs. I have tested this in several instances. In the western part of the nave at Westminster, there being no outer thickness of stone vaulting, the boss-stones appear, and their surfaces are horizontal. On sweeping away the accumulation of dust and rubbish which covers them, I found, sure enough, the centre and side lines of all the ribs carefully drawn upon them.

In the lierne vaulting at Ely, though there has been an outer thickness of stonework, it was cleared away in the last century for the sake of lightness, so that the boss-stones, once concealed, are now visible. On clearing them from obstructions, I again found, as at Westminster, the

* See p. 240, ante.

lines of the ribs (here much more complex), carefully set out upon the top of the stones. Each of these little stone tables, in fact, has drawn out upon it the bit of the full-size plan of the vaulting which its surface would contain.

The lierne vaulting, though commencing as early as the first quarter of the fourteenth century, was so popular as to be continued throughout the remaining periods of Gothic architecture, used side by side, and often in union with other and later systems. The same was naturally the case with ordinary rib vaulting, so that in later times we have at least three systems used contemporaneously.

I know of no specimens of lierne vaulting more charming than what we see in the oriels of the halls of Crosby Hall and Eltham Palace, two sister works, unquestionably the work of the same architect, in the reign of Edward IV. They are of different plans. The one consists of five sides of an octagon, the other of a double square. The latter is on the system I have mentioned as having its central compartment raised like a square dome, to allow of the passage of the arch by which it opens into the hall. Both are carried out with the depressed arch belonging to their late period, and are treated with exquisite care and taste.

At Gloucester, in the choir, and Winchester, in the nave, this manner of vaulting assumes a very peculiar form; the side cells falling in at a low level, as what are called "*Welsh*" groins, leaving a width of barrel vault above, which is richly decorated by surface ribs and liernes.

That at Gloucester is a work of extraordinary magnificence. Its great speciality lies in its having two sets of diagonal ribs, the one on the ordinary system, the other comprising two bays each, and by their intersection defining the position of the *Welsh* groins. Thus the whole of the ordinary diagonal ribs, and half of the others, become mere ornamented mouldings on the surface of the barrel-vault, while to them is added a vast network of liernes, cutting it into an infinity of panels, whose angles are marked by a perfect array of carved bosses. The same was imitated at a later period in the lady-chapel.

In many cases, as in the western portals at Winchester, the upper portion of the groining assumes forms in which the lines of the true ribs seem almost forgotten. This is done to a very vicious extent in the choir at Wells. I may mention, as a late but beautiful example of this manner of vaulting, that of an exquisitely beautiful chamber adjoining the cloister at Windsor.

During this period two practices crept into use, to which it is not easy to assign precise dates, but which worked great changes in the art of vaulting. The one is the use, especially at first for diagonal ribs, of a curve drawn from two centres, which gradually brought down the aisles to excessively low proportions. The other practice was the use of portions of the same curve for several, or even all, of the ribs, either throughout their height, or at least for their lower part. The first-named custom was very natural in cases where the height of the vaults was limited by circumstances, as in St. Stephen's crypt. The diagonal ribs here were struck from three centres to the double rib, and in the next ribs from two to each single rib, and were also slightly segmented; that is to say, that they made an angle with the vertical line. They may be said to be a sort of imitation of the ellipse, as also is the case with the diagonals of the south and west cloister vaulting at Westminster.

The other practice, i.e., the repetition of the same curve for different ribs, is very curious and important in its results. It influenced in an extraordinary degree the plan of the vaulting at its intermediate heights. Professor Willis has called special attention to these half-height plans, as a matter of much importance to the effect.

If vaulting were carried out on perfect theoretical principles, and with the level ridge, these plans would be rectangular. The mere substitution of circular curves, unless made a little segmental, softens the angle of the square, while any modification of these curves produces its effect, one way or another, on this half-height plan. Professor Willis has illustrated this in a very interesting manner from the variations found in the cloisters at Norwich; a work generally of uniform design, but which, having been carried out at several different periods, the habits of the masons had undergone changes which produced very curious effects in this respect.

I may mention that where the ribs are of the same curve the ridges cannot be level; but that

the use of the two-centred curve enabled them to repeat the same curve for the springers, but slightly to change it above by varying the position of the centre, from which the upper part of the curve is struck, so as to make the ridges level where it was desired.

This tendency to the repetition of the same curve led to the development of a most remarkable variety in vaulting, which especially characterised its later history in this country. I allude to that extraordinary form known as *Fan* vaulting.

It is self-evident that if a number of ribs of equal curvature spring at equal angles from a single pillar, the plan of the vault at any level will be a circle or a portion of a circle; and that they may be bounded at the level of their apex, or at any other level, by a circular moulding forming the whole into a figure, which I have had occasion to mention as having been generated at a very different date and from another cause, in the Norman vaulting of the circular Chapter-house at Worcester: a figure which I have defined as a concave-sided conoid, and likened to the flower of a convolvulus.

Now, the vaulting of any space, if set out in square compartments, and having ribs of similar curvature and at equal distances, may be formed into a number of portions of this figure by merely drawing semicircles and quadrants, as the case may be, from apex to apex of the surrounding arches.

A remainder of the ordinary vaulting, with rising ridges, exists, however, above this extemporised fan, and the whole has to be dealt with artistically on a system suited to the new form.

The general idea of such treatment of a fan or conoid may be said to be parallel to that of a circular or rose window. The ribs are viewed as radiating mullions, and are made to multiply in number as the circle expands, and usually to terminate round the outer boundary with a series of tracery forms like the heads of two-light windows. A good rose-window of late date, if imagined to be elastic, and drawn out from its centre into a conoidal form, would make a good compartment of fan groining; or a groining fan compressed into a plane would make a good rose-window. The intersections between the fans are filled up in various ways; either by circles of somewhat similar design, which sometimes drop down in little pendent fans, like stalactites from the roof of a cavern; or with a number of circles fitted together; or by continuing the diagonal ribs to their intersection with the ridges, and filling in the triangular spaces with tracery.

It is not, however, essential that the compartments so dealt with should be square in plan. If oblong, the semicircles or quadrants are drawn from the apex of the narrower and lower arches; and from the same centres portions of circles are drawn from the apex of wider and higher arches, assuming the form of an additional or outer zone of a rose-window, and intersecting on the line of the cross ridges, and thus forming a portion out of a great fan. Or the roof may be described as being formed of very large fans intersecting one another. Such is the famous roof of King's College Chapel, at Cambridge, but the frustums of fans are there bisected by vast transverse ribs, which were, no doubt, required for strength owing to the great scale of the vaulting.

The earliest instance which is known of fan vaulting is in the cloisters at Gloucester, dating from the beginning of the fifteenth century; indeed, Professor Willis thinks the invention due to a school of masons there. It, contrary to the usual practice, is formed with simple arches, instead of four centres. Each fan has but the transverse and wall ribs at its springing. At the next stage it forms the diagonal, then two intermediate ribs, and finally four more on each side of the transverse rib, and ends in little two-light window-like heads, while the space above is filled with four large cusped arches, and as many pear-shaped figures.

The limits of my lecture will not permit me to follow up this part of my subject as its importance demands; and my means of producing illustrations (for which I have heartily to thank several zealous and talented gentlemen engaged in my office, as well as one of my sons) have exhausted themselves before this laborious phase is reached. I have also to thank Mr. Herbert Poole, of Westminster, and Mr. Kabey, the clerk of works at the Chapter-house, for some most elaborate measurements of portions of the groining of the Abbey, which, if ever I publish these lectures, I hope to do justice to, but which were

too much in detail for my present purpose. I must, therefore, content myself with referring to some of the most prominent examples.

I have already referred to the Gloucester cloisters and King's College Chapel.

I will next mention the central compartment or crossing of St. George's, Windsor, a most magnificent treatment of an oblong space. The aisles of the same chapel, with the smaller chapels adjoining, are charming examples, as are the aisles and small chapels of Henry VII's Chapel, and the cloisters of St. Stephen's, Westminster. Bath Abbey and Sherborne Minster are thus vaulted, and a whole century later, appearing long after date, comes the beautiful ceiling, or the staircase to the hall, at Christ Church, Oxford;—a square space groined on a central pillar.

In the construction of the vaulting of these later periods, we have a curious instance of the manner in which extremes meet. In the earliest specimens of vaulting, all the strength lies in the vaulting surface itself. As time went on, ribs were introduced, one after another, to strengthen and support it, till at length they amounted to a permanent framework of stone, centring on which the vaulting surface lay.

Now, at length, time has its revenge, and the extreme multiplication of ribs led to the loss of their use; the whole, or nearly the whole, being cut out of the same blocks with the panels; and thus the original system was reverted to; the vaulting surface becoming again the entire structure, and the ribs and panels simply out as ornaments out of its substance.

The most remarkable production of the fan system of vaulting is the gorgeous central roof of Henry VII's Chapel, a work in which ingenuity, perplexity, and beauty are united in the most wonderful manner which can be conceived.

Though it stands quite alone in point of intricacy and magnificence, it is not the first instance of the use of the peculiar system on which it is founded. How Fuller could have attributed its origin to the foreign studies of the King and Bishop Fox it is difficult to conceive; for, not only is fan groining itself a purely English invention, but the special system of this roof has, so far as I know, only English prototypes.

The earliest of these is the vaulting of the Divinity School, at Oxford, finished about 1480. This was subsequently imitated, though with the loss of its leading principle, in the choir of the cathedral (then the church of St. Frideswid's Convent in the same city), a work which, though popularly attributed to Wolsey, is probably of earlier date.

I have often looked in vain for the leading principle on which this wonderful work was designed. Its construction is plain enough; the difficulty is the ideal of its design. Like everything, however, which is founded on reason, its idea once perceived, it becomes perfectly simple, and one only wonders where the difficulty lay.

It was simply as follows:—First imagine, for argument's sake, that the architect had intended to divide his space into three spans—a wide and two narrow ones—like the Lady Chapel at Salisbury or the crypt of the Sainte Chapelle at Paris, supporting the vaulting on ranges of thin pillars. The setting out of the divisions was about the following. The whole span being divided into five parts, two were given to the width of a bay, one to the imaginary aisle, and three to the central span. The vaulting of the aisles, then, would be in oblongs of double their width *set lengthways* of the building, and the central span in oblongs half as long again as their width *set crossways* to the building.

Let us apply to each the rule I have already laid down for the fan vaulting of oblongs. Beginning with the ideal aisles, from the pillars and responds and centres draw the lower circles of the fans reaching the apex of the narrower arches, and the upper circles reaching the apex of the wider arch. This gives us an oblong fan vault in its most normal form.

Then do precisely the same with the wider or central span, and our space is covered with oblong fan vaulting of the most usual kind. Now, as the lower arch of the central span is identical with the higher arch of the side spans, it follows that the fans in the sides (or aisles) are continued and completed in the central vault, the lower arch of the small vault being also continued round to complete the design. The decoration of the smaller fans then is in two stages, and that of the larger ones in three; but, the design of both being continuous, the one is only an extension of the other.

Had the architect stopped here, no system of vaulting, on the fan principle, or space so divided, could be more systematic or more simple in its ideal.

He had no thought, however, of stopping at so common-place a stage, and his pillars were designed only to do their work on paper and then to be erased. The columns were omitted, and their places supplied by pendants; but, as such a roof could not stand for a moment, something must be done to supply the support which the pillars would have afforded.

This was effected by the introduction of strong transverse arches crossing the whole chapel, and springing much lower than the vaulting. These crossed the narrower spans, striking arbitrarily into their fans, and uniting themselves with the central vaulting.

In the Divinity schools these great arches show themselves throughout, as the supports of the otherwise helpless vault; but in Henry VII's chapel they are visible only in the side vaults, which are strutted up from them with strong tracery; but their upper portions penetrate the central vault, and become concealed from view.

The same system is carried into the apse, and that with the most surprising skill. The apse is supposed to be a portion of an entire octagon, with an aisle supported by eight small columns, of which two are lost by its conjunction with the straight part of the chapel. These columns being converted into pendants, the structural arches supply, as before described, the support demanded; but in this case they converge to the central part of the octagon.

The treatment of this point in detail cannot intelligibly be described in words. It is, perhaps, the most consummately skilled piece of designing to be found in the whole range of Mediaeval vaulting.

I have now completed my running, and all too rapid, sketch of the arched and vaulted systems of Mediaeval architecture, though purposely leaving to another occasion the subject of domes. The limits of three lectures have only sufficed to give a somewhat cursory glance at its salient points, leaving the treasures of its detail to be searched out by the zealous student.

No subject in the whole history of architecture is so remarkable, or would more richly repay the investigator. I commend it to your individual study, and will only add that our own country is more rich in the variety of its vaulting than any other, and that London is especially well supplied with objects of study, containing, as it does, excellent examples of nearly every variety of vaulting, from the stern severity of the work of King Edward the Confessor in the substructures of his monastic buildings at Westminster, to that gorgeous and astonishing work which I have just been describing, and of which we may boldly assert (whatever may be our individual preferences), that *the world does not contain its equal*.

BELFAST TOWN-HALL AND MUNICIPAL BUILDINGS.

THE works for the new municipal buildings in Belfast, Ireland, are being energetically carried forward; the courts will probably be finished in May, and the whole completed in little more than a year from the present time.

The plan comprises, besides council-chamber and corporation offices, a recorder's court, custody and summons courts for magistrates, and the necessary offices in connexion with them; prisoners' cells and charge-office; police-barrack for sixty-four men, with stables, district stores, &c.; fire-brigade station for six engines, with superintendent's house and stables.

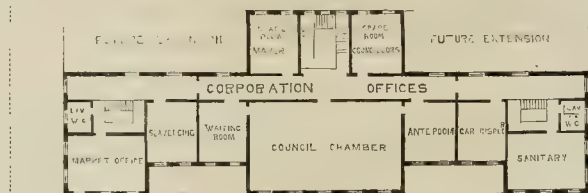
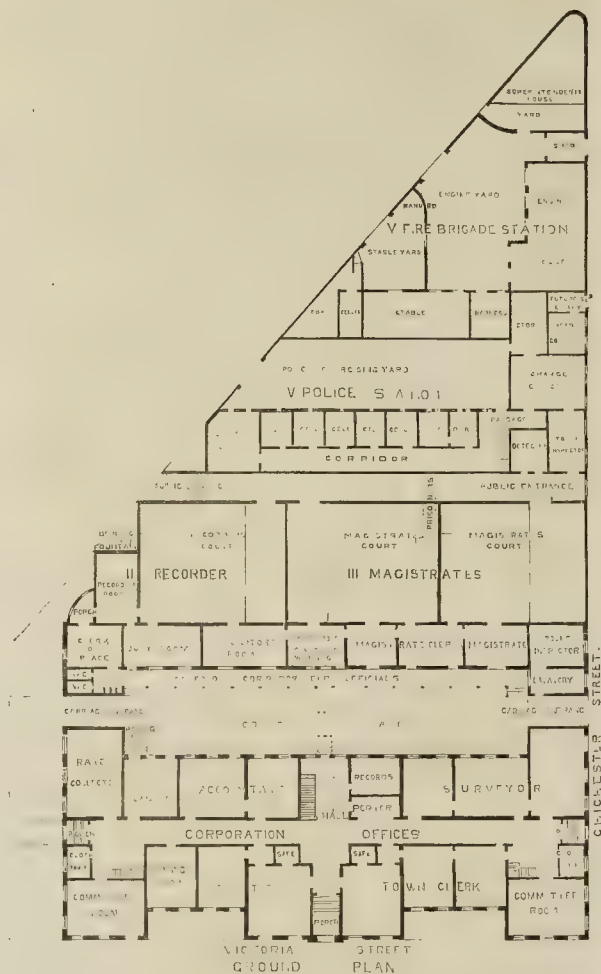
The material is perforated brick, from Ravenhill; and the freestone dressings are of red stone, from Dumfries.

The site is adjacent to the proposed Central Railway Station, and at the junction of Victoria-street and Chichester-street, from which point the view is taken.

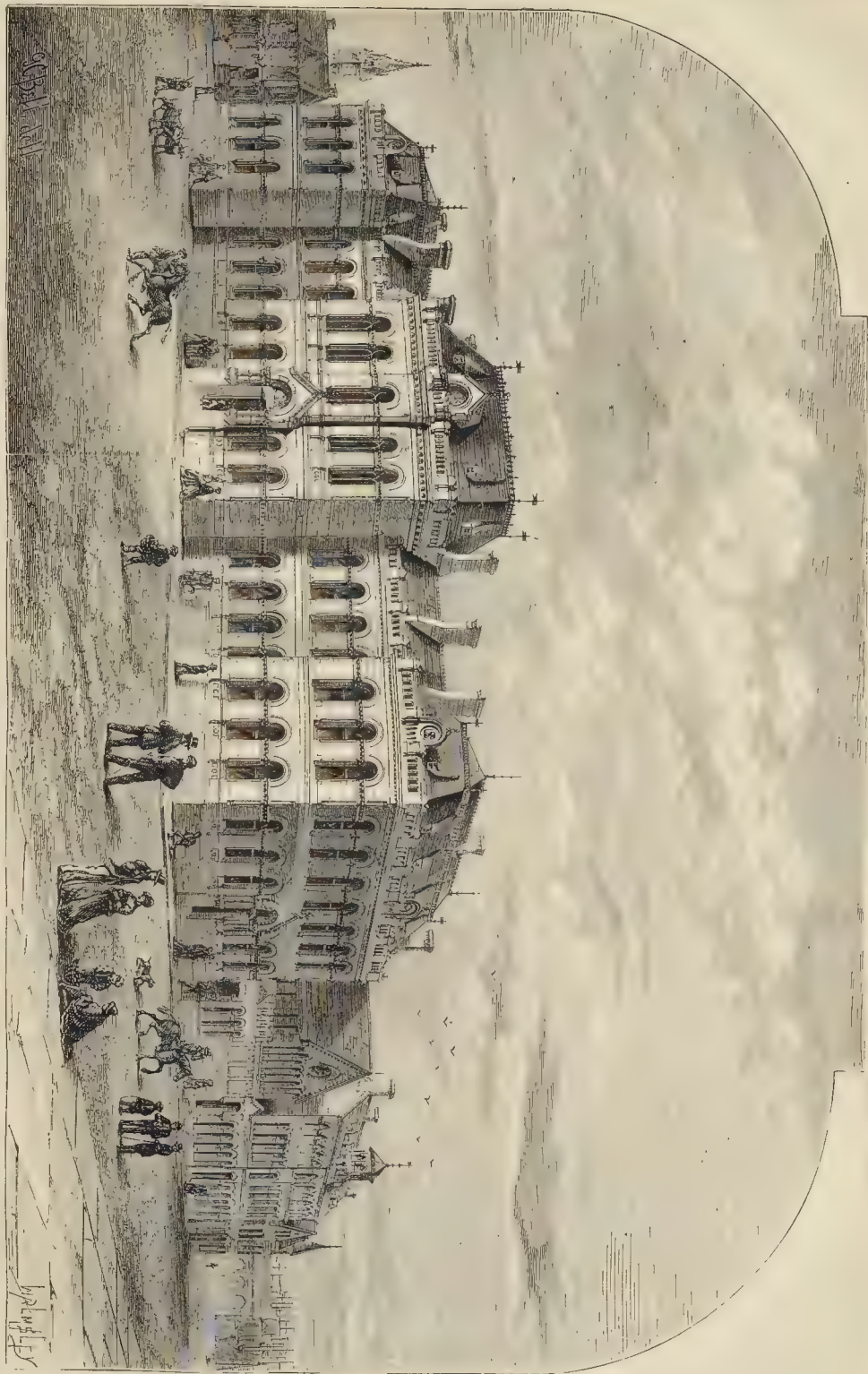
The design is that selected in the competition of January, 1869, but our view shows the additional building required subsequently to the contract plans to form the central police-barrack of the district, and a tower for the fire alarm-bell.

The contract was taken at 16,000*l.*, by Mr. James Henry. This was the sum stipulated in the instructions to competing architects, but the additional building will most likely increase the total outlay to 20,000*l.*

The architect is Mr. Anthony Thomas Jackson, of Belfast.



MUNICIPAL BUILDINGS, BELFAST, IRELAND.
Plan.



BELFAST TOWN HALL.—MR. A. T. JACKSON, ARCHITECT.

PICTURESQUE ARCHITECTURE.



Design for a Villa in the Old English Wooden Style.



Design for a Bath House and Summer Room.

[See p. 277, ante.]

RAILWAY MATTERS.

A DEPUTATION of tradesmen and other inhabitants of White Horse-street, Ratcliffe, have waited on Mr. Paget to complain of the Great Eastern Railway Company, which had completely blocked up the northern end of the street, a few feet from the Commercial-road. This had continued for upwards of five weeks, to the serious detriment of trade. The street was the great outlet for vans, wagons, carts, and other vehicles from the numerous coal-wharfs and other water-side premises to the northern parts of the metropolis, and all that traffic was stopped. A tradesman said a bridge, which continued the Blackwall line of railway over the street had exhibited symptoms of decay, and the buttresses had given way. What he and his brother tradesmen complained of was, the delay in pushing the works forward. Mr. Paget said he could not interfere until the case was regularly brought before him by the board of works of the district.

The bridge over the Dee, forming part of the viaduct which supports the Chester and Holyhead line of rails, is about to be entirely reconstructed by the London and North-Western Railway Company; the old wooden fabric being replaced by a substantial one of iron. A foot-path along one side of the bridge open to the public has been suggested, but the company so far reply that the suggestion comes late, as their plans are completed; but the effort to convince them is not to be given up yet.

Mr. John Swan, of Edinburgh, and Mr. Macpherson, goods manager of the North British railway, have submitted to Mr. Tennent (secretary of the Cattle Transit Committee appointed by the Board of Trade) plans of permanent watering-troughs to be placed at special railway sidings where unlimited supplies of water can be secured. These sidings, which may be specially arranged for out-of-the-way places, will cost comparatively little money, while the alteration required in the trucks, by which a top bar will be temporarily dropped to allow the animals to put their heads into the raised troughs, is of the most trifling character. As animals, unlike human beings, will only drink when they are thirsty, these trough-sidings might be conveniently placed about 200 miles apart.

THE RELATION OF THE STATE TO SCIENCE.

LAST week a conference was held at the rooms of the Society of Arts, to discuss the question of the "Relation of the State to Science, and the Necessity for Official Inquiry into the Subject by Royal Commission." Lord Henry Lennox, M.P., presided, and the following resolution was adopted:—

"That the conference at the Society of Arts desires emphatically to affirm the conclusion of the British Association for the Advancement of Science, that a royal commission to inquire into the relations of the State to science is very desirable, and to recommend that the scope of the inquiry be made as wide as possible."

THE ENCLOSURE OF BRISTOL EXCHANGE QUADRANGLE.

At a recent special meeting of the town council, the Corn Exchange Committee presented a report and recommended the carrying out of a plan prepared by Mr. E. M. Barry, architect, for covering the quadrangle of the exchange, at a cost of about 4,000l. By this plan, according to Mr. Barry's report,—

"The central area is enlarged to 55 ft. by 55 ft., from 50 ft. by 50 ft., as at present, which would add greatly to its convenience and architectural effect. To obtain this advantage, and to avoid the danger of darkening the ground-floor corridors, the latter are somewhat reduced in width by setting back the columns, though still of convenient and handsome dimensions. Galleries are placed on the upper floor, and the whole internal area, including the galleries, is covered with a roof, giving a total height of 57 ft. to the lantern. In order to avoid the objections to a roof of iron and glass over galleries filled with people, this mode of construction is confined to the central area, and the roofs over the galleries are of an architectural character, with a double-glazed skylight in the middle of each bay. In consequence of the doubt before explained of the adequacy of the present columns to support such a construction, they are raised to the upper floor, and their place taken on the ground-floor by new columns, with an appropriate entablature of the Doric order. This order, being of a stronger character than the Corinthian, is better calculated to support the weight of the galleries, and is architecturally suitable for the lower of two orders. The galleries might be level, or fitted with raised seats; in the latter case, they would provide sitting accommoda-

tion for about 800 persons; and the hall, constructed according to this design, would be suitable for many public purposes, such as meetings, concerts, &c."

The Mayor moved, and Alderman Ford seconded, the adoption of the report. Alderman Green moved as an amendment,—

"That to cover the interior of the exchange, and alter it in the way proposed, may impair, perhaps destroy, the beauty of one of the finest public buildings, erected at a large cost by the merchants and traders of Bristol, from the designs of an architect of great skill and taste."

Alderman Robinson seconded the amendment, but after considerable discussion the recommendation of the committee was adopted without a division.

TURNMILL STREET: ARCHES UNDER PUBLIC WAYS.

SIR,—Additional arches, invert arches, front enclosure, and transverse walls are being carried up to the existing arches under the public way in Turnmill-street, by Messrs. Peto & Betts, who repudiate any liabilities under section 9 and 25 of the Metropolitan Building Act, 1855, although called upon by the district surveyor of Clerkenwell to return the proper and necessary notices in respect of such works, and, in defence, refer to the solicitors of the Metropolitan Railway.

What they are doing is in anticipation of further subsidence. The roadway has gone down 2 ft. The Metropolitan Board might perhaps take steps. There is evidence on the part of Railway Companies a determination to resist all Common Law. A SURVEYOR.

"FEVER DENS."

SIR,—We have heard lately a great deal about "Fever dens," but it appears to me that the proper method is not taken to ventilate them.

I have had notice (where fever has been in the house), to have all the sashes made to open at top. The same are not hung at present, and many are not in small and old houses at this present time. This is all very well if you could only persuade the tenants to keep them open, but the poor generally are so averse to fresh air that they frequently paste and paper up the sashes in cold weather.

I would urge that an iron air-brick or ventilator be let into the chimney breast, close to the ceiling, the cutting made upwards at a very sharp angle into the flue: this would carry off the foul air, which is very bad in many cases where eating and sleeping are carried on in the same rooms.

The ventilator should always be kept open. If there were one in every poor person's living and sleeping room, I think we should not have so many cases of fever: they are bred by the foul air breathed over and over again. Care should be taken that the tenants do not paper up the ventilator. J. D.

* How many hundreds of times has this been said? And yet it is necessary again to say it.

THE LATE HULL THEATRE.

In the Westminster County Court, last week, before Mr. F. Bailey, Judge, the case of Jennings v. Chatterton was heard. The plaintiff is a plasterer, carrying on business at 40, Charlotte-street, Great Portland-street, and used Frederick Balair Chatterton, the present lessee of Drury-lane Theatre, to recover the sum of 27s. 8s. 6d., for alleged extras in finishing the late Hull Theatre.

Mr. Loxton appeared for the plaintiff; Mr. Cotnam for defendant.

From the evidence of the plaintiff, it appeared that plaintiff had contracted to do the plaster-work at the theatre for 150l.; but upon going down to Hull he found that the building was not the same as had been represented on the plan furnished to him. The items he enumerated as extras were,—having to seek for scaffolding, 17s. 10s.; for the architect's and friends of the reveal and top of main entrance-door, placing a key-stone and altering two windows, instead of doors (as in the plan); making niches of two places shown as windows; adding a portico and four Doric columns to the original plan, and carrying down six Doric pilasters lower than on plan. He mentioned these extras to Mr. Smith, who said, "Very well, get them done, and I will see you righted." He cleared the rubbish away at Mr. Chatterton's desire, and repaired a column which had been injured during an election meeting, which he also charged extra. The extras altogether amounted to 33l. 7s., but 61. 18s. 7d. had been admitted.

In cross-examination, plaintiff said that about 30 ft. of cornice work shown in his plan he did not do, in consequence of the portico, but he did other work to compensate.

The defence was, that the contract was taken for 150l., and the only extras which could be admitted were 4l. for the Doric columns and 11. 18s. 8d., which remained after

payment of 169l. 7s.; that although every little thing had been magnified, and the extra, not the slightest abatement had been made; and that the work was, in fact, carried out on the give-and-take principle.

Mr. Jephry Robinson, of Hull, who built the theatre, compared plaintiff's plan with the one from which the theatre was erected, and said that they both agreed, and that the theatre was not 2 ft. 2 in. higher than was represented on plaintiff's plan. The bills were paid, and he heard nothing of all these extras until about a year after the job was finished, about the time the theatre was burnt down. Mr. Smith was architect, and was to decide upon any extras and give orders. When the contract was taken, witness pointed out that the two side-doors were turned into niches. Plaintiff had no business to put a key-stone. 61. 18s. 8d. had been paid into court.

Frederick George Smith said he was borough surveyor at Hull, and was architect of this theatre. The plan, so far as heights were concerned, corresponded with the building. In November, 1868, he received an account of 122. 3s. 6d. for extras, from which he knocked off 17s. 10s., and certified for the balance, 111. 5s. 8d., which was paid as a settlement of the account. That was the only account for extras which he had seen until the morning of the trial.

His Honour said the verdict must be for defendant. It seemed clear that Mr. Smith was to decide upon anything you were entitled to for extras, and plaintiff seemed to have acted upon this, and sent in his claim accordingly, which was settled.

Judgment for defendant, and costs allowed.

LATCH-KEYS WITH SAFETY.

SIR,—The public have been recently cautioned against thieves with skeleton latch-keys, who lately, on a Sunday evening, visited some houses in Bloomsbury. I have devised a plan by which I think such keys might be rendered useless, while the inhabitants would still be able to let themselves into their houses. My suggestion is, that the chain, with which most doors are provided, should be more frequently used to supplement the latch-key. At present, and that two of the links near the end and attached to the wall, or door-post, should be separated, and be connected again by means of a good padlock of which the inhabitants of the house can carry one in their pocket. Still, that one of those padlocks should be used which are opened by being turned round so as to spell a particular word, to unlock which, therefore, no metal key would be of any use. A. T. F.

DANGERS OF KITCHEN BOILERS.

SIR,—I have just read a letter under the above head in your paper. My kitchen boiler is supplied by a cold-water cistern in the roof of my house in the country, say about 25 ft. above the boiler, whence a pipe rises to an iron hot-water cistern about 2 ft. below the level of the cold-water cistern. An escape-pipe issues from the hot-water cistern through the roof, this got stopped up by a deposit of time, the effect of which was that one of the lead pipes burst, and wetted the ceiling of the room below to some extent. There seems to me considerable safety in the lead pipe giving way easily before the pressure had accumulated sufficiently to damage the boiler or cause an explosion. In frost, I am obliged to prevent the water going down into the boiler by a stop cock, as soon as I find the water is frozen in the pipes, which, however, may often be prevented by hay-bands round the pipes. F. J. M.

THE PROJECTED CHANNEL RAILWAY.

SIR,—In the concluding sentences of your article of last issue upon our scheme for crossing the English Channel by a railway, you observe that "it is, however, unnecessary to enter into the details of a discussion, because there is one simple consideration, which, in my opinion, is wholly conclusive on the subject: 'you say, 'let us admit Mr. Bateman could complete his tube, &c., &c., and that the miners come out into open air on French territory. Still there remains the undeniable fact that the scale of this enormous toll lies, at every moment, and will be, at every moment, at the mercy of a few barrels of gunpowder.'"

It is no happens that there is some experience of torpedoes constructed by Governments on the largest scale and of the most powerful explosives.

It is, perhaps, not generally known that the largest mine ever used by Governments for the protection of harbours, &c., is wholly ineffective in deep water. Deep water is our difficulty in the construction of the Channel railway,—in turn, deep water is its safeguard; for it cannot be approached, and is practically beyond the reach of destructive agents.

The most destructive torpedoes may have injurious effects upon the thin shell of a vessel in a depth of water not exceeding 30 ft., provided the mine should explode within a few yards of the hull of the ship. The charge of such a torpedo, confined in a structure of iron casing, must be over one ton of rifle powder. At three times that depth, or about 90 ft. of water, the charge must be twenty-seven times that at 30 ft. to produce similar effects; at 120 ft., it would be sixty-four times that at 30 ft., and so on. This law was determined by experiment in various countries, and in England notably by Field-Marshal Sir John Burgoyne.

But even such enormous charges, involving the use of scores of tons of the strongest powder, would have a very limited range at the bottom of the Channel. Unless such a charge were placed in close proximity to the tube at which it was intended to explode, no effect would be produced, for the object to be destroyed must come within the cone of action of the torpedo. The proper position of such large masses of explosives is also a most difficult matter. If mismanaged, not one-tenth of the charge will be fired, and the rest will be blown away unconsumed.

It is easy to see why the above law of resistance holds good. In order to displace one cubic yard of water near the mine, precisely the same volume of water must be displaced on the surface within the radius of action. The whole mass of water above the mine, represented by the inverted cone, must be set in motion. The volume of water to be lifted by the mine increases as the third power of the height of the cone or depth of water; consequently, at double, treble, &c., the depth, the weight of water to be set in motion would increase eight, twenty-seven, sixty-four, &c., fold, and the power required, represented by the charge, would be correspondingly eight,

twenty-seven, sixty-four, &c., times that at 30 ft. to produce similar effects.

Your 'few barrels of gunpowder' would evidently be very ineffective and harmless; but, assuming the proper quantity to possess any element of mischief, may we not ask how you would propose to sink such immense charges from the surface of the Channel to within a few fathoms of the iron tube? Could any person tell its precise position in the open Channel within 100 yards; or, if he could, could he tell how many yards a gentle current would carry his 'barrels' right or left of the tube whilst they were sinking 30 or 40 yards through water? Do not you think that to lodge such a mine would require the ingenuity of the Royal Engineers, plenty of time, and no one to interfere with their grand operations?

It is only in shallow water, within half a mile or so of each shore, within the breakwaters and under any range of guns, that such an attempt might have a chance of success.

And, even assuming for the sake of argument, that a hostile power had, by greater ingenuity than is at present at our command, somehow succeeded in the destruction of the railway, do not you think that England and France—the assumed joint proprietors of that railway—are powerful enough to make the aggressors, or any combination of them, pay for the damage they had done? J. F. BURNHAM.

AN ARCHITECT'S ACCOUNT WANTING DETAILS.

A SOMEWHAT important case, it being the first of the kind heard under the New Bankruptcy Act, has been decided by the registrar of the Southampton County Court. It seemed that Messrs. Farmer & Guillemaud, of Southampton, architects, were employed by Mr. John Gater, of West End, to superintend the erection of some buildings for him, Mr. Togood being the builder. On the account amounting to £1,000, Mr. Gater rendered, Mr. Gater disputed it, one of the grounds being that the last builder's certificate should not have been given, and ultimately Messrs. Farmer & Guillemaud were ordered to order summons under the Bankruptcy Act, 1869.

Mr. F. Leigh appeared to show cause against the rule, contending that the proceedings were taken to annoy, and the parties were not bona fide creditors, and that there was consequently no foundation for the court's jurisdiction. The particulars delivered should be of such a character as to show the debtor what the claim was for, and whether it was a bona fide claim above all.

Mr. Kilby, who supported the summons, said Mr. Gater knew perfectly well to what the account referred, he having had full detailed particulars.

The Registrar considered he had nothing to do with any particulars which had been furnished before, but only those annexed to the summons. He should take no evidence. Under the Act Messrs. Farmer & Guillemaud were bound in the particulars to give reasonable and convenient certainty as to dates and all other matters. On reading the particulars he saw they set forth services rendered, and the debtors' account stated account, while the affidavit of the debtor said he did not owe the sum of money upon which it was sought to make him a bankrupt; in fact, he said he did not owe Messrs. Farmer & Guillemaud. There was no date of the 'account stated,' no amount named for the services or materials, but they were all lumped together in one sum, and he did not, therefore, consider the particulars of demand were of any expressly reasonable and convenient certainty as to dates," and therefore he should rule that they were insufficient. Reading the clause of the Act of Parliament which provides that the property of a debtor must be equally divided amongst his creditors, and looking at the affidavit filed by the plaintiffs, and at that filed by the defendant, he did not think these proceedings were taken for the purpose intended by the Act, the debt being so completely in dispute. Even supposing the particulars annexed had been sufficient, he certainly should not have made an order. The summons must be dismissed, with costs.

CHURCH-BUILDING NEWS.

Brick-kirk.—The new parish church at Bridekirk has been consecrated by the Bishop of Carlisle. The plans were prepared by Messrs. Cory & Ferguson, of the old church. The site is one closely adjoining the old church. The principal details of the old structure have been preserved. The old chancel arch has been re-used in the organ-chamber. The present south doorway was the original south entrance of the church. The north doorway has been rebuilt in the present south transept; and the old vestry door now gives access to the belfry stairs. The general features of the edifice partake of Norman character. The plan is cruciform, with a chancel, north and south transepts, and a nave. The square tower rising from the junction of the four parts is groined below, and has a large bell-loft filled by a peal of six bells. The upper part of the tower has eight windows—two on each side, and is terminated by a flat parapet. The church and tower are built of yellow freestone from quarries at Tallentire and Aspatir; and the interior of the building is lined with brick supplied by Mr. Lucock, of Broughton Moor. The original plan of the architects was to show the tower roof, to add to the length of the nave, and to construct the inside walls and arches of dressed stone. But they had to substitute brick for the internal lining, and to trust for effect, more to the massiveness of the parts than to the elaboration of details. The chancel, like the tower, has been groined with brick, having stone ribs. The roofs of the nave and transepts are semicircular, and lined with oak boarding. There are stained memorial windows at the eastern and western ends, and in the south transept of

the church. The seats in the nave and transepts are open, and made of pitch pine. The seats in the chancel, built at the expense of the lay rectors, are of oak. The reredos is of red terra cotta, executed by Messrs. Blashfield, of Stamford, from a design of Messrs. Cory & Ferguson. The communion railing was carved by Mr. Pickering, of Carlisle, by whom also the foliage and decorations of the capitals and the corbels supporting the groinings were wrought. The organ, which was built by Messrs. Holt, of Edinburgh, and cost 200 guineas, is placed near the pulpit in the north transept. The church is warmed by hot-water pipes of peculiar construction, whereby the surface of the pipes forms the floor, and much less heat is lost than when the pipes are laid in a trench with a grating above. The masonry of the church is the work of Mr. Henry Graves, of Aspatia, builder; the joiners' work has been done by Mr. Henry Dent, of Cokermonth; the plumbing, by Messrs. Thomson & Sons, of Carlisle; the painting, by Messrs. Slee & Morgan, of Carlisle; and the heating apparatus was supplied by Mr. Clarke, of the same place. The cost of the church, which is capable of seating 300 persons, has been about 4,500l.

Webbheath.—A new church, dedicated to St. Philip, at Webbheath, in the parish of Sardebidge, Worcestershire, has been consecrated. The edifice, which has been erected through the liberality of the late Baroness Windsor, is from the designs of Mr. Freedy, of London, architect, and is in the Early Decorated style of Gothic. The ground plan comprises a nave 60 ft. long by 22 ft. wide; chancel, 28 ft. long by 18 ft. wide; a vestry on the north side, and porch on the south-west. The accommodation is for 200 adults and children. There is a stone bell gable over the chancel arch. A suitable dwarf wall and an iron railing with entrance-gates enclose the site on three sides. The materials used are the local stone from the Hewell quarries, with Bath stone-dressings, bands of Red Finsial stone being introduced on the exterior, as also on the interior facing, which is of stone throughout. The roofs, which are open-timbered, are of red deal and pitch pine, boarded and covered with Staffordshire tiles. The font is of Painswick stone, with polished shafts of Irish green marble, and has an open oak cover. The pulpit and stairs on the north side of the nave are of English oak, with carved panels. The prayer-desk, chancel seats, altar table and rails, are of the same material, and the benches in the nave of stained deal. The windows are glazed with plain cathedral glass, of two tints of green, with the exception of the east window, which is filled with stained glass designed and executed by the architect, and contains the following subjects:—The centre light the Crucifixion, having on either side types of the same, namely, setting up the Brazen Serpent, and Abraham offering up Isaac. In the tracery over the centre light is Our Lord in Session in His Mediatorial Office, with angels in the side tracery. The passage spaces in the nave and chancel, and the porch floor, are laid with Godwin's tiles. The church is heated on the hot-water system by Mr. Skinner, of Bristol. The carving is the work of Mr. Boulton, of Cheltenham. Messrs. McCann & Eversall were the contractors; and Mr. Smith, the clerk of works. A reredos, constructed for the most part of Carthaginian porphyrites brought from Rome by the late Lord Plymouth, is in course of execution by Messrs. Burke, of London. The design consists of the material arranged in bands and patterns. There is a central cross in white marble flanked on either side by panels containing angels bearing musical instruments, executed in glass mosaics on gold backgrounds. In the side compartments are the Alpha and Omega, and the sacred monograms, inscribed in coloured cements on white alabaster.

Colbury (New Forest).—A new church at Colbury has been consecrated. Mr. and Miss Ibbotson called in Mr. Ferrey as architect. The edifice has cost between 2,000l. and 3,000l. It is in the Decorated style of architecture, and consists of a nave and chancel, with a vestry and north porch. Over the western entrance is a bell turret, about 60 ft. high, the frame being of oak, with ornamental cusplings in the upper part, and the covering cleft oak shingle. The walls are of brick and field flint, the quoins and dressings, both within and without, being of Corsham stone. The nave has an open-timbered roof, filled in at the back of the rafters with V-jointed boarding. The roof of the chancel is polygonal, with moulded ribs. The outer

covering is of local red tile, with banded courses. The internal walls up to the window sills are lined with Maw's tiles, supplied by Messrs. Simpson & Sons, of London. The encaustic tile pavement of the sanctuary is also of Maw's manufacture, and so is the reredos, though here mosaic has been introduced for the various sacred symbols and emblems. The pulpit, at the south of the chancel arch, is of stone, having panels filled in with mosaics. Near the northern porch is a stone font, the upper portion, bearing the typical flowers of the style in which the church is built, being supported by a series of arches, the pillars of which are of coloured stone. The east window has been filled with stained glass as a memorial of the late Mrs. Ibbotson. The three principal lights contain the Resurrection, the raising of Lazarus, and the raising of Jairus's daughter, the geometrical portions of the head of the window being filled with a suitable design. Accommodation is provided for about 200 persons, the seating being stained deal benches, and nearly the whole cost has been met by Mr. and Miss Ibbotson. The builders were Messrs. Goddard & Son, of Farnham, who have also nearly completed the parsonage-house. Mr. Charles Stapleton was clerk of the works. The grounds have been laid out by Messrs. Horsman & Sons, nurseryman, Longdown.

Barcheston.—The ancient church here having fallen into decay, has just been restored from the designs of Mr. Ewan Christian, of London. In removing the old plaster, at the east end of the north aisle, was discovered on old Norman door, blocked up; this has been retained. The church was closed on Quinquagesima Sunday, 1869, and the work begun by Mr. A. Groves, of Milton, near Chipping-Norton, whose contract was accepted.

Romaldsbirk.—The church restoration being nearly completed, service has been resumed in the edifice. The works have been carried out, from the plans of Mr. Haswell, architect, North Shields. By means of outside drainage, the damp which formerly affected the walls has been dispelled; and the removal of the gallery has made the church lighter, as well as done away with a structure that deformed the interior of the building. The large west window, formerly obscured by the gallery, is now revealed in its integrity. The high-backed pews remain.

Montacute.—The ancient little church at Montacute, near Yeovil, which has for a long time past been badly out of repair, is to be thoroughly restored and renovated. It is the parish church, and is dedicated to St. Katherine. The recent examination has discovered in it relics of Norman architecture. The plan for the work of restoration was prepared by Mr. Hall, architect, London, who directed the pulling down and rebuilding (in the local "Ham stone") of the nave and transepts, the substitution of new open benches for the antiquated high pews, &c. The tower will remain as it is, but the rebuilding of the other portions of the edifice is absolutely necessary. The plan also provides for the repainting and bringing in view of an old window at the western end of the church, which has hitherto been partially blocked up and obscured by the ringing-loft. The transepts belong to the Phillips family, of Montacute House, who will accordingly bear the expense of the restoration to that extent. Tenders for carrying out the work were invited, and the contract has been entered into. The contractor is Mr. James Pudden, of West Coker, the amount of whose tender was 917l. There were eight other tenders, the highest of which was 700l. above the one accepted. The greater part of the money required has been subscribed.

Runhall (Norfolk).—The church of this parish has been re-opened after having undergone a repair and partial restoration. It has of late years presented an appearance of desolation;—its chancel destroyed and gone; its window tracery patched with wood and red brick; its modern porch unsightly and dilapidated; its walls thrust out of the perpendicular; its east gable cracked by the pressure of an ill-constructed roof, erected some seventy years ago, which has of late been liable at any time to fall in from decay; and its tower, with its floors gone, and its sounding windows in ruin. The repair and partial restoration which have been effected are due to the very liberal response which has been made in the neighbourhood to the appeal of the vicar, the Rev. B. B. Slipper. The Rev. J. Barham Johnson, rector of Welborne, has given attention and trouble to the work while

in progress. The architect has expended the very limited funds which were available for the restoration in an economical manner. The form of the original roof could be gathered from a curved brace and the impression of a putline, and it would have been most desirable to restore it, thus repeating the local type of broad-naved churches found at Elsing, North Tuddenham, and elsewhere; but to do so would have involved pulling down and reconstructing the north wall, with its doorway and windows; therefore the buttresses have been rebuilt in cement, the walls have been repaired, and the simplest possible roof, supported by posts from the ground, and stiffened by longitudinal and transverse curved braces, has been made to relieve the side walls from pressure, and to give to the square-looking room of late years the appearance of a church, with nave and side aisles, a treatment which is found in the ancient church of Winterton, in this county. The restoration of the chancel being found impracticable, a raised dais, paved with tiles, for the holy table, with singers' seats on either side, has been placed at the east end. The remaining space has been provided with open benches of deal, and the tower has been made available for a vestry. The porch, the stone and glass of the windows, and the tower sounding windows, have been patched up as much as the funds would admit of. The contract was carried out by Mr. Hubbard, of East Dereham. The architect was Mr. Edward J. Tarver, of London. During the progress of the work, crocketed fragments of the ogee-headed niche in the east wall and other remains were discovered.

SCHOOL-BUILDING NEWS.

Tamworth.—A new day-school, which will accommodate more than 300 children, has just been erected by the Roman Catholics of this town. Mr. C. Clarkson was the builder, the cost being 400l.

Southampton.—New Roman Catholic Schools have been opened in Bugle-street. Mr. R. Critchlow was the architect. The cost is about 750l. There are two rooms, the one on the ground-floor, 35 ft. by 20 ft., and the other upstairs, 40 ft. by 20 ft.; each is 15 ft. in height, with a class-room in the rear, 18 ft. by 12 ft. The upper room is lighted by five, and the lower by four two-light windows, which extend to within 12 in. of the ceiling, the better to assist in the ventilation, which is aided by a series of Boyle's ventilators (recommended for excluding downward draught), fixed in the outer walls. The style is after the domestic architecture of the sixteenth century, adapted to harmonise with several of the old buildings for which St. Michael's-square is noted. The front is entirely of brick, the roof line being broken by three gables with ornamental verge boards. Mr. Laver is the builder.

Lincoln.—Four memorial stones of the new Sunday schools in Clasket-gate have been laid. These schools, when completed, will be the largest in the city. The main building comprises two rooms, 70 ft. by 34 ft., affording accommodation for upwards of 850 children, reckoning 6 superficial feet per child. Attached are four class-rooms or retiring-rooms, raising the accommodation to nearly 1,000 children. By glass sliding doors it is proposed to separate part of both rooms off to form retiring-rooms for classes on the Sunday; when the rooms are used for public meetings the doors will be thrown back, and the whole space will form one room. The estimated expense, including lighting and fitting, &c., is upwards of 1,200l. The character of the building is to be plain and substantial, to correspond with the adjoining chapel.

St. Silas, Islington.—The new schools, which have been erected in Vittoria-place, Barnsbury-road, have been formally opened. They have been built in accordance with the regulations of the Council on Education, and receive the maximum Government grant of 417l., and a grant of 250l. from the National Society, independent of great assistance from the Bishop of London's Fund. The building, which is in three stories, is intended to accommodate a total number of 417 children; the lower story, comprising a room of 54 ft. by 18 ft., and a class-room, is appropriated to the infant school; the middle story, containing the same accommodation, to the boys; and the upper floor, consisting of a room 43 ft. by 18 ft., and a class-room, is devoted to the girls. There are separate entrances, and two playgrounds. Messrs. Dove, Brothers, were the builders; Mr.

Edwin Clare was the architect. The amount of the contract for the works, inclusive of walls to the playgrounds, was £1,543*l.*, and the actual expenditure was kept within this limit.

STAINED GLASS.

St. James's, Marylebone.—This church is in course of restoration, and the Rev. Sir Lionel Darell, bart., of Fretherne Court, Gloucestershire, has commissioned Mr. George Rogers to execute six stained windows, containing life-size figures of St. James, St. John the Divine, St. Peter, the Virgin Mary, Moses, and Elias. These windows are intended to be dedicated by Sir Lionel Darell to the memory of his late sister, Emily Mary, wife of the Rev. A. B. Lechmere, of Hanley Castle, and other branches of his family.

Rinwood Church.—Two windows, executed by Messrs. Ward & Hughes, of London, are being placed in the lancet lights of the chancel, to the memory of the late vicar, the Rev. R. Holmes Tuck. The subjects are full-sized figures of St. Peter and St. Paul, the patron saints of the church. In a small panel over the figure of St. Peter is a design illustrating the walking on the water, while the group in the corresponding window illustrates the conversion of St. Paul. The cost of these windows has been defrayed by local subscriptions.

St. Patrick's, Brighton.—This church, in Cambridge-road, has just received an addition in the shape of a stained-glass window, presented by members of the congregation to the incumbent, the Rev. J. O'Brien, D.D., and Mrs. O'Brien. The design is of two-fold character, the lower portions of the five principal lights representing Christ in his humiliation, and the upper portions, Christ in glory. The lower part presents a connected scene of the Nativity; Virgin and Child in the manger of Bethlehem, occupying the centre, with the star of Bethlehem above; on one side are the shepherds in attitudes of adoration, and on the other the Magi presenting their gifts. Above, the centre is occupied by a representation of Our Lord enthroned, surrounded by the aureole, and carrying the sphere surmounted by a cross. On the right hand of the throne appear St. Peter, carrying the keys, and St. John the Baptist, with "raiment of camel's hair;" on the left are St. Paul, bearing "the sword of the spirit," and St. Patrick with the type of evil, the serpent, beneath his feet. The tracery of the upper part is filled in with angels (two of them playing musical instruments), the emblem of the lamb and flag, and chromatic devices. The figures are life-size.

Emmott Church.—A stained-glass window, the work of Mr. Wailes, has just been placed in the western end of the tower of this church, in memory of the late Mr. Simson, for many years a resident in the parish. The window is Perpendicular in style, 18 ft. high and 12 ft. wide. It is divided into four bays by the vertical shafts, and in each bay is depicted a group of figures illustrative of the early life of our Lord. 1. The Nativity, with the Shepherds adoring the Infant Saviour; 2. The Magi presenting their Offerings; 3. The Presentation of our Lord in the Temple; 4. Our Lord surrounded by the Jewish Doctors. Emmott Church has a triple lancet window at the east end, representing the closing scenes in the life of our Lord, also the work of Mr. Wailes.

Pershore Abbey Church.—This church has received a further adornment by the insertion of two large stained windows in the south aisle, as a memorial of the late Mr. Edwin Ball. They are the work of Messrs. John Hardman & Co., of Birmingham. The series of subjects chosen illustrate the chief events in the history of the abbey from its foundation. In the first window are—1. Eglwada bringeth the Saint to Pershore; 2. Abbot Foldbrith cometh to Life; 3. St. Eadburgh serveth her Fellows; 4. Ethelred and Elfrida, Benefactors; 5. Beornoth receiveth a Charter from Cenulf; 6. The Benedictine Rule brought in; 7. St. Eadburgh chooseth the Religious Life; 8. King Edgar giveth Charter; 9. Earl Odda becometh a Monk; 10. King Ethelred giveth Pershore to Oswald; 11. The Danish Fury; 12. Alphere (Alderman), plundereth the Abbey; 13. The Saint worketh Miracles; 14. Swoyn is defeated. The upper part of the window is filled with figures of King Canute, King Edward I., King Henry III., Bishop Britthart, and Ursio D'Abbiôt. The second window also contains fourteen subjects, namely—1. Abbot Upton is drowned; 2. Abbot Elerius preacheth

Crusade to Llewellyn; 3. William de Beauchamp, Benefactor, dies; 4. King Charles breaketh down the Bridge; 5. Harley is made Knight in Jerusalem; 6. Fire breaketh out on St. Urban's Day; 7. King Edward visiteth Pershore; 8. Queen Elizabeth passeth by; 9. The Confessor giveth Lands to Westminster; 10. Abbat Guido is deprived for Simony; 11. Fire burneth Church and Charles; 12. Monastery is dissolved; 13. The Fair holden in the Churchyard; 14. The Church of Holy Cross restored. This subject contains full-length portraits of the Bishop of Worcester, the Dean of Westminster, the late Dr. Williamon, and Mr. Ball. The upper lights of the window contain figures of King Edward III., King Henry V., King Henry VI., and Queen Victoria, as also of Nicholas, bishop of Danelk, and Bishop de Polinton.

St. Mark's, Woodhouse, Leeds.—The Rev. S. Kettlewell, vicar of Woodhouse, has recently erected a stained-glass window in St. Mark's Church, Woodhouse, to the memory of Ann Elizabeth, his wife. The style of the window is Perpendicular, and it comprises three lights and tracery, the former of which are occupied by the subject of the Sermon on the Mount, extending over the three openings, and inclosed within canopies and ornamentation of suitable design. The tracery and portions of the canopies contain the Beatitudes, with appropriate inscriptions. The glass was from the works of Messrs. R. B. Edmundson & Son, of Manchester.

Books Received.

The Rural Life of Shakespeare, as illustrated by his Works. By C. ROACH SMITH. London: J. Russell Smith, Soho-square, 1870.

THE vast amount of general and special knowledge reflected by Shakespeare's works includes evidence which might be presented, and indeed which has, to some extent, already been presented, to favour the supposition of his having studied for many professions or trades. "The Tempest" would tend to prove him a sailor; "Hamlet," and other plays, a lawyer and mad-doctor; and so forth; but, however that may be, Mr. Smith, we think, has clearly shown Shakespeare's intimate knowledge of gardening and rural life. The force of the numerous allusions to such subjects consists in their vivid and life-like character, as well as in their endless recurrence, and the obvious familiarity with rural modes of thinking, which manifests itself in wit and play upon words, and in conclusions not likely to present themselves to mere users of rural verbiage.

Thus, for example, to the unfamiliar beholder of a splendid display of bloom in early spring, the first and leading idea is naturally that it promises a fine crop; but that is far from being the notion of an experienced gardener, which Shakespeare often reflects in his writings, as in King Henry IV., part ii., act i., scene 2,—

— "As in early spring
We see the appearing buds, which to prove fruit
Hope we not so soon so momentary as despair
That frosts will bite them."

And this familiarity with gardening appears in his witty play upon words in use among horticulturists, such as Mr. Smith instances from "As You Like It," about grafting. In act 3, scene 2, Touchstone says, "Truly the tree yields bad fruit;" and Rosalind replies, "I'll graft it with you,—a medlar; then it will be the earliest fruit in the country, for you'll be rotten ere you be half ripe; and that's the right virtue of the medlar." The drift of this some of Shakespeare's best commentators have failed to see; and Stevens, not understanding horticulture himself probably, says as to it, "Shakespeare seems to have had little knowledge of gardening;" adding, the medlar is a late fruit, not an early! This, remarks Mr. Smith, Shakespeare knew well; and in this very peculiarity lie the wit and propriety of Rosalind's retort. To Touchstone's remark about the tree bearing bad fruit, Rosalind's reply may be thus interpreted:—"I'll graft it with you,—a meddling fellow,—a medlar; and, as you are already much decayed, you will change the character of the fruit by hastening its ripening before it is rotten, as all such decayed medlars tend to do; thus making this the earliest instead of the latest fruit."

The same play furnishes a passage equally misunderstood. Rosalind says she found the love-sonnet to her on a palm tree; on which Chalmers remarks, "A palm tree in the forest of Arden is as much out of place as the lioness in a

subsequent scene." Now palm is another name for willow, and willow was the tree, therefore, on which the sonnet was appropriately fixed.

Mr. Smith has clearly made out his case, by help of the numerous quotations which he has gleaned from Shakespeare's works, in his interesting and curious little treatise.

Recollections of Eton. By an ETONIAN. With Illustrations by SYDNEY P. HALL. London: Chapman & Hall, 1870.

It would not be difficult to find fault with this volume; to ask if Eton masters had taught the writer to say,— "With that he produced a couple of half-sovereigns, which neither of them were slow to accept," or "I paid him out for it, however, if it was him" (p. 196); and to point out that it is not the grub of the silk-worm that eats the lettuce-leaves (p. 90), and so forth; but we have no desire to take that line. The book describes as a boy would describe life at Eton,— its sports and pastimes rather than its intellectual struggles,—and will give pleasure to many other boys.

Elementary Principles of Carpentry: a Treatise on the Pressure and Equilibrium of Timber Framing, the Construction of Floors, Roofs, &c. By THOS. TRENGOLD, C.E. Fifth Edition. London: Lockwood & Co., 1870.

To the third edition of Tredgold's well-known work, Mr. Peter Barlow added an appendix of considerable value, containing plates of roofs. The new edition, the issue of which we have now to announce, contains this with a full examination of the roof and vanthing of King's College Chapel, Cambridge. Some of Tredgold's tables are a little under the mark; nevertheless the volume ought to be in every architect's and every builder's library, and those who do not already possess the third edition, ought to avail themselves of the new issue by Messrs. Lockwood & Co.

Miscellaneous.

The Historical Manuscripts Commission.—The first report of the Historical MSS. Commission has been published. The Commissioners say their object has been fully appreciated and favourably received. Many collections, the existence of which was unknown, have been brought to light and submitted to their inspection. They say that had the funds placed at their disposal for the appointment of inspectors been less limited, larger results would undoubtedly have been produced. Very important and valuable materials have already been brought to light, illustrating some of the least known periods of the history of Great Britain from the Saxon era down to the seventeenth century. The Commissioners hope that with enlarged powers of compiling and publishing calendars of the more important papers that may be brought before them, they will be able to render a most essential service to the historical student, not only in this country, but throughout the civilised world. In the Appendix (which consists of 133 pages) there are set out, as specimens of the results of the Commissioners' work, numerous documents of great historical interest. As a single instance out of many, we may state that in the collection at Montacute House, in Somerset, amongst a bundle titled "Law Papers," a collection of original documents relating to the Gunpowder Plot was found, of which the proprietor himself knew nothing, and probably the bundle had never been untied since the year 1612.

St. Mary Magdalene, Taunton.—The following notice has been freely circulated throughout the parish:—"The plan adopted by the parish in vestry provides free and open access, by steps, into the chancel, on the north and south from the cross-aisles, and on the west from the nave. The faculty requires strict adherence to the plan. The north and south entrances have been entirely closed, and that on the west obstructed by a wall and gates for its whole width. A few parishioners have commenced in the Consistorial Court, at Wells, to recover to the parishioners their right of unobstructed access to the chancel by these three approaches, in accordance with the plan and faculty, and the vote of vestry thus illegally infringed, and appeal to their fellow parishioners for co-operation and support. Protestant principles as well as legal rights are clearly involved."

Artists' Benevolent Fund.—The sixty-first anniversary festival of this institution was celebrated by a dinner at the Freemasons' Tavern on Saturday, the 2nd inst. Viscount Enfield, M.P., presided, and in giving the toast of the evening, said the fund was established in 1810, and received from George IV., its patron, a royal charter on the 2nd of August, 1827. The Queen was now the patron of the institution, which consisted of two separate and distinct branches—the Artists' Annuity Fund and the Artists' Benevolent Fund. The Artists' Annuity Fund was raised and wholly supported by the contributions of its members for their own relief in sickness or superannuation. Three hundred artists were at present members of the annuity fund, and all artists of merit in painting, sculpture, architecture, and engraving were eligible to become members. The Artists' Benevolent Fund, for the relief of the widows and orphans of members of the annuity fund, was supported by the donations and subscriptions of the patrons of the fine arts, by artists, and by the annual contributions of the members of the annuity fund. Since the formation of the fund 30,812l. had been distributed in relieving widows and orphans of British artists. The toast of "The Chairman," proposed by Mr. S. Solly, and "The Royal Academy," given by the Chairman, and acknowledged by Mr. Lumb Stocks, followed. Mr. Godwin, in proposing "The Societies connected with the Fine Arts," expressed his opinion that in England young artists had not the same opportunities of obtaining the technical and manipulative knowledge of the painter's art as men had in France, where they were admitted to the studios of painters of eminence, and saw them at work. The result was that on the Continent an artist began his career where in England he too frequently left off. He should be glad to see our English artists opening their studios to young students more freely. Among the other toasts were, "The President and Members of the Artists' Annuity Fund," proposed by Captain Dighton; and "The Artists' General Benevolent Institution," given by Mr. C. J. Dimond. Mr. Lambton Young, the secretary, read a list of subscriptions, amounting to upwards of 450l.

New Episcopal Chapel at Culross, Scotland.—A new Episcopal chapel is now being built, at the sole cost of Mrs. Sharpe Erskine, of Dunmarlo Castle, on a fine terrace in her grounds. This edifice, which is intended to bear the name of St. Serf, has been designed by Mr. R. Anderson, of Edinburgh, architect. The style adopted is Transition (end of the twelfth century), being the style exemplified in the earliest remaining parts of Culross Abbey. The building is intended to serve as a mortuary chapel for the fondress, as well as a place of worship for the Episcopalian families of the neighbourhood. It is of oblong shape, measuring internally 66 ft. by 18 ft. The east end is apsidal, and the west gable is surmounted by a belfry, having two tiers of openings for a peal of three bells. This gable is buttressed, and has a large circular window filled with tracery. The entrance to the chapel is on the south side, near the west end. The apse is lighted by five single-light windows, the semicircle internally being arcaded. The chancel has a two-light window on the south, and an archway on the north side for the organ. From the organ recess access is given to a small vestry. The nave is lighted by five single-light windows on each side. The whole of the chapel is vaulted internally with wood. The church will be fitted up in the usual manner for the clergy and choir, and the nave will be furnished with open deal benches for a congregation of about eighty.

Competition at Prescott.—The local board of this place have recently decided upon competition schemes for the sewerage and improved water supply of the district. The first premium of 100l. has been awarded to plans by Mr. Brierley, civil engineer, Blackburn, who has been retained to carry out the works. The second premium of 35l. has been awarded to Mr. W. A. Richardson, of Tranmere.

Passing the Glass with a Vengeance.—The other morning, at a draper's in Liverpool, a gentleman, instead of going out by the doorway, inadvertently stepped into one of the windows, which was empty at the time for the purpose of being redressed, and before any of the astonished salesmen could interfere had made his way into the street, through a very large thick plate-glass window. Fortunately, the only injury he received was a cut on the left cheek.

The Objectionable Sculptures on the Facade of the Paris Grand Opera House. M. Carpeaux assigned to a photographer, named Appert, the exclusive right, which he assumed to be still in his possession, of making photographic copies of his group of dancing girls. Another photographer, named Randnitz, conceiving that all the world has a right to photograph public buildings and their appurtenances, fixed his apparatus in the public street, brought it to bear upon M. Carpeaux's statues, which are popular, and placed in the shop windows a representation of the sculpture. M. Carpeaux and his assignee, M. Appert, brought an action against M. Randnitz for infringement of copyright. The Court of First Instance of the Seine rules, however, that the sale by M. Carpeaux to the Emperor's Minister, without making any reservation of the right to photograph his statues, was an absolute alienation and a bar to his action. MM. Carpeaux and Appert were, therefore, sentenced to pay 3,000 francs damages to M. Randnitz for seizing his photographs, and to defray all the costs of the litigation.

Masters and Men: Non-liability for Accidents.—A case of importance to workmen and their employers was tried at the Liverpool assizes on Tuesday last. A painter in the employ of a local firm was sent to work upon a scaffold which had been erected by other men in the same employ, and the structure giving way, the poor fellow was so seriously injured as to be permanently debarr'd from following his avocation. He now brought an action against his employers to obtain compensation. Mr. Justice Willes ruled that the action could not be maintained, for it had been decided over and over again that a master would not be liable for an accident happening to one of his workmen, through scaffolding erected by other of his workmen, unless some misconduct on his part were proved. It had been the law for the last thirty-three years that a servant could not bring an action against his master for the negligence of any other servant in the common employ. The plaintiff was accordingly non-suited.

Bilston.—At a special meeting of the Town Commissioners, after going through the modified plans for the enlargement of the baths, the Board accepted the following tenders:—Messrs. Thompson & Sons, for lengthening the boiler, and for a new tank, 21l. 10s.; Messrs. Claridge & North, for the engineer's work and new baths, 120l.; Mr. S. Sansome, for the general builder's work for enlarging the swimming-bath, 180l.; and Messrs. Garratt & Holmes, for painting, 69l. Total, 390l. 10s.—At a recent meeting of local ratepayers it was resolved, by a large majority, to adopt the Free Libraries Acts.

Design in Berlin.—It has been determined to form an exhibition in Berlin between the 10th and 24th of the present month of April, with the object of generalising and elevating the study of drawing, in giving teachers and the public the opportunity of judging of results obtained, and of the efforts that are being made towards their improvement. The exhibition is to be divided into three groups; the first to consist of models and examples; the second of works of all kinds produced by pupils; the third, of instruments and materials of all kinds connected with drawing.

University of London.—The new building of the University of London, in Burlington-gardens, illustrated in our pages, will be opened by the Queen in person on Wednesday, May 11. Her Majesty will be accompanied by the Prince and Princess of Wales and the Princess Louise. We may venture to say it will be satisfactory to the profession should it be found that her Majesty intends to confer honour on the architect of this building, the merit of which is undeniable. Mr. Pennethorne is a public servant of long standing.

The Round Church at Northampton.—An appeal is being made to the public for additional funds for the completion of the restoration and enlargement of St. Sepulchre's Church, or rather for the restoration of the old round church as a vestibule to the new. For this 1,400l. in all are requisite, and of that sum 1,400l. have been subscribed. The round church is in a sad state, and cannot long be allowed to remain as it is.

The Taunton Surveyorship.—Mr. Hargreaves, surveyor, has sent in his resignation to the Taunton Board of Health, and it has been accepted.

City Market Accommodation.—At a special meeting of the Common Council last week, a motion was propounded by Mr. Rudkin for disestablishing Billingsgate and Leadenhall markets, and erecting in their stead a large fish and poultry market on ground belonging to the Corporation of London in the immediate neighbourhood of Smithfield. Mr. Fricker moved an amendment that it was desirable that the fish-market at Billingsgate and the poultry-market in Leadenhall should be enlarged and improved, and that the Markets Committee be instructed to obtain plans with estimates of the cost of such improvement, and submit them to the Court forthwith. Eventually, the amendment of Mr. Fricker was carried by a considerable majority.

The Exhibition Model of Lincoln Cathedral.—The *Gentleman's Magazine* devotes a rather lengthy paper to a description of "A Wonderful Building,"—that is, the model of Lincoln Cathedral made by a poor farm-labourer out of old bottle-corks, and which was exhibited at the International Exhibition of 1862. It took ten years, we are told, to build up this cathedral of corks, cut and filed to look like stone; and a million corks were consumed in the erection. It produced 800l. at the Exhibition, and has gained its inventor a yearly income ever since. "Altogether he calculated that he had reaped 3,000l. from the structure. For a small portion, even like the southern porch, with its corks angels and corks devils going to 'eaven and 'ell respectively, he had been offered 15l.; and for a single pinnacle, 2l."

The New Corn Exchange, Cambridge.—This question is again postponed. Counsel's opinion as to the legality of purchasing property for the purpose of building a Corn Exchange is that the corporation had no power, under the several Municipal Acts, to do so. The market committee, therefore, after a good deal of discussion, have resolved that proceedings should be stayed, and that a further opinion of counsel should be taken on the subject. The local *Chronicle* states that advertisements for tenders for the new Corn Exchange had been sent for insertion in the local papers, and that Mr. A. D. Claydon had been instructed to sell the materials of the buildings now on the site.

The Northern Architectural Students' Society.—On Saturday, the 2nd, this society held its first out-door meeting at Seaton Delaval Hall. The members present inspected the interior as well as the exterior of this fine building. The hall was erected during the earlier portion of the eighteenth century, from the designs of Sir John Vanbrugh, architect. It was greatly injured by fire in the year 1822, and has not been restored. Fortunately, the destruction is mostly confined to the interior, so that the exterior is left almost intact. The Anglo-Norman church in the grounds was also visited.

Birds and the Fashion.—According to M. Pouchet, the architecture of birds has changed with that of men. In former days, when the swallow's nest was built against Gothic edifices, it made a semi-globular nest with a very small rounded entrance, but in the new streets of Rouen its nests are now found to be of a semi-ovoid instead of semi-globular shape, and the entrance is a long transverse cleft.

Worcester Cathedral.—The Dean and Chapter have contracted with Messrs. Collins & Collis, of Tewkesbury, to pave the floor of the Lady Chapel and its two aisles, and also those of the north-eastern and south-eastern transepts and their aisles, with red and yellow Mansfield stone, white Portugal stone, and black marble, from designs of the thirteenth century, prepared by Mr. A. E. Perkins, the resident architect.

Worse and Worse.—The following tenders were sent in for alterations at 51, St. Martin's-lane, for Messrs. Hayward & Co. Mr. W. F. Potter, architect:—

Stokes & Gill.....	£420
Watson, Brothers.....	320
Perkins.....	285
Hayatt.....	230
Honour (accepted).....	163

Lectures on Health.—The Social Science Association have made arrangements with Dr. Guy, F.R.S., for the delivery of four lectures on "Health and Disease" in their economic relations. The first will be given on Tuesday evening, April 12th, at 8 p.m., in the room of the Society of Arts.

p.m. on **THURSDAY**, 14th inst. Advertisements for insertion in that Number must therefore reach the Office before **THREE** p.m., on **WEDNESDAY**, 13th.

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VOL. XXVIII.—No. 1419.



Recent Travels in Asia Minor.*

T the present moment public attention is directed towards that long-neglected country which is evidently destined to become the road to our Indian possessions.

Whether it be true or not that the Ottoman Government has granted a con-

cession to a French company to carry a line of railway throughout the length of Asiatic Turkey, which is eventually to be extended to Bagdad, and so on to the frontier of India, it is certain that such a line will be made, and that probably before many years have elapsed. The plains of Asia Minor have already been invaded by two conquerors greater than Sesostris and Alexander,—since they carry civilisation in their train;—steam and electricity have already commenced their inroads on that vast continent; telegraphic wires already traverse the highlands, cross the mountain ridges, and dip into the ocean in remote bays on its coasts, while the shrill whistle of the locomotive already rouses the eagle from his eyrie on Mount Sipylus, and startles the cranes and pelicans on the borders of the Cayster and Meander. Where there are railroads, civilisation must follow; and though at present this country presents the strange anomaly of possessing no roads but iron roads, and though the trains frequently pass close to the haunts of brigands who live in defiance of the Government, yet all this apparently chaotic state of affairs will be set right at last, and probably this naturally prolific country will be at some future time colonised and cultivated by settlers from the West.

* "Travels in Little known Parts of Asia Minor, with Illustrations of Biblical Literature and Researches in Archaeology." By Rev. Henry J. Van Lennep, D.D., thirty years Missionary in Turkey. London: John Murray, Albemarle-street, 1870.

We speak advisedly when we use the term "much neglected" with reference to it; for, notwithstanding the fact that it was the theatre of some of the most important events in the history of the early world, and the stage on which strutted the imperial puppets Sesostris, Cyrus, Croesus, Xerxes, Alexander; though the finest temples of antiquity graced its soil; and though it has formed a theme for historians and poets from the time of Homer, about as much is known of the interior of the country as of that of the Great Sahara. The travellers who have traversed the continent, and left any record of their journeys, may be easily enumerated, as they probably do not amount to more than a dozen. Paul Lucas, Leake, Texier, Hamilton, Fellows, and Ainsworth, are, indeed, all whose names occur to us. With the coasts, however, we are better acquainted, as Le Brun, Pococke, Chandler, and Arandel have described them, and the Badrum expedition and the various missions of the Dilettanti Society have made us in some measure acquainted with their ruined cities and temples; but about the interior we have but little information. Therefore the works of all the "pioneers" have an especial interest for us at this period of awakening interest in the future prospects of Turkey; and for that reason we welcome with pleasure Dr. Van Lennep's volumes, containing an account of a journey from Samsoun, on the Black Sea, to Smyrna, and of several excursions to the right and left of the main route made for the purpose of visiting ancient sites. Dr. Van Lennep having resided thirty years in the country as a missionary, and being acquainted with the various languages spoken by its inhabitants, being thoroughly versed in the manners and customs of the people, and having also a taste for antiquarian pursuits, was, as may be supposed, well qualified to give us an accurate description of everything he saw during this interesting journey of five months through some parts of the country but little known, and through others entirely unknown. Leaving Samsoun in April, 1864, he visited Amasia, the capital of the kings of Pontus, then proceeded to the important town of Tocat, from which point he made excursions to Sivas and the Star Mountain, and afterwards started on his journey across the continent, going by way of Yuzgat, from which point he visited the interesting ruins of Pterium and Euyuk; thence to Angora, the ancient Ancyra, Sevre-Hissar, and the ruins of Pessinus, Afion-Kara Hissar, Ooshak, Sardis, and so on to Smyrna.

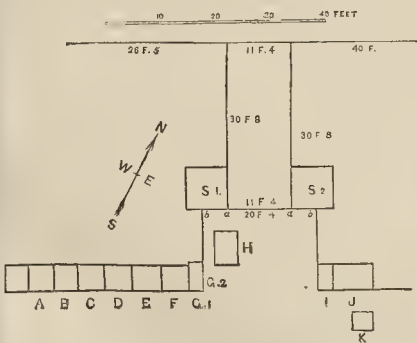
On referring to the map of Asia Minor it will be seen that he thus passed through almost the entire length of Asia Minor, and through the most important parts of Pontus, Galatia, Bi-

thynia, and Phrygia, provinces in which there are many ancient sites still to be identified.

To architects and antiquaries the most attractive portion of his book will be that in which he throws light upon one of the most obscure pages in the history of art,—the art of what Professor Donaldson has aptly termed "Anterior Asia," to which are due the sculptures of Pterium and Euyuk, the tombs of Midas and other Phrygian kings, many of the monuments of Lycia, and all those remains which present no sign of Greek, but many marks of Asiatic, Phœnician, Assyrian, or even Egyptian influences. We all know that certain discoveries have of late years shown that some of the early sculptures in Asia Minor, such as those of the Sacred Way at Branchidæ and the tombs at Urgub, exhibit an imitation of Egyptian forms; and that Phœnician origin may be attributed to the grotesque animals on the architrave and frieze of Assos. We can also trace Egyptian taste in the sarcophagi of the kings of Sidon which are in the Louvre; but in no place is there to be seen such a combination of Egyptian details and Assyrian plan, as in the palace of Euyuk, which Dr. Van Lennep has been the first thoroughly to describe and illustrate. We see here two gigantic sphinxes,—creatures of Egyptian origin rarely to be met with in Asia Minor,—guarding the entrance and supporting pilasters, exactly supplying the place of the winged bulls in the palaces of Nineveh; on either side are large blocks of granite or basalt, with processions of figures carved on them, forming the basement of two wings, which probably supported colonnades, as in Mr. Fergusson's restoration of Persepolitan architecture.* We are enabled to reproduce a plan of the best-preserved portions of the building. The sphinxes are marked on the plan S. 1 and S. 2.

Beyond the sphinxes was apparently the principal corridor of the palace; but everything beyond that has disappeared. A striking proof of the Egyptian origin of these buildings exists in the fact that the god Apis occurs twice in the series of carvings. Hamilton visited the ruin, but describes the sphinxes as enormous birds. Both here and at Pterium Dr. Van Lennep made careful drawings and measurements, which tend to illustrate thoroughly these important remains. The rock carvings at Pterium are well rendered, and show a thoroughly Assyrian character. They occupy the sides of a gorge, which appears to have formed the entrance to a regal sepulchre. The carved surface extends for a length of 124 ft., the figures varying in height from 2 ft. 10 in. to 4 ft. 10 in. Dr. Van Lennep confirms M. Texier's opinion that these

* See p. 306.



Plan of Temple at Euyuk.



Side View of Carving on Block K.

processional rows of figures, which represent the meeting of a king and a queen, each attended by a long train of attendants, signify the introduction of the worship of Astarte, the Syrian Venus Urania, into Phrygia. We refer those who feel interested in the question to the book itself, in which the subject is fairly put before the reader, and thoroughly illustrated.

Amongst the carved blocks of the Palace of Euyuk, is one which bears the figure of a lion devouring a ram, or more probably a bull. Of this, which is marked K on the plan, we give a representation. This mysterious emblem, which has never been satisfactorily explained, is frequently met with on the early monuments of Asia, and seems to us to have been imported from Phœnicia, since the earliest example of it we know is to be found on the coins of one of the kings of Sidon. Amongst other places it is to be found on the rock tombs of Lycia. Dr. Van Lennep gives an engraving of another from Amrya, and Mr. Pullan dug up a similar group near Claros and Colophon (see *Textier and Pullan's Cities of Asia Minor*).

At Angora our traveller visited the ruins of the Temple of Augustus. We do not agree with him in the supposition that the yellow tint observable on the marble there and at the Parthenon arises from the fact that the surface has been gilt; but we think that it has been toned down by a coating of yellow encaustic preparatory to the application of the reds and blues by which the mouldings were relieved, and the friezes heightened, in all buildings that were polychromatised.

By far the most interesting chapter in the book is that in which Dr. Van Lennep sets at rest the vexed question relating to the figure carved on the face of Mount Sipylus. High up on that part of the mountain which overlooks the town of Magnesia and the valley of the Hermias there is to be seen a niche, 35 ft. high, in which is a rudely-carved head with the bust of a female figure. All former travellers have in rotation repeated that this figure represents Cybele, the mother of the gods; but Dr. Van Lennep satisfactorily proves it to be that of Niobe. He remarks that though the features are obliterated, the figure has been so arranged that when it rains, two streams of water fall upon the breasts, and so trickle to the ground, as perfectly to represent the flow of tears, and that these streams have in the course of centuries left a bluish deposit on the surface of the rock, which is visible from the plain below, in the form of two dark streaks down the bust and the pedestal on which it stands. This, he says, with justice, must be the "stony Niobe, all tears," described by Homer when he thus sang:—"Upon arid Sipylus, upon the rocks of the desert mountain . . . Niobe, though turned to stone, still broods over the sorrows the gods have sent upon her." And by Ovid with still greater precision:—

"She weeps still, and, borne by the hurricane of a mighty wind,
She is swept to her home. There, fastened to the cliff of the mount,
She weeps, and the marble sheds tears even now."
Ovid, Met. ii. 210.

Again, Pansanias, who visited it, says:—"When standing close to it, the rock and precipice do not show to the beholder the form of a woman weeping or otherwise; but if you stand farther, you think you see a woman weeping and sad." (*Attica*, l. i. 21, 5.)

Another coincidence in support of M. Van Lennep's view exists in the fact that the figure is on the mountain of Sipylus,—the son of Niobe; and not far from the lake of Tantalus,—the father of Niobe. Our author, however, starts the theory that the figure may have existed from the earliest times, and may have been intended originally to represent Cybele, but that the myth of Niobe may have been derived from it. His explanation of this view is so very ingenious that we give it in full:—"Certainly, the whole scene around us at this moment agrees remarkably with the Grecian legend, and may be looked upon as the very birthplace of the myth of Niobe. She is the daughter of Tantalus over whose head, remember, the rock was always hanging ready to fall. Tantalus is nothing else but a rock hanging poised in the air (*ταλαντεύω*), ever threatening to come down, an exact description of the constant disintegration of the face of the hills in this region. Niobe, in her deep-cut alcove under the over-hanging rock, is the 'daughter of Tantalus.' She is as Cybele, the great

mother—her very boast; and her children struck down to earth, 'slain by Phœbus and Diana,' are the masses of rock, such as we have just passed over, that fall into the valley, separated from the cliffs by the action of the sun and rain. 'They lie unburied on the plain,' Homer tells us, 'till on the tenth day after, the heavenly gods bury them;' the fallen rocks break up under the influence of the weather. Here, in these mountains of Sipylus are the couches 'of the divine nymphs that dance or stream about Achelous'; that is, in this hill now above us are the springs from which flow down the streams that feed the Achelous at our feet;—Achelous, 'the son of Sol,' springing, that is, from the melting of the snows in summer. . . .

Carved in the most remote antiquity to represent, it may be, Cybele, the deity of a race that preceded the Greek immigration, the circumstances that gathered round it gave rise in the minds of the imaginative Greeks to the whole beautiful legend of Niobe, all stone and all tears, as we see her at this moment, and we here look upon a monument that was even to Homer an object of venerable and unknown antiquity, a monument antecedent not only to history, but in some sense to mythology itself."

FREEMASONRY.*

A GERMAN writer not long ago completed a history of Freemasonry, from, of course, a German point of view, which met with considerable approval in his Fatherland. It was translated into English, and mentioned in our pages at the time. A second edition of the English version has now appeared.

Wide, generous, and pleasant, with its corn-fields and vineyards, universities and meerschaums, traditions of free cities and great guilds, Germany is the very site for the luxuriant growth of an embracing, expansive, brotherhood, like that of the Freemasons; but it is not of the German lodges, so much as of the society generally, that we are minutely informed in this work. In various parts of Europe and America there are, at the present day, about 9,000 lodges, with 70 grand lodges, to which they are subordinate, forming invisible connecting lines of fellowship over this vast surface, having for asserted aim the exaltation of mankind in morals. The histories of these lodges in modern times are doubtless of interest, if only for the record of well-known names among the members, such as Elias Ashmole in an English lodge, Thomas Boswell, of Auchincloch, in a Scottish one; Daniel O'Connell in an Irish one; and Benjamin Franklin in a Pennsylvania lodge; but it is the ancient history of Freemasonry properly spoken of now as its legends and superstitions, that will have most attraction for non-masonic readers.

The legend that every one is supposed to know runs to the effect that the four children of Lamech, and his two wives, Ada and Sella, founded the beginning of all the sciences in the world. The eldest son, Jabal, pursued the science of geometry, and abandoned his flocks and herds to build with stones and trees; his brother Jubal founded the science of music; his brother Tubal Cain founded smithcraft in all metals; and his sister founded the craft of weaving. Having a foreknowledge of the punishment about to fall upon mankind, they engraved their sciences on two stones, so that they might not be lost when the "vengeance for syn" came. One of these stones was of marble, in the belief that it would not burn if fire consumed all else upon the face of the earth; the other was "clepped lateras," supposed not to be able to drown or sink in any water, if a flood should be the means of destruction. After the deluge, the great-grandson of Noah found one of these stones, and saw the science written on it, and taught it to other people. "And at the making of the Tower of Babylon there was masonry first made much of." Nimrod was a mason as well as hunter, it seems, and fond of his science, or, as we should now say, trade. And when the city of Nineveh and other cities in the East were to be built, he sent his cousin, the king of Nineveh, threescore of masons to assist him. We quote the legend:—"And when he sent them forth, he gave them a charge on this manner. That they should be true each of them to other, and that they should love truly together, and that they should serve their lord

truly for their pay; soe that the master may have worshipping, and that long to him. And other moe charges he gave them. And this was the first tyme that ever mason had any charge of his science." From this little band of masons, bound together as strangers in a strange land, possessed of the knowledge of a craft that was beyond the understanding of the dwellers in tents, according to this story, came Freemasonry.

So far this legend, with its patriarchal belongings, and surroundings, and discrepancies, its clink of pre-historic tools, on pre-Noachian tablets, and sight of Tyrian shipmen, and scent of cedarn forests.

German sympathies favour the supposition that Freemasonry really arose from the confederation of the Strasbourg stonemasons employed in building the cathedral. All that has been said in favour of this view is urged over again, lucidly; beginning with the first suggestion of the possibility made by the Abbé Granddier in 1778; though nothing is left unsaid that could be given in explanation of the statement made by some writers that the confederacy commenced at the building of Magdebourg Cathedral in 876. The claims of the eleventh century are also gone into. After the panic that the world was coming to an end subsided, building operations were carried on with great energy and new life, and these drew masons together into long and close intercourse:—

"The erection of these edifices united masons, especially stonemasons, together in large numbers. As they were so long engaged upon the same building, the workmen were brought into very close contact; while the practice of the same art, their uniting to carry out the same design, and the combination of their artistic faculties, united them still more, and was the cause that gradually arose from their body the fraternity of German stonemasons."

A symbolic language gradually took shape, formed of figures and ciphers, in which was framed a guide to the practice of the art. Every mason had to learn this; and no apprentice was admitted into the brotherhood who was not of sufficient capacity to be able to do so. "Mathematical axioms and geometrical figures, garnished with mystical hints, Biblical allusions and interpretations, whence the Gothic proportions were derived, and upon which they were based, with the rules prevalent in the Gothic style, formed the innermost and secret aim of the whole design."

A prominent place is given to the history of Freemasonry in England. The author says there is scarcely a doubt but that a considerable proportion of the builders of our larger edifices of the fourteenth century were Germans, and that the architects of that time were German masons; and the names of Schaw, Swalwe, Lote, Ambler, Bald, Beyst, Brekeling, Derlyng, Evers, Felter, and Fabrig, are brought forward as evidence. The English masons soon followed their example in forming themselves into associations whose members recognised each other by signs, held meetings and acted in concert.

"Meetings were held regularly wherever buildings were in the course of erection. Their lodges were opened at sunrise, the master taking his station in the east, and the brethren forming a half-circle round him. After prayer, each craftsman had his daily work pointed out to him and received his instructions. At sunset they again assembled after labour, prayer was offered, and their wages paid to them. In stormy weather the craft assembled in a convent hall, or some other sheltered place; but in fair weather their meetings (lodges) were held in the open air, generally on the top of a hill, where no one could listen to their proceedings."

This is difficult to reconcile with the frequent disputes among the masons in the reign of Edward III., disclosed in the records of the corporation of London, and detailed in these columns in our notice of Mr. Riley's memorials of London; which disputes the Lord mayor considered arose from the circumstance that the masons were not subject to "the government of folks of their trade," and endeavoured to settle their differences by the reception of a deputation, who were empowered to draw up articles by which they would abide. Unless, indeed, we take it for granted that the stonemasons with whom the light masons and setters quarrelled were not Freemasons, and the others were, or vice versa. The term Free-mason is met with, curiously, for the first time in this reign, 1350. Although self-government appears to have been put into their hands then, it was taken out again in the reign of Henry VI., when they were forbidden to assemble. Coming down to post-reformation times, and the introduction of the Renaissance by Inigo Jones, we are told the old symbols lost their work. "Instead of the buttress,

* "The History of Freemasonry, from its Origin down to the present Day." By J. G. Fudick. Revised and Preface written by D. Murray Lyon. London: Asher & Co., 13, Bedford-street, Covent Garden. 1869.

plain walls with pilasters were seen; instead of the pyramids ambitiously rising towards heaven, a drooping Italian cowl was set upon the top of the little fragile tower; the tall slender pillars, which supported the arched roof of the church disappeared, and ornaments of tasteless scrolls supplied their place. Thus did German art, so honoured and revered, sink to the tomb, the Fraternity on this account undergoing a mighty revolution." It is supposed that the institution would have sunk into oblivion at this time, if it had not been for the circumstance that persons who were not operatives began to enter it as members. Hitherto only masons, stone-cutters, and carpenters were Freemasons, unless we may count the ecclesiastical and secular patrons of the craft as such; but after this time, persons of different occupations, and others following none at all, were admitted as members. It was in the year 1800 that Buzzy's ancestor was chosen warden of St. Mary's Lodge, Edinburgh. In 1641, Robert Moray, quartermaster-general of the Scottish army, was made a master-mason; in 1646, Elias Ashmole was made a mason at Warrington, Lancashire; and in 1670, the earls of Cassilis and Eglington were received as Apprentices at Kilwinning. By degrees, practical knowledge was superseded by the pursuit of truth, freedom, and virtue, as the bond of union. The operative masons handed down their traditions and charges to a mixed brotherhood of various ranks and creeds bent upon developing their fund of intellectual capacity and moral rectitude. Innovations crept in, "high degrees," or "high grades," grand-masters, the grand orient, and other elaborations upon the three degrees of old, apprentice, fellow-crafts, and masters, which introduced dissensions in different countries, and which are all related by Mr. Findel. The ever-extending brotherhood occasionally spread into the orbits of other societies, such as the Rosicrucians and Illuminati, only, however, to retreat again within its own boundaries. And although each country has its own traditions, and its own grand lodges, they have the same aim of universal peace and goodwill. Nevertheless, Freemasons find it as difficult to overcome their prejudices as ordinary mortals. We read that the American brothers could not get over their deeply-seated sense of the inferiority of coloured men; for when the coloured lodge of Boston applied to the grand lodge of Massachusetts for a constitution, at the close of the last century, it met with a refusal.

Among the documents appended is the form of an examination of a German "Steinmetz,"—stonemason. We pick out a few questions for extract:—

Warden.—How do we recognise a mason?
Stranger.—By his honesty.
Warden.—Where was the worshipful craft of masons in Germany first instituted?
Stranger.—At the Cathedral of Magdeburg, &c.
Warden.—What was the name of the first mason?
Stranger.—Anton Hieronymus, and the working tool was invented by Walthar. (Perhaps corruptions of Adam-hiram and Tubal Cain.)
Warden.—How many words has a mason?
Stranger.—Seven.
Warden.—What are they?
Stranger.—God bless all honesty, God bless all honourable wisdom, God bless the worshipful craft, God bless the worshipful master, God bless the worshipful warden, God bless the worshipful society, God bless all honourable promotion here, and all places on sea or land.
Warden.—What dost thou carry under thy tongue?
Stranger.—A praiseworthy Truth.

Freemasonry has come to the front lately in two distant parts of Europe. It was the Masonic lodges of Madrid that conducted the funeral of Don Enrique de Bourbon a few days ago; filling the chamber of death with Masonic symbols, and placing on the coffin, with the dead prince's sword and sash, more Masonic emblems; and sending 600 fellow Masons as mourners to his grave. Again, though the fraternity takes no part in political or ecclesiastical contests generally, the Grand Lodge at Baireuth has now broken this transcendental silence, and issued a circular directing attention to the proceedings of the Oecumenical Council, vindicating the right of the society to exist in spite of ecclesiastical opposition, and calling upon members to perform the moral duties with zeal and exactitude, and uphold the freedom of science and of conscience. The adhesion of H.R.H. the Prince of Wales has given Masonry a fresh spurt in England. At the recent dinner in aid of the Boys' School, at which the Prince presided, more than £10,000 was subscribed. If modern Masons are not otherwise practical, they certainly are so in charity. Attention thus drawn to the subject, many will, doubtless, like to get some particulars of this remarkable organisation, now numbering about

600,000 members; and to these we commend Mr. Findel's book as containing much of the information they require. It is free from nonsense and error than other attempts of the kind, but the real history of Masonry has yet to be written.

BRIGHTON, AND ITS POSSIBLE FUTURE.

To write something new about Brighton is a task not easily accomplished. "The Queen of Watering Places," as some are pleased to designate it, has been often described. Artists by the score have sketched the picturesque of its inland boundaries and outer beach; tourists have traversed its every nook and cranny, and where the guide-book compiler failed to find something worth describing, he invented a fancy scene to fill up the hiatus. Our notes in Brighton are of a current nature, and of another kind. They relate more to things that ought to exist, and to things that ought not, for the well-being of the town, and the cause of social reform and sanitary improvement.

In looking at Brighton to-day, we must, however, glance at it retrospectively as well as in the face, and judge how far, with all the acknowledged facilities it possesses, its public boards are doing their duty for improving its condition by adapting the obvious measure whereby towns are made beautiful and ornamental without ceasing to be prosperous and healthful.

Brighton is rapidly increasing in population, and of course in area. In fact, it is becoming a little London of fashion, a little sea-side metropolis of ease to the greater city capital by the Thames. But unlike the City and other large towns, Brighton is but the creature of circumstances, which cannot be said to be perpetual. The progress and the wealth,—yea, even the existence,—of the most favoured and fashionable watering-place, rest on an unstable foundation.

During the last fifty or eighty years towns in England that promised to occupy positions like Brighton, and actually did as a resort of fashion, or as an Elysium for invalids, have been deserted, and have consequently gone into neglect and decay. We have had inland watering-places, lake districts, and woody dingles in this country that have coaxed our fathers and grandfathers during their pleasure tour in holidays of old—places which not to have seen was considered to be the deprivation of the greatest enjoyment. Many of these favoured spots have faded, or are fading, out of sight. Notwithstanding railway communication, Bath of to-day is not the Bath when George III. was king. Nor is Tunbridge of the "Wells," Cheltenham of the "Springs," or Leamington of the "Spas," what these once were. Some of the once fashionable resorts, even on the majestic Thames, and on our midland and northern rivers, are dying or drooping. New seaside resorts are springing up daily, because fashion is capricious and exacting, and is always athirst for something fresh and new. But, exclaims the reader, what has all this digression to do with Brighton? That it is not irrelevant, perhaps we shall show before we conclude.

Brighton probably contains nearly 80,000 inhabitants, and this amount is supplemented in the visiting season by perhaps little short of two-thirds of the above number, who come as sightseers, visitors, or temporary inhabitants. This influx of humanity is accompanied with an increase of wealth and capital, and on this immigration Brighton, as a town, in a great measure, depends. Were the tide of fashion to veer round suddenly, we have no hesitation in saying Brighton, "the queen of watering-places," would collapse, with all its shining brilliancy, like a soap balloon. The simile, though not a graceful one, yet we venture to say, is tersely true. Brighton, in a word, is a lodging-letting and shop-keeping community. Its permanent inhabitants are a population of parasites, and the visitors are the plant it feeds upon. On this we take our stand for our survey, and from this standpoint we draw the attention of all Brightonians and Brighton reformers, corporate and auxiliary, to the question of how they can best improve the permanent well-being of their town. Of local trade and manufacture Brighton possesses little indeed, and, owing to the demand for house property, the building trades are its best representative crafts; but even the trades connected with the building interest are feeling the pinch of late in the town as well as those of London, and from similar causes. Too many flock there in season, as they do to the metropolis, in quest of

labour, and the market gets overstocked. At the present moment and during the winter past there was much want and destitution in the town. The poor-house contained a good number of mechanics, and its board have been employing the surplus labour in the making of a new cemetery. We heard of two hundred hands being employed on this work, for which the pay amounted to about a shilling a day with a loaf or a loaf and a half, according to the number of the workman's family. The Corporation of Brighton have also been obliged to relieve the distress of the unemployed in the town by putting on hands at the beach, in the construction of a new roadway or promenade under the eastern cliff. A half loaf, it is truly said, is better than no bread, and it is a commendable thing to give even a little employment, that men may not starve in the midst of plenty.

There is work, however, in Brighton that requires execution and preference for the welfare of the town, even before that of constructing promenades or beautifying the approaches to the cliff. There are a number of new streets that either require to be opened or widened at right-angles to the King's-road, or beach; and the centre of the town requires to be better opened by a few wide leading thoroughfares. Breadth of opening and light and air exist on the surroundings of the Old Steyne and along the Grand Parade, but let one for a moment diverge from those open thoroughfares into the narrow dingles or lanes, dignified with the name of streets, on either side, and how stand the sanitary data. We shall not complain of the break-neck character of the streets, for their incline is unavoidable; we shall only note that many of them are painfully narrow and confined, and that their outlets are not what outlets ought to be in a much-visited town like Brighton.

The stability of some of the houses is an open question, but their back-yard accommodation and drainage is a sanitary question, though also an open one, and calls for closer attention and discussion. We do not deny that the Brightonians are making, and have recently made, some efforts towards an improved system of drainage; but why stop half-way? Bad drains and noisome smells must be stamped out, like the rinderpest, if health is ever to be thoroughly established, and guaranteed to poor and rich alike.

Some few ladies in Brighton, with excellent intentions, are stirring themselves in the matter of sanitary reform; and, with that discrimination that must be ceded to the sex whenever they sincerely strive to be humanely useful, they are acting on the principle that prevention is better than cure. But how far are they likely to be successful? To pay a few flying visits to one or two quarters of the town, with a few disinfectants corked up as if they were perfumes, and to distribute them to the poor as one would smelling salts? A mission of this sort will not accomplish much to kill the germinating seeds of disease.

Sanitary reform is a cause in which women can render much valuable assistance. Ladies with a little money to spare, and some leisure time on their hands, can be ministering angels to God's poor. They can aid in putting fire in the family grate, food in the cupboard for the little ones, and they can help the poor wife to tide over her illness. Their visits will also help to cheer the anxious, care-worn, and unemployed partner of her sorrows. A little relief and advice judiciously distributed in hard seasons works a wonderful amount of good. In whatever tends to make the poor man's home clean, healthy, cheerful, and neat, there a true and charitable woman's chief mission lies. But outside the threshold of the home man's real labour commences; and so with corporate bodies and public boards. They hold the public health more or less in their keeping. Their negligence of the common duties, or their ignorance of the simplest principles that govern health or prolong human life, may be the cause of sweeping hundreds of valuable lives to premature graves.

If those in authority in Brighton wish to improve the town, socially and morally, they must be more sanitary wise; and we would also recommend to their notice, now that houses are being run up in new quarters, that the breadth of roadway, and the outlet thereto, are of consequence. It would be hard to describe what figure Brighton represents. Built after no well-conceived design or plan, the town, as looked upon from an elevation, is a regular jumble of houses, up hill, and down hollow. Even in the

most fashionable quarters of Brighton all uniformity is eschewed, or unattended to.

"The sea, the sea, the open sea,
The blue, the fresh, the ever free,"—

this is the great attraction; and, in the face of the broad expanse of ocean, the non-uniformity of the broadways and buildings of Brighton is forgotten.

The architecture of Brighton is not of a very high character. On and leading off the King's-road and the Marine Parade, are squares and buildings, and crescents, presenting a very prepossessing appearance, large, lofty, and well lighted; but look where you will in Brighton, right or left, due east or west, north and south, you are confronted with plaster, plaster, eternal and unredceming plaster. Perhaps it is more the result of misfortune than fault that Brighton has developed little or nothing of stone in its street architecture. The old brick fronts that still exist without plaster coating in the town, have a more warm and genial look, and they harmonise better with one's feelings than the sickly glaze of endless and monotonous plaster.

It is not our purpose to describe the public buildings of Brighton. Its Pavilion has been painted, and photographed, and caricatured, a thousand times, and is likely to undergo the same operation again and again. In origin it was the offering of luxurious extravagance, and wanton and episcurean eccentricity. In design it was an anomaly, and it is so still; but the notions of both architect and king harmonised, as did also their taste in this respect. Whether we call it a pagoda or a pavilion it matters but little. Its onion-bodied cupolas or domes or its turnip-root minarets can neither add a grace to architecture nor warm into life one healthy idea of improved taste. It has outgrown its uses,—it is tabooed as a home for royalty; but though no longer the home of kings or regents, it contributes to the commonwealth by affording useful accommodation to public institutions and public committees. In its new character, say we, let the Pagoda live so long as the public cause is served.

In speaking of the Pavilion, we may note that within its rooms the Brighton and Sussex Natural History Society have their quarters, and within the building also is the Brighton and Sussex Museum. There is a very good and varied collection of minerals and fossils here; petrefactions in stone and chalk, of fish, molluscs, and bird and animal remains—some indigenous to Sussex. The collection of stuffed birds is also pretty fair, and there are old coins, medals, and other varied castings, British and foreign.

The sanitary department is meagre and poor, and there are many things which find a local habitation here which ought to be at once ejected. There are several articles in the cases which have more the character of an advertisement for their donors and makers than that of sanitary samples of what good and bad articles are.

We are glad to see that the Brighton Society of Arts, which meets in one of the Pavilion wings, is giving facilities for the furtherance of the art-education of mechanics. The system they have adopted is capable of a wider extension, and of a more constant attention in its prosecution.

Brighton, which justly boasts of a splendid esplanade, can boast of no public park. How is this? While best noted places through the kingdom are providing parks for its people, Brighton rests on its oars at the bench. In England, Ireland, and Scotland, merchants and landlords, and members of Parliament, are moving in the good cause. Mr. Baxter gave Dundee a free park; and a few days since in Ballymena, Ireland, Sir Shafte Adair presented several acres for a free people's park. There is, indeed, a piece of private property with some villas around it, which might have been secured for Brighton, but we hear it is at present down for building purposes. This park is called the Queen's Park, but there is nothing very queenly or graceful in the way in which its walks or paths are kept. Ground can be had for a public park in Brighton if its public board desire to move in the matter. Let the Brighton Corporation remember that open spaces mean health, and the health of a town bids fair for its permanent prosperity. It is considered by some that the construction of a harbour for shipping at Brighton or near it would be destructive to its visiting interest, and would have the effect of soaring visitors away, who would not care to come in contact on the

esplanades with a rough sailor or sea-faring community. Perhaps there is some degree of truth in all this. Still, we believe that a little more shipping interest than what is comprised in a few fishing-smacks or coal-brigs below the town would be a benefit to the place. With the shipping interest come capital, wealth, and consequently industry and enterprise.

We now get back to our starting-point; and it is for the purpose of showing that if Brighton in the future is contented to depend upon her visitors, her people and inhabitants will find they rest upon a very unstable foundation,—a foundation that will give way in course of time. It may be soon, it may be remote; but the day is certain to come. The only way to secure Brighton against future failure in this respect is for her wealthy citizens, or her enterprising ones, to originate, establish, and develop some local permanent trade and manufacture as a mainstay in hard days, should they arrive.

Corporations or municipal institutions are local parliaments, and they should be utilised for the service of the inhabitants of the different towns where they exist.

We throw out these few hints with the best good wishes for the future prosperity of the town. Brighton has many good and useful institutions. It is highly favoured as a watering-place, and its hotels and churches and house property are increasing in number. Schools, colleges, hospitals, prisons, and workhouses, however, do not constitute all the grand practical or grand ideal of a prosperous town. Labour and employment, trade and manufacture, are required, and a good quota of a permanent working population; a fair share of growers and producers, and fewer reapers. Under the aegis of these things, towns must grow to wealth, stand firmly through occasional storms, and prosper, always independent of any adventitious aid. In conclusion, we wish to add that our observations on Brighton have a twofold character, and they are not alone intended for those whose interest is altogether wrapped up in the town, but for outsiders, here, there, and everywhere throughout the kingdom. If Brighton should be benefited, as we hope it may be, by these passing remarks, the local interest and the national one will be served together.

ARCHITECTURAL OUTLINE.

Pursuing this topic beyond the mere generalities of character of which we lately spoke,* as belonging to such an aspect of architectural design, the subject, if strictly viewed, opens out into several distinct and separately important branches of artistic study. Some of these will obviously come under such heads as the adaptation of outline to locality—its adaptation to purpose—to scale—to material.

The first-named of these relations,—of form to locality,—contains in itself many points which must very materially influence architectural design; since, putting out of sight for the time the other considerations of purpose, &c., a building, otherwise correct in character, may fall in effect through oversight in this respect alone. Among the first points for thought under this section of the subject must ever be those of urban or rural situation; these again dividing themselves under the specialities of wooded or open, hilly or flat country; and closed or spacious, high or low-built town sites. Without pretending to discuss fully all these distinctions, we may glance at some of them, as we deem they should weigh with one designing to satisfy them; and taking the first,—a wooded rural site,—how should this be dealt with by an architect desirous and capable of treating his work as an artist?

It may, we think, be taken as an axiom in our art that its productions should pronounce themselves as artificial by a measure of contrast with their surroundings of natural objects, while, however, harmonising, not clashing, with the latter.

The general forms projected against the sky by a mass of wood or forest are for the most part rounded and undulating; most compact and uniform in what may be considered as a wooded country, and more separated and grouped where the greater scale of its parts gives it the character of forest.

The masses of shadow and light in both will be broad, though varied, as perhaps in no description of scenery so much as in that which is wooded do the charms of richness and diversity

combine so wonderfully with those of breadth and depth of effect.

Of all painters Claude Lorraine perhaps gives most evidence of entering into the full feeling of this class of scenery, which, even without the aid of very bold, mountainous, or rocky features, comprises in its broad masses, rich undulating outlines, and deep tone of colour, many of the elements of the truly grand in landscape; something perhaps analogous to the effect of a broad rolling expanse of dark green sea, such as Claude himself depicted in some of his noblest works.

We remember, years ago, standing high above the middle reach of Windermere, with the woods of Calgarth, Storrs, and Rayrigg, on the eastern bank, and those above Belle Grange and the Ferry, to the west, bathed in the hazy glow of a summer afternoon, long before a steamer's paddle had disturbed the placid mirror of that fair water, or a railway-whistle been heard within many leagues of Bowness, and we call to mind the profound impression of a great artist's truth to nature which led us to remark to a no less interested companion how like it was to Claude, and how it proved the fidelity of his pictures to natural effect, and the power of that expanse of purple-green in his middle distances, which scarcely another painter besides has ventured so to dwell upon.

Few scenes in England can equal this for such an illustration; and let us ask what are the architectural accessories which would fitly unite their forms with those which give the outlines of the grades of near, middle, and further distance, in this instance blending into a picture of surpassing rural and sylvan beauty?

For an answer to our question we may turn to Claude Lorraine himself; for how could his pictures of such subjects produce the intense impression of unity and harmony of effect which emphatically attaches to them, unless the architectural objects which enter into his compositions were of the very kind best suited to combine in effect with their natural features?

These architectural accessories we find to be generally of a massive and simple form, mostly square in outline, though sometimes circular or polygon, for the most part of castellated character, and, where not so, still having much of the solidity and simplicity which belong to such structures, as is the case with many of the Italian conventual buildings. The result is a style of form which contrasts agreeably with those prevailing in woodland scenery, and thus marking man's work where occurring among nature's, and at the same time a breadth of surface and of shadow harmonising with those of the masses of wood or forest through which the artificial forms break. To apply this to our immediate subject, we see how it points to the character which should mark, for instance, a church tower or lofty mansion in the midst of such scenery. Here all littleness of parts or fritter of detail would jar with the prevailing breadth of natural effect; and we may, not so infrequently as we might wish, prove this negatively by the mistaken styles sometimes adopted in such scenery for both ecclesiastical and secular buildings. It is often very difficult, we admit, for an architect to convince his clients of the value of plain design, even when they desire inexpensive buildings; there is a hankering after display, after a good show for the money spent, which stands in the way of simplicity of treatment; and we fear that it is sometimes too much the case that the designer, too, especially if young in practice, is tempted to show what he can do when a good opportunity offers, rather than to exercise that due reticence of hand which is often the very soul of art, in dealing with peculiar sites.

The want also of critical knowledge among those to whose lot it falls to make choice of an architect, or of a style, for some public building stands too often in the way of this discriminating exercise of our art. A case lately came within our knowledge where a most worthy clergyman about to build an additional church in his parish undertook to save the committee who acted with him any trouble in choosing an architect by visiting several of the churches lately built in his part of the country, and deciding on the point from what he should thus see. Without mentioning more than one of his comparisons, it is enough to say that he recommended for this church the architect of one which he greatly preferred to another in a parish near it, the first being a poor and weak, though over-laboured, imitation of one by the architect of the second, which was simple, massive, and impressive,—

* See p. 190, ante.

qualities eminently wanting in that preferred, and whose outline, in a very prominent position, falls utterly in respect of repose and dignity, or in harmony with the natural features of its site. Our friend's new church, it is but fair to say, promises much better than that which influenced his choice of an artist. Many an old country church tower comes to mind illustrating to memory the harmony, with contrast, which may exist between such scenery as we have been considering and well-adapted architecture, and not a few spires, but these all simple in their parts, and massive in their proportions even when moderate in scale; and such must ever be the qualities sought by an architect who would plant in such scenes a work of "art-building" un-discounting with the *genius loci*.

Our reference to Claude applying thus chiefly to buildings in hilly or undulating wooded landscapes, we can scarcely leave this part of our subject without a word or two on such as are placed in flat woodland scenery. The general outline of the trees clothing a plain follows, of course, in a great degree that of the surface they spring from, and thus much less of variety and vertical form is found here in the natural features, and more scope is given for direct contrast with the nearly horizontal landscape skyline. Hence in such scenery forms more lofty and taper than in hilly landscape will produce appropriate effect; and it is in this kind of country that our English church spires prove most effective, and of an angle and proportion finer and sharper than would produce an equal impression among more varied natural features.

When, however, trees of the fir tribe (other than the Scotch and Italian varieties) prevail, such forms will lose their power, and the broad square tower prove much more conducive to picturesque effect.

Some of the latter, of extreme simplicity, but of good scale and grey with age, are among the most powerful accessories we know to this quiet but charming style of landscape; form, colour, and association all combining to give them value.

To pass from country to town, let us consider for a little what points as to outline should guide an architect in designing a lofty building for an urban site, spacious as to openings, but abounding in features of considerable height.

Experience shows that in towns scenery, at least where the climate occasions much use of artificial heating, great irregularity and diversity of sky-line are sure to exist, and unfortunately often combined with much of weakness and inelegance, if not ugliness, of form; for rare indeed are the instances of really solid and artist-like design in chimneys, suggestive though such features be to an accomplished architect.

Contrast with this mixed outline, by carefully graduated and distinctly marked form, should be a primary aim in such circumstances: the breaks of line not frequent, but all decisive, and care being taken to avoid in the ornamental or sculptural accessories such shapes as might approach any prevalent type of form among the familiar and undignified vertical excrecences in the neighbourhood. Breadth fully proportioned to height should be aimed at in such a situation where, perhaps, from several points complete views of the whole height of the building could be obtained, a point of less importance, where, as in crowded localities among narrow streets, such can seldom be the case, and that part of the building rising above the general mass, alone likely to impress its outline strongly on the eye. Careful study of detail is also here imperative, as, while conducing to give the general character of form relieved against the background of sky, it is certain also to be often subject to close examination, the inclination always existing where a building of importance reveals itself fully from such a distance as affords a good general view, to approach it gradually till generally loses itself in detail. As regards the terminal forms of structures such and so placed as those now under consideration, it will be found that much of their success will depend on definiteness and decision of outline rather than on any high degree of elaboration in their parts, careful though, as above remarked, the study of those parts, however simple, must be. A well-considered combination of curved and straight lines, where the style admits of it, will generally surpass in effect any form composed wholly of straight lines, and this because in almost every case this will afford the best measured degree of contrast with the forms generally prevailing in such town sites as we are supposing. Where the style of

architecture excludes any large application of curved lines, a massive squareness will generally prove most effective; and as illustrations of each of the above classes of form, we may instance as pre-eminent the cupola of St. Paul's, London, and the centre tower of York Minster. Of course, the grand scale of these examples removes them from the class of ordinary design; but the principles which they depend upon are common to all scales of building,—with this reservation, that with diminution of scale an increased proportional degree of terminal solidity should be sought, or the result may be that of flimsy weakness, such as was alluded to in a former paper on this subject, as marking some late tower designs in the provinces. At the same time a more finished—we do not say a more studied—style of detail should be adopted in the upper parts of the structure, thus by smallness of scale brought nearer to the eye.

One of the stateliest examples extant of simple form on a grand scale rising among town masses of ordinary buildings is presented by the tower of the church of St. Rembault, at Meublin, most beautifully depicted by David Roberts for the illustrated edition of Lord Lytton's "Pilgrims of the Rhine," and also in Coney's well-known etchings. It is remarkable that this tower, like that of York Minster, and others of very imposing appearance, has the bases of pinnacles at the parapet without their shafts, giving the idea—whether correctly or not can scarcely now be known—of their having been intended, but omitted from the completed design with the apparent object of preserving squareness and simplicity of outline, which certainly in these examples produces a noble and powerful effect.

Of town spires, those seem most effective which, with considerable massiveness of proportion, have their decoration confined in a great measure to the point of junction with the tower, as is the case with St. Mary's, Oxford. One celebrated steeple, that of St. Nicholas, Newcastle-on-Tyne, has always appeared to us weak in its impression, save on the direct square elevation; its effect on the diagonal having to our eyes the defect we have before alluded to, of deficiency of mass in the lantern and spirelet as compared with the tower seen diagonally.

The great Somersetshire towers, as that of Tintern and others, as also the cogate example of Wrexham, present fine instances of appropriate urban features, and in most of them the bold treatment of their parapets and pinnacles is conducive both to loftiness of aspect and grace of terminal outline without weakness.

Wrexham Tower, though in some of its details late almost to debasement, is an especially fine example of bold proportion and massive design, and few towns in Great Britain can boast of a finer and more appropriate central object; the spire of a lately-built church, designed apparently for contrast, of a very fine angle, groups strikingly with the old tower in distant views of the town, but, on a nearer approach, especially when viewed in comparative isolation, seems too attenuated for dignity, and in its very marked simplicity in respect of detail lacks something of the force derived from clustering decorative features at the base of a spire, bringing it also somewhat more into harmony with, though not imitating, the varied and broken character of the general town skyline around it.

A critical comparison of various examples with a close scrutiny of the mental impressions they produce and their sources, fixed in the memory by careful sketching (an exercise which no number of photographs or engravings can supersede in value) will lead to much of knowledge and quick perception of what is appropriate or the contrary; and no less will such study convince of the fact we have before sought to impress, of the great scope for variety of treatment which exists for works in this class of design, notwithstanding the simplicity of the main elements entering into their composition.

Having touched, though slightly, on a few parts of our subject, such as seemed calculated to convey correct impressions of the principles of criticism involved, we may hereafter enter into a brief examination of some of the rather more detailed points of treatment affecting this important province of architectural design.

The Water-Colour Societies.—The Society of Painters in Water Colours and the Institute of Painters in Water Colours will both open their exhibitions to the public on Monday next; the private view taking place this Saturday.

THE ARCHITECT AT THE HOUSES OF PARLIAMENT.

THE correspondence between the First Commissioner of Works and Mr. E. M. Barry "respecting his duties as architect of the New Palace of Westminster," as moved for by Mr. Cowper Temple, has been published. We print a portion of the architect's last letter, which led the First Commissioner to take legal opinion as to the right of the Crown to ask for all the contract plans and drawings of the Houses of Parliament:—

"I have ascertained that the professional custom of American architects in such cases agrees with our own, and that the roles of the American Institute of Architects declare that 'drawings, as instruments of service, are the property of the architect.' I have received numerous communications from architects and others to the same effect. I have also been informed by members of my family that they will feel aggrieved if I surrender that which they consider was left in my hands as a sacred trust, and the nature and tenor of all this which I have referred to, combined with my own feelings on the subject, place an insuperable barrier in the way of my handing over my inheritance to the First Commissioner of her Majesty's Works. I am, however, most anxious not to offer any impediment to his views, and I shall be happy to show all my drawings, &c., to the Director of Works, and to make tracings for his use of any of them of which he may require copies. For so doing I will make no professional charge, merely asking the First Commissioner to defray the actual and necessary cost of making such tracings or copies. Moreover, though I cannot admit the right of the First Commissioner to give me directions respecting my own property, I am willing to give to him, without any charge, originals or tracings of all drawings made in my own office, during my engagement, which have been signed as contract drawings, and referred to as such, and I sincerely trust that these proposals will put an end to a misunderstanding which I greatly regret, which I am not conscious of having done anything to bring about, and to the continuation of which I am anxious not to contribute."

The proposition seems most fair. There is an entire misunderstanding abroad as to architects' plans. Mr. Ayrton is reported to have said, as we mentioned last week,—"It was correct that certain architects had resolved that they were entitled to keep plans which they had prepared for other people who had paid for them." We have pointed out on many occasions, without reference, of course, to this case, that an architect is paid not for his drawings, but for producing a building. The drawings are his tools, his means for producing that result; and, whether numerous or few, whether made with ink on paper or with chalk on a deal board, do not regulate his charge. There is no more reason that the architect should give up his drawings to his employer at the close of the work than that the carpenter and mason should leave behind them their centres, templates, and drawing-boards, and it never is done. A plan of the drains or a section showing the flues may be and often is made for the owner, sometimes with and sometimes without extra charge; but as a principle the drawings belong to the architect, unless, indeed, there should be any special arrangements to modify that principle. We do not desire to see Mr. Barry commence a legal fight singlehanded with the Government, for whom law is cheap. The whole profession is concerned, and ought to make common cause to prevent the possible establishment of an unjust and injurious precedent. We sincerely hope, however, that the legal advisers of the department may take such a view of the question as may prevent what would certainly be a discreditable collision.

At a meeting of the Manchester Society of Architects, held on the 4th inst., it was resolved:—

"That the Manchester Society of Architects, being satisfied of the correctness of the views as to the ownership of architects' drawings set forth in the Rules as to professional practice drawn up by the Royal Institute of British Architects, desires to assure Mr. Barry that he will have their cordial support in resisting the demand of the First Commissioner of her Majesty's Works to deliver up to him the drawings prepared by his late father and himself, in their capacity of architects to the Houses of Parliament."

We understand that the Society also expressed their willingness to take up the suggestion made in our last, and join in a general subscription, to fight the question on public grounds.

SIR,—Having just read the correspondence between the First Commissioner of Works and Mr. Edward Barry, it appears to me a case of extreme hardship.

During an experience of thirty years and more on some of the largest buildings in England, I cannot call to mind a solitary instance of an architect surrendering his working drawings to his client; and to my mind it becomes imperative that such a demand, now made for the first time

should, in the interests of the profession, be resisted to the utmost.

To fight this question, which affects every architect in the kingdom, single-handed, against one of the most powerful Governments of modern times, would be a most unequal contest. Every associated body of architects should, therefore, be up and doing, and aid in furnishing the services of war by forming a defence fund, to which I, for one, would readily subscribe.

Let the Institute of British Architects at once appoint a treasurer, and there will be no lack of contributors to aid Mr. Barry in his defence.

A SURVEYOR.

METROPOLIS BUILDINGS AND MANAGEMENT BILL.

The new "Bill to consolidate and amend the Building Acts relating to the metropolis; the Formation of Streets and of Sewers and Drains in the Metropolis [not very clearly expressed this, by the way], and for other purposes relating thereto," consists of 132 clauses, and 17 schedules, printed on 69 pages. It was brought in by Sir W. Tite, Mr. Bontinck, and Mr. Bowring, and is to come into operation, if so accepted, on the 30th of September next. The definition of a building not given in the present Act, stands thus:—

"'Building' includes every erection comprising a cubical space defined by walls, piers, posts, or other structures, and a roof or other covering, whether such erection is fully enclosed, or not, and whether it is fixed on permanent foundations or not, and of whatever materials it is constructed, and for whatever purpose it is used, or constructed, or adapted, but so that this interpretation be not construed so as to exclude from the application of the term building as used in this Act any erection that would have been determined to be a building according to the true construction of this Act if this interpretation had not been inserted in this Act."

The fees to be paid to district surveyors are not stated, but are to be the subject of bye-laws.

When a building has been taken down or destroyed to the extent of one half its cubical contents, the rebuilding is to be deemed as now the erecting of a new building, but the difference of opinion which prevails as to what constitutes cubical contents is not dealt with.

By Clause 45,—

"A building in a street may, with the permission of the Board, given by them after considering any objection made by any of the owners of each adjoining building or ground, be brought forward to any extent, provided that no part thereof extends beyond a line drawn at an angle of forty-five degrees with the front wall or boundary of the adjoining building or ground; and the decision of the Board shall be final and binding on all parties and those claiming under them, as well in respect of easements of light and air as in all other respects."

As to public buildings, the Board takes much larger powers than heretofore. By clause 70,—

"A building shall not be used as a public building until the superintending architect has certified his approval thereof in relation to the matters referred to in the tenth schedule."

Those matters are:—

1. Width of lobbies, corridors, passages, landings, and stairs.
2. Freedom thereof from inconvenient barriers, and steps of narrow tread or curve.
3. Construction thereof with fire-resisting materials, carried by supports of fire-resisting materials.
4. Strength and security of railings and balustrades.
5. Width of openings for doors for public entrance or access and egress, and method of opening same.
6. Means of ventilation.
7. Provision for water supply by constant pressure or otherwise.
8. Provision for extinction of fire."

By Clause 99, the district surveyor, if he find a building in an eminently dangerous state, is himself to cause it to be shored up and hoarded in.

115. By order of Council, one of the police magistrates may have the exclusive execution of the duties to be performed by a magistrate under this Act confined to him.

126. A builder who executes work not in conformity with the Act is not entitled to recover payment.

As to foundations, the present requirement, that "the footing of every wall shall rest on the solid ground or on concrete" remains, and is not sufficient for security. A thin layer of concrete meets the legal requirement, and if on loose or unequally solid ground, will not ensure stability.

Party fence-walls exceeding 7 ft. in height are brought under supervision.

Amongst the exemptions we find,—

"Greenhouses, plant-houses, orchard-houses, summer-houses, poultry-houses, and aviaries, used exclusively for such purposes, standing detached, and not less than 10 ft. from any other buildings, not being heated otherwise than with hot water, and the fire-places, if any, being detached, with no flues of any kind within the houses or buildings,

"Water-closets and privies not exceeding in area 35 ft., and not exceeding in height 7 ft. 6 in. measured from the level of the ground to the under-side of the eaves or roof-plate, and built on separate foundations and external to the buildings to which they belong, and having no internal communication.

Roofings not exceeding in area 30 ft., and not exceeding in height 7 ft. 6 in. measured from the level of the ground to the under-side of the eaves or roof-plate, and distant at least 10 ft. from any other building, and from any street, and not having therein any stove, fire, fireplace, hot-air or hot-water pipes, or other apparatus for warming or ventilating the same."

These exemptions are very objectionable, and would fill the back yards of suburban districts with dangerous wooden structures.

We shall have opportunities to look farther to the provisions of the new Bill.

The ugly coinage "storey," plural "storeys," is, we are sorry to see, adopted throughout the document.

THE LATE MR. PATERSON, OF NEW ZEALAND.

We have to record the death in New Zealand of Mr. Thomas Paterson, C.E. He was the son of a Leith merchant, and was born about the year 1832. He received his education at the High School, Edinburgh. He was articled when young to Messrs. Grainger & Miller, in the railway branch of engineering, and at the dissolution of the partnership, Mr. Paterson remained with Mr. Miller, and finally became managing assistant to Messrs. Blyth, who succeeded to Messrs. Miller's business.

In 1863, the Otago Government required the services of an engineer, to whom they guaranteed a two years' engagement, and a salary of 1,000*l.*, with expenses out and home again. Mr. Paterson obtained the berth by his testimonials, without any competition. He went out by the *Suez* route, in 1863, and was first appointed as road engineer for the greater part of his engagement time. He carried out many important and successful works. He surveyed and prepared Parliamentary plans for the Dunedin and Clutha railway, and for the Southland government he supervised the completion of the Bluff and Invercargill railway. He also prepared specifications for the re-construction of the Oreti line. Mr. Paterson drew up some able and careful reports on the Lyttelton tunnel, and on railway works in general in the colony.

At the period of his death he was engaged in the preparation of plans for the Rangitara Bridge, and as late as November last he had written to the Gladstone Board of Works that he had completed his design, and to the effect that, if a special meeting were called, he was in readiness to submit his plans, and make arrangements for the prosecution of the work.

He met his death, along with others, by the upsetting of the Dunedin mail-coach, in the Kakanui river.

Mr. Paterson's loss is severely felt in the colony. He was considered to have no equal in his own peculiar line in New Zealand. The deceased gentleman was unmarried, and was not known to have any relatives in the colony. In business matters he was considered upright beyond suspicion, and he was generally respected by all who knew him, or had dealings with him professionally or otherwise.

MR. PAGE'S SCHEME FOR A CHANNEL TUNNEL.

MR. THOMAS PAGE, C.E., has read a paper to the Society of Arts on his plan for a submarine tunnel across the British Channel.

He proposes to sink, between Dover or the South Foreland and Cape Gris-nez (17½ nautical miles), eight conical wrought-iron shafts, the longest about the height of Westminster Abbey towers; these shafts to be two miles apart, and consisting of an inner and an outer casing, the space between to be filled in with concrete after they are sunk and fixed or imbedded, and embarked also round with concrete to a height of 30 ft. on a base of 45 ft. all round. A network of moored chain cables would also help to secure them. Lighthouses would be placed on the tops of these shafts, at a height of 180 ft. above low-water mark.

"The shafts being in place, the bed of the sea would be brought to a fair surface by the operation of divers, who would be enabled to work without pressure on their lungs or their bodies; but into the particulars of this system (said Mr. Page) I do not wish to enter, as it is a special arrangement for such purposes of operating in deep water.

The next operation is that of sinking and bedding on the bed of the Channel, the tubes or construction for the

railway. These may be for a single line or a double line. I will refer to the double line at present, and then describe a tube, the joint of which is patented by Mr. Williams, of Liverpool, by means of which the tube, moving on circular joints, can take an elastic position, and all the junctions can be made above the surface of the water, while the remainder of the tube is bedded in the sea.

The space between the shafts being divided into lengths, say of a quarter of a mile each, and heavy iron frames fixed in the bed of the Channel by the divers, the lengths of tubular sections which I would propose to submerge at one time are 1 mile, 1,320 ft. more than the length of Waterloo Bridge. Eight of these lengths being sunk, and covered, complete the distance of two miles, and if a sufficient power and a sufficient number of operators were provided to commence from each shaft, the whole between two shafts would be done in half the time; and it is equally certain also that nine times the power and operators would complete the whole distance between Dover and Cape Gris-nez in the same time as would be required for joining two shafts.

The gigantic nature of the work and the magnitude of its details require corresponding means of execution, both in the steamships and other vessels, for placing the shafts in position, and for embedding the lengths of tube in their proper places in the bed of the Channel, as well as for all the operations for filling the spaces between the outer and inner rings of the shafts with concrete, in forming the banks of concrete round the shafts, and in covering with concrete the tubes immediately they are placed in position. It is by an excess of power and means, in steamships and other vessels, in operators, and in materials for forming concrete, that the progress and completion of the work can be accomplished with rapidity and economy. Thus to cover a length of tubular section a quarter of a mile long, in two hours of the tide, would require 1,500 men; to fill the space between the rings of each conical shaft would require 600 men for two hours' work; and to form the bank of concrete round each shaft would require 350 men for the same time.

The cost seems to have been estimated at 8,000,000*l.*; or rather Mr. Page's plan was devised on an understanding with Mr. Newman, of the firm of Freshfield & Newman, that if he could state his professional reputation on a plan that could be completed for 8,000,000*l.*, there would be no difficulty in providing the funds for its execution.

In the discussion which followed the reading of the paper, opinions were expressed *pro* and *con*, as to the practicability of the scheme. Mr. Brassey was amongst the speakers. He said that so far as he had been able to understand the project, it was one of such a gigantic and exceptional character as he had never before heard propounded. No engineer had ever attempted anything of the kind, and he very much doubted whether it would succeed; his impression was that it would sink the tube, as was proposed, to the depth of some 200 ft. by any means yet known; and to attempt to do a thing so gigantic without greater experience would be a very hazardous experiment, to say the least of it. He agreed with Mr. Bateman (who had previously spoken) that it was impossible for miners to work at a depth of 200 ft. Therefore, with no experience to guide them, he thought it was a bold matter to attempt to execute such a project, and no wise man would attempt it.

Mr. Page said Mr. Brassey's objection as to divers working 200 ft. below the sea, without undue pressure upon their lungs and bodies, was very easily answered. Supposing the room in which they then were was at the bottom of the sea, and the walls were carried up above high water, would any one dispute that they could stand out of the sea from that room into the sea, passing through a sort of valve-upboard into the sea, and give him only the atmospheric pressure, with perhaps a pound or so more. He had devised a dress for this purpose, by which all pressure was removed from the body. That being explained, all the difficulty about divers operating in deep water was removed. As to want of experience, all great engineering feats had been carried out without previous experience.

THE TRADES MOVEMENT.

Manchester.—Some months ago the painters of Manchester gave notice that on the 1st of April they would cease work unless an advance of 1*d.* an hour was given by their employers, along with a reduction in the hours of labour of three hours and a half per week. The men and their employers each agreed to select six of their number to form a committee of arbitration, to lay the whole subject before the Mayor of Manchester, who was appointed umpire. His worship has been hearing both parties, and at the close he said, it appeared from the admissions on both sides, that every four years there was a proportionate rise in the wages paid to the men, and he thought that, under the circumstances, the masters should pay the 7*d.* per hour, and accede to the demand for a reduction of three hours and a half per week. This was, in fact, giving the men an extra 3*d.* per hour, with the reduction

demand in the hours of labour. Mr. Harwood, one of the principal employers in the trade in Manchester, in proposing a vote of thanks to the mayor, stated that it would be a great loss to the masters to give the advance at the present time, but it was preferable to coming into collision with the men, and creating misunderstanding and contention. He hoped that the men would, by increased diligence and attention to their work, in some respect qualify the great loss which they must inevitably sustain.

Motherwell (Glasgow).—A large number of labourers in the employment of Mr. Smith Brown, contractor, have turned out on strike for an advance of wages. The men allege that although other branches in connexion with the trade have received an advance, they have obtained none; hence the dispute. The strike at present is only partial.

Stirling.—The operative masons in Stirling have struck work, in consequence of the employers having refused to give an advance of 1d. per hour per day of nine hours. The strike will continue, and upwards of 100 masons, with a considerably greater number of labourers, are out of employment. The masters have resolved to assist each other as far as possible, and, by the aid of their apprentices, are endeavouring to push forward the work upon such buildings as are most urgently required.

Peth.—A meeting of the master masons has been held, and it has been unanimously resolved not to comply with the demand of the operatives for the additional 3d. per hour. A good number of men are coming from the country districts and obtaining work at the present rate of wages, —viz., 5 1/2d. per hour. The men connected with the Masons' Association continue to hold out. Seventy-seven have found employment in other places, but thirty-two are still idle in the town.

Coatbridge.—The joiners of Coatbridge and neighbourhood have lately evinced considerable dissatisfaction since the commencement of the strike at Glasgow, and every effort has been made by them not only to support their city brethren, but to obtain the terms for which they are agitating. Weekly meetings have been held to consider the question, and it has been decided that, unless the masters agree to the terms proposed by the Glasgow men on strike, they shall also turn out. Accordingly, no agreement having been come to, the men have ceased working.

Fatal Trade Dispute in Bohemia.—The Austrian journals give some imperfect details of a lamentable collision between the Imperial troops and a body of workmen on strike. It appears that the trade differences in Northern Bohemia have lately resulted in the now ordinary form of a strike on the part of the discontented workmen. On the 31st of March the artisans employed at several manufactories at Reichenberg, having ceased to work, proceeded in a body to some establishments at Swarov, with the object of compelling a cessation of labour in that town. On their arrival they found the principal manufactory occupied by the troops, and a conflict ensued, which, unhappily, terminated in loss of life. It is stated that the workmen on arriving proceeded to insult the soldiers and to pelt them with stones. The latter after a time became exasperated, and fired upon the crowd. The result was five men were killed and twenty-five or thirty were more or less seriously wounded, whereupon the workmen dispersed; threatening, however, to return in greater numbers and better prepared to exact vengeance. One soldier was killed and another seriously wounded by stones. Great agitation prevails throughout the northern part of Bohemia, and all the manufactories of Swarov have been closed, while reinforcements of troops are being sent from Prague.

THE GREATNESS OF GREAT MEN.

RECENTLY an excellent lecture on this subject was delivered, in Wakefield, by Mr. Walter Smith, the head-master of the Leeds, Bradford, and Wakefield Schools of Art. In the course of his remarks he said he considered that in all great men there were these three features,—love of work, unflinching courage, and perseverance. Had some men not been the greatest workers the world would never have known them as great men. Mr. Smith, in answering the question "What is the secret of the success of great men?" said:—"The secret of great men is that there is no secret at all, and this is a secret which, though proclaimed upon the house-tops before

multitudes of hearers, will always be believed to be a secret, and for no better reason than that it is the easiest and most plausible way of explaining the difference that we see to exist between ourselves and those we acknowledge to be great. If we would fairly and honestly take to the acknowledgment that whilst we have slept great men have worked, whilst we have been self-indulgent and prone to luxury, they have been self-denying and inured to hardships, we should lose something in the good opinion we have of ourselves, but we should gain a great deal in self-knowledge, and dispel a mystery that should be no mystery at all. There seem to be common elements of character in all great men, almost the identical basis of character in the one as in the other, the different vocations explaining any minor differences that are to be found in them. Thus I find precisely the same features in the character of Michelangelo and the Duke of Wellington, two men living three centuries apart, in different countries, one a great artist and the other a great warrior. In them, as in every instance I have yet studied, the distinguishing feature is an intense love of work, work of the kind that fell to the lot of each to do. Another feature is indomitable courage, and the last is a never-dying perseverance. Though I have carefully studied the histories of many of the greatest men, in order, if I could, to discover the source of their greatness, I have never yet come upon one great life that has lacked these three features,—love of work, unflinching courage, and perseverance.

And this leads me to express the opinion that the only reliable sign or indication of genius is eagerness for and love of work as a basis; and whether this genius will ever become developed to maturity will depend greatly upon the other two features, courage and perseverance; though, of course, something depends upon health. Another feature of great men was, that failure did not discourage them. If they sat down with tearful eyes and lamentations, surrounded by their mistakes, and overwhelmed by them, they would never rise over them. Greatness persevered and overcame, whilst littleness lost heart and failed." As an illustration of perseverance the lecturer instanced the case of George Stephenson, who succeeded, in the face of apparently insurmountable obstacles, in laying a railway over Chat Moss, between Manchester and Liverpool. That which at first sight was deemed impossible to achieve was afterwards declared the strongest, and safest, and cheapest part of the line. Other men would have abandoned the project, but George Stephenson was a great man, and he did not. The lecturer conceived that in one single injunction, "Whatever thy hand findeth to do, do it with thy might," lay the elements of success. "It is not," said he, "the nature of your work, nor the importance, socially or pecuniarily, of your trade or profession that will give you the opportunity or means of living a great or noble life; for there are models in every calling, however important, and nobles in every occupation, however insignificant. The man dignifies or degrades the office, the office does neither to the man. There is absolutely no employment which may not be made the means of arriving at success in life; there is none which cannot be degraded into failure. The only stipulation is, that your hands shall have found the work to do, and that it shall be done with your might. Not with your inclinations only, nor with your faltering hands and timid hearts, but with might; and might means strength of hand and strength of heart, skill and courage combined in one strong word."

LECTURE BY SIR H. JAMES ON THE GREAT PYRAMID.

A LECTURE on the Great Pyramid of Egypt has been delivered before the members of the Hartley Institution, at Southampton, by Col. Sir Henry James, R.E., director-general of the Ordnance Survey. Sir Henry entered at some length into the details of measurement of the Great Pyramid, pointing out its perfect exactness, and said that many enthusiastic gentlemen imagined these beautiful proportions must have been the result of superhuman labour, following out this idea in a manner which excited the admiration of those who were their followers, and the ridicule of those who were not; among the latter of whom he included himself. In passing, the lecturer exhibited an exact representation of what he said was the most interesting piece of wood in her Majesty's dominions—the wooden

cubit measure found in Egypt, and now deposited in the British Museum, and which was more than 3,200 years old. Having remarked that he had a copy of this measure sent out to Egypt to Sergeant-Major Macdonald, with instructions to measure the pyramid, and stated one or two of the results thereof, Sir Henry went on to say that the side of the square base of the pyramid was equal in length to 760 English feet, and his experience was that people had a very imperfect idea—a difficulty of realising such dimensions. The stone used for the facing was of a better class than that which formed the inner portion of the building, and to give an idea of the recklessness of cost, so to speak, and the tremendous indifference to any amount of labour which characterised the old Egyptian kings, the lecturer said they, at enormous pains, had large stones brought from the opposite side of the Nile, and placed in their present positions. They were, too, very clever as architects; for instance, in the king's chamber inside the pyramid there were stones 30 ft. long, placed one over another: these stones were not found in Lower Egypt at all; but although some were 90 tons in weight, they were brought in vessels 500 miles down the Nile, carried across great causeways, and then placed in the pyramid 100 ft. above the level of the ground. Then, again, as to the finish, this Syenite stone was one of the very hardest known, and yet it had been polished and built in to form a casing for the king's chamber with such an exact skill and so high a finish, that the finest piece of tissue paper could not be put between the joints, and this in a place built 4,000 years ago for no other purpose than to hold the body of one man. If there was one thing which more than another he admired in the construction of these pyramids it was the extraordinary manner in which the builders introduced the principle of counterbalancing, by which, he believed, the stones were raised to their positions. By aid of a model, the handiwork of Corporal Goodwin, R.E., who worked it on the platform, Sir Henry explained his theory upon this point. In conclusion, he said that the assertion of some that the pyramids were built only as a standard of measure was an insult to the understanding.

THE NINE HOURS MOVEMENT.

BY A WORKMAN.

SIR.—Another agitation in the building trade is the last ominous announcement which has been the round of the papers. Among the many strange things in existence there is none more startling than the continual agitation of the builders' workmen: contentment to them is unknown,—and in season and out of season the brains of the leaders are scheming agitations. It matters not what is the state of trade. When brick they want a rise of wages; if slack, a reduction in the hours of labour.

According to the reports, the new movement is making great progress. Meetings are held, at which every one agrees, and the rules for the guidance are unanimously passed as the apex of legislative wisdom. It is a pity that any doubts or jars as to the benefits of the movement should disturb such rare harmony. Nevertheless, I think it is the workmen's duty to weigh their unanimous proceedings in the scale of common sense, and, if found wanting, to expose the fallacies which have misled a portion of their fellow-workmen. Before doing it, I may state that I have spoken to many workmen about the movement, and have not found any in favour of it. The labourers are tooth and nail against it; and the others say, that as the building trade is better paid, has more privileges, and works less hours than other trades, it is the wisest course to let well alone.

The movement in 1859 for a reduction in the hours of labour led to one of the greatest strikes on record. The revivers of that movement have changed their tactics, and state they are willing to drop the hour's pay, and take nine hours' pay for nine hours' work, thereby assuming that no opposition will this time be offered by the employers, as the object is to provide for the surplus hands in the trade, and the leaders think they are entitled to much praise for their philanthropic efforts. But it so happens that there is something further in the shape of a code of working rules which gives the key to the movement, and from them we learn that the reduction of the hours of labour is the pretence,—higher wages, more privileges, the object; and it is evident that the masters must, in the inte-

rest of the public, resist, or this movement will, like many others, end, if not at once opposed by masters and workmen, in a ruinous strike. As such is the case, it behoves employers and workmen who object to the movement, and to these continual agitations in the trade, to arouse themselves and form, not an anti-strike or a free-labour society, but a common-sense society, whose object would be to expose the fallacies and inconsistent considerations of the men who now pretend to lead and regulate the building trade. The reduction of the hours of labour is a favourite theme with trade-unionists; they have an idea they can, by reducing the hours of labour, regulate the supply to the demand; they appear to think that work is a fixed quantity, and that workmen are an exact number. But, unfortunately for their theory, London is the metropolis of Great Britain, and workmen from all parts flock to it; and, further, it is the ambition of a large number of apprentices, to become London workmen. They have heard of it as a place where enormous wages are to be earned, and thus it is that in London there is, and always will be, a large number of unemployed workmen. And this demand to raise wages, that are already much higher than the wages in other trades, will end disastrously to all concerned, in the first place, by the absorption of workmen whose trades are closely connected; and in the end they will be compelled to accept lower terms and less privileges than they previously possessed.

The rule relating to working hours states "that nine hours are to be reckoned as the working time; all over that to be called overtime, and to be paid time and half, and double time." Before discussing the consequences of that, I might ask, who now objects to overtime? I have worked with unionists, and I never heard any object. We know that in theory they pretend to object, but in practice they take to it kindly without a protest, and therefore this nine-hour movement is a dishonest movement, because it is in its essence a scheme to raise wages. It is, or ought to be, well known that a large part of the builders' work in London consists of alterations and repairs, and it is that branch of the trade which the rule as to overtime would most affect, and its influence would have a deadening effect in relation to the various trading establishments in the metropolis. In shops and offices, every inch of space is economised, and all sorts of schemes are devised to make the most of it; and alterations and repairs are a serious consideration, as it is a partial stoppage of business, and the tradesman is always glad to see the backs of the builder's workmen; and no doubt in the first-class businesses the inconvenience of having workmen about is almost as great a consideration as the cost. Overtime is then a matter of necessity, and if they are to be taxed from 50 to 75 per cent. for it, the chances are they will prefer to go on in their old way rather than submit to the workmen's demands. Other cases might be cited which would more illustrate this short-time movement, but sufficient on this point has been said to show that, in relation to alterations and repairs, it would inflict loss on the public and seriously affect the workmen's earnings.

In London there is a large number of small builders who employ from two to twenty workmen, and these in most cases have not more shop-room than they require to carry on their usual business. It sometimes happens that they are unusually busy; every bench is full, and they require the men to work overtime; but if they are to pay a heavy tax for it, it is evident that it would prevent any increase or enlargement of their business; and thus the rule would keep small tradesmen in a fixed position, and give an advantage to those who happened to have more shop-room than they actually required. As some builders are more fortunate than others,—or, in other words, there is a surplus of master builders,—it would be well for the leaders of the movement to make it more absurd than it at present is, to take into their consideration the case of the unemployed masters, as there are at present many of them who have no storage, and yet want more room, whilst there are others with plenty of shop-room and no work. According to our leaders' ideas this state of things ought not to exist. I hope, sir, you will allow, in the interest of the workmen, this question to be discussed in the *Builder*, as, in my opinion, that is what is required to bring the workmen to take a common-sense and practical view of the unwise proceedings of the so-called working-class leaders.

JACK PLANE.

THE POOR OF EDINBURGH.

SIR,—You have frequently, in the pages of the *Builder*, called attention to the subject of the destitution existing in the metropolis, and it has occurred to me to bring under your notice the "Edinburgh Association for Improving the Condition of the Poor."

The Association has been in existence for two years, and after having had many obstacles to contend with, is now in good working order, and is doing much good. This city is favourable for such an experiment. The poor are more concentrated in certain districts than is generally the case, and these are not far removed from the residences of the better classes. There are here a number of retired military and professional men, with time hanging on their hands, to whom the work of visiting, &c., is not burdensome, and the visitors are recruited from all of the well-to-do classes who have any time to spare; and some of the most energetic and useful of them belong to the class of skilled artisans. The Association is particularly anxious to get at the children: where possible they are sent to school, and free dinners have been given to many of them (all are invited). Members of the Association attend these dinner-parties, and a register is kept of the guests, and their cases inquired into. By this means we get at the root of the evil.

By your making public this matter you may induce others to follow a good example. I believe that applications have been made to the central committee from other cities for information as to the working of the system.

W. G. SHIELDS.

WORCESTER DIOCESAN ARCHITECTURAL SOCIETY.

THE annual meeting of this society has been held in the Council-room of the Museum of the Natural History Society, Foregate-street, Worcester; present,—Earl Beauchamp (in the chair), Rev. R. Cattley, Rev. G. S. Mann, Hon. and Rev. H. Douglas, Rev. T. G. Cartier, Rev. H. J. Vernon (Eckington), Rev. H. G. Faussett, Rev. J. F. Green, Rev. B. H. Eyre Davies, Mr. E. Lees, Mr. J. Severn Walker, and Mr. G. J. A. Walker.

The Secretary (Mr. Severn Walker) read the annual report, which was adopted; after which some discussion took place as to the right and duty of the society to criticise the various public buildings erected in the locality during the past year.

The Rev. M. E. C. Walcott was elected an honorary member of the society, and the office bearers were re-elected.

THE ARCHITECT'S DEPARTMENT, BOARD OF WORKS.

THE preparation of the New Buildings Bill, to which we have referred in our present issue, as well as that of various previous drafts, devolved on Mr. Walter Newall, the principal clerk in the Architect's Department. After 26 years' service, partly with the Referees of the 1844 Act, and since then under the present Board from its foundation, Mr. Newall finds himself with a salary of 300*l.* a year, attained at the beginning of 1868 by the final increment of 10*l.* under the first-class scale, and we do not wonder to hear that he is now seeking to induce the Board to consider his position. We have reason to know that his duties are such as have always required knowledge and judgment, and have long called for nightwork, week by week, in the preparation of returns and reports which could not be attended to during office hours. A public servant such as this should not be allowed to end his days at 300*l.* a year.

THE GREAT HALL, ALLEYN'S COLLEGE, DULWICH.

This handsome apartment forms the central feature of the block of buildings just completed, as the new College at Dulwich, of which a general view, plan, and particulars were given in a previous volume of the *Builder*.* The whole of those buildings are now complete, and have been partially in the occupation of the school, where 250 to 330 boys are at present assembled. The

building, when fully occupied, has accommodation for 800, and situated as it is close to London, and in the midst of a very populous neighbourhood, which is ever on the increase, there can be no doubt that the full number of scholars will be at once eager to enter so soon as the arrangements of the trustees permit. At present, as we have said, they do not propose to take more than 300 boys.

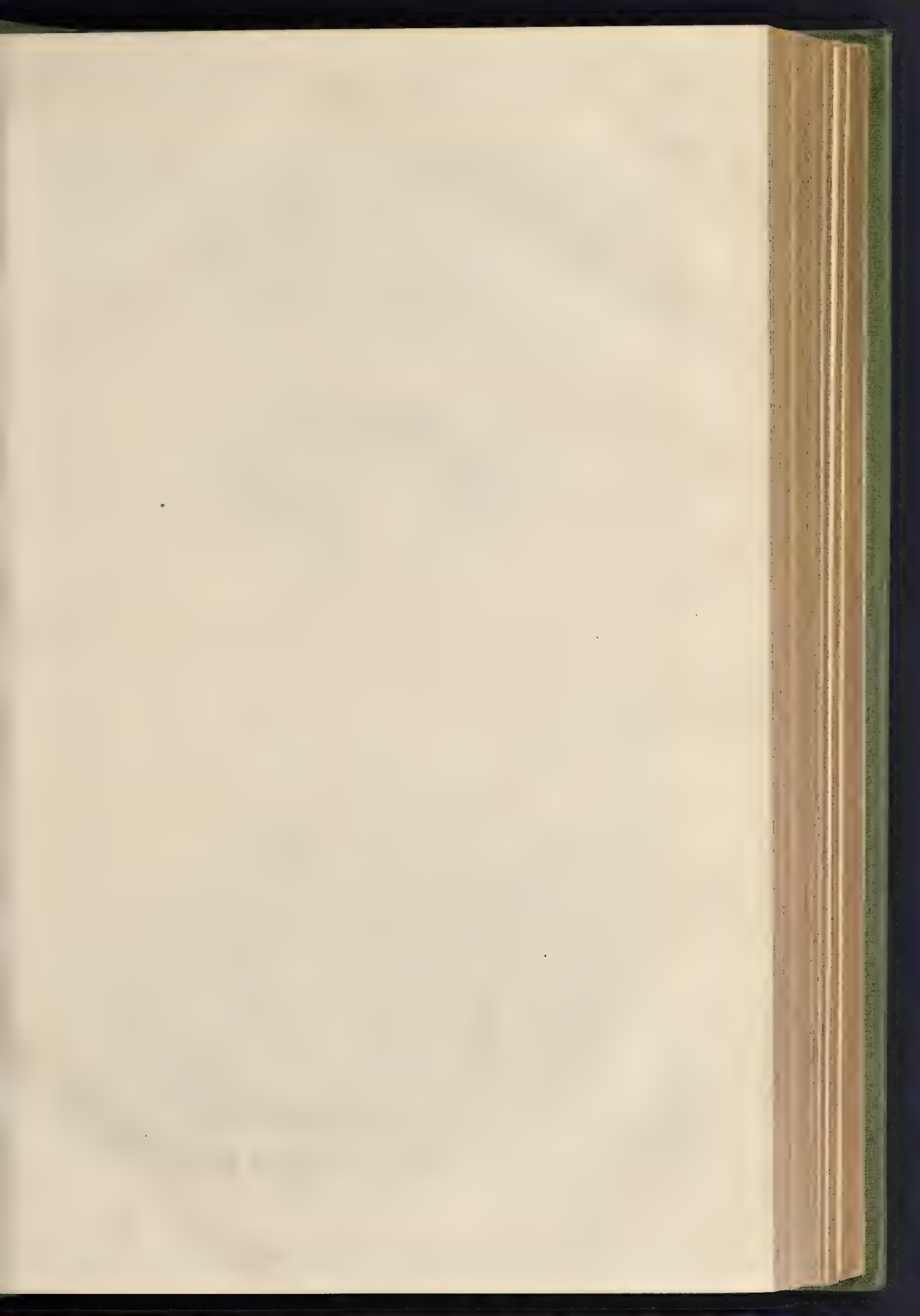
The hall is on the principal floor of the building, and is approached on each side from the ground floor by spacious staircases communicating with the play cloisters of the boys, and which connect the north and south wings of the building with the central block. Its length is 92 ft., its width 43 ft., and its height above 50 ft. There is a raised dais at the eastern end, which will be available, we presume, for those speeches and dramatic recitations which have so agreeably marked the examination prize-days of Allyn's College during the last few years. The great ribs of the roof are supported on pillars of red Devonshire marble, highly polished, with richly-carved stone capitals, and standing on pedestals of terra-cotta work in cream colour and light green ware of very finished and beautiful manufacture, from the works of Mr. Blashfield, of Stamford. A paneled oak dado runs all round the hall between these pedestals, while the panels between the pillars are to be gradually filled with the recorded names of scholars of Allyn's College who shall have attained distinction in their after-studies and their future lives. The great doors each side of the hall leading to the staircase, of carved oak, are worthy of observation. The hall is lighted by a large mullioned window at each end, as seen in our engraving, and which is filled with glass, relieved by a stained glass bordering; while the tracery contains the armorial bearings of the College. These windows have been executed by Mr. Moore, of the Eekford Glass Works, Clerkenwell, and the border and other coloured parts are formed from Stamford coloured glass, the ingenious process for doing which has been patented by Mr. Moore. The window jambs, mullions, and tracery are all of terra-cotta, enriched with modelled carving from Mr. Blashfield's manufactory above mentioned. The roof of the hall is entirely in deal. Its design is similar in style to the roofs of some of the great churches and basilicas of North Italy—that is, a wagon form; sometimes found with a single curvature from wall to wall, and sometimes, as at the great church of St. Fermo, at Verona, of several stages of curvature—an idea which has been carried out at Dulwich. These roofs in Italy, however, are never divided into bays, as at Dulwich, and the result is a heaviness of effect which is here relieved by the circular principals springing from hammer beams supported on the marble pillars before referred to. The spandrels of the springers under the hammer-beams are filled with the armorial bearings of the College, duly emblazoned in colour, and the effect of the whole is enhanced by the simple expedient of staining its principal lines of mouldings, but leaving the natural colour of the deal in the carved or enriched features; the whole then being varnished. From the centre of the roof rises a louvre, for about 30 ft. above the ridge of the roof, intended for ventilation, which, being treated externally in several stages, and terminating with a crocketed spire, forms an important and graceful feature of the exterior.

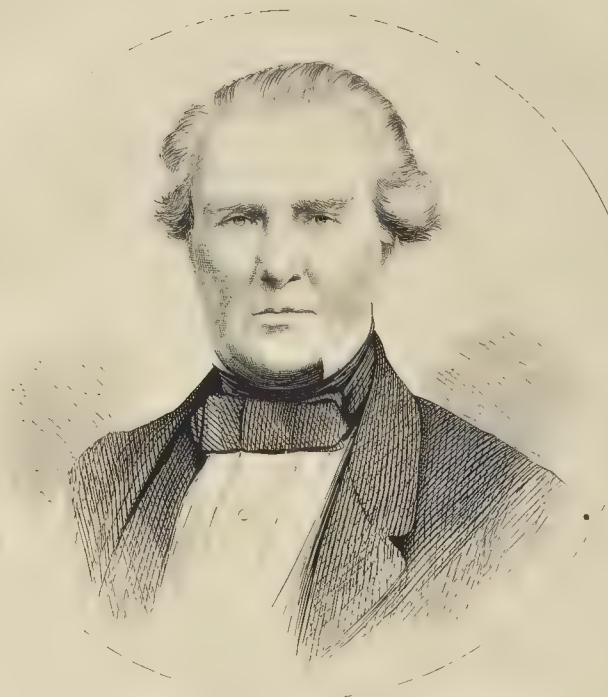
This hall is intended to be used for dining the masters and those boys of the College who may wish to avail themselves of the arrangements about to be made by the trustees for this purpose, and with a view to which a complete range of kitchens, &c., is provided on the lower floor, with a double lift thence to the service-rooms on one side of the hall. It is calculated that about 400 can easily dine at the same time, though it is doubtful whether so many scholars will wish to do so, as, of course, many live with their relatives in close proximity to the College.

On the annual prize days, 700 to 800 spectators will readily be accommodated, a fact which will encourage and reward the exertions which doubtless will be made to vie on these occasions with Westminster, Eton, Harrow, Rugby, and Marlborough.

We should not omit that the walls and roof have been tastefully decorated in colour and arabesques, by Mr. Schmidt, of Kingsdown-road, Islington, under the immediate direction of the architect to the governors, Mr. Charles Barry, from whose designs the whole pile of buildings has been carried out.

* Vol. xxvi., pp. 621, 631.

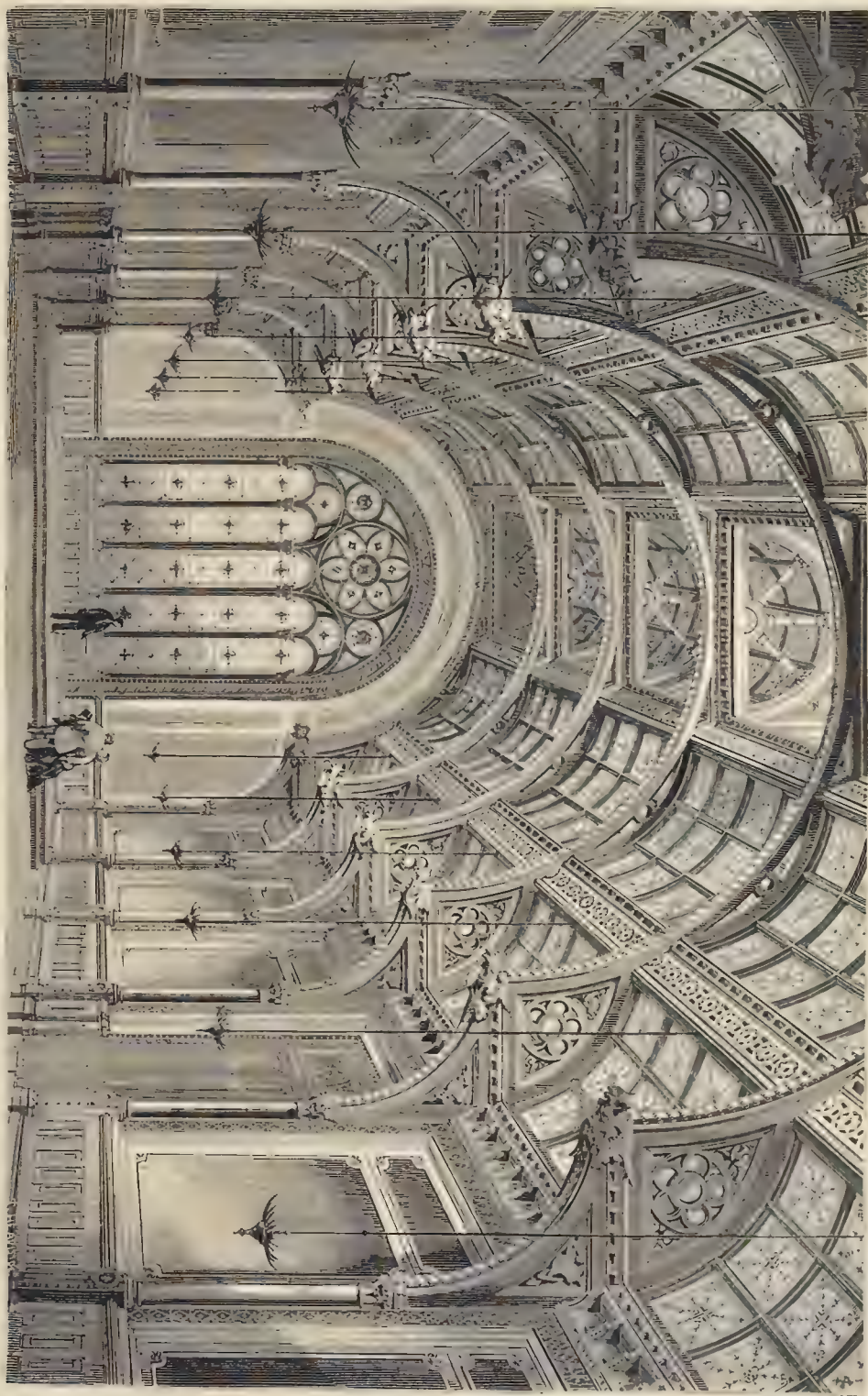




MR. CHARLES B. VIGNOLES, F.R.S., *President of the
Institution of Civil Engineers.*



ANCIENT TEMPLE AT EUYUK.



DULWICH COLLEGE: INTERIOR OF THE GREAT HALL.—MR. CHARLES BARNES, ARCHT.

RUINOUS BUILDINGS AND THE BUILDING ACT.

WITH reference to certain proceedings taken by the Commissioners of Sewers against Mr. De Keyser, of the Royal Hotel, Chatham-place, in respect of certain works required to be done to his premises, to render the same safe, as reported in our pages,* Mr. Power has forwarded to us a communication, of which we give the pith:—

"On the 3rd of January last, a policeman (and not 'or somebody else,' as in your report) called here, and left word with my clerk that the back wall of No. 10, Chatham-place, was in a dangerous condition. This information I forwarded to the commissioners in the usual way, upon forms supplied by themselves for this purpose, and on the 11th of January I received an order from them, to survey and report upon the state of the house in question. On the 17th of the same month I reported that, in my opinion, a portion of the back wall was in a dangerous state, and recommended certain steps to be taken to secure the same.

Mr. De Keyser, who is one of the commissioners, seems to have felt himself aggrieved, and complained, through his surveyor, Mr. G. Gunning, to the commissioners of my conduct in this matter.

My certificate and report upon the above bear date January 17th; and Mr. De Keyser's complaint, through his surveyor, is dated February 7th, nearly one month after my report had been sent to the commissioners; and when I state that, up to the former date, Mr. De Keyser was an entire stranger to me, it will be seen how groundless is the insinuation that in these proceedings I was actuated by 'malicious feelings,' quite the contrary. Mr. De Keyser solicited an interview with me on January 28th, relative to this same certificate, and I then found him to be a sensible and courteous as I thought, honorable gentleman; indeed, we parted on very friendly terms.

With regard to the question put to me in cross-examination, as to whether the wall would stand for 'one, two, ten, or twenty years,' I did not answer, on the ground that I had nothing to do with the future; the point I had to decide, regard being had to the safety of the public, was, 'is or is not the wall dangerous?' and my opinion is most decidedly that it is dangerous, and ought to be properly secured.

All practical men who are conversant with defective old buildings, and who are sensible of the danger to the public, and may, on the other hand, give way at any moment.

The statement that a 'fillet of cement had been run round the house' is simply untrue. The only cement I could discover was a few small bands, about 2 in. or 3 in. long, placed at the top of the cracked brickwork. This was, however, at some considerable distance above the crack to which I more particularly referred; and when I say that it is some 12 ft. long, and varying from 1 in. to 1½ in. wide, running obliquely from north to south, and subject to all the vibration consequent upon the roadway past the house, the purpose of conveying heavy loads on to the new Embankment, I think you will agree that as the subject was brought before me in the first instance, in the interests of the public, have expressed a different opinion than the one contained in my certificate—a view not a grave dereliction of duty, and, in the event of an accident taking place, a judicial censure. I am, therefore, far from feeling that I have committed a cross-examination that the wall was to a certain extent dangerous. . . . EDWARD POWER, District Surveyor."

COMMUNICATION WITH FRANCE.

SIR,—I have read with much interest your article on the above subject, and although I take quite a different view as to what ought to be done, I trust that you will give insertion to the following remarks, as it must be the desire of us all to arrive at the truth, and the really best means of effecting the object desired. . . .

It is now more than five years since I first brought forward, as a project of tunnel under the Channel, and before doing so I was guided entirely by the experience I obtained, first in the mining districts of Northumberland, where, for ten years of my practice as a civil engineer, I obtained much useful information applicable to the subject in question. The Radcliffe Colliery, near Amble, is but a few hundred yards from the sea shore. The depth of the shaft is 75 fathoms, that is, about 65 fathoms below the level of the sea, and there is not the slightest drop of seawater. I opened out an extensive quarry close on to the sea shore, and which supplied the greater part of the stone used in the construction of two breakwaters, one of them nearly half a mile in length; and although there was only a thin wall of natural rock left as a barrier to the sea, the excavations within the quarry were carried in some places as much as 40 ft. below tide-level, and the infiltration was only sufficient to make the water in the quarry slightly brackish, so that a ten-horse engine, working a 10-in. pump eighteen hours out of the twenty-four, was sufficient to keep the quarry dry. Then, as the Western formation contains much thin beds of clay than are met with in the coal measures, there would not, in my opinion, be the slightest chance of meeting with sea water at the depth I propose to construct the tunnel under the Channel between Dungeness and Cape Griznez; and, to show the retentive nature of the soil at Dungeness, there are two or three large ponds of fresh water almost close to the shore; the bottoms of these ponds are below tide-level, and I believe that not the slightest drop of salt water would be met with in sinking a shaft there. It is quite certain that spring water could be overcome by pumping the chalk, the five years' experience I had as civil engineer to the Admiralty at Bermuda, where very extensive quarries have been opened out, in which from 40 to 120 men daily worked, the whole of the island where the works were situated consisted of time stone; some portions hard, others soft, approaching to chalk, but more compact; nevertheless, it was quite impossible to get down more than a few feet below tide-level by any amount of pumping brought to bear; and in consequence of this difficulty a graving-dock could not be constructed in the ordinary way, which led the Lords of the

Admiralty to determine upon the floating-dock sent out last year to Bermuda.

When I took up the subject no project of the kind was then before the public. I was free to select what I conceived to be the best line for the tunnel. My experience at Northumberland convinced me that if strata could be found in any way resembling the coal measures there, the tunnel could be made. My experience in Bermuda convinced me that any formation resembling chalk should be avoided, and having ascertained that Dungeness is the very centre of the Wealden, and that it extends under the Channel in the direction of Cape Griznez, I feel convinced that the tunnel might be constructed there with the greatest certainty, and at much less expense and in much less time than generally supposed. Now, in comparing this line with the line of tunnel more recently proposed to pass through the chalk from Dover and the South Foreland to Cape Blanc nez it will be seen that the latter requires 28½ miles of continuous tunnelling, whilst the Dungeness line will require 28½ miles: assuming both to have equal gradients at the approaches, the South Foreland line would have only two shafts, the Dungeness line three—one on the shoal in mid-channel, which would not only more than double the facilities of constructing the work, but would give much better ventilation than could be obtained without a central shaft; and if it be desired to put down other temporary shafts in order to expedite the works, the clay strata of the Dungeness line will admit of it without difficulty; but it would be impossible to put down shafts in the midway along the line of the chalk.

There are a great number of other considerations in favour of Dungeness. It would be the nearest route between London and Paris. It would be the most central for joining the railways. The wealden formation would produce much useful material for the works. Several thousand acres of barren land might, by means of the spoil from the excavations of the tunnel, and from other changes that would be effected by the railway, be brought to great value for building and other purposes; and I believe that if the work was once commenced, it could be carried on without the slightest interruption, and that I have in my estimate of cost and time allowed for every possible contingency. GEORGE REMINGTON.

NEWTON MARKET COMPETITION.

SIR,—True it is that I, the successful competitor in the above competition, am a son of one of the members of the Board, but what difference that makes in the design I cannot see. Does your correspondent mean to insinuate that there was any unfairness in arriving at the decision? If so, I simply challenge him to prove it.

An architect's assistant (not a pupil), until very lately a resident in Newton, thoroughly acquainted with the site, and the requirements of the place; and, moreover, having given the subject great attention for three or four years past (having made designs for improving the market for the former proprietor, before the property came into the hands of the Local Board), it may not seem very surprising that the first premium fell to my lot.

That my design is better suited than any other to the requirements of the town, I think may be inferred from the majority (8 to 3) through which I obtained the premium, and by its having passed two discussions in committee, and the plan being materially altered, and the elevations, which were kept very plain to save expense (neither the situation nor the instructions justifying expenditure in this particular), may of course be improved, if thought desirable by the Board, at a proportionate increase of cost. If the two other designs you name did obtain a larger share of favour with the public than those premiated (which, however, I greatly doubt), I can only attribute it to their highly-finished perspectives. There are, however, I am happy to say, gentlemen on the Board, "old birds" who are not to be "caught by such chaff." JOHN CHUDLIGH.

THE ARCHITECTURAL EXHIBITION, CONDUIT-STREET.

WE desire to point attention to an advertisement in our present Number announcing that the time for sending in drawings has been extended to the 20th inst. The private view is fixed to take place on the 7th of May. We have quite recently exhorted members of the profession to support the exhibition, and would ask them to look back to what we then said. Just now the committee have special need of assistance.

BELFAST.

The Albert Memorial.—This memorial is not likely, it seems, to be inaugurated by royal hands, Her Majesty the Queen having declined, through the Home Secretary, the invitation forwarded to her to visit Belfast, and the Prince and Princess of Wales cannot go to Belfast this year.

Workmen's Belfast and International Exhibition.—At a recent meeting of the Executive Committee in connexion with the exhibition, the secretary submitted the programme of arrangements for the local exhibition, and it was ordered to be printed and advertised, for public information, as soon as possible. The tender of Mr. Wm. Martin, for supplying refreshments to visitors to the Ulster Hall during the exhibition, was unanimously accepted. Some conversation then ensued on the best situation for the display of the fine arts contributed, and it was agreed that these should, as far as possible, be exhibited in the Minor Hall. The secretary reported that the erection of the shedding for the machinery was progressing satisfactorily. He also stated

that he had received a considerable number of applications for space from local manufacturers.

New Church for Strabane.—A movement has been set on foot to erect a new Episcopal church at Strabane, the present edifice being old and badly adapted to meet the wants of the parishioners. 8,000l. is the sum named as the probable cost of the new church. The adjacent town of Omagh will shortly have a new church to replace the old and unsightly edifice in which the parishioners at present worship.

COMPETITIONS.

Eccles.—The following gentlemen have been invited to compete for the Roman Catholic Industrial School proposed to be erected on land already purchased at Eccles, near Manchester:—Mr. Young, Mr. Wm. Nicholson, Mr. Kirby, and Mr. Tjoun.

INSTITUTE OF ARCHITECTS.

At the last meeting, the Chairman reported that the formal presentation of the Royal Gold Medal and the distribution of the Institute medals and prizes would take place on Monday, the 2nd May, 1870, immediately before the annual general meeting, when it was hoped that the President, Sir W. Tite, M.P., would take the chair. The attention of the meeting was called to some specimens of terra-cotta facing brick, exhibited by Mr. W. Davison, of Epton, York. These bricks, which when used in execution are said to be washed clean by every shower of rain, are supplied by Messrs. Davison & Co. at 4½ ds. per 1,000.

SANITARY ASPECTS OF ARCHITECTURE IN GLASGOW.

A PAPER has been read before the architectural section of the Glasgow Philosophical Society, by Bailie Salmon, on "The Sanitary Aspects of Architecture, as exhibited in the City of Glasgow."

Public sentiment, he said, coinciding with their own he had no doubt, had condemned the present sanitary aspect of Glasgow architecture as unsatisfactory and unbecoming. Alluding to what ought to be the character of the dwelling prepared for the family of a working man, he said he thought they must abandon the plan of erecting tenements of four stories high for the housing of the working classes, on the simple but emphatic ground that they could not do so without overcrowding; and he believed this could only be properly accomplished by extending the area of the city. He was convinced, after forty years' close acquaintance and much experience in connexion with this subject, that if our citizens were to be protected from infectious poisons, moral and physical, it could only be by transferring them to districts where the arrangements of houses and streets, and the provisions for every sanitary want, would be such as to render the infliction of such wrongs impossible. Thinking over this question for many years, and still more so of late, he had come to the conclusion that four or five villages should be built on each side of the city, and as close to its boundaries as suitable ground could be obtained. Each village or suburb should be large enough to contain a population of 10,000 or 12,000, or about 50,000 in all, and to which could be transferred a portion of the 30,000 or 40,000 who, from railway and City Improvement operations, would be compelled to leave their present noxious and miserable dens. In these villages every variety of working-class houses could be provided, from the cottage of the foreman, or small master, with its three or four apartments, to the one apartment and bed-closet, for those to whom it might be suitable. A large proportion of dwellings should be restricted to one story; none should be permitted of more than three stories in height; and not more than 300 inhabitants should be allowed to each acre.

Mr. Salmon made some remarks on the buildings erected by the Corporation of London and by the Peabody Trustees, which afterwards led Sir S. Waterlow to write a letter to the president of the Sanitary Section of the Glasgow Philosophical Society, in which he says:—"I have now under my control and management more than 1,000 tenements, containing between 5,000 and 6,000 souls, all the blocks constructed on the same principle, with external staircases, and four tenements or houses on each floor or flat,

* See p. 270, ante.

and varying from four to seven stories in height. The death-rate on the average would be less than 22 per thousand. Bailie Salmon would not have made himself at all acquainted with the details of the subject when he speaks of the buildings erected by the Corporation of London and by the Peabody Trustees in the same category. If he had examined the principles of construction in each case he would have seen at a glance that they were entirely opposed to each other, the Corporation having adopted my plan of external staircases and perfect external separate ventilation to each tenement, while the Peabody Trustees have invariably followed the old plan of internal corridor, with the necessary consequence of internal ventilation and increased difficulty in the prevalence of the spread of epidemic disease. In my houses the tenements consist alternately of two rooms and a scullery, water-closet, &c., to each family; and averaging the family at five souls, the cubic area for each soul would be about 490 ft. Bailie Salmon's objection to six stories seems to me quite ridiculous, especially in the face of the fact that in my buildings the highest stories (even the seventh) are the most healthy, and let the best. Give me good and sufficient drainage, and a plentiful supply of water at the top of the houses, as we have in London, and then the higher the better the through ventilation and the more healthy the tenement. Suburban villages have been tried in the neighbourhood of London and have failed. Mr. M'Adam is quite right—the working people will not live in them; they prefer, and almost necessarily, their crowded localities, where work for themselves and their children is more readily obtained, and where their amusements are close at hand. Dr. Ferguson is also right when he says that the great thing is to get rid of the foul air in houses. This can only be effectively accomplished by adopting the external staircases, and providing proper and sufficient drainage, well-trapped at basement, and with upcast ventilating pipe from lowest syphon. The working classes in Glasgow are housed much worse than in any city I have ever seen in Great Britain or on the Continent, and it behoves the more wealthy inhabitants to look to it ere great mischief arises."

CHURCH-BUILDING NEWS.

Westward Ho! near Bideford, Devon.—The new church of Holy Trinity for this increasing watering-place, has been opened by the Bishop of Exeter. It has been erected by the Rev. I. H. Gosset, vicar of Northam, and stands as a Chapel of Ease to that parish. It is built in the Early Pointed style, and in plan consists of a nave, 60 ft. by 20 ft.; chancel, 32 ft. by 18 ft.; chancel aisle, 19 ft. by 9 ft.; north and south aisles, 60 ft. by 9 ft.; organ chamber, 10 ft. by 9 ft.; vestry on north side of chancel, south porch, and western narthex, 20 ft. by 7 ft.; the height from nave floor to ridge of roof being 40 ft. Strength and solidity have been the aim of the architect. The external dressings are of Lundy Isle granite, except where Marwood and Forest-of-Dean stone have been used for contrast in colour. There is a bell turret, 18 ft. high, with two bells over the chancel arch. The dressings of the interior are of Bath stone, and the plaster is finished deep red. The nave roof is of deal, and that over the chancel pitch pine. The stone for facing all the plain masonry of the exterior was taken from the Kenwith Quarries. The floor of the chancel is laid with encaustic tiles, supplied by Mr. William Whitestone, of Coalville. The foundations rest on a bed of concrete, 4 ft. wide and 3 ft. deep, and in some cases 8 ft. below the surface. All the works have been completed by Mr. J. C. Tremear, builder, Bideford, from the plans and under the superintendence of the architect, Mr. W. C. Oliver, of Barnstaple. The carving was executed by Mr. H. Hems. The cost of the works will be about 1,700*l.*, exclusive of boundary walls, excavations, and fittings. The nave will seat about 400 persons.

Otterton, Devon.—Lady Rolle is rebuilding, at her own expense, the ancient parish church of St. Michael, Otterton. In taking down the chancel the workmen found a staircase leading originally, it is supposed, to the roof-loft. In the main the plan of the church has not been altered. The tower will still stand at the east end of the south aisle, but the chancel will be carried out further eastward, so that it will project beyond the aisle, and a north aisle will be added to correspond with that on the south side. Greater length will also be given to the west-

end, and thus the church will be made to accommodate 700 people. The style will be Early Geometrical, which will carry the work back in association with the only period when such irregularities occurred as the eccentric position of the old tower. The nave and the two aisles will be covered by separate span roofs springing from bold columns and arches, and the chancel, which may be regarded as an addition to the form of the old building, will be proportioned to the increased breadth and length of the structure. There will be south and north entrance porches, but no door at the west end. The north entrance will be reached by a flight of steps, which are rendered necessary by the fall of the land on that side. The old tower remains; at least, the lower part, having been rebuilt above the belfry windows, and surmounted by a parapet with quatrefoil piers. The roof will be tiled. The walls will be of Berryhead stone, the windows, and all external dressings, of Ham Hill, and the interior arches of Bath stone; while the walls internally will be lined with Beers stone, and the columns made of Plymouth marble. The roofs of nave and aisles will be of stained deal, and the chancel fittings of oak, while the area of the church will be furnished with open deal benches. The ancient font will be retained. The capitals of the polished marble columns will be of Caen stone, of large size, and finely carved, and the chancel steps will be of Plymouth marble, like the piers, while the floors will be paved with Maw's encaustic tiles of rich design. The architect is Mr. B. Ferrey, and the builder, Mr. Burridge, of Exmouth. The carving and sculptured work will be executed by Mr. Harry Hems, of Exeter. The total cost of the building will exceed 7,000*l.* Service will be held meanwhile in the adjoining schoolrooms, which, like the church, are the gift of Lady Rolle to the parish, and have been only recently finished from Mr. Ferrey's designs. Mr. Cloutman is the clerk of works.

Falkstone.—Considerable alterations to the Church of St. Peter will be proceeded with immediately after Easter. The principal works will consist of a new north aisle, the enlargement of north transept and sacristy, and the extension and improvement of the sanctuary, which will have an apsidal termination, with windows of stained glass, and be separated from the nave by a low screen wall. The present roof is to be raised bodily an extra height of 5 ft., and at the intersection of the roofs of the nave and transepts will be erected an oak octagonal *fiche* finished with a leaded circular spire. All the present benches are to be altered by reducing the height of seat and back, and the new seats will be low, movable light benches. Externally, the walls will be of Kentish Rag, with Box-ground stone dressings. The walls on the inside will be of red and blue bricks, and the columns and arches to the arcade, &c., will be of Caen stone. The work will be executed by Mr. Bowley, from the plans and under the direction of Mr. S. Slingby Stallwood, of Folkestone, architect.

Derby.—The corner stone of St. Luke's Church, Derby, which is being erected as a special local memorial of the late bishop of the diocese, Bishop Lonsdale, has been laid. It is being built in a rapidly increasing suburb of Derby, on the new Uttorster road, called California. The plans were prepared by Messrs. Stevens & Robinson, of Derby, architects; and the contract was taken by Mr. J. Fryer, of the same place. The walls have been raised to the level of the ground-floor. The new church consists of a nave, which, with the porch at the west end, is 94 ft. 6 in. long, and 52 ft. 6 in. wide; a chancel, terminated by an octagonal apse, 37 ft. by 31 ft.; two narrow side aisles to the nave, 3 ft. 6 in. wide in the clear; and a tower at the north-west angle, 21 ft. 6 in. square, and 120 ft. high to the top of the roof. Under the chancel, which is considerably above the level of the adjacent street, there will be a large room for vestry and other meetings, and over a chamber devoted to a heating apparatus, on the south side of the chancel, are vestries. The vestry is lighted with ten lancet windows, one on each face of the apse, and the others in the side walls. In the west end a rose-window will be placed, 14 ft. 6 in. in diameter. The walls and dressings are of stone, from Riggerlane quarries, at Little Eaton, near Derby. It is rock-faced on the exterior, and the interior is dressed ashlar. The roof, which will be of deal, stained and varnished, with circular trusses, will be covered with brown and blue Staffordshire tiles, and it is intended to pave the aisles with Minton's tiles. The interior of the church will be fitted with open deal seats,

stained and varnished; and accommodation will be provided for 650. The whole of the seats will be free.

Hertford.—St. Andrew's Church has been consecrated. The style is Geometrical Pointed. The church consists of a nave, 78 ft. long, 25 ft. wide, and 47 ft. high, to the apex of the boarded vaulting, with aisles and transepts. The organ-chamber (12 ft. 6 in. by 16 ft. 6 in.), is on the north side of chancel, and the vestry, which is on the south side, is of the same dimensions. The total length of the church, including the old tower, is 122 ft. The width across the transepts is 75 ft. 6 in., and across the aisles, 49 ft. The area of the old church, exclusive of tower and porch, was 3,308 ft., including walls, and the area of the new church is 6,362 ft., or nearly double that of the old. The church is faced externally with knapped flints, random worked, the dressings being of Bath stone. The windows to the aisles (three in each bay) are cusped lancet lights. The clerestory windows are of two lights, with plate tracery. The transept ends are designed so as to form important features—the church being seen more in elevation than perspective. The transept rose-windows, which are filled with geometrical tracery, are 10 ft. 6 in. diameter, and below them there are two two-light windows. The roofs of the church are covered with red tiles, with ornamental cresting. The old tower has not been pulled down, the funds not justifying an attempt to rebuild it. Accommodation is provided for nearly 650 persons, including the choir and children. The cost of the church was 3,831*l.* The whole of the works have been executed from the designs of Mr. J. Johnson, of London, the architect, and the contract for pulling down and rebuilding the church was carried out by Messrs. Dove, Brothers, of London.

Datchworth (Hertford).—It having become necessary, in consequence of the unsafe condition of the tower of Datchworth, to remove and reconstruct the upper portion, a lofty spire has been erected. In addition to this the old and somewhat inconvenient pewing has been removed, as well as the gallery, and the interior of the church has been re-seated, repaired, and restored, under the direction of the architect, Mr. A. Blomfield. The total expense is said to be over 1,000*l.*, of which sum nearly 950*l.* have been raised.

DISSENTING CHURCH-BUILDING NEWS.

Sunderland.—Trinity United Presbyterian Church, Sunderland, has been inaugurated. The site is in Toward-road, facing the new park. The edifice is approached by a broad flight of steps, through a triple doorway, and owing to the fall of the land, almost perpendicularly towards the back, to the extent of upwards of 20 ft., a school-room of this height, and of proportionate length and breadth, has been obtained. The church is capable of accommodating 800 persons. In addition to the church and school-room, a sessions-house, vestry, and keeper's rooms, with conveniences, are attached. The building is designed in the Gothic style of architecture, and is built of stone throughout. The total cost will amount to about 4,000*l.* Mr. R. Allison, of Whitburn, was the builder, Mr. H. Andrews the clerk of the works, and Mr. T. Oliver was the architect.

Burslem.—The Wesleyan chapel at Burslem is to be considerably enlarged, with a view of providing proper accommodation for school children in the gallery during divine service, and additional sittings for the general congregation. The present front of the building will be taken down, and the length of the chapel will be increased 16 ft., the new front being in the Corinthian style of architecture. There will be a porch, with new staircases and vestibules. The gallery over the new part will be used for the accommodation of the school children during service, and additional sittings will be added to the body of the chapel. The work is to be executed by Mr. Hollington and Grinshill stone, the shafts of the front windows being of Aberdeen granite. There will be new windows to the sides of the chapel, glazed with obscure glass with ornamental margins. Mr. John Stringer, of Sandbach, has contracted to do the work, from the designs of Mr. George Woodhouse, of Bolton. The total cost of the alterations will be about 3,000*l.* The corner stones of the new portion of the chapel have been laid.

Wakefield.—A Wesleyan chapel and school for the suburb of Belle Vue is to be erected, and, with this view, a premium was offered for the

best plan, and out of five sent in one forwarded by Mr. Watson, of this town, architect, has been selected. The chapel will be 40 ft. long by 31 ft. wide, and the schoolroom 31 ft. long by 15 ft. wide. The design is Gothic. The external facings will be red pressed bricks, relieved by white and blue bands and arches and stone dressings, the front gable to be coped with stone and have ornamented terminations and iron foliated finials. The roof is of moderate pitch, and will be covered with blue slates. Internally the fittings will be of red deal, and these also and the roof timbers will be stained and varnished. The division between the schoolroom and the chapel is so arranged that the two can be thrown together. The chapel will seat 210 adults, and the school accommodate 100 children. The cost of the building will be over 400*l*. The architect has already advertised for tenders for the various works. He has also been instructed to prepare a design for the chapel and schools at Eastmoor, which are to cost about 1,200*l*.

Shelf.—The New Independent Chapel at Buttershaw has been opened for divine service. The edifice stands in the midst of a large population, on the north side of the Halifax and Bradford turnpike-road, and a few hundred yards from the school-room in the direction of Buttershaw. The architecture is Gothic, and the plan consists of an elongated nave, with an apse for the organ at one end. The pews are open, and have sloped backs. There is a gallery over the entrance-door, and provision has been made for the erection of side galleries when required. The accommodation at present is sufficient for about 450 persons. A spirelet rises to a height of 90 feet from the front angle. The roof is open, the windows of tinted glass, and the vestibules and aisles are laid with mosaic tiles. The building stands in the centre of an area of ground containing 2,522 square yards, the cost of which was 252*l*. 4*s*. 6*d*., being 2*s*. per yard, and is enclosed by a fence-wall. The contractors were—Mason, Mr. Thomas Lightowler, Buttershaw; joiner, Mr. John Patchett, Clayton Heights; glazier and painter, Mr. Henry Crowther, Shelf; slaters, Messrs. Hill & Nelson, Bradford; plumber, Mr. Samuel Dyson, Sowerby Bridge; ironwork, Mr. John Robinson, Stockton. Mr. J. Pritchett, Darlington, was the architect. The cost, including building and site, will be about 2,400*l*.

Nottingham.—The new Congregational chapel, St. Ann's Well-road, Nottingham, has been opened for divine service. The building is situated at one angle of the square formed by the junction of St. Ann's Well-road, Great Alfred-street, and Union-road. The style is Gothic, the materials being red brick, and stone dressings relieved with bands of blue bricks. On the front elevation are the two principal entrance-doorways, the heads of which are of moulded stone, pierced in cusped foliations. Between these entrances, which are approached by flights of steps, are two stone windows divided into two lights, and having cusped tracery in heads, and with moulded jambs and mullions. In the gables above these windows is a circular stone window with moulded tracery. Around the windows are arches of moulded and cut bricks, and moulded stone labels finished off with carved bosses. The front gable is surmounted with moulded stone coping and a cross of ornamental design. Between the side windows are brick buttresses, having weatherings of cut bricks. The interior of the chapel consists of a nave, with side-aisles, divided by an arcade of five bays, with pointed arches resting on iron columns, having moulded caps and bases. Above the arcade is a clearstory. At the east end is a circular stone window of foliated tracery, filled in with stained glass. The roof is lofty, all the timbers being visible, and, instead of being plastered, the ceiling is formed with beaded boarding, the whole being stained a dark tint. The gasfittings consist chiefly of rings encircling the capitals of the iron columns, with brackets at the pulpit end. The church is 63 ft. long by 40 ft. wide, providing accommodation for 500 persons; and underneath is an extensive school-room, with class and infant rooms, the floor of which is only 2 ft. 6 in. below the ground-level, so that the whole is well lighted from windows on both sides. The new edifice will cost 1,600*l*.

Hippelholme.—The corner-stone of the new Wesleyan chapel here has been laid. The site is immediately opposite the Whitehall Inn, the principal front being into the Brighouse and Denholme Gate turnpike-road. Messrs. R. Ives & Son, of Halifax, are the architects, and the chapel will be in the Geometric Gothic style. It will be built of Northowram wall-stones, with

freestone dressings. The length will be 80 ft., the width 37 ft., and the height externally 50 ft., and there will be minister's and other vestries at the back. The interior will be divided into six bays. The roof will be an open one, with circular bindings, supported by stone corbels. One bay is treated as a transept, and the roof will be groined. There will be a gallery at the west end, over the entrance and vestibule, capable of accommodating 180 persons. The internal wood-work will be of yellow pine, stained and varnished, and on the ground-floor will be 298 sittings, making altogether a total of 473. The schools and class-rooms, to accommodate 150 scholars, will be constructed under the chapel at the east end. The principal entrance is to be at the west front, by a moulded doorway. On the side elevations there will be four bays, each having a two-light traceried window, the other bay being brought out to form a transept, having a five-light window. All the windows are to be glazed with quarry-glass, and the chapel will be lighted with gas, by corbuse, pending from the roof. The total cost will be 1,953*l*. The contractors are:—Masons, Messrs. Fletcher & Sharp, of Hipperholme; joiner, Mr. G. Townend, Halifax; plasterers, Messrs. J. Bancroft & Son, Halifax; and plumbers, Messrs. Firth & Son, Halifax; the total amount of the contracts being 1,556*l*. 19*s*. 6*d*. One-third of the cost of the chapel has been given by the trustees of the late Mr. Wm. Heap, of Halifax.

Birkenhead.—A new Primitive Methodist chapel has been built in Grange-lane, on land purchased from Sir William Jackson, bart., and in a central and suitable situation. The new chapel has been opened. It is a brick and stone building, built by Mr. W. Dickinson, Seacombe, from designs by Mr. John Wild, of Oldham, the architect. It is situated at the corner of Grange-lane and Horatio-street, opening into which are large school-rooms. The chapel will provide seat-room for 600 persons, and is the fifth place of worship belonging to the body in the Birkenhead circuit. The cost, including the land, will be about 3,000*l*.

East End (Middlesex).—The memorial stone of a Wesleyan new chapel has been laid here, by Sir F. Lyett. Mr. J. Willey is the architect, under whose superintendence the chapel has already been erected, by Messrs. T. Niblett & Son, of Hornsey Rise, builders. The cost is about 1,000*l*., and the building will seat about 250 persons; the school, which forms a transept to the chapel, will seat about eighty more. The building is in the Early English style.

PROVINCIAL NEWS.

Prestwich.—The new workhouse and hospital situate at the Cleveland, Crumpsall, cover some three acres of land, with about seventeen surrounding. The buildings and ground are estimated to cost 40,000*l*., or, it should be stated, the guardians of the union have sought borrowing powers for that amount. Mr. T. Worthington, Manchester, is the architect, and Messrs. R. Neild & Sons are the contractors. The building, which at present contains 128 inmates, but is calculated to accommodate 312, is situate in the immediate vicinity of the Manchester workhouse at Crumpsall, and was entered upon by the inmates in September last. Leaving the entrance lodge, almost immediately in front, and occupying the centre of the block, and so arranged as to command ready access to any portion of the house or hospital, are the apartments of the master and the matron. On the right of the rooms occupied by the master are the male wards, and to the left of those occupied by the matron the wards set apart for the female inmates. The first room along each corridor is devoted to a store-room for clothing and material for clothing, that worn by the female inmates being made upon the premises. Adjacent to this, and well lighted, ventilated, and warmed, is a large room termed "the day-room," for old paupers. From this point, the corridor is intercepted, and the visitor enters upon a distinct ward,—that set aside for the imbecile inmates, of whom there are twenty-six at present. On either side of the central building, from the master and matron's apartments, are distinct day-rooms, baths, and yards and offices for male and female imbeciles. Immediately above the wards are the dormitories, and on the ground floor a similar rule is observed. The imbecile dormitories are separated from the other rooms by doors, rendering each a distinct and independent ward. A similar observance is visible in the separation of the able-bodied

paupers' apartments. At right angles to the main building, and connecting it with the premises in the rear, is the chapel, situate immediately over the general dining-hall. From this point,—the chapel occupying the centre of the whole block,—wash-houses, laundries, drying-rooms, and baking departments are ranged. Separated by a covered passage-way from the other buildings, the fever and hospital wards are erected in the rear of the buildings. Hospital accommodation is afforded in four separate wards for thirty-two patients in each. In constructing the new building, the Prestwich Board, according to the new legislative enactment, found it necessary to supply 1,200 cubic feet per inmate.

FROM VICTORIA.

Melbourne.—The foundation stone of St. Mary's Roman Catholic Church, at Williamstown, was laid about twelve years ago by Dr. Wilson, then Bishop of Tasmania. The works were for a short period pushed forward, but when the walls of the western end were a few feet above ground they were discontinued, [and have ever since remained in that state. A few months back the Roman Catholics of that suburb determined to resume operations, and the original plans not being forthcoming, called for competitive designs, incorporating the existing work for the completion. The one furnished by Mr. T. A. Kelly, of Elizabeth-street, architect, was selected. The plan includes a nave 24 ft. wide, and side aisles, giving a total internal width of 49 ft. by 100 ft. in length. A polygonal apse terminates the nave, while the "Ladies Chapel" and tower terminate the north and south aisles respectively. The tower is surmounted by an octagonal spire rising to an elevation of 110 ft. Internally an arcade of six bays of moulded arches, resting on cylindrical shafts with carved caps and moulded bases divides the nave from the aisles. The clearstory is pierced with foliated windows, two to each bay. The height from the floor line to the ridge of the roof is 40 ft. The principal entrance is at the west end, and consists of a projecting covered porch, having shafts, arch moulds, and dressings of freestone; similar porches, one at either side, give access to the aisles. A large wall window set in a recessed bay, occupies the centre of the west gable, an ornamental cross surmounting the apex. The roofs will be open-timbered. The nave passages and porches will be laid with Maw's encaustic tiles. The main building has been constructed of bluestone, with fine axed dressings of the same material, while the tracery of the windows throughout will be in Geelong freestone. When completed, the church will afford accommodation for about 800 sittings, and the expenditure will be under 6,000*l*.

The new hall at the Criterion Hotel has been opened. It is nearly 69 ft. by 32 ft. in the clear, and 20 ft. from the line of the floor to the centre panel of the ceiling. The ornamentation of the hall is in the Greek style, the walls having panelled pilasters, with enriched caps and centre paterae, surmounted by an enriched entablature, the frieze containing the honeysuckle and the husk of the order in relief. On the west side of the hall are six windows with enriched blockings and architraves, and the eastern wall has large mirrors to correspond. In the centre of the ceiling is a sunlight, 4 ft. in diameter, ornamented with Greek margins; and on either side are centres of flowers. In order to secure a thorough ventilation, the pilasters have fines at the back, and the paterae are fitted with suitable gas brackets in case they should ever be needed. The architect for the work was Mr. Peter Matthews, of Collins-street; and the contractor Mr. George Freeman.

It is proposed to fill up the niche in the front of the Mechanics' Institution with a full-size statue of Shakespeare, chiselled out of some very choice freestone from the quarries in the Barra-bol-hills. Mr. Brain, a Geelong sculptor, has undertaken the performance of the work, more for "the cause" than the profit. This artist is carving a group titled "Faith gazing on the Cross," in monumental marble, for Mr. Le Sure.

At a meeting, in October, of the Technological Commission, held in the Exhibition Building, the members present being Judge Bindon (chairman), Messrs. Rolfe, Thomas, & Blair, M.L.A.S., and Dr. Bleasdale, the chairman presented a report of his visit to the carpenters' and joiners' school for technical education. He stated that the committee of the school were progressing in

their arrangements for organising the school in an efficient manner. The school had only been opened on four nights, and there were twenty pupils present. The committee proposed that the course of education should be general, so as to meet not only the special, but the general wants of the trade they represented. Preparatory classes were to be commenced. A class for geometry had been already formed, and classes for mechanical, architectural, figure, and other branches of drawing were about being formed, as was also a class for the making of models, &c. The committee expressed to him their desire for assistance from the Technological Commission, to enable them to purchase figures, models, and other necessary materials, and also stated their opinion that nothing would be more likely to advance industrial education than the delivery of lectures. On the motion of the chairman, the commission granted 5*l.* to the school. Mr. Rolfe then reported that he had visited the school of design at the Trades' Hall. There were 102 pupils present. 10*l.* was granted as a donation to the school, to enable them to purchase materials.

Melbourne derives a considerable part of its water-supply from a reservoir in the neighbourhood, named Yan Yean. A quick-sighted physician, who has brought the subject before the Medical Society of Victoria, has discovered that the whole drainage of a township, after creeping through a foul swamp, flows by three outlets into the main feeder of the reservoir.

The Jewish fraternity of Melbourne are about to erect almshouses for their poor, and have accepted a design for the erection of the same. Competitive designs were invited from the various architects, and about a dozen designs were sent in, when one with the motto "Charity" was accepted, the author being Mr. Geo. R. Johnson, of 46, Elizabeth-street. The design selected is in the Lombardic style of architecture. The buildings will form two sides of a quadrangle, fronting the St. Kilda-road and Union-street, with a synagogue on the angle. The whole is estimated to cost 5,000*l.* It is intended to build only a portion at present, and fence in the land, which will cost about 1,000*l.*

Beechworth.—The Post and Telegraph Office at Beechworth, situate at the corner of Camp and Ford streets, is erected in the modern Italian style of architecture, of brick, stuccoed, and on granite foundations. It contains on the ground floor, post-office, telegraph office, savings-bank, and money-order offices, postmaster's private office, battery-room, store, kitchen, and out-offices. The receiving and delivery windows are under an arcade 38 ft. in length fronting Camp-street. The clock tower, constructed of granite, has a three-faced dial. The roofing is of Bangor slate. The upper floor contains quarters for postmaster consisting of six rooms, passage, and terrace over the arcade. The whole is being erected in connexion with the Public Works Department by Mr. Nation, whose contract amounts to 3,687*l.* 10*s.*, and was to be open to the public by the beginning of the new year. The *Illustrated Australian News* contains good engravings of this and three other new edifices on one of its recent pages.

Castlemaine.—The Castlemaine Hospital, in the Italian style of architecture, erected from designs by Mr. J. A. B. Koch, and built by Mr. Borland at a cost of 2,500*l.*, has been opened for public use. It is constructed of brick, on sandstone foundations, with granite plinth, and is approached by a double flight of granite steps. It stands on a piece of land granted by the Government, and will ultimately form the centre block when the entire structure is completed. On the ground floor is an entrance-hall, 9 ft. wide, extending from front to back, having on its right board-room, patients' waiting-room, consulting-room, and dispensary; and on its left, casualty-ward, with bath-room, lavatory, nurse-room, closet, and scullery. From the main hall a staircase leads to the upper wards. The basement, which consists of spacious dining-room and sleeping apartments for the servants, is reached by a separate staircase leading from the dispensary. All the apartments are well lighted and ventilated. The piece of land around the building affords space for recreation grounds, which are neatly laid out and ornamented with shrubs. The situation is pleasant, being at the north end of the town, facing the railway, the back garden having a frontage to Barker's Creek. The new portion has accommodation for fifty patients, and has all the latest improvements connected with hospitals.

Ballarat.—The Ballarat Water Supply Com-

mission have decided to proceed with the erection of new offices at the corner of Grenville and Lewis Streets, opposite the new premises of the Gas Company. The building will be after a design by Mr. Bagge, the committee's engineer, and will consist of two stories, the estimated cost being something like 2,500*l.*—The foundation-stone of the new Town-hall, Ballarat, has been laid. The principal entrance to the municipal offices will be in the centre under the tower, which will stand right out to the front, so that the stone, which has just been laid, will also be the foundation-stone of the tower. This tower is to carry the Alfred memorial bells, which have already arrived at Ballarat. They have been cast by Messrs. Mears & Stainbank, of Whitechapel, as already noted in the *Builder*. The bells are valued at 1,180*l.* The present contract for the erection of the tower has been taken by Mr. William Cowland for 16,767*l.*

Books Received.

On Art Training. By JOHN G. CRACE. London: John Bumpus, Oxford-street.

UNDER this title Mr. Crace has published the address delivered by him at a meeting of Art Workmen, February 15th, to which we referred at the time. He begins with an art-workman as a lad, and shows what should and may be done for him by his parents, and what he should, and, if he please, may, do himself. We would willingly reprint half the excellent matter of which it consists, but think it better to recommend the purchase of the tract itself. We content ourselves with quoting a little story that Mr. Crace tells to show what may be done where there is a will. He is speaking of the advantages obtainable by travelling, and says,—

"And I think it quite possible for a young man who is careful to be able to do it. I knew a young fellow many years ago now, who scraped together the sum of 30*l.*, being determined to travel in Italy and see all the wonderful works of art there, and he went."

Of course he was obliged to use very strict economy. He took conveyances now and then in the dull parts of the countries, but he mostly walked, and chose his routes through beautiful scenery as much as possible. Well, he went all over Italy, he saw Milan, Venice, Florence, Rome, Naples, Pompeii; he was three months absent. He made careful sketches of much that he saw; and, though he returned to England with only a few shillings in his pocket, he had riches in store, being wonderfully enlightened and improved by his knowledge of art.

This young man was a writer by trade; he taught himself to draw, and, by practice, he drew beautifully; he applied himself very diligently to work; he got on; he copied manuscript writing and illumination; he did arduous work, especially in Medieval style. He, in time, earned his five or six hundred a year, and supported his family in comfort and respectability. Poor fellow—he died last year, loved and respected by a large number of friends, among whom I truly class myself. His name was James West.

I think it is not useless to mention this little episode to you, for many a man, by abstaining from drink and by careful economy, may save up 3*l.*, and every man can learn to draw."

Notes on Sanitary Reform. By a Sanitarian. London: Simpkin, Marshall, & Co. Bristol: Kerslake & Co. 1870.

THIS very useful contribution to the great cause of sanitary reform has been re-issued in a revised form, with the name of the author, Mr. S. Sneed Brown, of Bristol. It has been well circulated, especially in Bristol. There is a discreditable freemasonry existing in some towns to suppress all efforts to throw light upon the real state of things, and it is against this evil spirit that the shilling pamphlet under notice has been chiefly directed. It is well adapted to strengthen the hands of sanitary reformers in such cases, and so to do good.

VARJORIUM.

"Street's Indian and Colonial Mercantile Directory for 1870. Street, Cornhill."—The re-issue of this Directory shows that it is useful, and destined to live. To London and other merchants, traders, and to all interested in India and the colonies, it is indispensable, although, no doubt, there is much still to do in rendering it complete as a directory. The present issue is said to contain much additional information.—"The Bicycle: its Use and Action." By Charles Spencer. Warne & Co. The instructions given, and illustrated, in this little volume are, we dare say, correct, since they are given by a manufacturer of the article, who advertises his goods at the end.—Mr. J. N. Lockyer, in his third lecture on the "Sun" delivered at the Royal Institution on Saturday last, showed (according to *Nature*) an interesting experiment with a candle, which

gives a good general idea of the solar phenomena as observed by his new method. As round the sun Mr. Lockyer can spectroscopically detect an ordinarily invisible hydrogen envelope which is rendered evident by bright lines only as contrasted with the nearly continuous spectrum given by the white light of the double surface of the sun, so also there is an ordinarily unnoticed envelope (of sodium vapour) round a common candle flame which gives a bright line spectrum as contrasted with the continuous spectrum of the flame itself. Mr. Lockyer also showed that some of the phenomena he has seen when watching a solar storm may be reproduced by disturbing a candle flame.—The *Food Journal* says:—"In ten years a fishing village may spring up into a town—a quiet bay become a fashionable watering-place. The increase may not be the natural growth by excess of births over deaths, but due to other causes, acting spasmodically and unforeseen. The further, therefore, we get from a census, the less reliance can we place on the figures denoting the estimated population, that is, the population at the preceding census, with the addition for each year that has since elapsed of the annual increase, as ascertained from an average of the preceding decade of years. It may be Utopian to hope for a more frequent enumeration of the people; but Prussia, with her triennial census, and France, with her quinquennial returns, should stimulate our exertions in this direction. Why should there not be an annual enumeration of simply the numbers and ages of the population?—"American Society of Civil Engineers: Transactions." No. XIV. March 16, 1870. A paper on American Inter-oceanic Ship Canals, by Col. J. W. Adams, member of a committee on this subject, occupies the pages of the number under notice. Col. Adams advocates the Tehuantepec route in preference to any other of the twenty-six various routes for a canal across the narrow neck of Central America. The Darien route he considers to be scarcely practicable, and if so at all, it would require, for a thorough cut, a ship tunnel miles in length. The Tehuantepec route, however, would require locks; but Col. Adams states that as the tide on the Pacific side rises 18 ft. to 20 ft., while there is no such tide in the Gulf of Mexico, locks are unavoidable on any route. The society, having heard the paper, passed a resolution in favour of the Tehuantepec route as best suited for United States purposes as regards its northern position, and expressing an opinion that a survey of it should be made before the citizens should be committed to any other route.—"Trade-unions and the Cost of Labour: Speech delivered by Thomas Brassey, jun., M.P., in the House of Commons, 7th July, 1869." London: Longmans, Green, & Co., 1870. The vast and varied experience of Mr. Brassey, sen., gives great force to anything based, as much of his son's speech was, upon that experience. Mr. Brassey, in reprinting his speech, has given additional statistical details, and inserted a few new observations on the danger to the working classes of the restrictions imposed on the free supply of labour by the dictation of ill-informed agitators. In this speech Mr. Brassey urges the injustice of condemning British labour as more costly in its results, simply because the daily rates of pay are higher in England than on the Continent; but he "condemns the errors into which our operatives are being betrayed by the ill advice of leaders who have no just claim to the influence which they unhappily possess."—"Report to the Finance and Improvement Committee of the City Commissioners of Sewers, upon Street Tramways." By William Haywood, Engineer and Surveyor to the Commission. This report shows that the total length of street in the City at present proposed to be occupied is 3,268 yards, or about a mile and three quarters. The total length projected in the whole metropolis is 134 miles. Mr. Haywood's conclusions are that,—

"While there are undoubtedly advantages in street tramways, yet there are many disadvantages attending them, but there can be no doubt that they will afford much comfort and convenience to a vast number of people; on the other hand, in streets of great traffic, it will no longer be possible to maintain the pavements in a similar condition to that in which they now are; and therefore that the comfort of those who ride in or drive vehicles of another description will be more or less sacrificed to the comfort of those who ride on the tramways."

Mr. Haywood also remarks that,—

"Special consideration will be needed as to how far competition should be allowed to establish what may, in a degree, be considered a monopoly of portion of the highway; and it becomes a question, if the advantages to be

derived from the tramways are clear and undeniable, whether it should not be the duty of the Highway Boards throughout the country to form and maintain them out of the rates; and this is a fundamental question which lies at the threshold of the whole inquiry."

"Report of the Health of Liverpool during the year 1869. By W. S. Trench, M.D., Medical Officer of Health for the Borough." (Liverpool Printing Company.) From this report it appears that in 1869 the death-rate of the borough was equal to 28.9 per 1,000, or 3 per 1,000 less than the average rate which has prevailed for the past ten years. The death-rate of the parish was equal to 31.6, and of the out-townships 25.8 per 1,000. The highest rate was found, as might be expected, in Vauxhall Ward, where it was 38.5 per 1,000. With reference to the comparative mortality in the large towns of the kingdom, Liverpool stands fourth, being less unhealthy than Glasgow, Edinburgh, and Manchester. The population per acre is higher in Liverpool than any other town in the kingdom, being 97.7 per acre. In Manchester the average is 91, in Glasgow 79, while in London it is 40.7, and in Birmingham, 45. The average age at death throughout the borough is 23 years. The deaths of infants below the fifth year of their age amounted to 7,319, or about 49.6 per cent. of the entire number of deaths, and were equal to 10.5 per cent. of the entire number of children under that age. Infant mortality is highest in Scotland and Vauxhall Wards. The number of deaths from typhus and intermittent fever was 783, which is considerably below the average for the preceding ten years, the figures for which are given at 1,050. Dr. Trench says of scarlatina that it assumed during the last six months of 1869, within the borough of Liverpool, the gravity of an epidemic. It accounted for 1,042 deaths out of 14,744, and was at the rate of 2 per 1,000. It constituted 7 per cent. of the whole deaths, and was most fatal in the third and fourth quarters of the year. Of the Workshops' Regulation Act the medical officer is constrained by further experience to express his opinion that, "however beneficial in intention, it is not only impracticable in its machinery, but inequitable in its effects."

Miscellaneous.

Society for the Encouragement of the Fine Arts.—On Tuesday last there was an exhibition of a collection of drawings and paintings by Birkett, Foster, Richardson, Mole, Henry Tidy, Girardot, Shalders, and other artists. — Mr. Richard Redgrave, R.A., in the chair. Mr. Henry Tidy read a paper on "Beauty and the Beautiful." He insisted that the source of all beauty (which he defined to be realism idealised) was not something apart from, but existed only in our minds. He next adverted to the different national types of beauty—to the melancholy ideal, at one time, of Italian art—the emaciated saint; to the glorious colouring of Rubens, which was but a reflex of his own times; and to English landscape painting and portraiture, which accorded with our scenery and mode of life; and he concluded an admirable lecture with some feeling allusions to the disappointed hopes of the artist in his search after beauty, to the shortness of the moments of inspiration accorded to him, and to the impossibility of ever attaining to the ideal perfection which was the aim of his life.

Discovery of a Roman Amphitheatre in Paris.—Modern Paris covers the ground of old Lutetia, the capital of Transalpine Gaul, and it is surprising that so many centuries should have passed before this relic of the olden time has been brought to light. This Gallo-Roman amphitheatre, in which public games were held as late as the period of the Merovingian kings, occupies the eastern side of the Mons Lucotitius, now the Montagne Ste.-Geneviève. It had become gradually hidden under a thick deposit of rubbish from 7 to 8 metres deep. About one-half of its vast oval, according to *Galignani*, is now uncovered, in the Rue Monge, on the site where, not many years ago, stood a convent of English nuns. The rows of stone seats on this side are nearly all destroyed, but the main walls, built of stone and Roman cement, without any admixture of brick, are still in good preservation. Two of the recesses in which the wild beasts used to be kept are still visible. The style of building denotes a later period than that of the Palais des Thermes. Several medals and fragments of a rich turquoise and lapis-lazuli necklace with gold clasps have been found.

The Influence of the Suez Canal on Ocean Navigation.—At a recent meeting of the Institution of Naval Architects, Mr. J. D'Aguilar Samuda, M.P., read a paper upon "The Influence of the Suez Canal upon Ocean Navigation." He said that the canal would make the following savings in distance in the voyage to England:—From Bombay, 5,570 miles; Ceylon, 3,840; from Hong Kong and Singapore, 3,520; and from Melbourne, 91 miles. This represents a saving of about half the distance between England and Bombay, about one-third the distance between England and China, and practically none between England and Australia. Manifestly, then, the canal will greatly benefit carriers. The opening of the canal had caused a great falling off in the construction of sailing ships, and it tended to the further substitution of steam for sails in carrying on our traffic with the East. Without doubt, nearly all the traffic between here and Bombay will be lost in sailing-ships; but as the lives of sailing-ships were not of long duration, he thought the present panic among owners of such ships was not fully justified. He thought that there would shortly be a great substitution of steel for iron in hulls of ships, and a general adoption of the principles of expansion in engines. A report presented by M. de Lesseps to the meeting of Suez Canal shareholders at Paris, we may here add, states that the total number of vessels that passed through the canal from the day of its opening to the 15th of March was 209, representing 146,631 tons; and of these 56,052 tons were English vessels, 34,390 French, 17,666 Egyptian, 14,625 Austrian, 7,386 Italian, 4,178 Russian, 4,000 Norwegian, 3,200 Dutch, 880 German, 528 Spanish, 3,015 Prussian, 869 Portuguese, and 342 Turkish. Of the 209 vessels 200 were steamers, the others were sailing vessels. With respect to England, the report says, "England has from the first day been able to utilise the canal largely. You have seen what an imposing commercial fleet she has sent to it, and that fleet augments every day. Building yards work literally night and day in the United Kingdom in transforming or building vessels. We could cite to you a single company which, in its calculations, has put down an annual payment of 100,000l. for the canal."

Sunday Water Supply.—The want of a supply of water on Sundays, in the metropolis, has long been a grievance, as old readers of the *Builder* must well know, from our frequent endeavours to obtain a remedy for that grievance, which, however, still exists, though not to such an extent as formerly. We are glad to notice that leave has been given to Mr. Stapleton to bring a Bill before the Legislature requiring the metropolitan water companies to supply water for domestic purposes on Sundays. The West Middlesex Water Company has already begun to give a Sunday supply; the Chelsea Company has promised to give a half supply; the Grand Junction Company supplies a considerable quantity of water; and the New River Company supplies 57,000 houses on Sunday. The East London Company has always been ready to furnish a Sunday supply when needed in times of epidemic, upon which Mr. Stapleton very properly remarks:—"By giving a Sunday supply in times of epidemic, the company admitted its necessity; and by withdrawing it at the end of one outbreak of epidemic disease they had laid the foundation of another." The South-west and Vauxhall Company supply on Sunday the whole of their metropolitan but not their suburban district; and the Lambeth Company has followed the course of the New River and Grand Junction Companies; while the Kent Company, which supplies Greenwich and Woolwich, "made the objection that a great part of their district was not in the metropolis."

Institution of Surveyors.—At the ordinary general meeting held on Monday, April 4th, the discussion on the paper by Mr. J. Mathews, entitled "A Plea for Culture in the Profession of a Surveyor," then ensued; and a vote of thanks was accorded to Mr. Mathews. The next meeting will be held on Monday evening, April 25th, when a paper will be read by Mr. E. Ryde, in continuation of his paper of last session, entitled "Parochial Assessments." Answers to the Questions on Agricultural Customs are needed for the following counties, and the council appeal to members and their friends to supply the information necessary to complete the returns, viz.:—Westmoreland, Lancashire, Northampton, Leicester, Berks, Essex, Kent, Dorset, Rutland, and Worcester.

Raising the Euston Station Roof.—Five bays, or 100 ft. in length, that is the distance included between six columns, and 145 ft. in width—the whole width of the station—are raised at once in the following manner, according to the *North Londoner*.—The columns are first detached from the ground, and a platform of wood, 3 ft. or 4 ft. square and as many inches thick, is placed on each side of them, and cut and wedged up so as to overcome all inequalities, and present a perfectly smooth upper surface. On each platform so prepared is placed a screw-jack—a strong iron frame on a very wide base—containing an immensely powerful steel screw, 3 ft. 2 in. long, worked upwards by means of levers, which enter horizontal holes in the head. This head has a pivot at the top, on which turns a cast-iron socket, 9 in. or 10 in. square, made to receive the ends of massive timbers that go to the whole height of the column into similar iron sockets in the underside of a sort of iron box made to bolt like a mould round both the cap of the column and the bottoms of the two iron girders carried by it. In some cases the timbers, which are two separate pieces bolted together, do not enter sockets at the top, but are cut to fit outside the iron girders, and screwed together; and as the soft wood yields readily to any inequality in the iron, a firmer and more vice-like hold is obtained by this than by the former method. In addition to this, strong beams are screwed together and arranged according to scientific principles, so as to make the part that is to be moved one solid mass, and to prevent the slightest possibility of its tilting over in any direction; and so skillfully has the disposition of these numerous supports and ties, been managed, that there is not the slightest obstruction to the traffic. Everything is stowed away up in the air amongst the iron rods of the roof, except a few scaffolding poles, that get into nobody's way if nobody gets into theirs. The segment to be moved is severed from the rest, the boarding and slates of the roof taken up, and the glass of the sky-light taken out at the joint, and all is ready for the great operation of lifting to begin.

The Rotundity of the Earth.—A stupid attempt has been made for some years past to induce the belief that the earth is a flat surface, and a Mr. Hampden, who seems to have been persuaded that it is so, has rashly risked 500l. on the issue of an experiment on the Bedford Level in order to test the truth of the assertion. His offer was taken up by Mr. A. R. Wallace, and arrangements satisfactory to Mr. Hampden having been made, the experiment was tried by means of three discs, rising 12 ft. above the level of the surface of a piece of water large enough to show the curvature, if there were any. The referee has just decided against Mr. Hampden, the central disc, as every one with a grain of sense supposed it would, rising considerably above the line formed by the two outer discs, as seen from one end through a selected and approved telescope. The curvature to and fro in six miles to the extent of about 5 ft. was proved. As was also to be suspected, an attempt is being made to shuffle out of the bet, now that it has been decided.

Civil Service Estimates.—The Civil Service Estimates have been issued. The total is 16,416,265l., against 16,316,388l. last year, showing a net increase of 99,877l. On public works and buildings there is a net decrease of 70,173l.; on salaries and expenses a net decrease of 30,671l.; on law and justice a net increase of 138,592l. The department of education, science, and art shows a net increase of 88,916l. Under this head the cost of public education is shown to be 914,721l., against 840,711l. last year.

Guildhall, London.—At the last Court of Common Council an offer from some of the principal inhabitants of the ward of Farringdon Without, to put a stained glass window in the Guildhall, in commemoration of the great improvements which have recently been carried out in that ward by the corporation, at an expense of 3,500,000l., was accepted by the court, and it was referred to the City Lands Committee to give the necessary directions.

Interesting Discovery at Newcastle.—The workmen engaged in the excavations near the Black Gate, Newcastle, have discovered a curious subterranean passage, at a depth of about 12 ft. from the surface. The passage extends underneath the ancient gateway, and is, like the basement of that ancient building, in an excellent state of preservation.

Rome.—A correspondent writes.—The British Archaeological Society of Rome continues its work steadily, and visitors to Rome now hear a great deal more about the antiquities than they ever did before. The society has stirred up others to emulation with them, and has given great activity to the study of the antiquities of Rome. The weekly lectures are always well attended, and give a good deal of useful and interesting information, not easily obtained elsewhere. Mr. Shakspeare Wood, the secretary, is indefatigable in giving lectures on the spot, sometimes three times over. But there are always two sides of every question, and I hear that the society consists almost entirely of the strangers who flock to Rome, and that the older residents in Rome generally hold aloof from it; that even the members of the committee, who are the managing body, are sometimes strangers, who hardly know the names of the places they go to see. I hear little of Mr. Parker's excavations this season, and I am told that this arises from his finding difficulties put in his way by the Government authorities at the instigation of the local antiquaries,—that they have not renewed his permissions which they had given last year. It is against the law in Rome for any one to dig more than 6 ft. deep without permission from the government, and any labourer found doing so is liable to be sent to prison at once by the police without any form of trial. Mr. Parker has, however, continued to go on exploring the remains of the old Mamertine prison, and has found three doorways under the level of the ground in the cellars, and therefore at a great depth below the surface. All the walls and doorways are made of the large square or oblong blocks of tufa, the same as the walls of Servius Tullius.

Worcester Cathedral Clock and Bells.

The Rev. R. Catley, minor canon of Worcester, writes to the local papers saying that the bells are already pronounced by competent judges to be of surpassing excellence, and that the clock has been for some time ready for erection, and as the internal approaches completion, it will soon be placed in its proper position. He gives the following estimate of the total cost:—

Bells, oak frame, and all necessary fittings complete.....	£2,677 0 0
Clock, about.....	500 0 0
Timber trussing, floors, &c., about.....	1,800 0 0
Architect's commission, about.....	70 0 0
Gasfittings.....	12 0 0
Chiming apparatus.....	20 0 0
Wires for lower bells, about.....	35 0 0
Incidental expenses, including taking down old bells, printing, advertising, &c., about.....	200 0 0
£3,714 0 0	
Amount already promised.....	£3,999 0 0
Leaving a balance yet to be provided of.....	908 0 0

An appeal is made for further contributions, to be sent to any of the Worcester banks.

Sewage Farming.—A paper on this subject has been read by Mr. Bailey Denton to the members of the Farmers' Club, and appears at some length in their *Journal*. The title of the paper was, "On Sewage Farming, and the Position of Sewer Authorities in relation to Lands to which Sewage is applied." There was a very full attendance. Mr. Denton, in the outset of his paper, said that his object was not so much to pronounce opinions of his own as to elicit the views of others; and, considering the highly practical character of his fellow-members of the club, he would avoid dwelling on those general agricultural laws which rule in sewage as in ordinary farming, and address himself at once to the particular objects of his paper, which as a new branch of farming, demanded special treatment. An interesting discussion followed the reading of the paper, in which a variety of opinions were expressed.

The Late Mr. George Leather, C.E.—The remains of this gentleman have been interred in the Burmantofts Cemetery, Leeds. In early life Mr. Leather enjoyed considerable reputation as an engineer. He was concerned in the improvements of the Aire and Calder navigation, by which it was made available for sea-going vessels to Leeds and Wakefield, and also in the like improvements of the River Don navigation to Sheffield. The various bridges which have been erected over the Aire in Leeds within the last forty years were also designed and executed by Mr. Leather, either solely or in conjunction with his son.

The New Public Buildings.—In the House of Lords last week Lord Redesdale said that he had looked at the designs of the new public buildings, but he was disappointed to find that there was no block plan to show the disposal of the buildings when erected. He wished to know whether there was any objection to the preparation of such a plan; also whether a connexion could be made between the new buildings and the Privy Council offices. He drew attention to the fact that a house in Spring-gardens was lately taken possession of by a banking company, and that a large palatial building was about to be erected on its site. This house might have been purchased some time ago at a low figure, and by means of its clearance a fine entrance into the mall might have been secured. Earl Granville said, in reply, that he would make inquiries into the matter.

The Boutet Bridge.—According to the *Moniteur*, the model of a single span, of 80 metres, is now nearly completed. The two abutments, formed of blocks of granite, the tress and platform are set up for a length of 80 metres (the ground where the model is provisionally installed, at the "Dépôt des Marbres," not allowing of the whole length of 100 metres being extended). The tress was tried on different occasions, and resisted, without the slightest deflection, a strain double that of the trial weight required by the rules of "Le Ponts et Chaussées;" lastly, the "longrines," or rafters, are ready to be mounted. The model is intended to prove the efficacy of the Boutet system for the construction of a great bridge over the Channel.

A Benedictine Monastery in Wales for Father Ignatius.—The foundation-stone of a new monastery has been laid by Father Ignatius and his monks among the Black Mountains in Monmouthshire, in the Valley of Ewys, near Llanthony. A spectator thus describes the site:—

"We were standing about 300 ft. above the gliding river Honddu, on the slope of the western hill, with a full view of the magnificent valley of Ewys to the south, and the grand towering Black Mountains on either side. On the north, a bold and beautiful round-shaped mountain stood out alone, separating two most lovely valleys, which swept past it to the right and left. All was silent, solemn, beautiful, and still. A narrow ravine, verdant with ferns and bushes, through which rushed a mountain stream, formed the south-eastern limit of the site marked out for the new abbey. The level for the foundation of the west cloister was already nearly finished. The foundation-stone was ready for the ceremony, being placed at the base of the first buttress of the west cloister."

"Scholars' International Exhibition."

The *Kenington News* says.—A further novelty is in the course of introduction in Kensington, at the Allen-street Schools, in the form of a Scholars' Industrial Exhibition. The exhibition will comprise various specimens of ornamental and decorative art, results of applied science and skill in handicraft, with a large admixture of the more humble specimens of the arts practised in domestic life by the girls and young women connected with this institution. Mr. S. H. Trotman is the manager.

New Synagogues.—The new Central Synagogue, in Great Portland-street, which we illustrated on page 887 of our volume for 1869, has now been consecrated by the Chief Rabbi. The opening of the new Synagogue for Rochester and Chatham, built and endowed by Mr. Simon Magnus, a merchant of Chatham, is postponed indefinitely, as Mr. Magnus insists on having at the consecration, and taking part in it, Professor Marks, who belongs to the "reformed" party amongst the Jewish community, and to this the Chief Rabbi and others object.

Billingsgate.—A correspondent suggests a plan for the enlargement of Billingsgate Market, by means of a floating covered way, to extend the entire length of the Custom House Quay, and of sufficient width to give an addition of four times the space of the existing market, with which it is proposed to connect it on the river-side, so as in no way to obstruct the navigation. The structure to be of a suitably ornamental character.

TENDERS.

For the erection of a villa residence, Crouch-hill, Horsey, for Mr. W. R. Perry. Mr. Alfred W. N. Burder, architect. Quantities not supplied:—

Timewell.....	£2,024 0 0
Wood.....	1,900 0 0
Dove.....	1,894 0 0
Williams & Son.....	1,867 0 0
Roberts.....	1,860 0 0
Carter & Sons (accepted).....	1,840 0 0

For making 17,409 superficial yards of roads, &c., at Stoke Park, near Bristol. Mr. Henry Masters, architect:—

Adams & Kirby.....	£2,800 0 0
Pidditch & Sons.....	2,207 18 2
Price.....	1,892 2 6
Rogert.....	1,899 13 0
Storkey.....	1,834 0 0
Mullett.....	1,735 0 0
Mareweather & Sons.....	1,690 0 0
Davis.....	1,541 3 0
Baker (accepted).....	1,521 0 0
Sidwell.....	1,500 10 3

* Informal.

For enlarging and restoring Starston Church, Norfolk, exclusive of the old materials. Mr. R. M. Phipson, architect:—

Grinwood (accepted).....	£725 0 0
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For alterations and additions to The Grove, Yorkford. Mr. R. M. Phipson, architect:—

Mountain & Cotton.....	£1,339 0 0
Grinwood.....	1,246 11 0
Smyth & Sons (accepted).....	899 17 6

For rebuilding part of Writtle Mills, Chelmsford, for Messrs. W. & J. Beach & Sons. Mr. Rikington, architect:—

Little.....	£2,489 0 0
Roper.....	2,368 0 0
Wale.....	2,293 0 0
Gardner.....	2,168 0 0
Brown.....	2,069 0 0
Saunders.....	1,991 0 0
Sudbury (accepted).....	1,930 12 0

For detached villa residence at Turnham Green, for Mr. W. H. Thomas. Mr. C. Sewell, architect. Quantities provided:—

Scott.....	£1,880 0 0
Wilson.....	1,828 10 0
Westomb.....	1,826 0 0
Wright.....	1,767 0 0
Flemman.....	1,755 0 0
Adamson & Son.....	1,737 0 0
Wigmore.....	1,699 10 0
Fisher.....	1,654 10 0
Cordland.....	1,655 0 0
Perry Bros.....	1,617 0 0
Heaver & Coates.....	1,597 0 0
Whitlock.....	1,563 0 0

For rebuilding the Old White Horse Tavern, Brixton, Surrey, for Mr. H. J. Rees. Mr. C. Sewell, architect. Quantities provided:—

Scott.....	£2,837 0 0
Hoare & Ponsellwaite.....	2,430 0 0
Staines & Son.....	2,395 0 0
Cooper.....	2,350 0 0
Smith.....	2,339 0 0
Heaver & Coates.....	2,207 0 0
Perry Bros.....	2,247 0 0
Jackson (accepted).....	2,183 0 0
Rowe & Verran.....	2,037 0 0

For the erection of the West London District Schools, at Ashford, Middlesex. Mr. H. H. Collins, architect. Quantities supplied by Messrs. Batstone & Hunt and Mr. Gritten:—

Merritt & Ashby.....	£27,905 0 0
Brass.....	55,990 0 0
Newman & Mann.....	54,726 0 0
Crockett.....	52,300 0 0
Jackson & Shaw.....	52,300 0 0
Touque.....	52,253 0 0
Nutt & Co.....	52,339 0 0
Meyer & Sons.....	51,601 0 0
Crabb & Vaughan.....	51,600 0 0
Capps & Riteo.....	51,126 0 0
Hart.....	50,800 0 0
Gibson Bros.....	49,918 0 0
Perry & Co.....	49,770 0 0
Hendshaw.....	49,660 0 0
Howard.....	48,968 0 0
Ebbs & Sons.....	48,868 0 0
Hill, Kedwell, & Waldram.....	48,800 0 0
Kelly.....	48,435 0 0
Martinez & Thurgood.....	47,479 0 0
Kirk.....	46,994 0 0
Harris.....	45,600 0 0
Ferguson.....	44,670 0 0
Kelly Bros.....	43,600 0 0
Bull & Sons (accepted).....	43,590 0 0

For the erection of seventeen houses, Birkland-avenue, Peck-street, Nottingham, for Mr. George Abbott. Mr. J. Collyer, architect. Quantities supplied:—

Curtis (accepted).....	£3,636 0 0
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For extension to factory, Sherwood-street, Nottingham, for Mr. John Farmer. Mr. J. Collyer, architect. Quantities supplied:—

Vickers.....	£730 0 0
Hill & Sons.....	698 0 0
Shepperson.....	672 0 0
Curtis.....	670 0 0
Jeiley (accepted).....	665 0 0

For the erection of a teacher's residence, attached to Oakley National School, Bishop's Stortford. Mr. Alfred W. N. Burder, architect. Quantities not supplied:—

Repairs to School	
Residence.	Buildings.
Glasscock.....	£222 10 0
Brown (accepted).....	205 10 0
	£7 10 0
	9 10 0

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The Builder.

VOL. XXVIII.—No. 1420.

The Sanitary Condition of Edinburgh in 1870.



E have once more walked through the wynds and closes, the broadways and the by-ways, and crept up, nearly on all fours, a good number of the steep corrugated and slippery and sludgy defiles of the old town of Edinburgh. We have often seen Auld Reekie before, and it has often been our painful province to criticise somewhat severely its most wretched and deplorable sanitary condition. Within a few years various commendable improvements have taken place. Some new and improved dwellings have been erected for the accommodation of the working and small shop-keeping classes,

and two or three notorious rookeries have been pulled down to make way for this improvement; but the old town of Edinburgh, betwixt the lines of the High-street, the Canongate, and the Cowgate, with its extremities, the Grassmarket and the Westport, contains yet a squalid and miserably-housed population. It would take too many lines of these columns to enumerate in detail the reeking alleys, slums, and tottering, slippery, and headlong, break-neck passages, which intersect the many leading and back streets in the direction we have indicated,—passages and alleys with noisome smells and accumulated heaps of filth. Rickety, dingy, dilapidated, and dismal dwellings by the hundred can still be seen and reckoned on any occasion in every quarter of the old city.

To view the bleak side of Edinburgh as well as its bright, it is necessary to dive into its dismal closes, and wind round its corkscrew stone staircases; to mount, still mount, up, still up, from flat to flat, to the sixth and seventh story,—to where the cradled and creeping bairn, or the poor decrepit crone, may be seen, indifferent to the life and bustle of the work-a-day world below on street and pavement. Truly in Edinburgh there are human entities perched aloft in inaccessible eyries, of whom their neighbours know absolutely nothing; and the saying "that one half of the world does not know how the other half lives," is sensibly applicable to them. We have visited them, we have seen their homes, we have examined their surroundings, and we must be forgiven if we draw the obvious conclusion which such a state of life warrants us to draw. The last was a hard winter in Edinburgh, and employment was very dull; for Edinburgh, it must be remembered, is unlike Glasgow: it does not possess many factories or foundries of sundry descriptions. It has a few foundries, which employ a small number of men, and the vulcanite or India-

rubber factories are the best open in the city for absorbing a large amount of the surplus male and female labour which exists. Here, in those factories, some hundreds of men, women, boys, and girls, are employed in the manufacture of an almost indescribable number of articles of a useful and ornamental character. It would be well if a few more factories were established of a similar description, for Edinburgh at present requires openings for waste labour.

The building trades may be said to be the only ones that are brisk, or will be brisk when the spring is farther advanced; several new buildings are in progress, terraces are laid out, and railway termini are undergoing metamorphoses. For instance, the Caledonian Railway Company have nearly completed their new station at the angle of the Lothian-road.

Off the High-street several improvements have taken place since 1864. One side of St. Mary's Wynd, a noted narrow gut sacred to *Old Clo*, has disappeared, and new houses, with shops, have been erected, conformably with the spirit of the Improvement Act of 1867, having been carried on under the provostship of Mr. William Chambers. A tablet in commemoration is inserted over the doorway of the angle house. The houses are a vast improvement on the old edifices of the town. The stairs are wide and easy, and, of course, of stone, as mostly all the stairs in Edinburgh are. They are not of the old spiral fashion, but what we call dog-legged, and are easy of ascent. The rooms are somewhat roomy, to use a homely phrase. But these houses in St. Mary's Wynd do not meet the requirements of the working classes, nor can it be said that they were designed to do so. One side of St. Mary's Wynd is improved without doubt. The thoroughfare is wider and healthier; but the poor are not helped by good house-room and low rents in consequence. There are other improvements in connexion with the High-street under consideration, and houses are in course of demolition for the purpose. Around by that quarter of the town that looks out upon Salisbury Crags (Arthur's Seat) several lines of new houses have been erected within these three or four years, and others are in course of incubation. These houses, although of a not very ornamental cast, are pretty fairly built, and are better ventilated. Their approaches, though steep, are not offensive, nor are the unsavoury smells which one finds in the heart of the city felt.

Edinburgh, though less silently and less markedly than London, is gradually extending itself, even beyond and upon its old frontiers, and twenty years hence the new portion of the old town will have outgrown its predecessor as much as the new town (the Princes-street side) has outgrown the old in good buildings during the last forty years. But at this point let us inquire, seriously, is it possible to improve the sanitary condition of the old town of Edinburgh? It is a difficult question to satisfactorily answer. During our visit we have penetrated the precincts of upwards of a hundred old Wynds, Closes, and Entries, and we have found them in as bad a condition, and the majority of them in a worse one than we did in 1864-5, or any time previously. Muck and filth of every kind were to be encountered, and unless a man possessed an india-rubber nostril that could shrink and dilate at pleasure, he could not escape the penalty of inhaling pervading odours. If life is to be seen in Auld Reekie, reeking filth and fume must be waded through.

But we must say that the worst closes and wynds, and the greatest dinginess, desolation, and dirt exist in the closes off the High-street, the Cowgate, the Grassmarket, and the Westport. We are not writing from hearsay, but personal observation and examination. Discussions are going on in the Corporation about over-crowding of lodging-houses, and Baillie Miller, in the

Council denies the soft impeachment, but another more outspoken member confirms the fact by offering to prove that overcrowding does exist, and he can put the Baillie's finger upon it. We can confirm the truth of this. Overcrowding exists in the Grassmarket, and the Westport, and in some other of the quarters which we have already enumerated.

We went in search of these lodging-houses, and found them. Poor speculators make a living by lodging their fellow worms, and as long as the sanitary condition of old Edinburgh remains as it is, there will be overcrowded lodgings, fever, cholera, plague, and penny. Only those who have made an extended visit through the old town can form an idea of what a horrible and rotten old carcass is contained within the outer skin of the Modern Athens.

Athens, oh? Yes, we must acknowledge that Edinburgh has buildings,—public and ecclesiastical,—and streets and picturesque eminences almost unequalled in the summer sun. She has wealth—she has beauty—she has good moral and physical attributes. She has great men,—men of science, lawyers, engineers, artists, churchmen, and others; but, alas! she has a diseased sanitary core. She has had a cancer for years, that must be cut out; for if ever a great epidemic should sweep over the northern capital, "Wo worth the day—wo worth the hour." She would not escape the effect of the blow for a half-century.

How is such an undesired casualty to be, if not in a manner prevented, at least lightened materially if it should occur? Simply by beginning at the right end, doing things in the right way, and putting the right men in the right place. This has not been done heretofore in Edinburgh. Of course, jobbery in connexion with corporate works is common, and Edinburgh is not an exception. It would be a wonder if the Scottish character were impervious, in the individual or the community, to the duty of providing for itself; therefore high personages, it is said, have taken especial care of themselves, while the public were left to take care of themselves. The sanitary condition of Edinburgh can be gradually improved, but it will be the work of two or three generations, as far as the old town is concerned.

The majority of the houses in the wynds and closes are unfit to live in. The majority of these entries are of a steep incline on their base line, and the staircases of these dwellings are in character with the outside passage. Their ascent is steep, darksome, and dangerous, and every "flat" comprises tenements, where the sunshine seldom enters, morning, noon, or evening. The breeze of heaven, God's light, and pure air, are unbidden visitants in these dreary and dingy closes.

To abolish these dark slums is desirable. You cannot at present, for whither are the working poor to go? There is no quarter where the dwellers in these places can find homes neat, healthy, and cheap, or even at all. There are interests, too, involved in these houses varied and curious. Take, for instance, any house in the leading or bye streets of the old town, and you will learn, perhaps, that the house has half a dozen landlords. Some may be factors, and others factotums; but the fact remains, they are managed for different landlords. In other places every man's house may be his castle; but in Edinburgh, though every landlord's "flat" may be his "flat," the house as a whole belongs to a good many other bodies besides himself. The poor tenant of a "flat," in fact, pays the taxes for his landlord, and these are allowed to be deducted from the rent. The tenants feel this hardship, and are loud in condemnation of a system that compels them to pay taxes in advance for their landlords, and then remain for six months before they are recouped by deduction from the rent.

We have found instances in our peregrinations where one "flat" was owned by a half-dozen proprietors. For instance, it was devised to a family of six or eight children, brothers and sisters. The bequest gave them all the benefit of an identical interest. One could sell without the other's consent his sixth or eighth part to another landlord of another "flat," and then the five or seven brothers or sisters might sell their portions *separatim*, or let them alone. Or, if they liked to club with a mutual consent, they might dispose of the family property, and divide the price obtained for the "flat" among them.

We will relate another curious instance illustrative of how a duty devolved upon the owner of a top "flat," and how the system worked in relation to the interests of the other proprietors. A stipulation was inserted in the lease that the owner of a certain top "flat" (in the High-street) would agree to keep the roof in repair. The task of keeping a large roof in a state of repair would be no easy affair for a poor owner, who might live on a very small income. The owners of other flats underneath might prove disagreeable neighbours, if the roof leaked, and if water from gutters trickled along the outside walls, making their bedrooms damp, and injuring their chance of getting good tenants.

Built by building speculators in days past, a good portion of the house property in Edinburgh Old Town has undergone many changes, and has entered into the possession of various landlords. Many, if not all, the landlords of the house property in these old wynds and closes are now speculating on the chances that will exist of disposing of their bargains for greater bargains. Some have already amassed capital by the new improvements going on, which necessitated the demolition of portions of those old closes; but if future improvements advance only at the rate of the past, it will take a long period before Edinburgh can put in a decent sanitary appearance.

When Edinburgh is ramified with metropolitan railways, or even when one or two lines sweep the circuit of the city, better conditions will exist for leading to its purification. Building in Edinburgh is rather costly in one respect, as stone forms the principal material. The Edinburgh folk do not like the idea of brick structures, but if brick or concrete houses were erected by the score in Edinburgh, and let at a low rent, they would pay the speculator after a short time. Workmen's dwellings, built with brick, of suitable dimensions, and with the ordinary requirements that the improved dwellings recently erected in places throughout England afford, would be, in a measure, palaces compared with the wretched "flats" in the closes and wynds of the High-street and the Cowgate.

By the opening of wide entries or streets off each side of the High-street and the Canon-gate, crossing the Cowgate, and brought up to a level by bridging the latter thoroughfare, further improvements would be made, and freer currents of air would be let into quarters which stand sorrowfully in need of it. Bridge-street, and its continuation in Nicholson-street from the leading High-street, is an example of what is wanted. Radial arteries directed from the main trunk would circulate the life-blood of the city through channels that are all but lifeless and inert,—choked for want of pure air, and suffocated with chronic foulness and not easily removable filth.

Some of those very high houses in the old town have not water laid on in many of their flats; and, though the pressure is great enough to raise it to the highest flat, many of the tenants are obliged to carry up the water they use in buckets, to the height of six stories, round and round a most tortuous spiral stair, where it requires one accustomed to every step and landing to ascend without accident. The poor are not half accommodated with water in Edinburgh.

The water-supply, which is now in the hands of the Corporation, who desire to improve the city, should be managed in a better way. The poor should not be obliged to come down five or six stories to fountains in the alleys and lanes for their water. As every flat is considered in the same sense as if it was a house, therefore, to every landing and every kitchen of each "flat" water should be laid on, and all the poor should be properly served. Where there is not a good water-supply there must be accumulation of dirt; and where dirt exists disease is not far distant.

Edinburgh requires a good system of sanitary inspectorship. The city requires to be told off in divisions or districts; and sub-officers, acting under one supreme and responsible head, ought

to be stationed in suitable quarters of the town, and their allotted work mapped out for them. We confess that we hardly know what system at present the sanitary management of the city of Edinburgh is under. If a proper Board of Health existed something ought to be and would be expected at their hands. But it appears to us that in the meetings of the Town Council, whenever sanitary matters are discussed, there is a great deal too much talk that ends in nothing or next to nothing, for repeated adjournment is only another method of shelving measures which are distasteful. Opposing members have their own hobbies, and as it takes months to reduce theories to practice, it need not be marvelled at that Edinburgh is still overcrowded in her wynds, and has a sickly constitution.

Edinburgh, of course, is fashionable and wealthy, and has good streets and squares in the modern or new city, but of these we are not speaking at present. The fashion and the equipages that roll through Princes-street and its surroundings do not ebb through the Cowgate or the Grass-market, nor do we believe they allow their nostrils to be offended by a sweep through the High-street, except when a desire arises for visiting the old Castle on the rock and the Royal Palace of Holyrood.

Royalty and fashion forewear the old historic portions of the city, and the old memorised spots sacred to king and Covenanter, Royalist and Jacobite, are tabooed, because a deadly asthma is in the heart of the Old Town, and a churchyard cough is heard rattling in the throat of poor Auld Reekie.

Edinburgh requires a thorough and complete system of main drainage, sweeping down towards Leith, where the sewage might be utilised with effect for irrigation purposes, on adjacent districts, and for sale to the farmers inland. The present system of scavenging the town is a disgrace, and the morning view on the streets and alleys, of night soil and ashes, is unworthy of Modern Athens in the nineteenth century. Where shall the poor throw their dirt, slush, ashes, and sundry nasty sweepings? Not certainly on the footway of the wynds and closes, or in the channels of the open streets. There should be respectable bins or ashpits put up in certain quarters by the corporation to meet the requirements of the back-to-back dwellings in the closes, and no more new structure should be erected in Edinburgh of the criminal and barbarian type, which has disgraced, and is still disgracing the city, and making old Edinburgh a scandal to the empire.

We know it is difficult to do an expeditions work of a sanitary kind in Edinburgh. We are not blind to the obstacles, nor ignorant of the manifold interests that link into each other. But all these things will grow small and appear puny when a hearty movement for thorough sanitary reforms is undertaken by the corporation of Edinburgh. The Water Trust, which comes under the complete control of the town council in May next, will be a step in the right direction; and we hope when it takes place, that not one attic, or cellar, or lane, alley, or close in Edinburgh will gasp for water, and gasp in vain.

We marvel very much, indeed, that the death-rate is not larger in the Old Town than it is, for the seeds of fever, cholera, and other human plagues exist, and certain atmospheric conditions only are necessary at any time to transform a city with wealth and learning into a dismal and plague-stricken capital.

These may be gloomy observations, but they are fortified by incontrovertible data. The more is the pity.

ALBERT BRIDGE, BATTERSEA PARK.

The disadvantages which are allied with the existing arrangements as to toll and non-toll paying bridges in the metropolis might well attract notice in connexion with the long contemplated erection of a new bridge at Chelsea. Few pronounced instances probably could be so well adduced in favour of the equity of the total abolition of tolls upon metropolitan bridges than those which may be found to be associated with this undertaking. The distance from the existing suspension bridge at the eastern end of Battersea Park to Old Battersea Bridge, it may be true, would be scarcely likely to suggest the necessity of any intermediate erection. At the Surrey side the interval between the abutments of the two bridges which are already in existence is scarcely more than 1,700 yards; while on the Middlesex side that distance is exceeded

by about another hundred yards, due to the land curve formed by the River at Battersea Reach. The completion of Albert Bridge would accordingly render accessible to the public no less than three bridges within the limits which we have indicated. Apart, however, from the question as to the extent of over-river accommodation that may be demanded at these points, there are circumstances which connect themselves with this particular project which would, in the opinion of many, in some measure justify the execution of a work which obviously has been long held in view. The expected improvement in the condition of house property in the neighbourhood, which it has been stated would be likely to result in opening up readier means of intercommunication across the river, could hardly, in fairness, be considered likely to follow upon so large a scale as circumstances would appear to render desirable. Speaking of Battersea alone, the extent of the erection of house property in that locality of late years, from a recent allusion to the subject in the House of Commons upon the question of the desirability of freeing the Eastern Chelsea Suspension Bridge from tolls, may be inferred from the statement that no less than 3,000 houses in that district are at present uninhabited. While dwelling upon this, which has come to be regarded as an important element in various proposals towards the possible redemption or abolition of tolls, it might be noted that the proportion of untenanted houses to which attention has been so prominently called in the case of Battersea, is by no means at this moment exclusively to be found in that part of the metropolis. In one ward alone of the parish of Camberwell at the present time no less than 950 houses are unoccupied; and it is alleged that, taking the entire district into consideration, a greater number of houses may be found untenanted in Camberwell than in Battersea. In some districts of Peckham, comprising houses now in course of erection, probably an equal number of unoccupied houses may be met with; but in this instance there are indications that the result is in some degree to be attributed to the want of facilities of access to the habitations which have been newly erected. There would appear ample reasons for concluding from various conspiring causes, in the main to be traced perhaps to the suspension of labour and trade which has so long afflicted certain parts, that in one division of the metropolis alone there may be found at this moment no less than 10,000 eligible dwelling-houses uninhabited. Such incidents point out undeniably the grave results which cannot fail to reach certain sections of the community, in every instance of a protracted commercial crisis such as that from which it is happily predicted the country is at length affording signs of recovery. Whether the erection of the proposed Albert Bridge would or would not operate in favour of the owners of household property in Battersea, it has been rendered more obvious perhaps than could have been wished that as a proprietary scheme it could have been more warmly supported in those localities which would be more likely to be interested. Other circumstances, however, which attach to this project, and to which we have alluded, are more or less of an official character; and while having confessedly prejudiced or delayed the undertaking as a private enterprise, but little intention would appear to have been declared towards remedying a situation of affairs with reference to which but little reason for excessive congratulation might, from any point of view, be afforded.

The western extremity of Battersea Park, as may be well known, was planned with a special view towards the construction of a bridge. The general arrangements, or it might be said the defiguration of this portion of the park, has been ostensibly so subordinated to the erection of such a structure at this site, that in the absence of any such intention acquiring further determinate signs of being realised, the formation of Albert-road might come to be regretted on many grounds.

The normal boundary of the park would appear not only to have been fruitlessly curtailed, but the adjacent land could scarcely be so well appropriated while the original design is held in abeyance or so tentatively proceeded with.

Should no readjustment of the land at this point be made, it might still be in vain to look forward to any official explanation as to the delay which has impaired or limited the intended utility of the park, involved considerable expenditure of the public money in the formation

of impracticable roads, and invited an incorporated body towards the prosecution of an apparently impossible enterprise, and one which, upon its original merits at least, appears to have lost so many of its former elements of attraction. Nor could it but be supposed to spring from gratuitous reticence on the part of any one to believe that, taking all the circumstances into consideration, any public, or perhaps it might equally be said, any private advantage could be still expected from an undertaking whose original shares of 10l., fully paid up, have been publicly offered for sale in the open market for a sum of three pence per share. There may be some who will recognise that in all charity we abstain from further comments in this direction, and prepared to admit from late occurrences that no degree of prudence could be deemed excessive in venturing to trespass too far upon even the credulity of the public. The parties concerned, however, in the case which we have in view, might be held to have just and substantial grounds of complaint; and it is because we would hail with satisfaction any practical suggestions, with the view of restoring public confidence to a work of promising utility, that we would be inclined in any way to aid so desirable an object. From the circumstance of the tolls upon the existing Chelsea Suspension Bridge—which, unlike most of the other bridges along the Thames, is neither private nor corporate property, but in the hands of the Government—not being continuous, but relinquished in favour of the public when the facilities which such structures are intended to afford are most demanded, it may become apparent that but little encouragement may be derived in any supplementary accommodation that might be sought to be extended upon a speculative basis. It might recommend itself also as a matter open to consideration whether the modifications which may be attempted with a view of limiting the cost of the structure which was originally intended to be erected at Battersea may meet with that approval which could scarcely fail to be desired.

In the instance of the proposed new bridge at Wandsworth, where such a structure may be more needed, and with reference to the erection of which Parliamentary powers have long been granted, it has been found necessary to apply for further authority to reduce the cost of the undertaking. Although this may be practicable, it could in no way enhance the merit of the project, nor appear calculated to command so large a share of public support as could be wished. Such a policy could be refined to the simple proposal of suspending a wire across the river, with a locomotive basket attached, as was employed at Clifton prior to the erection of the Clifton Suspension Bridge. It may be accepted, however, as a further illustration of the difficulties which have to be encountered in the construction of a proprietary bridge, while it is in the power of certain authorities to relieve such structures from tolls, and the expediency of the abolition of tolls upon all metropolitan bridges, courts such frequent advocacy.

The Albert Bridge Act was obtained so long ago as the year 1864, with permissive but conditional powers to amalgamate with the Old Battersea Bridge Company or proprietors. The proposed arrangement was, we believe, to the effect that those interested in the old bridge should be entitled to a preferential rent-charge clear of all deductions to the amount of 3,000l. per annum upon the united takings of the two bridges, assuming that the Albert Bridge had been erected within the time stipulated. The joint undertakings would then have merged into the single corporation of the Albert Bridge Company, upon which would have devolved the maintenance of the two bridges. The long-deferred erection of the new bridge, however, would appear to have rendered other arrangements desirable. From a report which was issued at a general meeting of shareholders, held at the Westminster Palace Hotel in January, 1866, it may be gathered that the company then congratulated themselves upon the satisfactory terms upon which the contract for the construction of the new bridge had been made; but considering the manner in which the works have since been proceeded with, it could scarcely be deemed importunate should the shareholders seek for some further justification of the report. Seldom has any enterprise of similar character appeared to have made so irresistible a start. The official statement at the meeting to which we have referred was to the effect that her Majesty's Commissioners of Works had agreed

to convey to the company the land for the purposes of the bridge on the Surrey side for a merely nominal sum. The Metropolitan Board of Works had consented to construct their embankment wall in a line with the abutment of the bridge at Cheyne Walk, and form two approach roads, each 60 ft. wide, along the Embankment to the east and west of the bridge.

The Conservators of the River Thames had consented to the erection of a pier for the landing of passengers from steamboats immediately adjoining the bridge. The Metropolitan Railway Company were promoting a line in connexion with their system from Kensington to Chelsea, passing by Cheyne-walk, contiguous to the foot of Albert Bridge—a circumstance which was thought worthy of being included in the general statement. Beyond all, an offer had been made, we learn from a published report by a responsible party, to take the bridge and collect the tolls, including lighting and repairs, paying 6,500l. to the company per annum for three years,—an offer which we are asked to believe was not only made, but accompanied by a recommendation to the shareholders not to accept it. It might be inferred from this, as well as from later occurrences, that a more conciliatory or accommodating body of shareholders it has seldom been the good fortune of many companies to attract. This concurrence of unheard-of felicities could scarcely have been improved upon save by the gratuitous erection of the bridge by disinterested parties; and why in face of all these tributary encouragements the original design should come now to be impoverished or abandoned, it may well be inquired. It would be widely apart from what may be considered necessary to enter more at length upon such observations as certain incidents with which the project in view has been attended would appear to render but too well warranted. As we have already observed, we would more gladly hail any fair indication of the undertaking being carried to a successful termination, and it is in that view that we for the moment abstain from further reference to matters which, as subjects of public interest, might be well communicated.

THE VAUDEVILLE THEATRE, STRAND.

So many of the newspapers have given the official description of the theatre that has been erected on the site of 403 and 404, Strand (a few houses east of the Adelphi Theatre), that it is scarcely necessary for us to repeat the particulars. Briefly, however, the principal entrance is in the Strand, by a hall leading to the stalls, on a level with the Strand; and by a staircase, 6 ft. wide, to the balcony and boxes. The pit is approached by a separate corridor, 5 ft. wide, level with the Strand. The gallery entrance is in Lumley-court.

The auditorium consists of a balcony, the front forming a semicircle, opening out by curves of a contrary flexure, as at the Gaiety, to the proscenium columns. Behind this, at a higher level, is the dress-circle tier. Above the upper circle is a spacious gallery. There are, on either side, between the balcony and the stage opening on the grand tier, three private boxes, divided by pillars having enriched capitals, and surmounted by semicircular arches, containing figure-subjects from *Midsummer Night's Dream* and *The Tempest*. Below these again, on the pit level, are two more private boxes on each side. There are seats, it is stated, for 1,000 persons. Opening out from the first landing of the staircase is a refreshment-saloon, with cloak-rooms contiguous; above this, and occupying the frontage towards the Strand, are rooms for the management offices, wardrobe-making rooms, and a spacious refreshment saloon for the gallery. The lighting of the auditorium is by one of "Strode's" sun-burners in the centre of the ceiling.

The stage is 30 ft. 6 in. in depth from the flat lights to the back wall, with a dock for showing scenery. The width between walls is 41 ft.; the stage opening 22 ft. wide; and the height above is sufficient to take up scenery out of sight. The footlights, by Messrs. Strode, burn downwards, the produce of the combustion being taken away in an iron cylinder running parallel with the front of the stage, and carried up in a flue in the main wall.

The coloured decorations have been well executed by Mr. George Gordon. They are principally on the flat, there being no raised ornament on the ceiling, or on the box fronts, except the upper and lower mouldings. The ceiling is divided into compartments with white

ornaments on a blue ground. The panels in the cove over the proscenium are of varied design, in colours, on a gray ground. The front of the balcony tier is ornamented in colour on a gold ground. The lunettes in the arches over the private boxes (which remind the spectator of the little Charing-cross Theatre), have been painted by Mr. W. Phillips. The hangings for the boxes are of dark amber-coloured figured satin.

The Greek set-drop has been designed and painted by Mr. Gordon, the odd and wild figures in the foreground being by Mr. Alfred Thompson.

The general builder's work has been done by Mr. Hyde, and Mr. C. J. Phipps was the architect.

The theatre, which is in three heights only (the pit, the boxes, and the gallery), is advantageously lofty, and the seats in the boxes and the gallery are well raised one above another. So far as we could observe, there is scarcely a seat in the house from which the performances cannot be seen and heard, and this is no slight merit. Mr. Phipps has also produced an elegant *ensemble* before the curtain. We cannot speak so warmly of the arrangements behind, where, as in other theatres of the day jammed in amongst houses, the accommodation is unsatisfactory, and well calculated to lower the character of actors and actresses. We attach no blame to the architect; it is a question of area; but we should be glad to find the erection of theatres under such public control as would enforce the provision of proper accommodation.

The house opened with a very agreeable little comedy by Mr. Andrew Halliday, called "Love or Money," well played by Miss Amy Fawcett, Miss Ada Cavendish, Mr. Geo. Honey, Mr. H. J. Montague, Mr. H. Irving, and Mr. W. H. Stephens. Burlesque, unhappily, is to find another home here. The example of it which has been produced, "Don Carlos, or the Infante in Arms," is one of the most senseless of its class, deficient alike in dramatic form and decent writing.

IVORY CARVING.

OUR readers have heard that *camei* in onyx and in shell are to form part of the prize list of the Art Union of London; and we now put in a plea on behalf of *camei* and other carvings in ivory.

Those who are familiar with the working of this exquisite material are aware that no other substance lends itself with such facility to the highest skill of the artist. Capable, on the one hand, of a breadth and largeness of treatment equal to that to be attained by such a wood-carver as Grinling Gibbons himself, it is susceptible, on the other hand, of a microscopic delicacy of finish equal to that of the Greek gem-cutters, which may be combined with a boldness of relief, and shadow of undercutting, equal to those of the modelling of Ghiberti.

The chief defect of ivory as a material is its loss of colour by exposure to dirt or damp. This may be entirely prevented by proper care, and by exposure to light under glass. Under these conditions ivory is inferior to gems alone in durability, as metals are subject to oxidation, and wood to cracking by change of hygrometric condition. The most delicate *camei* of Wedgwood are coarse, when viewed under the magnifying glass, in comparison with *camei* in ivory. Nor is shell capable of equal finish.

Ivory carving is not to be judged of by such productions as the rude little figures, the execution of which forms an industry at Dieppe. These are essentially wood toys, executed in a better material. Neither are the brooches, earrings, and other ornaments, now executed in London, to be considered as specimens of artistic work in ivory. The price at which they are sold is too low to allow of the exertion of artistic skill and taste worthy of the beauty of the material. A case of modern English carvings exhibited at South Kensington may be referred to as another example of inferior modern work in ivory.

On the other hand, the well-known set of six plaques, representing *amornini*, goats, satyrs, and vintage scenes, attributed to Il Fiamingo, may be cited as an example of the bold broad style of carving for which ivory is eminently suitable. Of the *cameo*, or gem-like style of work, it is difficult to name any publicly accessible example. Exquisite statuettes were produced, some thirty years ago, by machinery invented by Mr. Chervin. But in this case the reduction, which made no allowance for the diminution of scale, revealed its merely mechanical mode of execution to the

critical and educated eye. Very recently a few modern French carvings of great beauty have been added to the collections at South Kensington.

The importance of offering some encouragement for the revival of one of the most charming branches of the sculptor's art, will become apparent to any one who should wish to sell, or in any way to bring before public notice, a modern ivory carving, even if of a thoroughly artistic character. The first question with which he will be met is, "Is it antique?" The second, "Is it foreign?" If neither of these questions is answered in the affirmative, neither dealer nor connoisseur will glance further at the object. Grace of design, purity of rendering, boldness or delicacy of touch, attract no admiration, if the work confess a modern English origin. "There is no sale for objects of that kind," says the dealer. "I take no interest in any but antique," says the connoisseur. A hideous triptych, boasting a consular date, or a clumsy Lot, embracing a one-legged damsel, but attributed to a Flemish chisel, may command a hundred guineas, while an English work of art—deserving the title,—attracts no attention whatever. It will be a task worthy of the Art-Union of London to encourage, by more than words, the revival of this elegant art.

SOCIETY OF BRITISH ARTISTS.

THE forty-seventh annual exhibition by this society now open in the Suffolk-street galleries has two points of novelty, a collection of the paintings of the late Mr. F. Y. Hurlstone, for thirty years their president, and two contributions from Royal Academicians, namely, a powerfully painted study of a head by Mr. F. Leighton, and a graceful group in chalk by Mr. Frith. Amongst the works by the late president are (51) a "Portrait of the late Earl of Cavan;" (52) "*Salute, Stignori*," a portrait of a roguish Italian boy looking out of a wine-shop window; (175) "Columbus with his Crew in Mutiny," a very animated and vigorous composition; (226) "Eros;" (227) "Italian Peasant Boys;" (228) "Italian Boys of the Nineteenth Century;" (229) "Columbus asking Alms at the Convent;" (230) "The Moorish Girl;" (231) "Italian Peasants Gambling;" (288) "A Portrait Group;" and (518) "The Venetian Page." They serve to show what many knew before, that Hurlstone narrowly escaped being a great painter. Of late years, however, he got farther and farther away from the chance.

We are disposed to consider the whole collection as above the average, and we advise our readers to go and judge for themselves. It includes a considerable amount of mediocrity, but displays at the same time many more pictures that have expression and tell a story than usual, as well as a large number of excellent landscapes.

The exhibition comprises 969 paintings and drawings, and 15 pieces of sculpture. Amongst the latter we would especially point out a candelabrum (1,000), executed in marble by Professor Steinhäuser.

ASSERTED REMEDY FOR DAMP WALLS.

THE value of bricks and mortar is well known; but they possess the disagreeable peculiarity of being very absorbent of moisture, so that in exposed situations, in wet weather, the usual results are damp walls. Stone, too, is liable to be, and indeed is, acted upon very injuriously by gaseous and other atmospheric impurities, which cause the corrosion and disintegration, unfortunately visible in some of our most prominent public buildings. There have been many remedies proposed from time to time, and there are now a number of inventors before the public professing to cure the evils of damp and decay. What their means are we do not now stay to specify, nor to point out whether they have succeeded or failed. Our object is to notice the remedial measures adopted by Messrs. Gay & Co., of Alton, Hants, which seem to deserve attention. There are two remedies proposed; one, however, is visible, whilst the other is invisible. We will first notice the visible remedy, which is an impenetrable paint or solution made in the various colours suitable to architectural purposes, and applied to the surface of the material to be protected with a brush in the ordinary way. It is alike applicable to brick, cement, stone,

wood, and iron, upon all of which it acts as a preservative from decay and the action of moisture. The surface presents a hard, enamelled appearance, which, it is asserted, is preserved for years. The solution dries very rapidly, so that three coats can be applied within an hour. It will not answer on new brickwork. We now come to the colourless process. The visible paint is applied in the ordinary way, and can be used by any one. The colourless waterproofing process, however, can only be executed by workmen specially instructed by the patentees. The process is termed "invisible," because, after its application, there is no perceptible change in the appearance of the material to which it has been applied. It consists in dissolving a patented compound by heat, and, whilst in a liquid condition, in applying it externally to buildings of stone, brick, stucco, or other similar porous material, the face of which is also heated to receive it. The surface is thus permanently secured from damp, and decay is arrested at one operation. By the method of application the compound is forced some distance into the pores of the material treated, independently of and beyond the absorbent action of the pores themselves. The preservative substance combines mechanically with the structure of the material into which it enters, and by the partial exclusion of the air under the influence of heat, a degree of permanence is insured, the testimonials assert, which has not previously been attained. The chemical character of the preservative is such that its nature cannot change, being affected by neither acids nor alkalis. Its action in arresting and preventing decay is both mechanical and chemical. In applying it the air-space between the particles of the material treated is reduced by the forcing in of the compound, which enters the pores for some distance, and there remains unaffected by changes of temperature, no matter how rapid or how extreme. The pressure and action of the outer atmosphere are thus kept from the interior of the material, which in effect becomes embalmed and in a condition to permanently resist decay.

With regard to the merits of Messrs. Gay's paint and solution, we gather from a number of testimonials before us that they have both been extensively used, and have proved perfectly successful. The strong expressions contained in these documents have led us to mention the processes.

Seeing how numerous are cases which come under our notice of damp houses, especially where exposed to the south-westerly winds, we feel bound to call attention to whatever seems really likely to prove a remedy.

ON COMPETITION IN TRADE.

THIS subject was treated recently by Dr. W. B. Hodgson, at a meeting held under the auspices of the Social Science Association. In the discussion which followed,

Mr. Paterson said, as long as you kept to the buying and selling system, competition might be true, but it seemed to him that there were other great laws to be considered. The socialists advocated the co-operative system, and he could mention two or three instances in which unrestricted competition worked very badly. As to what had been referred to in the lecture on the supply of articles for the consumption of the inhabitants of London, he considered there was a great waste of labour in the distribution of these articles. Whole quarters of the metropolis were made hideous by great advertisements, and these were a tax upon all articles bought and sold, while they were of no use. It was as difficult to find an honest coat, an honest pair of boots, or an honest loaf, at a low price, as if there were no advertising. This was competition, not dishonest necessarily, but, nevertheless, a great evil. Competition, as it was, left a large portion of the people inadequately fed, housed, and cared for. He did not lay the blame of this on the competitive system. He had on a former occasion insisted cases of individuals earning from 3s. to 4s. a week, which they had to eke out by taxes levied on their more fortunate brethren. There was a prejudice on the part of employers that women ought to work cheaper than men. Was this dishonest? It was productive of great evil, for it created a feeling among workmen to exclude women from certain kinds of work because they naturally feared the introduction of lower wages. How was it that competition left a vast proportion of labour at prices that would not support the labourers? There

was much stir now about education, but in many families it was impossible to send the children to school, and to keep them there long enough to make any useful progress, because their labour was needed for the support of the family. Competition ought to be restricted by certain laws and customs: it had been so restricted, and sometimes with beneficial results. Children had been employed at a very early age in factories, and had not the Legislature interfered, the well-disposed employer would be compelled by competition to continue to employ this kind of labour. He would ask Dr. Hodgson to reconsider this question.

Mr. Wilson said political economy was the poetry of transfer, but it did not take into account the wickedness of the world. They were surrounded by difficulties because society had got hold of the good things. What was needed was co-operation, or reciprocity, or, in other words, the mutuality of realisation, all might be brought to bear for the revolution of freedom. There was nothing to hinder a person from selling an article at a higher price than he ought to, for none of us know really the value of a thing we had to buy. The man who gave 15 oz. of sugar for 1 lb. might go on for six months, or six years, until he was found out, and then he had, perhaps, to pay 1l. There was also an instance lately of the introduction of a quantity of rotten salmon. We were, in fact, surrounded by a large organisation of determined enemies of the community, who made us pay their own prices. Co-operation should put an end to this, and enable the sufferers, by the free trade prices of goods, to set up a shop of their own, and get one man to sell to them instead of employing three at the same work. We must get rid of money, which was worshipped because it was the key of their citadel.

Mr. Ryan had attended the meeting as one for working men, and thought what had been laid down was far above their scope. He thought Dr. Hodgson deserved the thanks of working men for giving his thought to the subject, but he had not touched upon competition as they found it. He had told them that fair competition would remedy every evil. He thought there was not another commercial community which took such advantages, and played such tricks, as in this country. As to advertising, he thought scarcely any person believed in the posters which were put up in so many places. What must be the state of sellers in general when these advertisers sold adulterated articles. The lecturer had alluded to 5s. as the value of a book, but books which were of the most pernicious character were sold without any check. He did not mean to say men were not to try to sell cheaper than others, but they should be compelled to sell genuine and wholesome articles. In the competition with labour, capital could close its gates for a year without inconvenience, while economic science condemned combination on the part of the workmen. While exposing the evils that existed, it would be well to enforce laws that would be productive of health and justice.

Mr. Pears said that competition was the cure for monopoly, and in some cases where monopolies existed, such as railways, rival companies had been permitted for the sake of competition; but in many cases these competing companies had amalgamated and established monopolies. In the consideration of such things the question arose whether it was not desirable, in the interests of the community, that when there were certain enterprises which the country should have, and which from their nature must be monopolies, those monopolies should be in the hands of the public. Thus, in the case of the railways, many were now of the opinion that it would be for the interest of the community that the country should own the railways, because in that branch of enterprise competition could scarcely have fair play. Dr. Hodgson had not said that competition would cure all our evils. All that he had said was, that competition was productive of very great benefits. Mr. Safford had fallen into a fallacy in stating that prices were regulated by custom. No doubt you might buy a cigar in Regent-street for 1s., while you might be able to purchase one of as good quality near the Elephant and Castle for 2d.; but the high rents and different circumstances of the place were to be considered. Mr. Paterson had spoken of unrestricted competition as producing a great waste of labour, and of the evils of placarding and of attractive fronts. Was he about to propose to forbid all that? Was he prepared to say that this was productive of no benefit to the great mass of the community, or

was it a system sapping the vitals of the community and ruining us? This fact had to be kept steadily in view, that the whole progress of modern civilisation was a progress from monopolies to free competition. Civilisation was nothing more nor less than the full development of contract and the displacement of monopoly. In the days of Elizabeth exclusive trading rights had been granted to companies. Monopolies of this kind were the law over all England. The East India Company held a monopoly of the Eastern trade for centuries. In no town in England could a man set up in trade unless he were free of the guild or trading company which held the monopoly of the business. In those days one or two persons held a licence from the Crown, giving them the exclusive right to sell certain articles. Modern civilisation checked all these monopolies, and removed all trammels of this kind; and there was no doubt that all were now better off than at any previous period in history. There were many very badly off, but the proportion of these was smaller than it had ever been.

Lord Houghton, who was in the chair, said this course of lectures had been instituted, as he understood, for the purpose of presenting to a mixed audience certain elementary truths of political economy which it was supposed they did not fully comprehend, or, at least, did not act upon. One gentleman had decried to the lecture as being rather above the heads of the class to which he belonged, and as not taking sufficiently into account the circumstances of that class; but it should be remembered that it did not do more than lay down certain principles which were parts of the foundation of the science. One point on which people were wrong was in thinking that political economy was a theory of one man, or of any set of men. It was merely an explanation of the laws of society, which were as rigid and severe, and sometimes as hard and cruel, as the laws of nature itself, or as the laws of health and life itself, which to all appeared unintelligible, and to many unjust. He did not think it was the object of anybody, in delivering this course of lectures, to make things better for them. All they could do was to lay these laws and principles before them, and to show them that, if they acted upon them, they would come to certain results; and if acted against them, they would come to other results. Competition was not without its evils; but what they had to do was to diminish these by making it as just and as innocent as they could. The evils of competition had struck some men as being so cruel that they had said, "We will not have it any longer; we will have in its stead a law of sympathy and love." So had said of old the author of our Christian religion. But through all the centuries since competition had gone on, despite all the lectures and sermons, and it would go on still. Those who worked against it tried to establish a world of sympathy and love, but we were forced to say that the attempt to apply those higher rules to the ordinary transactions of business had not succeeded. There had been a burst of this feeling on the outbreak of the French Revolution of 1848; but of all the various schools which had grown up on the ruins of competition, which of them had given the slightest hope of success? It had been truly urged that the system of competition could not be said to have acted badly or injuriously to mankind at all. It was not a theory, it was an imperative law of society; but as mankind had become better, the action of competition had been modified, and had taken an improved form. Among the Australian savages, its form would be that of knocking one another on the head. Here it was transferred to that of taking in by false weights, lying advertisements, and adulteration. Bad things, no doubt, but better. Political economy was no poetry, as one gentleman had said, but a science, and a very hard and painful science at times. He had read that day in the papers of a notable scheme of our American cousins, who, being struck with the paucity of native literature, had proposed to lay so heavy a tax upon all productions of English literature, that Americans shall be forced to think and write for themselves. A hope had been expressed that a tax of 250 per cent. upon Shakespeare might prove prohibitive.

Dr. Hodgson, in reply, said it was a misapprehension to suppose that those who defended the principles which underlie all society defended also all the accidents of the time. They were supposed to defend low wages and starvation; but he would ask, how would you prevent this by altering the fundamental conditions of

society? How would you make people honest by preventing competition, or by removing liberty? There was an enormous mass of evils which he could not explain, though he could mention two causes of social disturbance. There had been a great number of legislative interferences, and we were now suffering from many of the legislative blunders of our ancestors. When we had ascertained certain conditions, it was the most logical course to charge an evil upon the violation of these conditions, just as a physiologist considered diseases as caused by disturbance of natural laws, and by disturbances arising from the individual ignorance of mankind. He had no doubt that great harmony would arise if these laws were understood and acted upon generally. When the law interfered to prevent the selfishness of one man from injuring another, it might remove an enormous amount of evil. The use of short weights and measures, and the practice of adulteration, ought to be punished most severely. In practice, at present, these things were followed by a fine altogether inadequate; for the man who picked a pocket was (he thought) an honest man, compared with those men who thus pursued a course of robbing their neighbours; and these things should be put down.

ART MOVEMENTS IN NEW YORK.

ARCHITECTURE and its cognate arts, in the teeth of the progress and civilisation which are being developed in the first city of the United States, are at present at a very low ebb. There is a struggle with artistic aims; but it is only a struggle, resulting, for a while, in uncertainty and confusion infinite. Perhaps it may interest the general reader, and, at the same time, prove of assistance to those who are striving to advance art-education, if we view the latest efforts which the citizens of New York have felt themselves called upon to make in increasing the embellishment and attractiveness of their magnificently-placed city.

During the autumn which has just passed, some of the leading residents have taken part at meetings which were summoned, in the first instance, at the Union League Club, for the establishment of an art museum. Each of these meetings included persons of influence and cultivation, who have seen with anxious eyes and a certain amount of self-reproach, the growth of the Department at South Kensington, and especially its steady and striking increase in the treasures of its art museum, and who accordingly attended to declare their willingness to found a similar institution in their own city; so that both the decision to establish such an art museum and the *locus in quo* are indisputably assured to all who recognise such a foundation as a popular need and a public benefit. This museum is to have direct and positive aims. It is not merely to be a lounge for the idle, or a means of amusement and sight-seeing to the casual frequenter. It will define and exhibit the early steps of art education, by the arrangement and classification of models of excellence, acknowledged by every one, artist or amateur, who takes pains to understand their value and significance; and it has been felt by those who have been most concerned in the origin of this important undertaking, that it has to supply and provide for the great want of proper artistic perception which is only too frequently shown by the wealthier classes and those who manifest the effects of an education in which art has had no voice.

New York may be said, singularly enough with its incessant enterprise, to be exceptionally unfortunate in not possessing citizens of public taste and intelligence sufficient to have founded a school of art long ago. A Peabody in art education, it would appear, is no more easily found than a Phoenix. Collectors of pictures and articles of virtu and luxurious display exist by the thousand. But who sees their collections? And when they are seen, of what account, character, or instructional value are they? The Stewarts, Astors, and Vanderbilts, possessors of untold millions, are notorious either for a segregateness that would do honour to Daniel Dancer, or for an ostentatious squandering in architectural follies that display a vulgarity and a disdain of the simplest rules of construction and beauty, such as could hardly be matched elsewhere. The examples of ugliness displayed in their public stores and so-called "palatial" residences, do but accustom the American eye to a false taste, and vitiate it with an ignorant satisfaction that are hard indeed to eradicate,

especially as these examples move the masses by their stupendous size and gigantesque proportions. Such men, moreover, are frequently inclined to great public acts of generosity; but they lack concert and purpose to combine for the general good, even in what they undertake. When they contribute funds, it is but fair to allow that there is no mean parsimonious spirit presiding in their donations. They give largely and freely, and like princes, but they give, it would seem, too frequently, more as a matter of ostentation than to help a great public want. With every respect for the value of the bequest just made by Mr. James Lenox, of his pictures and unrivalled library,—in which are some of the rarest Biblical treasures extant,—it may be asked why the collection was not added to the Department, which has already done much, and that much most worthily, for the Art Education of New York citizens. Why could not Mr. Lenox have incorporated his collections with the Art Museum which is to be located in the noble domains of the Central Park? This park is a public ornament of which any city might, indeed, be proud, and its features have been perfected by a skill and intelligence that augur well for any further development of the artistic aims of the authorities, under whose charge it has come to its present attractiveness. And, by the way, England may be congratulated on the fact that this imperial work has mainly been the result of the genius and taste of two Englishmen,—Mr. Calvert Vaux and Mr. Jacob Wrey Mould, the one a pupil of the late Mr. Cottingham, and the other of Mr. Owen Jones. The principal attractions of this, the very lungs and breathing-place and daily resort for all classes of citizens, from the dashing driver of the four-in-hand to the *gamin*, who is here provided with a special playground and cricket-field, may be summarised as follows. And our first observation justifies us in asserting that Nature has done so much for the park that in many instances the ground, with its wild beauty and rich disposition, has been left to itself, and that there has been little or none of the "manufactured wilderness," such as may be seen in the Bois de Boulogne or at Alton Towers. Foot-paths, bridle-paths, and carriage roads, permeating and circuiting the area of nearly 1,000 acres, are entirely distinct one from the other. In the centre rise the two large reservoirs of the Croton Water Works, which supply the city of New York with a pure uninterrupted flow of unimpeachably fresh water. The three lakes and the waterfalls are fed from this source. On the larger lake, over twenty acres in extent, an admirably-arranged service of pleasure-boats is established; and immediately beyond this lies "the Ramble," a secluded shrubbery, spread over 40 acres, for "talking age and whispering lovers made," with rustic paths and seats, and summer-houses, dotting the more picturesque elevations. During the winter there is a skating carnival on these lakes, visited by all classes. Noticeable, also, is the inception of a zoological collection which it is proposed to locate worthily on the western side of the park. Mr. Waterhouse Hawkins, of Sydenham notoriety, has been engaged to create the palæontological department, and has already produced illustrations of some of the indigenous fossilized pre-Adamite animals belonging to the American continent. Two well-organized places of refreshment supplement fifty these popular grounds; there is also the nucleus of a botanical conservatory, on the model of the great palm-house at Kew, which the Commissioners hope to amplify to the dimensions and functions of the edifice which it is to rival on their side of the Atlantic. Although we have used the term "Commissioners," and the Board consists of seven members, it is no breach of confidence to assert that the whole credit of the official control of the park for the last eight years is to be unhesitatingly awarded to Mr. Andrew H. Green, formerly president of the Board of Education, and a distinguished lawyer in the City of New York. Amid the universal corruption and misuse of office which unhappily have rendered the city notorious in the eyes of its worst citizens, the management of the central park can be referred to as singularly honest, pure, and unspiced by any mean motive at all. Mr. Green has worthily held power, though, in some instances, he is to be blamed for not sufficiently trusting to and confiding in the superior intelligence and knowledge of the able professional assistants with whom he has had to co-operate. Other blame there is none, and it is but fair to observe that he, perforce, it may be, of the educating influences of the park itself, is gradually

becoming sensible of this the one defect in his management.

It will be allowed that this locality is indisputably the site for the future Art Museum, surrounded by the varied natural and artificial attractions of the park, away from *funum strepitumque et opes* of the City, and an additional ornament in itself to that which, we repeat, is already the art-distinction of New York. A high-class edifice will worthily auxiliaryise the evidences of educated taste, which the park already owes to its architect, Mr. Jacob Wrey Mould. Those who are best informed have not been slow to acknowledge the merits of this gentleman. A genuine art critic, one of the first in the empire city, thus describes the terrace, which furnishes some of the most graceful of Mr. Mould's designs in the park:—

"On leaving the Hall we come out upon the lower terrace between the two great stairs that descend to it from the carriage-road. These staircases have been designed with a view to receive a great deal of ornamental sculpture, and much of it has already been executed. There are, of course, two balustrades with their posts and ramps to each of the two staircases, and the four have been made emblematic of the seasons. On the newel-posts of the balustrades are carved on three sides the animals and fruits that belong to the several seasons,—bees, birds, butterflies, grapes, and berries. The balustrades themselves are formed of panels and open borders, each panel being filled with a flower or fruit in the balustrades belonging to Spring, Summer, and Autumn; while those of Winter are prettily designed with the leaves and cones of evergreen, and in one of them is a pair of skates. All these panels are designed with the idea of keeping as close to nature as possible, conventionalising the objects no more than has been necessary to bring them into the squares of the panels. The freest and most elaborate sculpture has been reserved for the ramps which take the place of balustrades between the first landing and the posts at the head of the stairs. The designs for these ramps are composed of flowing scrolls, formed by the branches of flowering plants, among which birds hover, alight, and play. On no public building in America has there yet been placed any sculpture so rich in design as this, or so exquisitely delicate in execution. It is not saying as much as it may seem to declare that all the sculpture on the walls of the Houses of Parliament in London is not worth, either for design or execution, these four ramps of the great stairs of the terrace alone."

We cannot but add a hope that Mr. Mould will be entrusted with the erection of the edifice which is to be devoted to the future progress of art-education in New York.

New York.

GOOD ROAD-MAKING.

We are so much accustomed to the middle and want of intelligence frequently displayed in work done by vestries or boards, and our feelings are so continually harassed by seeing the cruel way in which fine-limbed horses, drawing narrow-felloed wheels, are compelled to level the roads for their own use, that it is quite refreshing to notice a case of the contrary kind.

I allude to the laying down of new "Macadam" in York-road, Lambeth, which is now going on. The pieces of granite are not too large to pass through the original "test-rig" of the inventor; a portion of gravel is mixed with the granite; the road is well watered, and then a powerful but very compact steam roller (I do not know the maker's name, and this is not meant for an advertisement) is passed over the whole, and, in a very short time, a smooth and compact surface is produced. The work is done in sections, determined by the intersection of cross-streets, along which the traffic can be diverted, thus avoiding the danger which might arise if the roller were driven amongst the horses.

I do not know to what body the adoption of this plan may be due, but they certainly deserve credit for producing a capital road with rapidity, and saving of wear and tear both to horse and vehicle.

VIATOR.

The following will interest some of our readers:—Statement of the cost of repairing the Macadamised road in the Upper-street, Islington, from the Cook Tavern, at Highbury, to the Angel Tavern, Pentonville-road, by thoroughly breaking up and levelling the surface, coating same

with broken Guernsey granite, and using Hoggins as a binding material, together with the cost of rolling it with Aveling & Porter's Steam Road-roller, and expenses incidental thereto:—

Labour, Material, &c., for Repair.

	£.	s.	d.
Labour, picking, levelling, and spreading	74	15	10
Granite	1,030	17	4
Hoggins	67	3	0
Tolls	9	18	0
One-horse cart attending	7	13	0

£1,190 7 2

Rolling, and Expenses incidental thereto.

	£.	s.	d.
Time, 31½ days	63	0	0
Rolling	12	5	0
Labour, sweeping in hoggins, and attending	35	15	8
Watching	12	5	0
Candles	2	1	8
Coal	1	19	0
Coke	10	13	9
Wood	0	3	10
Water-cart	10	7	2
Water	1	18	0

138 4 10

Total

Surface of road repaired and rolled, 20,750 yards superficial.

The following report of the Liverpool borough engineer as to the cost and working expenses of the steam-roller was laid before the staff sub-committee of the local Committee of Health:—

"The first cost, carriage, and other expenses of the steam-roller was 1,000l.—say 1,000l., allow its life to be five years, and 5 per cent. interest on cost, 25 per cent., 250l.—or per month 20l., or per week 5l., or per day 1l. (assuming its working days to be five per week, one day being allowed for repairs); first cost and interest, including wear and tear per day, as above 1l., and including working expenses, 1l. 17s. 10d. per day. During the three months ending March 31st the steam-roller was unemployed 12 working days."

The sub-committee resolved:—

"That the charge for the hire of the steam-roller be 2l. 2s. per day, the Corporation providing fuel and three men."

Mr. Whitty, in moving at the Health Committee Board the confirmation of the proceedings, said that the expense of working the roller came to 498l. a year; and it was for the committee to say whether the roller was of sufficient use to justify the expenditure. Mr. Davies, deputy borough engineer, said that at times the steam roller was very valuable, because they got the macadam set by it in one day, while it would take a week to set the macadam by the ordinary means. It was resolved that the charge per day to the out-townships for use of the steam roller should be 2l. 10s. The proceedings were then confirmed.

EASTER ISLAND.

A LECTURE on "The Origin and Migrations of the Polynesian Nations," read before the Royal Society of Sydney, New South Wales, by the Rev. Dr. Lang, and reported in the *Sydney Morning Herald*, has been forwarded to us. In this lecture Dr. Lang maintains that the Americas, South and North, were probably peopled with their so-called "Indian" natives from the Pacific or Polynesian islands, and especially from Easter Island, which is one of the nearest to South America. The Polynesian nations themselves, he considers, emanated from the Malayan stock, spreading eastwards throughout the islands, even to the Americas. He points attention to the evident affinity of the Malays, the South Sea Islanders, and the American Indians, in race and in habits and characteristics, in corroboration of his theory; and to the objection that the trade winds were much more likely to lead the population from the Americas westward through the islands, he opposes the fact, which he has himself experienced, of strong gales eastward which were likely to drive canoes or other vessels from Easter and other islands to the American shores.

Dr. King, as a clergyman, limits the time requisite for such migrations from the Malayan districts through the Pacific islands, to America, to the period which has transpired since the Deluge, according to the literal interpretation of Scripture.

Of the lecturer's remarks on the Easter Island and other Polynesian monuments, and his ideas as to how these bear upon his theory, we may quote some passages:—

"The South Sea Islanders were not savages when they discovered and took possession of America. They had carried with them from the cradle of their race—the islands in the Indian

Archipelago—a peculiar type of civilisation, of which they have left us numberless monuments all over the Pacific, and of which the comparatively high civilisation of Peru and Mexico at the period of the Spanish conquest was merely the natural development. Easter Island itself presents us with a remarkable example of the skill they had attained in the management of the mechanical powers.

"The most remarkable objects in Easter Island," says Mr. Ellis, "are its monuments of stone and sculpture, which, though rude and imperfect, are superior to any found among the more numerous and civilised tribes inhabiting the South Sea Islands. These monuments consist in a number of terraces and platforms built with stones, cut and fixed with great exactness and skill, forming, though destitute of cement, a strong durable pile. On these terraces are fixed colossal figures or busts. They appear to be monuments erected in memory of ancient kings or chiefs, as each bust or column had a distinct name. One of these, of which Foster took the dimensions, consisted of a single stone, 25 ft. high, and 4 ft. wide, and represented a human figure to the waist; on the crown of the head a stone of cylindrical shape was placed erect; this stone was of a different colour from the rest of the figure, which appeared to be formed of the stone of a different lava. In one place, some of these statues or busts stood together; one, which they saw lying on the ground, was 27 ft. long, and 9 ft. in diameter."

Monuments of a similar and colossal character are found also in other groups of the South Sea Islands, besides those I have alluded to, and particularly in the Marquesas Islands, situated between the 8th and 10th degrees of south latitude, and in 140 degrees west longitude. "At the base of one of the mountains," observes Mr. Herman Melville, an intelligent American mariner, the author of a work, entitled "Types, or a Narrative of four months' residence among the Natives of a Valley of the Marquesas Islands;—

"At the base of one of the mountains, and surrounded on all sides by dense grass, a series of vast terraces of stone rise, step by step, to a considerable distance up the hillside. These terraces cannot be less than 100 yards in length and 20 yards in width. Their magnitude, however, is less striking than the immense size of the blocks composing them. Some of the stones, of an oblong shape, are from 10 ft. to 15 ft. in length, and 5 ft. or 6 ft. thick. Their sides are quite smooth; but, though square, and of pretty regular formation, they bear no mark of the chisel. They are laid together without cement, and here and there show gaps between. The topmost terrace and the lower one are somewhat peculiar in their construction. They have both a quadrangular depression in the centre, leaving the rest of the terrace elevated several feet above it. In the intervals of the stones immense trees have taken root, and their broad boughs, stretching far over, and interlacing together, support a canopy almost impenetrable to the sun. Overgrowing the greater part of them, and climbing from one to another, is a wilderness of vines, in whose sunny embrace many of the stones lie half-buried, while in some places a thick growth of bushes entirely covers them. There is a wild pathway which obliquely crosses two of these terraces; and so profound is the shade, so dense the vegetation, that a stranger to the place might pass along it without being aware of their existence."

These structures bear every indication of a very high antiquity, and Kory-Kory, who was my authority in all matters of scientific research, gave me to understand that they were coeval with the creation of the world; that the great gods themselves were the builders; and that they would endure until time shall be no more. Kory-Kory's prompt explanation, and his attributing the work to a Divine origin, at once convinced me that neither he nor the rest of his countrymen knew anything about them."

As I gazed upon this monument, doubting the work of an extinct and forgotten race, thus buried in the green nook of an island at the ends of the earth, the existence of which was yesterday unknown, a stronger feeling of the same sort came over me than if I had stood musing at the mighty base of the Pyramid of Cheops. There are no inscriptions, no sculpture, no clue, by which to conjecture its history—nothing but the dumb stones. How many generations of those majestic trees, which overshadow them, have grown and flourished and decayed since first they were erected! (Typee, page 173.)

And in reference to the period at which these remarkable monuments of the ancient Polynesian race were originally erected, the same intelligent writer coincides entirely with myself as to their high antiquity.

"These remains," he observes, "naturally suggest many interesting reflections. They establish the greatness of the island." "But . . . For my own part, I think it just as probable that the beings who were living in the valleys of the Marquesas three thousand years ago, as that they were inhabiting the land of Egypt." (Ibid.)

Now surely the men who could move and sculpture such immense blocks of stone as these were not savages. On the contrary, it is evident that they had the whole type of the civilisation that prevailed in the world, at the time when their forefathers were separated from the rest of mankind in their island homes, photographed, so to speak, upon their minds, and ready to be reproduced in all its parts whenever they should find a suitable field for its reproduction or development."

Society of Arts Conversazione.—A conversation will be held by the Society of Arts at the South Kensington Museum on Wednesday, the 4th of May.

CHANCEL GATES.

THE churchwardens of St. Mary's, Taunton, have been cited before the Consistory Court of Wells to answer—

"Certain articles, heads, positions, or interrogatories to be administered to them by virtue of the office of our Judge aforesaid, touching and concerning their souls' heat, and the lawful correction and reformation of their manners and excesses, and more especially for having lately made, erected, or built a stone wall or screen on each side of the west end of the chancel of the said parish church, with a gate or gates between such walls or screens; and also for having lately removed the steps on the north and south sides of the said chancel, and destroyed the avenues or passages whereby the said chancel was heretofore approached from such steps respectively, by covering such avenues or passages with stalls or seats; and also for having lately removed the communion rails of the said parish church, without setting up the same or other suitable and proper ones in place and lien thereof."

The case was heard before Dr. Wallis. The Rector (the Rev. W. B. Clark) said he had a petition from 420 parishioners against the suit, but he believed he could not present it.

Dr. Wallis said he could not, as the parishioners were not cited.

Dr. Wallis gave judgment against the churchwardens, and ordered them to remove the gates, the other question having been compromised.

At a vestry meeting since held, a resolution was adopted, by 50 votes to 13, accepting the decision of the Court as a "temporary necessity," but regretting the removal of the chancel gates.

SHORT HINTS ON CHURCH BUILDING AND FITTINGS.

Srs.—The following hints, briefly put, the result of some personal experience as a member of a Church Restoration Committee, may be useful to some of your readers:—

Architect, of some existing good model, to be selected.

Inspect several churches, and learn their merits and defects.

Plans should be laid before any church building societies whose aid is desired, at an early stage, or grants may be withheld.

Estimate to include all internal fittings and furniture; as, communion plate, chancel furniture, window blinds, organ, bells, lightning-conductor, clock (if intended), and heating apparatus; and external approaches, railings, boundary walls, and drains.

A fourth, or sixth, to be added to the estimate, for omissions, contingencies, and possible high lettings to contractors.

Number of sittings (at first, and ultimately) to be determined on.

Transepts are convenient for future galleries. Galleries in the nave and choir are unsightly, darkening, and unwholesome.

Style to be selected or accommodated to secure abundant light, uninterrupted seeing and good hearing.

Comfort to be preferred to ornament.

A dry basement to be secured, but with as few steps as possible, for the sake of the aged and infirm.

Heating to be, if practicable, by constant inflow of fresh air, over hot-water batteries and coils, with circulation of hot-water also. A low heat for several days, better than a higher one on the Sunday only.

Yestry, near desk and pulpit.

Doors, numerous; so that all on the windward side may be closed on stormy days. All to have inner doors also.

Windows, double, to exclude heat in summer and cold in winter.

Roof, double, or felted or boarded, for the same reason.

Entire windows or lights to be made to open, if possible, as well as portions of them, so that leeward windows can be opened wide in hot weather.

Window glass, generally plain, for light.

The east windows of coloured glass, to soften the light.

Roof ventilators only produce down-draughts, unless fitted with gas-jets or sun-lights, or with cowls having their openings turned from the wind.

Echoes, if any, to be prevented by open tie-beams, drapery, cordage, &c.

Pulpit low, if no galleries.

Desk to face the people, for audibility.

Seat-backs to have slight slope or curve, and to be flat at the top, for those behind to sometimes rest their books on, when standing.

Book-shelves to have a rail to prevent dresses sweeping books off.

Pews to have doors (high or low), for warmth. The partitions should come down to the floor for the same reason.

Knéeing-boards or hassocks, throughout, in pews and free seats.

Umbrella supports and drains to each pew, as at Meltham Mills, Huddersfield.

Seats of Sunday School children and aged poor, to be well placed for seeing and hearing, and therefore near the pulpit and desk.

Free pews, some in the centre, at the back, as at Christ Church, Harrogate, as well as in the aisles, and so marked; and notice to be placed outside the church accordingly.

There seems no sufficient reason for the seats being generally free. Families should sit together, and in their long-accustomed places. The absent would thus at once be missed. Heavy large-print books should not have to be carried to and from church. Strangers should not have to stand a moment after the service or organ begins, but should be at liberty to take any vacant seat, whether offered or not.

Gaslights to be abundant, and equally diffused, by string-course pipes, standards, or brackets. Brackets, if any, to be very delicate, and gracefully curved.

Any texts on the walls to be in plain legible characters. The selection at Lockwood, Huddersfield, is carefully made as to subject and length. A moveable curtain to be contrived for a small week-day congregation to be seated together.

Organ to be of little power, but sweet tone, of good metal, and without a case.

Clock, illuminated, may be made to turn on and off its own gas.

Superintendence.—A gentleman building a house for himself should be able to give nearly his whole time to it, either at the architect's office, the contractors' shops, or the place itself. In no other way can absurd blunders, culpable irregularities, and needless delays, be prevented. A degree of the same attention will be required from a church-building committee, in addition to the services of a clerk of the works.

The writer of the above has since met with Mr. E. B. Denison's able, interesting, and practical little volume of "Lectures on Church Building." Second edition. Bell & Daldy, 1856. Price 7s. 6d. It confirms many of his own views. Reference may be made to it on the following points in particular.

Style, p. 118; transepts, p. 138; roof, pp. 236, &c.; seats, pp. 243, 244; pulpit, p. 247; ventilation, p. 241, 261; heating, pp. 258, 260; gas, p. 262; organ, p. 265; bells, pp. 153, 290; alterations and bills of quantities, pp. 209, 210.

H. N. C.

HANDY RULES.

THE following is a rough-and-ready way to find the contents of circular tanks, wells, and pipes:—

Square the diameter in inches, and cut off the right-hand figure as a decimal, and the result will be gallons in each 3 ft. (yard) of depth,—or length, if a pipe; as,—

PIPER.			
Diameter.	Inches.	Square.	Gallons in 3 ft.
2	2 × 2 =	4	0.4
4	4 × 4 =	16	1.6
6	6 × 6 =	36	3.6
12	12 × 12 =	144	14.4
WELL OR TANK.			
36	36 × 36 =	1,296	129.6
72	72 × 72 =	5,184	518.4
100	100 × 100 =	10,000	1,000.0

To turn francs into pounds sterling English. Multiply by 4 and cut off two right-hand figures; as,—

100 francs	£4
1,000 "	40
10,000 "	400

And so on—

25 francs	£1
50 "	2
75 "	3
1 franc	10d.

By using this rule, French money may be turned into English; that is, its value in English money may be seen at a glance.

To turn English pounds sterling into francs, reverse the process: divide by 4 and add two cyphers; as,—

£1	100 francs.
40	" 1,000 "
400	" 10,000 "

To illustrate the rule practically, take the

Times' report of the sale of the San Donato collections of pictures, Paris, and it is there stated that—

	Francs.	£.
11 Bouchers sold for	141,000	5,664
Jeune Fille implorant l'Amour	60,000	2,360
La Toilette de Vénus	23,000	920
2 Joseph Vernets	8,800	352

And so on.

This rule assumes that 25 francs are the value of one pound sterling, and is near enough for the rough-and-ready purpose indicated.

THE DRAWINGS OF THE HOUSES OF PARLIAMENT.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the meeting of this society, on the 20th ult., Mr. Bonlt moved, and Mr. H. H. Vale seconded, the following resolution, which was unanimously adopted by the meeting:—

"That this society much regret to learn that the First Commissioner of her Majesty's Public Works should have been induced to prefer any claim to the ownership of the drawings and other documents prepared for the works in the Palace of Westminster, thus departing very widely from the practice of his predecessors in office for a period of thirty years; and this society, being strongly of opinion that the plans, specification, and other documents employed by the architect in carrying out his designs are, and continue to be, his sole property, hope that the abolition of Mr. E. M. Barry, will steadfastly resist the claim of the First Commissioner of her Majesty's Works, as otherwise the rights of the profession to retain their property in such documents will be seriously imperilled."

The subject given by the Council for the annual students' competition had been responded to by an unusually creditable set of designs, from which the first prize was awarded to Mr. Chas. Townsend, and the second to Mr. E. Banner. The subject was a design for a park entrance combined with lodges.

Mr. Parslow read a paper entitled "Science in Architecture," including a considerable number of practical recommendations with regard to details of building construction.

ARCHITECTS' DRAWINGS.

Srs.—An old proverb says, "There is nothing new under the sun." What has just happened relative to M. Barry's discharge from the Houses of Parliament had its prototype with another of our national monuments more than 150 years ago. Mr. Penrose, in a paper read before the Royal Institute of British Architects in 1859, stated, with reference to St. Paul's Cathedral, that "on April 26th, 1715, Sir Christopher Wren, after forty-four years' superintendence, was dismissed from the office of surveyor, and an ignorant person named Benson was installed in his place; but, after a year's trial, was dismissed in consequence of his incapacity."

How similar is the case now under discussion. For some what such reasons as actuated Wren's dismissal, Mr. Barry has been superseded by officials of the Office of Works, whose names no one has ever heard before, and from what specimens we have of their powers of artistic design in the New Post Office, Regent's Park, and elsewhere, were certainly educated when art was at a very low ebb, and have not improved since; the whole to be under the superintendence and direction of a gentleman educated as a military engineer, who, however accomplished he may be in other respects, is certainly not an architect.

With regard to the ownership of the Westminster Palace drawings, it is, I think, very much to be regretted that the Council of the Royal Institute of British Architects have not taken some more efficient action in the matter, being as they are, in a measure, the governing Board of the profession.

Mr. Ayrton stated in the House on the 31st ult. "that certain architects had resolved they were entitled to keep the plans prepared by them for persons who had also paid for such plans." Is this totally correct? Is the architect paid for the drawings? Is he not rather paid for designing, &c.? Are not the drawings, as you have said, merely his tools as much as his pencils, or the stock held the tool of a solicitor?

It is possible for the works to be carried on without drawings if the architect be constantly on the spot to direct, but this would prove too expensive a method for the present age, though often used in the past; the drawings are therefore prepared by him for his own guidance and that of persons under his direction, and if submitted to the client previously to execution are merely so done in explanation of his ideas. Much difficulty might possibly be avoided if the architect's charge to his clients ran as:—"For designing and superintending the erection of, &c., instead of:—"For preparing plans, specifications, &c., and superintending the erection, &c."

The worth of the material and construction of the works is paid to the builder; the worth of the arrangement and design (that is, the architect's skill and thought) and securing efficiency of execution is paid in the form of commission to the architect. The drawings are not paid for, and why should the client receive his money's worth twice over by their becoming his property? Besides, if the drawings are the property of the client, those which are delivered to the builder for the purpose of carrying out the work (and for which the architect is scarcely ever paid) are surely the ones which should be so considered, and let the client recover them from the builder if he can. And further, if, notwithstanding all this, the second set of drawings is to become the client's property, there is no resource but to do so as solicitors do; that is, charge for drafts and copies to keep.

A relative case deserving of attention is that in which drawings are prepared, but the works from some cause or other are abandoned for the time, and the drawings are delivered to the client (as they must be, for the law, or

rather equity, will always give "quid pro quo"). Ultimately, however, the works are carried out by the same architect, and from the same drawings delivered to him for that purpose. To whom do they belong?

Ross, E. T.

PERMIT me, Mr. Editor, to say that the profession in the provinces are watching with some anxiety the result of the conflict between the first Commissioner of Works and Mr. E. M. Barry.

As a provincial architect, I feel that should Mr. E. M. Barry determine to give up the drawings demanded by Mr. Ayrton, a very awkward precedent will be established, and one which to a certain degree will entirely overrule the now acknowledged custom of the profession, that all drawings of a building are and do remain the sole property of the architect. I think the case might be viewed in this light: if, as stated in your quotation from the *Echo*, all constructive drawings do belong to the individual who has satisfied the architect's charges, then in equity might it not be said that since these drawings are the property of this individual, he can dispose of them in any way he may think fit; for example, sell them to some friend who purports building?—and consequently this friend would have the full advantage of the architect's abilities without paying one farthing to the architect. Surely, Mr. Editor, this cannot be said to be either justice or equity.

I do, therefore, trust that Mr. Barry shall feel it to be his duty to resist to the very last Mr. Ayrton's demand, were it for no other reason than that by acceding to Mr. Ayrton's claim a serious and positive injury will be done to the profession.

E. S. INGRAM.

TASTE ON THE THAMES EMBANKMENT.

THE Metropolitan Board of Works, which possess so much power, and which might do so much to guide public taste and evolve artistic feeling, strain at a gnat, but swallow a camel. This is illustrated in their doings, by what they have demanded, and what they have permitted, on the Thames Embankment.

At the Charing-cross Station of the Metropolitan District Railway the Metropolitan Board have exercised their powers of interference, and we dare say rightly. The station, it was supposed, would be unsightly, and they stopped the works. A compromise has been effected. The station is to be hidden by a screen wall, and that, again, is to be hidden by a triangular mound of earth, sown with grass or covered with turf. The Board have even ruled that only white bricks are to be used in the construction of the sewers; and not only so,—the bricks are laid out and the shades assorted, so that there may not be any violent contrast in the work which nobody is to see; and yet they intend to allow such a fine work as the Thames Embankment should be, to be damaged at its eastern end by tramway accommodation across the Embankment, provided for the gas-works at the bottom of Whitefriars-street, which ought long since to have been removed. The Embankment will be degraded by having coal-quays, and coal-barges delivering at them, unless public opinion or a higher authority interpose to prevent this.

S.

SCULPTURE AND ARCHITECTURE.

THE current number of the *Fortnightly Review* contains an essay by Mr. F. T. Palgrave (originally delivered as a lecture at Cambridge) on "The Practical Laws of Decorative Art," wherein occur some remarks on the decorative function of sculpture in connexion with architecture which are well worth the attention of some of our architects. Adopting the principle that accessory ornament should always be of subordinate interest to the whole work which it serves to decorate, Mr. Palgrave protests, with complete consistency, against the too lavish employment of mediocre sculpture in many modern buildings, resulting, as he says, in an expenditure totally disproportioned to the effect obtained.

"Among the three fine arts of design, sculpture is at once the most difficult and the most directly intellectual. It follows at once from the follows irresistibly—that it should be rarely employed, and employed to give the highest point of effect. Although, looking at the building as a whole, we may regard its sculpture as part of its ornament, yet the sculpture itself is, by the very conditions of the art, the most removed from the merely ornamental. It is a contradiction to first principles, and hence sure to be followed by ruinously bad effect, to employ it profusely and to employ it decoratively. In sculpture there is absolutely no middle way between the good and the bad: it is a success or a failure. The most powerful means of giving beauty; it is hence, also, the most dangerous. A figure is in itself an appeal to the mind; when, therefore, we discover a mere piece of ornament instead, we experience an anti-climax; the effect of it is not simply neutral, it is positively injurious to that of the building."

Upon these premises, Mr. Palgrave charges the architectural profession, alike of Medieval and of modern days, with having constantly designed as if all the good sculptors in the world had been at their command. "We see altar-screens framed to hold fifty figures together; niches and pinnacles and pedestals between every window." And as from the diffi-

culty of the art it has been rare to find more than two or three efficient sculptors in a whole century, the result has been a quantity of mediocre sculpture on the façades of Gothic cathedrals, in a style which the modern revivers have introduced again, from a mere sentimental admiration for all that belonged to the Medieval period. A friend to the Gothic architectural revival, Mr. Palgrave regards the accompanying revival of Gothic sculpture as doubly unfortunate:—

"For not only are our modern buildings disfigured by a crowd of beings in crumpled folds, innocent of anatomy, and inexpressive in form, but the peculiar early sentiment, the *naïveté* of Gothic times (such as it was), being irrecoverably gone, the enormous majority of these figures lose the one genuine interest of their originals; they are an eyesore to all familiar with good work, and lower the popular standard of sculpture, already low enough."

And even were all these of Phidian excellence of execution, yet it is to be remembered that all sculpture is no sculpture. The power of the art is limited in proportion to its intensity, and "to have little sculpture, but that little of first-rate quality," is the only safe rule for the architect.

We draw attention to these remarks, of which we have quoted the salient points, as the criticism of a thoughtful amateur, and worthy of the consideration of architects who are inclined to sin in sculpture. The doctrines laid down in the essay are generally such as will not, indeed, be new to most of our readers, but they will very well bear repetition.

BRICKLAYER FINED FOR NOT PARGETING FLUES.

WE hope the following will prove a warning:—

At Wandsworth Police Court the other day, Thomas Maddock was summoned for a penalty on workmen, under sec. 45, for infringing one of the rules of the Building Act, sec. xx., cl. 4, by not "pargeting" flues. Mr. Hansom said the defendant was a bricklayer employed by Mr. Loud; he found that the flues of twelve houses in Livingstone-road, Battersea, had been carried up without being pargeted on the inside as the work proceeded. He said it was a novel proceeding, for there was little or no economy in not pargeting the inside of the flues. By not doing so it would probably prevent the smoke from rising through the chimneys, and become a source of annoyance to future tenants. Mr. Loud said he had told the defendant it would be better to have the flues pargeted, but he did not think it would prevent the smoke rising. He had built a number of houses, but he did not know whether the chimneys were pargeted. He had not received any complaints of smoky chimneys.—Mr. Hansom said he had inspected the other houses which Mr. Loud had built, and could speak to their being pargeted.—The defendant said he did not understand the Act of Parliament.—Mr. Ingham said it was part of a system which prevailed of making buildings look substantial and correct, when in fact they were not. It was a most gigantic fraud upon persons who were foolish enough to buy houses so constructed. He had had to complain of masters, but now it was a workman who had scamped his work; and to mark his sense of it he should fine the defendant in the full penalty of 50s. and 2s. costs, or one month's imprisonment. The fine was paid.

MADELEY UNION WORKHOUSE COMPETITION.

WITH reference to some observations in our issue of the 9th, headed "Management of Competitions," we have received a letter from Messrs. Haddon, in which they say:—

"That so far from having sent a 'highly-coloured perspective,' ours was stated entirely with a view to a slight wash of neutral tint over a portion of the background, to 'throw up,' the buildings, and give distance to the view; and this we do not conceive to be a departure from the instructions."

They give reasons, doubtless very good ones, for naming a larger sum than the other competitors (but this does not touch the point in question), and say that "the premiation of the designs was referred to three gentlemen, members of the board, of whom one is a retired architect, who, whilst in practice, had a very large experience in the construction of workhouses; another, a builder, who has carried out some extensive works under leading architects in different counties of England; the third, a gentleman, who, from having the management of important

manufacturing works in the neighbourhood, has in that position acquired a considerable degree of knowledge in building operations."

"Throughout the competition," they conclude, "we scrupulously adhered to fair and honourable principles, and if Mr. Griffiths can prove anything to the contrary, we shall be willing to yield our position in his favour."

LINE OF FRONT: METROPOLITAN MANAGEMENT ACT.

Metropolitan Board of Works v. Abbott.—In this case, heard at the Lambeth Court on the 22d inst., before Mr. Woolrych, Mr. Abbott, a builder, was summoned for erecting a dwelling-house, in contravention of the 98th section of the Metropolis Management Act, 1862, by not leaving in front of such house a road of 20 ft. in width to the crown or centre.

It was stated that the house in question was situated at the corner of Blewit-street and Pleasant-row, at Walworth, and fronting on Blewit-street, which was a new street, formed by the sundry of the Board to a width of 40 ft. Pleasant-row is an old way less than 40 ft. wide. Since the erection of the house in question, other buildings had been erected in Pleasant-row, which brought that street early under the jurisdiction of the Board, who had required the same to be widened in front of the new buildings. The contention of the Board was, that the house at the corner of Blewit-street should have been set back so as to give the full statutory width to Pleasant-row, in case that row was at any time afterwards, or, in fact, as it was subsequently, brought under the jurisdiction of the Board.

The requirement is one of serious consequence to owners and builders of property, as it would place those dealing with properties at the corners of old streets at the peril, at any time within six months of the discovery of the objection, to have a considerable portion of their property confiscated and their buildings pulled down, in consequence of the acts of other owners of property in the same street.

Mr. Reginald Ward appeared, as assistant solicitor to the Metropolitan Board of Works, in support of the summons; and Mr. Rooke, of the firm of Rooke, Kenrick, & Henson, for the defendant.

The magistrate, after hearing the evidence and carefully examining the plans, deciding that there had been no offence under the Act, and that the house having been built, fronting Blewit-street, within the line shown on the approved plan, the defendant had a right to erect this house, even though the result would be that the side street, which the defendant wanted, would still be left as an old street of lesser width than 40 ft. Summons dismissed.

ENGLISH CONVICT PRISONS.

THESE are the establishments where reformatory and remunerative labour can be best carried out, by reason of the longer terms of confinement. Great efforts are being made in this direction, and with much success, especially at Woking, where a variety of useful occupations are enforced; Dartmoor, where waste land is reclaimed by convict labour, and 200 head of stock attended to; and Chatham, where many million bricks are made.

But at Chatham and Portland, although the prisoners are worked hard, their labour is very much wasted; the nominal value of it, especially at Portland, as returned in the official reports, is very high—almost self-supporting indeed. But by the plain test of *marketable value* it is almost nil. What real public service would it be to quarry away even the whole peninsula of Portland, if the stones are not used for really useful purposes? Any amount of dockwork or masonry may be projected and accomplished without enriching the nation 5l. The convicts at Portland work very hard, yet their labour is mere coercion rather than industry. And as to the real value of the "work" done, when done, it is largely artificial and imaginary. An intelligent magistrate, after visiting Portland convict prison, remarked to the secretary of the Howard Association, that the work there (apart from the physical exertion required) is, as to its real value and utility, "mere child's play."

"WESTWARD, HO!"

WHERE does the flood of London humanity intend to stop? It seems to be bubbling up on all sides at the same time with concerted action, as if fed from some exhaustless, central ocean; and this ever-flowing tide appears in the richness and strength of its quality to be rolling westward. Its waves are also in motion towards every point of the compass, but the most powerful surge out "Westward, Ho!" and westward it is accordingly. Many of us are old enough to remember the opening of the Finchley-road some seven-and-thirty years ago, and even later, when the Swiss Cottage was the solitary goal of Cockney pleasure-seekers—the *ultima thule* of London civilisation in that direction.

Looking over a plan of London of that period, we find a thin red line—"Proposed Railway from London to Birmingham." But that is not the line we have now. After passing Kensal-green it curved away to the north, crossed Kentish-town about a third of a mile beyond the Mother Red Cap, and terminated at what was then the tile-kilns, by the end of St. Paul's-road, York-road, King's-cross. Another line is a "Proposed Railway from London to Greenwich." The terminus was then intended to be in Church-street. The remaining line was—"Proposed Railway from London to Southampton," the terminus being at Nine Elms. The Greenwich line was the first metropolitan railway having its commencement in London. It obtained its Act in the session of 1833, and opened for traffic on December 26 ("Boxing-day"), 1839. It was partially opened to Deptford in 1836. The "London and Birmingham" Company also obtained their Act in 1833, and the line was opened on the 17th of September, 1839. It was a grand affair that opening, and much was made of the directors' special train running the distance from Euston to Birmingham, 112 miles, in four hours fourteen minutes; and the second train of 200 passengers, only occupying six hours! The South-Western Company obtained their Act in 1831, and the line was opened throughout its whole distance, of 76½ miles, on the 11th of May, 1840. These were all the lines that appeared on the "New Plan of London," published in 1832. What a different aspect a map of the metropolis presents at this day! What would London do now without a railway? And yet it is not much over thirty years, barely a single generation, since there were no such means of conveyance for us here! What would become of the immense holiday crowds who are regularly whirled over the country, fifty miles and back, in a single day, with "eight hours at the sea-side included," if the railways were suddenly to "shut up shop"?

In the quarter of London to which we are now more especially referring, we had, away in the fields, St. John's-wood Farm, a length of Abbey and Wellington roads, commanded, as the strategist would say, by the "Artillery Barracks." The brook Finchley-road shook hands with "Life in London" at the Swiss Cottage tavern door, and there met town and country. All before you, and around you, to a quadrant of the compass, were fields, gardens, and farms, with breezy Hampstead up the hill on the right, and the pleasant village of Kilburn away on the left. We are not going into any historical sketch of the neighbourhood, the Northern Heights of London having already had ample justice done them by a much abler hand, but we are going to glance at the progress of building in this direction.

If the reader will look at a suburban map of the metropolis, he will take within his view a large tract of undulating land lying between the Finchley and Edgware roads. Every one knows where the Edgware-road is, but the Finchley is not equally understood. If the reader will start from the Primrose-hill side of Regent's Park, and go up Avenue-road, a continuation in the same direction will bring him to what was formerly called the Marylebone-road, and a mile or so further on the Finchley-road began. But all that is altered. There is no "Marylebone" road in that direction now. Avenue-road has swallowed it up as far as the toll-bar, whilst Finchley-road has, by way of compensation to the other fork, been pulled down to the Eyre Arms tavern. All suburban pedestrians of twenty years' standing will remember Belsize Park and Belsize-lane, going from the west up to Hampstead. But all that is changed now. Belsize Park and lane have become Belsize-square, Belsize Park-avenue, Belsize Park-road, and other roads, covered with goodly houses wherein the well-to-do of the City and town rest in the bosom of their families, after their day's labour and their double ride on that valuable, or rather invaluable, convenience, the Metropolitan and St. John's Wood Railway.

Here let us step on one side for a moment to ask a question or two about this said railway. It is a dear little thing, but very small, extending only from Baker-street to the Swiss Cottage, some two miles or so. Indeed, a factions friend of ours has composed a jingling ditty, which he sings as he rides, with the chorus of "Our own Swiss Cottage Line." There is a junction with the "Underground" proper at Baker-street; but from some cause or other, some of those mysterious reasons which the wisdom of railway management so ably contrives towards the diminution of railway dividends, that junction is

never used by the St. John's Wood line. We have heard it stated, though surely it must have been ironically, that the Underground big-wigs will have it that the Swissstonians would object to being carried straight into the City without a break; that, as things are now, they stop at Baker-street, have the pleasure of running along the platform, up a couple of flights of steps, across the next line, and down stairs again to get into the next train; whereas if their own train ran right through, such a source of pleasure as that which we have named would be entirely knocked on the head. This the Swissstonians broadly and emphatically deny. They say that the big line is a big bully, and, like all bullies, will not let its little brother have a chance to get on in the world. In the meantime the public, about whose convenience Boards of Directors are all so anxious, when wanting anything from Parliament, are made to suffer at Baker-street. If any higher power in the realm take the management of railways into its hands, let us hope that it will not be long in finding a solution of such "tremendous" difficulties as that of the Baker-street junction.

Of the future of this wee little line we cannot speak with confidence; but, as to what will conduce to its prosperity and further public convenience, we are very certain. A scheme was deposited this session to carry it about a mile in a westerly direction, namely, from the Swiss-cottage Station over to Kilburn, at the end of Willesden-lane. This, with an addendum, is the very best thing that could happen to it; that addendum is a through route, without break, to Moorgate-street. Public convenience demands this concession, and public convenience will not remain long without it, because it will pay well. There is very little doubt but that a Hampstead branch, and a Kilburn one, with either a free right of way direct to Moorgate-street, or a Charing-cross extension, would give the convenient little line plenty to do and a most profitable return. Failing the realisation of either of the projects mentioned, the next best thing for the residents in that suburb will be an amalgamation with the Midland in the Finchley-road. This arrangement would open up the way to the Midland ultra-Metropolitan system; and, as the latter is a powerful company, and has running powers on the Underground already, the difficulty would be solved at once. The City and St. John's Wood line could take all the Midland's suburban traffic off its hands beyond Kentish-town, and run right down to Moorgate-street.

The strip of country between the Finchley-road and Kilburn is very pleasant, as well as very healthy. The contour is of an undulating character, well wooded, and the atmosphere remarkably clear. The landscape, fieldwards, is studded with the residences of the wealthy, and hundreds of the semi-detached villa community are daily taking root in the soil. Whilst they are very much pleased with the means of transit that exist, the great desire is for freer railway locomotion. We visited it on two consecutive Sunday afternoons, and notwithstanding, as the song says, that

"The wind from the northward blew keenly,"

the roads were alive with groups of people, who had come up by the Swissstonian line to take in their weekly stock of crisp, invigorating fresh air. At the junction of the Finchley-road and West End-lane, at the top of the hill from the Cook and Hoop Tavern, a very large mansion is in the hands of the finishers. There are no pretensions to architecture shown in this building, but it appears to be substantially built, has large bay windows, and seems very commodious. Beyond that, further up the Finchley-road, on the confines of Hampstead Heath, other structures may be seen in various stages of progress. Around, we saw the well-known signboards, white upon black, indicating building land to be let.

Looking across the valley in the direction of Kilburn, stakes in lines are driven into the earth, marking the outline of future "roads," "avenues," "terraces," and so on.

Pursuing our way homewards down West-end-lane, we find that they have not begun to move much there as yet; but, after crossing the two railway bridges, to the east of which the Midland Railway passes under the Hampstead and City Junction Line, we come upon the outposts of advancing London. To the east and west two new roads are being made. The eastern one will terminate in the Finchley-road, and the western one in the Edgware-road. When they are finished, they will, wonderful to

say, form the completing links in the great chain of suburban road communication, that will tie together the whole of the wide-spread northern side of London, from Haokney, in the east, to Kilburn, in the far west. The eastern half of the new thoroughfare has not been as yet christened; it was our old friend Gipsy-lane; but the western one has been called "Nicoll-road." From what can be judged of it at present, it will be nearly half a mile long. The broad, black, white-lettered boards are up, and, already, close to the lane, the ground is cleared between this new road and the railway, which runs parallel to it, and the plots for the Londoner's enviable snuggerly, the suburban semi-detached villa, can be plainly discerned. At the Kilburn end, several houses are up and inhabited, and others are in process of erection.

"Where will London end?" we said to a respectable-looking man who was surveying the situation, like ourselves, and with a very suspicious brick-and-mortar appearance.

"Goodness knows," was his reply. "Building plots are snapped up as if they were so many gold nuggets. You go to-day, and all but settle; only you think that you'll consider for a day or two. By the time that you have made up your mind some 'early bird' has dropped down at the land agent's and gobbled up the morsels that you had set your heart upon."

Resuming the walk, we came upon a pile of building on the western side of the lane that is always sure to arrest the attention of the wayfarer. It is a long, red brick structure in the Old English Manor-house style. The rear front is towards the lane, and the gabling has a pleasant effect after so much of the commonplace town type that one sees around the metropolis. This is Oaklands Hall, the seat of Mr. Donald Nicoll, one of the magistrates of the county, and well-known in political and mercantile circles. He built the hall about ten years ago, all in the fields, and now the railway station is about to sit down under the shadow of the Oaklands' vine and fig-tree, bricks and mortar are pushing their trenches towards its porch, and on all sides; and the house will be soon surrounded and beleaguered by the restless guerrilla villa, detached and semi-detached. The owner, if he would be alone, must betake himself to the distant wilds of some unknown, undiscoverable country, far away from the incursions of the ever-building white man, where the crowl of the bricklayer is never heard, and the Celtic hodman cometh not.

But, here we are at the top of the Abbey-road, the lamp-lighter is running along, and—we are in town again!

POST AND PAN HOUSES.

In the work on "Picturesque Architecture," reviewed in our Number for April 8th, Mr. Richardson adopts the expression "post and pan" in reference to the ordinary timber and plaster construction; an expression still known in some parts of the country, though not now, as far as we know, in general use anywhere. Mr. Richardson's theory as to the meaning of the word "pan" in this connexion appears to us questionable. He takes "pan" as synonymous in Lancashire with "beam," and "post" and "pan" as representing respectively the uprights and cross-pieces of the carpentry. The only fact we can ascertain in favour of this is that in parts of Lancashire and Staffordshire a "purlin" is called a "pan," but it is quite possible that this is a corruption by contraction; and the statement that "pan" is habitually used for "beam" in Lancashire, and that the latter word is unknown in that county, is an error. It is only right to say that Mr. Richardson gives various other theories as to the word. We have little doubt that "pan" refers to interspaces between the carpentry, and that it is identical with the old French word "pan," given in the best French dictionary to which we have been able to refer as "*partie considérable d'un robe, d'un manteau*," and in its secondary meaning as "*partie d'un nerf, d'une des faces d'un ouvrage de menuiserie*;" and again "*pan de bois*"—plastered or mud wall, which brings us very near to the mark. It may even be short for "post and panel."

If Mr. Richardson turns to "pane" in the "Glossary of Architecture," he will find we are not alone in our view. It is there given "Pane (Fr. pan), an old term formerly used in reference to various parts of buildings, such as the sides of a tower, turret, spire, &c., which were said to be of four, eight, &c., panes, according to the number of their sides. It was applied to the

lights of windows, in which sense it is still retained, and also to the spaces between timbers in wooden partitions, &c."

Whoever is aware of the close intermingling of French words and expressions with English some centuries back, in the Chaucerian and pre-Chaucerian period, can have little doubt that the French and English "pan" or "pane" are the same word originally.

"To pan" was a verb at one time current in England, meaning to join or close together; so that an enclosure, when the spaces between the uprights had been filled in with plaster or brick-work, might have been termed "panned." In a somewhat obscure proverb,—"Weal and woman cannot pan, but woe and woman can," the word is taken to mean "join or agree."

We add to the illustrations of the work "Design for a Garden Seat" (No. 31), and a view of a "Triangular Lodge" (No. 10), erected in an ancient park in Kent, both which are mentioned in our notice of the book.*

THE CASTLE OF COBURG, GERMANY.

The charming little town of Coburg is well known by name to Englishmen from its connexion with the early history of the late Prince Consort, and a visit to this interesting and beautiful place will soon lead one to understand the affection with which it was regarded by the Prince.

The greatest charm of Coburg is its romantic situation. It occupies the centre of a kind of "amphitheatre," surrounded by beautifully wooded hills, one of the most important of which is crowned with the picturesque and interesting castle.

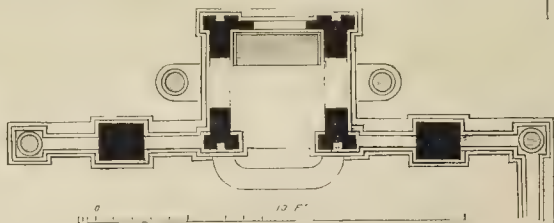
The town itself consists chiefly of two long streets running at right angles to one another, and where they cross is a large market-place. Originally there were two walls surrounding the town, but the gates alone remain. There are four churches, the chief of which, called the Pfarr Church, is a fine building, consisting of a nave and aisles and an apsidal chancel; at the west end are two towers, one crowned with a lofty bulb-shaped spire of slate. There is a fine western porch, over which is a rather singular apse (a most remarkable feature in this position). It is difficult to understand what could have been the original use of this apse. It now contains the organ, but from the fact of its having large windows in each face, it is quite certain that it was intended for other purposes, and was probably used as a chapel.

The Rathhaus is an interesting building, of the latter part of the sixteenth century, with two good oriel windows at the angles. In the centre of the "markt-platz," in front of the Rathhaus, is a fine modern statue of the late Prince Consort, erected at the cost of her Majesty the Queen. Not far from the "markt-platz" is the schloss, or modern palace of the Dukes of Coburg. Some portions of this edifice date from the earlier part of the seventeenth century, but the greater portion is not earlier than the present century. There is a charming park attached to this schloss, extending for several miles along the valley, and enclosing the hill upon which stands the ancient Castle or "Veste" of Coburg. This is an interesting building, in a very perfect condition, consisting of an outer circle of walls or rampart, and two inner courts. A portion of the principal court is represented in our engraving. It is, perhaps, one of the most elaborate and interesting examples of ancient timber construction in existence. It is composed entirely of oak, and all the carving is most elaborately executed, and is in a beautiful state of preservation. The interior of this portion of the castle at Coburg is as remarkable and beautiful as the exterior; but of this we may have to speak on another occasion.

Some time ago we found it our duty to criticise rather severely the new timber buildings being erected in New Zealand, and we condemned strongly the practice of erecting timber structures in imitation of stone ones. The specimen of a timber building which we now give offers our New Zealand friends an example which they will do well to study; for in addition to being quite as disguised and elaborate as they can possibly require, it is thoroughly structural and substantial, and would not cost half as much money or labour as the pretentious shams that our colonial friends are now erecting.

* See p. 277, ante.

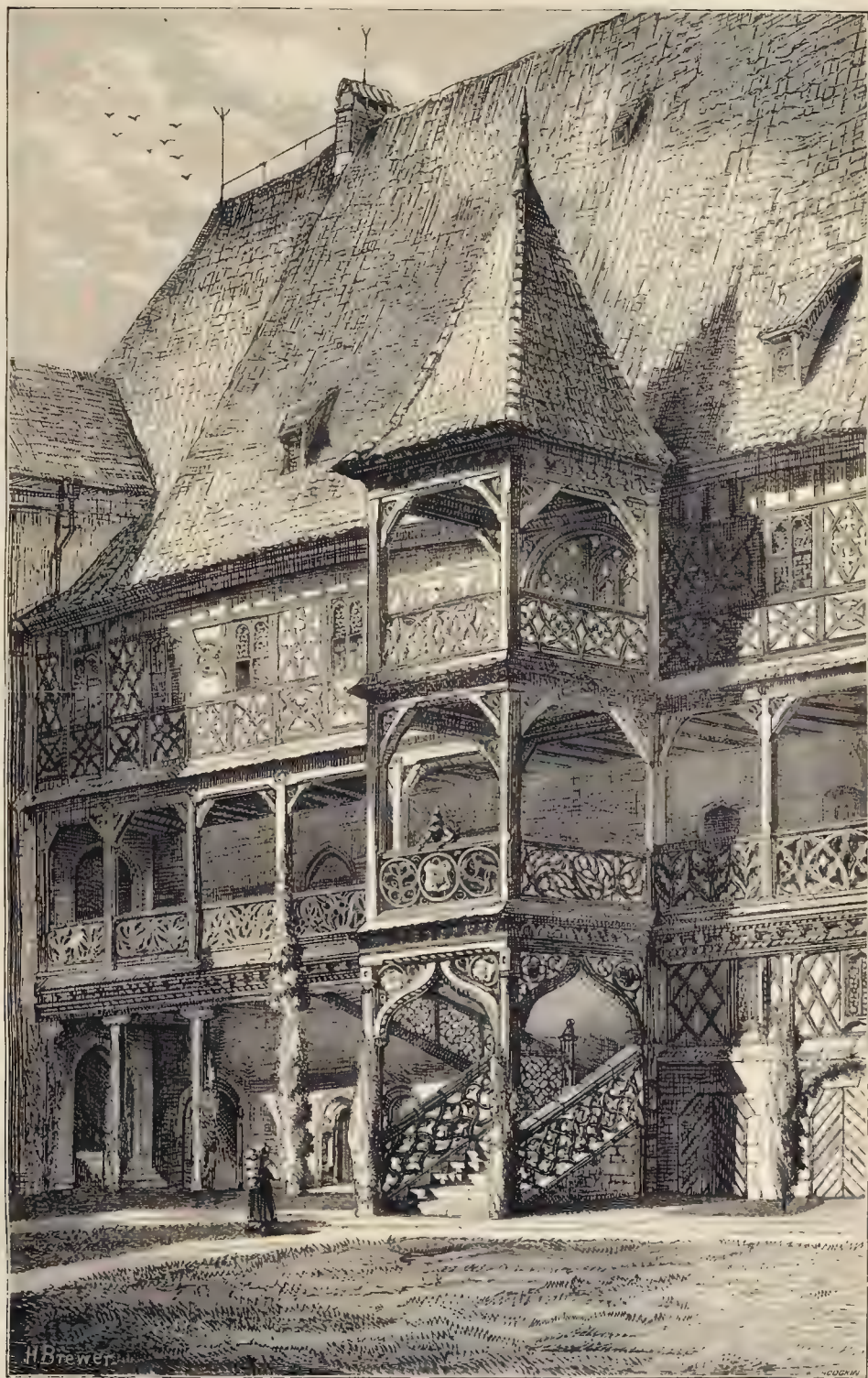
PICTURESQUE ARCHITECTURE.



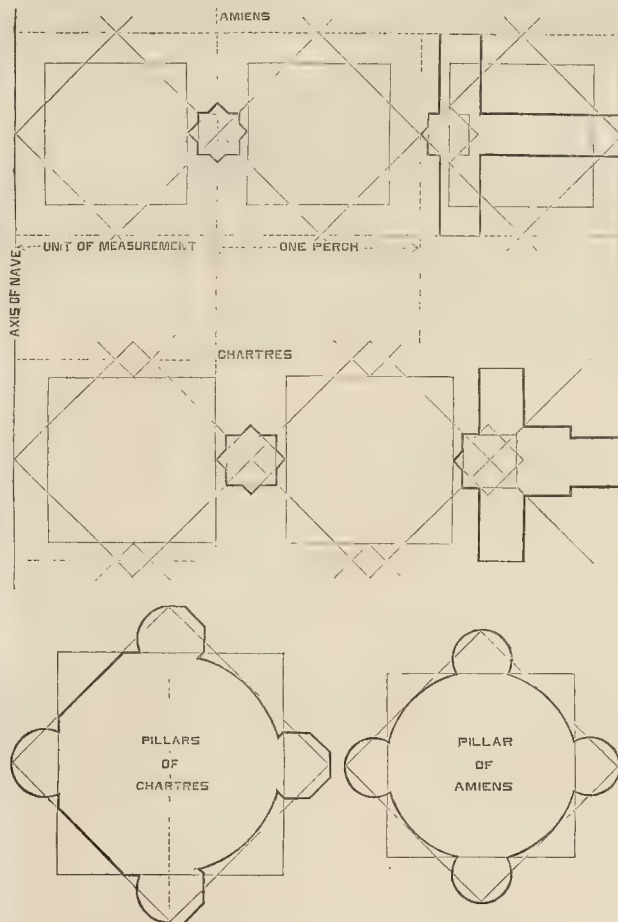
A Garden Seat.—Elevation and Plan.



A Park Lodge, on Triangular Plot of Ground.



THE CASTLE OF COBURG: INNER COURT.—ANCIENT TIMBER CONSTRUCTION.



GEOMETRICAL PROPORTIONS IN ARCHITECTURE.

GEOMETRICAL PROPORTIONS IN ARCHITECTURE.

IN December last, a correspondent of the *Builder*, in an article entitled, "Symmetry in reference to sound," suggested that "by using the square and its diagonal," we should have a system of proportion, "in which the dimensions bear a geometrical relation to one another." Mr. Cresy, in his "Encyclopædia," has given numerous examples of proportions deduced from the square and the cube, but he appears to have overlooked one use which the architects of the Middle Ages constantly made of the diagonal. He shows that the nave of the great cathedral, at Amiens, is contained within a cube, and that the proportions of all its principal parts are determined by dividing the whole cube into 216 smaller ones ($6 \times 6 \times 6 = 216$), each one of which measures 1 French perch, or $23\frac{1}{2}$ (23.452) English feet. He then assigns 2-7ths of a perch to the diameter of the pillars.

This arbitrary method of determining the dimensions of so important a feature has not the geometrical character prevailing in all pointed architecture. But if, within each of the 36 squares of the plan, two squares crossing each other diagonally be inscribed, measuring $23\frac{1}{2}$ ft. on the diagonal, or 16.59 ft. on the side, the difference between the diagonal and the side

(6.86 ft.) will be the proper diameter of the pillars, which Mr. Cresy says vary from 6.70 ft. to 7.17 ft. By the same diagram we have for the clear breadth of the nave, 40.04 ft., and of the aisle, 20.02 ft., or very nearly the figures given by Mr. Winkles, — $39.75 + 7.17 = 46.92$ ft., or 2 units as breadth between centres of pillars.

At Chartres the nave is wider, or 2 units in the clear, and the aisle narrower than at Amiens, but the proportions are derived from a similar diagram. The *Builder*, in vol. xvii., 1859, page 706, gives as the breadth of the nave from centres of columns, 16 m. 40 c. The diagonal of the squares is therefore 8 m. 20 c., or 26.90 ft., and the side is 5 m. 80 c., or 19.03 ft., the difference, 2 m. 40 c., or 7.87 ft., being the proper diameter of the pillars. By the diagram the nave, in the clear, will be 14 m., or 45.92 ft., and the aisle 5 m. 80 c., or 19.03 ft. These dimensions correspond exactly with the scale and drawing in the *Builder*, page 712, and with the figures of Mr. Winkles.

It will be observed that at Chartres the breadth of the nave is twice the breadth of the aisle, measuring from centres of pillars; while at Amiens, the same relation exists, if the measurements be taken in the clear.

At Chartres, the perch or unit of measurement seems to have been about 22.96 ft. long, or somewhat shorter than the one used at Amiens;

but in Angers Cathedral we find both dimensions and proportions too similar to those of Chartres to have been accidental. M. Felix de Vornelle ("L'Architecture Byzantine en France," p. 283) says, "Elle (la nef) a 16 m. 40 c. entre les murs opposés; 14 m. et plus de colonne à colonne." And it is a similar diagram which, at Amiens and at Chartres, determines the plan of the pillars and the proportions of the shafts. The central cylinder is inscribed within a square, the diagonal of which is equal to the whole diameter of the pillar, while the diameter of the subordinate shafts is the difference between the side of the square and its diagonal.

Other examples of the use of these crossed squares might be pointed out, as well as their application to sections, but it would require many drawings to go fully into the subject. The figure was in general use during the Middle Ages, and will, I believe, be found to be the key to most, if not all, of the plans of the great ecclesiastical structures of the thirteenth and fourteenth centuries, although some have been misled, by an accidental coincidence of measures, to suppose the equilateral triangle to have been used as a guide to harmonious proportions. Hiram and Solomon, Ezekiel and Pythagoras, Ictinus and Vitruvius, all knew the use of the square and the cube, and the architects of the Middle Ages did not disdain to follow in their footsteps.*

W. RUSSELL WEST.

Philadelphia.

"RECENT TRAVELS IN ASIA MINOR."

IN the very interesting review of Dr. Van Lennep's travels, in your issue of the 16th inst., remarking on the "Temple of Augustus" at Angora, you state that you "do not agree with Dr. Van Lennep in the supposition that the yellow tint observable on the marble there and at the Parthenon arises from the fact that the surface has been gilt; but you are of opinion that it has been toned down by a coating of yellow encaustic. . . ."

Allow me to suggest another reason for the appearance he mentions.

I think it will be found on examination that the stone in these ruins called marble (carbonate of lime) is really alabaster or gypsum (sulphate of lime) of which rock there are to my knowledge several ancient quarries in Asia Minor, and that the yellow coating is the effect of atmospheric influences during a very long period.

The ancient alabaster quarries are all coated in like manner, and the stone would not be recognised as crystalline in structure from its outward appearance.

With regard to the half-finished bust carved in the face of Mount Sipylus, it surely could not have represented any other than Niobe, since the time when the mountain was first called by the name of one of her sons. The figure does not exactly overlook the town of Magnesia, but is very appropriately located above the hot springs at Khasserje Caivée, about three miles to the east of that town. Thus the "marble" sheds tears,—and hot tears,—even now. There are two copious hot springs from this part of Sipylus.

Your quotation from Pausanias would, I think, imply that, if the bust were then carved, he never saw it; for at present it is barely perceptible from the foot of the rock. But he retired to a distance where he could observe the whole "contour" of the mountain, and therein recognised, or thought he recognised, "a woman weeping and sad." May it not be possible that some one, more matter of fact than Pausanias, knowing the legend, but not recognising the "sad woman," caused this half-finished statue to be commenced in the rock above Niobe's tears (the hot springs), and left it uncompleted in consequence of the inappropriate nature of the stone selected. With regard to the "masses of rock which fall from the cliff," the long preservation of the statue, as well as of the entrances to several excavated chambers at the base of the mountain, which is principally composed of a very hard rock, show the disintegration to have been unusually little.

The construction of railways in this part of Asia Minor will no doubt cause the discovery of many important antiquities; and in a short time when the Cassaba Railway is extended to Sardis, I hope to be able to furnish

* In pursuing this often-revived subject reference may be usefully made to the works of Mr. W. P. Griffith, F.S.A.—Ed.

you with some very interesting information with regard to the lakes and other ancient public works which have evidently been once extant in the precincts of the ancient capital of Lydia.

CHARLES E. AUSTIN,
Consulting Engineer of the Smyrna and
Cassaba Railway.

SOUND AN ALARM!!!

JEWELLER tradesmen are in great perturbation for the safety of their valuable stock: the usual precautions of "iron-clad" shops are now surmounted by our "engineering burglars." Permit me, Mr. Editor, to "spring a mine," or rather let them do it when they attempt to breach a castle (i.e., crack a crib).

Let an upright board be placed next to the window; the slightest touch of any boring instrument would cause it to fall, to ignite a taper, turn on and light gas-jets, fire a pistol, and ring bells in bedrooms, — simple, self-acting, and efficacious. It is a game of chess; they are after the "pawns," so it is our duty to check-mate them. R. T.

SCHEDULE OF CHARGES ADOPTED BY THE AMERICAN INSTITUTE OF ARCHITECTS.

The following schedule has been issued by the American Institute of Architects:—

For full Professional Services (including Superintendence),
5 per cent. upon the cost of the work.

Partial Service as follows:—

For Preliminary Studies 1 per cent.
For Preliminary Studies, General Drawings, and Specifications ... 2½ per cent.
For Preliminary Studies, General Drawings, Details, and Specifications 3½ per cent.
For Stores, 3 per cent. upon the cost, divided in the above ratio.

For works that cost less than \$5,000, or for monumental and decorative work, and designs for furniture—a special rate in excess of the above.

For alterations and additions—an additional charge to be made for surveys and measurements.

Necessary travelling expenses to be paid by the client.

The architect's payments are successively due as his work is completed, in the order of the above classifications.

Until an actual estimate is received, the charges are based upon the proposed cost of the works, and the payments are received as instalments of the entire fee, which is based upon the actual cost.

Drawings, as instruments of service, are the property of the architect.

RICHARD UPJOHN, President.
P. B. WIGHT, Secretary.

THE NEW BUILDINGS BILL.

SIR,—This Act, in licensing wooden erections is taking a very dangerous step, in a wrong direction.

Practically, no Act could ever work that recognised such erections: it would open the door to numberless evasions and misconceptions. These could be indefinitely added to or altered; small shops built, to which stores would be added long after completion of work, would soon create dangerous structures.

There is no *viâ médiâ*: either wooden buildings are right or wrong. A SURVEYOR.

NEWTON MARKET COMPETITION.

SIR,—Whatever Mr. Chudleigh may write in defence of the local Board's decision in this matter, it is notorious about here that a scandalous piece of jobbery has been perpetrated, as the enclosed cutting from the *Western Morning News* will go far to show. Mr. Howell, one of the members of the Board, and a professional architect, deemed it his duty to protest against the decision, as an insult to his profession, as well as a disgrace to the Board.

Of the plans themselves, the least said is the better, both as regards their practical and æsthetic treatment; the Board have been obliged to so cut them to pieces that a new design is necessary; and when they have obtained it, in accordance with the latest instructions, I very much doubt whether they will have the area for market purposes which was stipulated in their original published requirements and instructions to competing architects. You would have been much amused, sir, had you seen the plans, and heard the various criticisms thereon. The local Board has become a laughing-stock, and a striking instance of what men in a corporate capacity can stoop to.

KEEL AND RUDDER.

SIR,—Naval architects are in conclave endeavouring to devise remedies for the increasing disasters and losses at sea. I hope good will result. Allow an old salt to bear a hand.

Casualties occur through the ship not answering to the helm; an adverse current often prevents its gripping the water. I have made a rudder with an india-rubber centre, and whichever way it is turned it will cap and bag the water; thus great power is gained. I have shown it to a few nautical men, and they think well of it. It can be made of any degree of strength, and will never decay under water. I have also devised a keel fan or fin (of imperishable material) to prevent rolling or going over on her beam-ends. This fan can be drawn down in an instant by a turn of the winch; it will stow itself away alongside the keel when not required. It may prevent top-heavy craft being blown over.*

Perhaps some of our naval philosophers will adopt these twins. They are my offspring, but I am unable to do for them. R. T.

BELL LEGENDS.

SIR,—A short time ago I examined the bells in the spire-steeple at Ketton, near Stamford. The legends upon them may interest readers of the *Builder* who are collectors of such inscriptions, and who do not possess these specimens. They are as follow:—

RE ... RE ...
RE ... RE ...
... 1808
SAYE ... LORD:
1601.

BE IT KNOWN TO ALL THAT DOTH ME SEE
THAT NEWCOMBE OF LEICESTER MADE ME.
(Big bell.) 1608.

I SWEETLY TOLLING DO CALL TO TAKE ON
MEAT THAT FEED THE SOULE. 1609.

MOSES: Sisson: C. H. W. HENRY: PENN:
FUSON: 1712.

T: WOTTON: W: ROWLETT: NICHOLAS: BUL-
LINGHAM:
AB: ME: SUIB: SUMPTIBUS: HIO: COLLOCARI:
CURAVIT: 1640.

(Treble.) W. 1748. F. R. W. ILSON.

WOODEN PULPITS.

SIR,—Can any of your readers tell me where I can see a really good wooden pulpit, such as would be fit for the nave of a large cathedral? INQUIRER.

ACCIDENTS.

A GREAT fire has taken place near Drury-lane in a range of premises belonging to Messrs. Flavell, timber benders, No. 16, Parker-street. The premises in question were exceedingly old, and were fitted up with machinery of great value. The conflagration could not be subdued until the factory was nearly destroyed. The whole of the workmen have lost their tools, and they were uninsured. The origin of the fire is unknown.

A heavy thunderstorm recently passed over Halifax and neighbourhood, its effects being particularly felt at Orvendon, where the residence of a cotton-spinner was struck. The lightning went down one of the chimneys, and, with two exceptions, entered every room in the building, smashing all the windows and destroying the principal staircase. The lightning passed through the back kitchen window, which was instantly demolished, and entered the yard, where it tore up the flags, after which it entered the wash kitchen, destroyed the pump, and tore up the flags. Considerable damage was done to the house internally. Fortunately no one was at all injured. There was an immense fall of hail-stones.

Trentham Hall, the Staffordshire seat of the Duke of Sutherland, has had a narrow escape from destruction by fire. The fire was discovered in a closet. The stairs were so full of smoke that the hose could not be carried into the house, and an opening was made, through which a strong stream of water was poured. After an hour and a half the conflagration was entirely extinguished, the closet being destroyed, and the adjoining apartments more or less injured. Besides three powerful engines kept in

* As an illustration or example, float two corks, with a sixpence partly inserted in one of them, then agitate the water, and observe which rides over the "mountain waves" steadiest.

the building, pipes and plugs run all through the house ready for immediate use. These appliances probably saved the hall.

A correspondent of the *Standard*, writing from Vienna on the 6th inst., says:—"A dreadful accident took place here this morning. The immense scaffolding in front of a new house in the Maximilian-street suddenly gave way, and buried beneath its dismembered parts and a fearful mass of heavy stones about twenty men and women. It appears that the upper wall was not thick enough to support the stones laid upon the jettings, on which the roof in part rests. That part of the masonry work was completed in the depth of winter, and it is supposed that the half-frozen mortar then used gave way under the influence of the sun's rays. Be this as it may, a heavy responsibility attaches to the architect and to the builder. Five women labourers and three men are dead; the remainder were conveyed to the nearest hospital, most dangerously mutilated and wounded. The lives of but few can be saved."

SCHOOLS OF ART.

Hanley.—The annual meeting of the supporters of this school has been held at the Mechanics' Institution, Hanley, under the presidency of Mr. Alderman Wedgwood, chairman of the committee. There was as usual an exhibition of the works of the advanced pupils, many of which displayed ability, but it was considered doubtful whether on the whole the exhibition was equal to those of some former years. At the last annual meeting Mr. Bodley offered a prize for the best decorated plate in enamel colours, and this produced three or four tolerably successful efforts; but the competition did not excite the interest which had been anticipated. The attendance was fair, but not large. The annual report said:—"Your committee have pleasure in according their satisfaction with the progress made by the students under the able teaching of the master, Mr. Carter, and would at the same time express their regret that they are about to lose his valuable services." Mr. Carter's report stated that the several classes had continued to progress steadily and efficiently, and that he felt the greatest confidence in directing the attention of the friends of the school to the high quality of the work in the advanced section of painting and modelling as a sufficient proof of the present healthy condition of the institution. The total number of students for the year had been 153, showing a decrease of 17 upon the previous year. As this loss had been felt chiefly in the elementary section, he trusted it would be looked upon as but a temporary falling off in the numbers. The prizes were distributed by the chairman.

Cork.—There is now exhibiting at Mr. James Hackett's establishment in Patrick-street, Cork, a silver medallion, which, from its intrinsic value and the circumstances under which it has made its way to Cork, is one of the most interesting objects amidst the many which attract the eye in the shop-window. It is a prize which has been awarded to Mr. Jeremiah Mullins, of Maylor-street, coach-painter, and student of the local School of Art by the Worshipful Company of Coachmakers and Coach Harness-makers of London, for the best drawing and painting executed in competition with the students of Schools of Art engaged in these trades throughout the United Kingdom.

CHURCH-BUILDING NEWS.

Wickham Market.—The church of Wickham Market has been restored. The external restoration has been confined to partly rebuilding the east wall, rebuilding the other defective parts of the walls of the nave and chancel, refacing them, newly pointing the buttresses, and filling the panels with black flint, and where necessary the stonework of the windows and doorways has been restored. A new north aisle has been added, and is lighted by the windows which were formerly in the north wall of the nave, and by a special arrangement at the north end. The roof of the aisle is of deal. The interior of the church, so far as the fittings are concerned, has been completely altered from what it was. The plastered ceiling of the nave, however, still remains. The gallery that blocked up the west window is gone, the old pews are replaced by open benches, and the gallery in the south aisle is gone. In the north chancel aisle, the organ

(which has been repaired by Mr. Green, Ipswich) is placed, and in the chancel are benches and stalls for the choir and reading-desks for the clergy. The roof of the chancel is coloured a deep blue with golden stars at regular intervals, and that of the south aisle is similarly treated. In the tracery of the east window, at its highest point, is the figure of our Lord, carved in stone, and the vicar has obtained a design for filling the window with stained glass, the subject being the Adoration of our Lord by the Angels. The three upper compartments have been filled with stained glass at Mr. Image's expense. The contract work has been carried out by Mr. Henry Luff, of Ipswich. The total cost is about 1,400*l.*, of which sum the subscriptions fall short by some 800*l.* There is a gain of over 160 sittings, the number who can now find accommodation in the church being about 700. Mr. Hakewill was the architect.

Limington (Somerset).—The chancel of Limington church has recently been restored, and part of it rebuilt, as it was out of the perpendicular and almost dangerous. It is fifteenth-century work, and contains some portions of the ancient elaborately-carved bench-ends and poppy-heads, and linen-pattern panelling. But the most interesting objects discovered during the progress of the works were some thirteenth-century coffin-lids, exquisitely floriated, and fortunately in a very fair state of preservation. The chancel was blocked up with modern pewing, into which the remains of the ancient seats had been inserted. These incongruities have been swept away, and the old work replaced in properly-arranged chancel seats. The base of the rood-screen still remains, and has, of course, been preserved. The old roof which was dilapidated has been replaced by an arched ribbed and panelled ceiling, with carved pateras at the intersections. It is hoped that before long the rest of the church, which is of earlier date and of great interest, will be restored. Mr. Ferrey was the architect, and Mr. Maurice Davis, of Langfort, the contractor.

Hounslow (near Southampton).—This new church at Hounslow has been consecrated by the Bishop of Winchester. In plan it consists of a nave (with north porch), chancel, and vestry; at the west end is a bell-turret, formed of oak. The main material of the walls is composed of stock bricks, faced externally with field flints, and rough-stuccoed internally. The quoins and dressings to the exterior of the church are of Corsham Down, and inside, of Coombe Down stone. The nave has an open-timber roof, filled in at the back of the rafters with V-jointed boarding. The chancel roof is polygonal in form, with moulded ribs, and has carved pateras at the intersections. The whole of the internal walls up to the window-sills are lined with Maw's tiles. A new feature in the wall tiling is the introduction by the agents, Messrs. Simpson & Sons, of hand-painted tiles in place of ordinary encaustic, by which they think the apparent repetition of the pavement on the wall is avoided, and a more artistic effect gained. The tiles being painted in enamel colours, are perfectly durable. The east window is filled with painted glass, by Messrs. Clayton & Bell. The church will accommodate about 200 persons, and all the seats are open. The architect was Mr. Ferrey, and the builders were Messrs. Godard & Son, of Farnham.

Starston (Norfolk).—This church is about to be enlarged and restored under the direction of Mr. E. M. Phipson. Such timbers of the nave roof as are decayed will be taken out, and others in oak, precisely similar in size and mouldings substituted, and the whole re-covered with lead. This roof is figured in Brandon's "Open-timber Roofs." A new north aisle is to be built, with three stone arches and piers opening into the nave, the present decorated windows on the north side of the nave being refixed in the aisle walls. The roof of the aisle will be in pitch pine, with moulded timbers and tracery spandrels, and covered with lead. An unsightly west gallery will be removed, and the benching will be continued in the aisle, in oak, similar to that at present in the nave. A new organ-chamber at the east end of the new aisle will be erected, and have arches opening into both aisle and chancel. The passages are to be paved with tiles, and Gidney's underground stove used for warming. The contract has been taken by Mr. Grimwood, of Weybread, Suffolk, who has restored several churches under Mr. Phipson, in this district, in a satisfactory manner.

Wrington.—Christ Church, Redhill, has been re-opened for divine service. Being situated on

a spur of Broadfield Down, overlooking the vale of Wrington, and exposed to the full power of the south and west gales, the walls had become more or less permeated by the rain from those quarters, and the inside very much disfigured; and as the time had arrived when a thorough cleansing of the interior was requisite, it was considered indispensable first to remedy the dampness. This has been effected by removing the plastering from the interior and coating the walls with asphalt, and then replastering thereupon. The walls were considered suitable for the introduction of colour decoration, and a plan, subservient to the architecture of the building, for lining out and decorating them in encaustic painting, has been carried out. An ornamental string course, or impost, runs round the church and chancel at the level of the springing of the windows and chancel arch, and a second string around the chancel at about 5 ft. from the floor. The intermediate space is lined out in blocks, and the space above the upper string in the chancel and east end of the church diapered. The arches and soffits of the windows have been lined out archwise, and the chancel arch similarly treated. The leading colour is Venetian red upon the stucco ground, with green and gold colour upon a white ground for the ornamental portions, the whole of which are outlined with black. The repairs and improvements in the church have been carried out by Mr. Thomas Young, of Bristol, under the direction of Messrs. Foster & Wood, architects.

Selly Hill (Birmingham).—The foundation-stone of a new church, which is to be erected at Selly Hill, has been laid by Miss Jaffray, of Park Grove, Edgbaston. The site chosen for the edifice is on the brow of a hill at the top of the Eastern-road, and about midway between the Bristol-road and the Pershore-road. The cost of the church will be a little under 3,000*l.* The builder is Mr. Charles Jones, of Birmingham.

Overton (Flintshire).—The chancel of the parish church is being recast, and an endeavour is being made to render it more in harmony with the older portions, particularly the north transept, which is contiguous to it. The style of the new work will be that of the fifteenth century, and it will consist of new east, north, and south windows, new roof, chancel arch, paving, and seating, the whole of which, it is hoped, will be completed in about six weeks or two months. A house, which has been for some time rented by the late curate, has now been purchased for a rectory. The building only needed some minor repairs and alterations, with painting, &c.; but the offices required entire reconstruction and rebuilding, and some additional sitting-rooms and bedrooms were required. The additional rooms have been joined to the old house. The offices and stabling are also built in continuation. The works here and at the church are being executed by Mr. John Edge, of Overton, from the designs and under the superintendence of Mr. Wm. Milford Teulon, of London.

Leigh.—The architects of the proposed new parish church, Messrs. Paley & Austin, of Lancaster, have forwarded to the chairman of the committee a plan and a prospective view of the exterior, as they propose to rebuild it. As stated in the architects' report, it is not intended to remove the tower, but to restore it as it stands. The whole of the church will, however, be entirely rebuilt. The site of the church, as shown on the drawing, is nearly that of the existing building. The plan presents a long unbroken nave and chancel 125 ft. in length, of which the chancel takes 40 ft., and 54 ft. 6 in. in width, including north and south aisles, the arcading springing from octagonal piers. If a chancel arch is intended, it is apparently proposed that it should die away into the piers on either side, and not divide the building, but preserve as far as possible the unbroken line from east to west, which forms the keynote of the design. The chancel is raised two steps above the nave, the choir being accommodated on either side. The only difference apparently between the nave and the chancel will be a greater richness of detail in the latter part of the church. The seats are arranged with passages down the centre of the nave, and one also in each aisle. The tower arch is thrown open. A porch is provided at the west end of the south aisle, and entrance also apparently through the tower. Separate entrance is also given into the children's aisle by a doorway with one of the exterior buttresses, and a priest's door is shown to the vestry on the north side. The style is that of the present church.

The church is raised some 2 ft. or 3 ft. above the present level, which will obviate interfering more than is absolutely necessary with the remains of those interred within the church. The subscription-list requires to be largely increased. The Grammar School accommodation is sadly deficient, and the erection of a more suitable building would be a great advantage to the town.

Stainland.—A boon is about to be conferred on the district of Holywell-green, in the shape of a cemetery and its chapel, to be formed at the expense of Messrs. J. Shaw & Sons, from designs by Messrs. Horsfall, Wardle, & Patchett, of Halifax. The site, which embraces an area of about 4,000 square yards, is in rear of the present schools, and is triangular in shape. A little cemetery chapel, Gothic in design, is placed in the grounds, and the number of graves will be 746, so that the ground will suffice for one hundred years to come, and ground will be left for future enlargement. A site is also left, close to the schools, for an intended new Congregational chapel, to be built at a future day.

Burford (Oxfordshire).—It has been unanimously resolved at a meeting of parishioners, that it is desirable that the church of Burford be restored, under the direction of Mr. G. E. Street, who has prepared plans and specifications. A committee was appointed at the meeting. The sum required is between 4,000*l.* and 5,000*l.*

Bridlington Quay.—The corner stone of a new church at Bridlington Quay has been laid by the Rev. Y. G. L. Greame, of Sewerby House, who gave towards its erection 1,000*l.*, and his sister, Miss Lloyd, of Stockton Hall, 800*l.*, the remainder to be raised by private and public subscriptions. Mr. Richard G. Smith, of Hull, is the architect, and Mr. J. Rennard, of Bridlington Quay, the builder. The site was given by the owners of the Beaconfield estate. The new church will be composed of a nave, chancel, tower, vestry, and north aisle; the space for the south aisle is left for further extension. The length of nave, is 87 ft., and breadth, 33 ft.; north aisle, 17 ft. 3 in. by 64 ft., and the base of the tower, 24 ft. square; chancel, 36 ft. long, and 30 ft. wide; vestry, 25 ft. long by 18 ft. wide. The building is calculated to hold 500 people. Its cost will probably be about 4,000*l.* The church will be of the Gothic order of the twelfth century.

Bungay.—The restoration of the chancel of St. Mary's Church is now completed. Its chief feature is a stone reredos, executed by Mr. Henry Nursey, of this town. It consists of perpendicular panel work of the fifteenth century, the central compartment (containing the Commandments and sacred monogram) being enriched with polished marble columns and carved capitals. The floor of the chancel has been laid partly with Portland stone, and partly with Min-ton's encaustic tiles.

Upper Holloway.—On Saturday, the 9th instant, Bishop Ryan, acting for the Bishop of London, consecrated St. Paul's Church, which has been erected in the Kingsdown-road, Upper Holloway. The building consists of a nave 66 ft. long and 24 ft. wide; a chancel, 33 ft. deep, terminated with a three-sided apse; and north and south aisles, each 80 ft. long, 13 ft. wide, and 20 ft. high. The roof over the nave is 55 ft. high, and that over the chancel is at the same level. As there is no chancel-arch, the clearstory windows, which are nearly 20 ft. high, are continued round the chancel. Five arches on each side divide the nave and chancel from the aisles. They are supported on coupled columns of red Peterhead granite. At present sittings are provided for 600 persons in open benches of deal, stained and varnished; and there is unoccupied space for another 100 sittings. The roofs are neither stained nor varnished; that over the nave and chancel is boarded to a cradle form in the centre, supported on groin-shaped pendentives between the clearstory windows. The walls are built of yellow stock bricks, with Bath stone-dressings. The inside walling is relieved by occasional bands and arches of red brick. Externally, the effect chiefly depends on the height (73 ft.) to which the unbroken line of the roof over the nave and chancel rises. An octagonal bell turret, covered with slating nearly 90 ft. from the ground, caps the west gable. The aisles are lighted by dormer windows, filled in with plate tracery. With the exception of moulded eaves, cornices of red brick, no decorative features have been introduced on the outside of the church. The total cost is 5,100*l.*, including gasfittings and heating, by Goldsworthy Gurney's stove. The

work has been carried out by Mr. Thompson, of Camberwell, from the designs and under the superintendence of Messrs. Henry Jarvis & Son, architects.

Ilchester.—The first stone of the new church here has been laid. It will consist of nave, with western bell-turret springing from the ground, chancel, vestry, and south porch. The old open-timbered roof will be repaired and placed over the nave. Accommodation will be provided for 200 persons in open seats of pitch pine. The chancel fittings are intended to be of oak. Local stone is being used for the walling, and Sholeoke for dressings. The work is being carried out by Mr. W. Morgan, of Llanfair Caereinion, from the designs of Mr. E. Haycock, jun., architect, Shrewsbury.

Islington.—St. Anne's Church, Poole's Park, has been consecrated. The new ecclesiastical district of St. Anne's is taken out of that originally assigned to St. Mark's, Tollington Park. The church, which is situated in the midst of a rapidly rising district, near to Finsbury Park, was erected from designs furnished by Mr. A. D. Gough, architect; and in style and character it is Lombardic. It is built of brick, with Bath and Mansfield stone dressings. The internal divisions comprise nave and north and south aisles, chancel and vestry, organ chamber, and western gallery. The nave is divided from the aisles by Bath stone piers, from which spring arches of black, red, and white bricks. The clerestory windows are similarly ornamented. The roof is open-timbered, stained and varnished, and supported upon fifteen semicircular headed principals, springing from corbel shafts of stone, with carved caps and foliated drop corbels. The chancel arch is of Bath stone and semicircular, supported upon stone shafts, carved capitals, and moulded bandings. The accommodation provided is for 1,037 persons, the seats being chiefly on the ground floor. The church is paved with coloured tiles. The entrances are from Poole's Park and Palmerston-road. Messrs. Dove Brothers, of Islington, were the builders, and the contract price was 5,375*l.*; but this is exclusive of the upper part of the tower and spire, the enclosing boundary, and gates and railing. The total cost, including architect's commission and incidental expenses, is put down at 6,270*l.* Two memorial windows, given by the architect and the incumbent, are the work of Mr. Gibbs, of London.

STAINED GLASS.

Elton Church, Oundle.—Two three-light painted and stained glass memorial windows have just been erected in this church. One, at the east end of the south aisle, has, in the centre opening, the Crucifixion; in the dexter opening, the Baptism; and, in the sinister opening, the Resurrection of our Saviour. Each group is under a canopy or shrine, with an inscription at the base, "To the Memory of Granville Leveson Proby, third Earl of Carysfort, Admiral R.N., born in 1783, died November 3rd, 1868, this Window was erected, by his Son and Successor, Granville Leveson, fourth Earl." The window adjoining (south) contains, in the centre opening, the Nativity; in the dexter opening, the Annunciation; and, in the sinister opening, the Angel at the Sepulchre, with the three Marys. These are in medallion shapes, on a mosaic background, with an inscription at the base,—"To the Memory of Isabella, Wife of Granville Leveson, third Earl of Carysfort, died January, 1836, this Window was erected, by her Son, Granville Leveson, fourth Earl." These windows were executed by Messrs. Baillie & Mayer, of London.

East Relford Church.—A new accession has been made to the interior of this church by the erection of a window in three lights, near the south door, by Mr. O'Connor. The prevailing idea of the illustrations in the three lights is to give examples for imitation of the submission of Christ to his earthly parents.

Shillingford St. George, Devon.—A stained glass window has been placed in the south wall of this church, to the memory of the late Mrs. Pitman, of Dunchideock House. The large openings are filled with representations of St. Catherine and St. John, and the tracery openings with appropriate texts. The whole has been executed by Mr. Drake, of Exeter.

Haughley.—Messrs. J. & J. King, of Norwich, have recently executed a memorial window, in commemoration of the charity and kindness manifested to the poor in her lifetime by the

late Miss Pretymann, of Haughley-park, Suffolk. The window, which consists of four lights, has for its subject the alms-giving, the death, and the raising of Dorcas. The window was designed by Mr. T. J. Scott.

Hereford Cathedral.—A memorial window, to the memory of Capt. Edward Kempton, brother to Mr. F. R. Kempton, of Hereford, architect, has been inserted in the north window of the east aisle of the north transept of this cathedral. The window is by Messrs. Clayton & Bell, of London. It adjoins that erected to the memory of the late Captain Arkwright, and is a similar three-light window, the subject being, in the centre compartment, the figure of St. Michael, with a medallion beneath, representing two angels, and the badge of the Cameronians (26th Regiment), composed of a star in the centre, and the word "Cameronians" encircling it. On the right is represented St. Alban, and the martyrdom of that saint is the subject of a medallion beneath. In the left compartment is St. George, with a medallion containing a representation of that saint and the legendary dragon beneath it. In the three circular lights in the heading of the window is represented, in the centre, the shield of faith, and in the other two respectively, the "sword of the spirit" and the "helmet of salvation."

St. Olave's, York.—A three-light memorial window, executed by Mr. J. W. Knowles, of York, has been erected on the south side of this church. The subjects are Faith, Hope, and Charity, and are represented under canopies of the Perpendicular period.

St. Lawrence's, York.—A two-light memorial window, painted by Mr. J. W. Knowles, of this city, has been erected in the south side of this church. The subjects are the Crucifixion and the Resurrection, which are represented in panels under canopies of the Perpendicular period.

Great Gaddesden Church, near Hemel Hempstead, Bucks.—A stained glass window has been fixed in this church in memory of the late Mrs. Moore Halsey, Lady of the Manor, containing the subject of Dorcas feeding the hungry, and other acts of charity; the death of Dorcas; and St. Peter raising Dorcas to life, under canopies, with angels in pedestals. The work was designed and executed by Messrs. Holland & Son, of Warwick.

Trinity Church, Gosport.—The example set by the erection of memorial windows in the east end of this church is likely to be promptly followed by the erection of another window on the south side, thus completing the design which the two already placed there in part only illustrate. The church being dedicated to the Holy Trinity, the windows will illustrate that mystery. The central window is a representation of the worship offered in heaven to the Eternal Father, and the symbols under which the Holy Scripture has veiled Divine realities in the fourth chapter of the Revelation of St. John have been employed. The object of worship is represented by the human nature which our Lord has taken into the divine,—"A throne is set in heaven, and one sitteth on the throne." The covenant of grace is shadowed forth by the rainbow that overarches the throne, and around the Creator are the four living creatures which are types of life outcoming from Him, their central source, and ever offering their sacrifice of praise. Before the throne are the seven-branched candlestick and the crystal sea, symbols of baptismal washing, and the manifold, yet uniform, energies of the Holy Ghost. Beneath, and in the foreground (so to speak) of the picture, the elders of the old and new covenant offer the worship of the church—"To Him that liveth for ever and ever," casting down the crowns before the throne. The north window is devoted to the second person of the Holy Trinity, whose incarnation for the salvation of man is figured by the adoration to the Babe in the grotto of Bethlehem. Above, the hosts of heaven obey the command of the Father, "Let all the angels of God worship Him." The windows are from the firm of Messrs. Holland & Son, of Warwick, and have been placed in position by Mr. Jesty, of Gosport.

Chichester Cathedral.—Of late several workmen from the establishment of Messrs. O'Connor, of London, have been engaged in the erection of a new stained glass window in the south nave aisle of this cathedral, between what may be termed the Pilkington and Roberts memorial windows. The window, which is now completed, is constructed as a memorial of the late Mrs. Johnson, mother of Mr. E. W. Johnson and Mr.

J. J. Johnson, Q.C., Recorder of Chichester. The design is a representation of four events in the life of St. John the Evangelist, the first being his call by the Saviour; the second is John taking the mother of Jesus to his own home; the third is the Beloved Apostle as an aged man teaching his disciples; and the last is the banished disciple in the Island of Patmos when, gazing at the beautiful vision which is made to pass before him, he sees, "The Holy City, New Jerusalem, coming down from God out of Heaven, prepared as a bride adorned for her husband." The whole is surmounted by a medallion of the Evangelist.

Gainsborough Church.—A new stained-glass window has been placed in this church in memory of the late Mr. Robert Capes, by his executors. It is the easternmost window on the south side. The subject is the resurrection of Lazarus. It is intended to harmonise in idea with the opposite window, on the north side, with which it corresponds in pattern and colour of its border and arabesque work. It is from the studio of Mr. C. E. Clutterbuck, and its cost was 75*l.*

Books Received.

The Organist's Quarterly Journal. Novello, Ewer, & Co., Berners-street.

The Organist's Quarterly Journal of original compositions, the sixth number of which, published on the 1st of the month, is before us, is a publication well deserving encouragement on the part of any journal devoted to the interests of art. In England the organ was long considered as an instrument mainly for the display of extempore playing; and later it has been given up far too much for the performance of mere "arrangements" of music, not originally written for it, nor suitable to it. The attempt on the part of Dr. Spark, the editor of this *Quarterly Journal*, to provide a series of compositions by modern composers written for the instrument, is in every way deserving of success. The present number includes compositions by Gustave Merkel, and the less known names of Tietz and Kerbusch, and also one from the pen of Mr. F. Archer, the talented English organist, who has made Brighton his headquarters. If these do not present the clearness of form and certainty of intention of the older German organ-composers, they have merits of their own, which are peculiar to modern music.

VARIORUM.

The current *Quarterly* examines appreciatively the position of Eastlake and the claims of English art. The writer takes high ground, and sees in Hogarth, Reynolds, and Gainsborough the "heroic ancestors" of modern art:—

"What does painting owe to these men, and to their countrymen and contemporaries? It owes the power to deal with the tragic and the comic sides of human life; to hold up the mirror to ourselves, teaching and moving us while it pleases. It owes the perception of the magic of landscape. It owes the restoration of the imaginative style of portraiture. It owes the discovery of childhood as one of the purest and most attractive sources of pleasurable representation. It owes the first fusion of the prosaic incidents painted by the Hollanders with the sentiment of modern poetry and romance. And when we compare these varied sources of delight and emotion with those presented by the first school of painting, wholly restricted to religious teaching; or, with the second, devoted to an artificially revived mythology; or, with the third, tentatively wavering between worn-out traditions and half-understood new impulses, we may fairly say that that art which was inaugurated by the English masters of the last century was a new thing in Europe. It bears the name of painting, yet it is almost wholly different from what bore the name three hundred years before; it appeals to other sympathies, it pursues other objects, it must be tried, in a great measure, by other standards."

An elaborate article on "Non-Historic Times" will also interest many of our readers. The writer considers that Silbury and Stonehenge belong to post-Roman times, and objects altogether to the term *pre-historic*.—"We may mention, as bearing on the same inquiry, that the *Quarterly Journal of Science* (April) contains a paper on "Megathic Structures of the Channel Islands: their History and Analogues," by Lieut. S. P. Oliver, of the Royal Artillery. It is illustrated with several views. The second number of the *Photographic Art Journal* contains illustrations of considerable interest produced by some of the new processes. The "Stirrup Cap,"

* Note also that England is equally the inventor of water-colour painting, with all its vast and varied capacities for humanising and elevating pleasure. But this branch of art would require separate consideration.

after a painting by Verschure, has been photographed and printed in permanent pigments by M. Goupil, of Paris, by Mr. Walter Woodbury's process, and is remarkably beautiful. The second illustration, "Netley Abbey," is printed in printers' ink, at the ordinary printing-press, by a process recently perfected by Messrs. Edwards & Kidd, and assimilated in many respects with the Albert-type process, the prints being taken direct from the gelatine and bichromate matrix. The third is produced by an autotype process; and the fourth is an example of Frerich's phototypy, and illustrates the power of reproducing printing surfaces from engravings, drawings, and wood blocks, thus rendering the works of the great art-masters of the past capable of cheap reproduction.—The first article in *Fraser* of this month makes a good fight for the agricultural labourer and his children,—a long-neglected class.—"Spon's Tables and Memoranda for Engineers, selected and arranged by J. T. Hurst," will lie in the smallest waistcoat-pocket, and will often be found useful at a pinch. A penny at hand is sometimes more useful than a pound left at home.—Hardwicke has published, as usual, his "Shilling House of Commons for 1870," his "Shilling Knightage," "Shilling Baronetage," and "Shilling Peerage." The fact that they are edited by Mr. Edward Walford, M.A., gives assurance that so far as they go they may be depended on.—"The Woman of Business; or, the Lady and the Lawyer, by Marimon Savage" (Chapman & Hall), is a very good novel. The story is interesting, and the interest is well maintained throughout the three volumes in which it is told.

SALES OF HOUSE PROPERTY.

APRIL 13.—By Mr. W. H. Moore.—Leasehold residence, No. 18, Abbey-gardens, St. John's Wood; annual value, 55*l.*; term, 69½ years unexpired, at 8*l.* per annum—sold for 550*l.*
Leasehold house, No. 6, Robert-street, Roston-road; annual value, 68*l.*; term, 97 years from 1824, at 9*l.* 1*6d.* per annum—sold for 935*l.*
Leasehold, No. 15, Granby-street, Hampstead-road; let on lease at 16*l.* per annum; term, 96 years from 1842, at 5*l.* per annum—sold for 300*l.*
By Mr. Salter.—Leasehold, No. 25, Drury-lane; let at 64*l.* per annum; term, 61 years from 1828, at 27*l.* per annum—sold for 476*l.*
By Messrs. Rogers & Chapman.—Leasehold, Nos. 3 and 4, Upper Dorset-street, Fimlico, producing 94*l.* per annum; term, 77½ years from 1848, at 12*l.* per annum—sold for 1,180*l.*
Leasehold, Nos. 61 and 63, Bensborough-street, Fimlico, producing 125*l.* per annum; term, 83 years from 1860, at 22*l.* per annum—sold for 1,330*l.*
Leasehold, No. 48, Lupus-street, Fimlico; annual value, 75*l.*; term, 70 years from 1893, at 11*l.* per annum—sold for 9*l.*
Leasehold, Nos. 11, 12, 14, 15, and 16, Vincent-square, let at 60*l.* per annum each; term, 60 years from 1864, at 8*l.* per annum each—sold for 2,645*l.*
Leasehold, Nos. 70 and 72, Lupus-street, Fimlico, producing 130*l.* per annum; term, 79 years from 1863, at 16*l.* 10*s.* per annum—sold for 1,430*l.*
Leasehold, No. 82, Church-street, Fimlico, let at 80*l.* per annum; term, 74 years from 1852, at 10*l.* per annum—sold for 900*l.*
April 14.—By Mr. H. J. Phillips.—Freehold residence, No. 10, Ashby-street, Islington; annual value, 65*l.*—sold for 870*l.*

Miscellaneous.

The Hardships of Brickyard Children.—A correspondent of the *British Workman* says: Some of the boys employed are about eight years old, and each one is engaged carrying from 40 lb. to 45 lb. weight of clay on his head to the maker, for thirteen hours per day, traversing a distance of fourteen miles. The girls employed are between nine and ten years of age. They are partly occupied, instead, in taking bricks to the kiln. Some of the children are in a semi-nude state. Many of them in Derbyshire work what is called "eight-hour shifts," which, reckoning from twelve o'clock on Sunday night to twelve o'clock on the Saturday night following, make a weekly labour of seventy-two hours. To ascertain really what work these children have to do, we must suppose a brickmaker (not over quick in his operations) making 3,500 bricks per day. The distance the boy or girl has to travel with mould, which weighs 4½ lb., and bricks in it 10½ lb., one way, and back to the brickmaker with mould only, is upon the average twelve yards. This multiplied by 3,500 makes the distance nearly twenty-four miles that each child has to walk every day, carrying this weight with it. Mr. Mundella, stated in the House of Commons that "ignorance, vice, and immorality prevail to a greater extent amongst the employes in brick-yards than in any other trades." We are fully of the same opinion.

Railway Matters.—A new method of warming first-class carriages in express trains has been adopted in Bavaria. A special van is attached to the train, and contains a powerful "calorifer," and the heated air is conveyed to all the carriages of the train by means of india-rubber tubes. The experiment with first-class carriages is reported upon so favourably that the authorities have determined to apply it to all the carriages on the Bavarian lines, and it is expected that it will soon be adopted on all the German railways.—The singular names possessed by stations on many of the Illinois roads have often been noticed, such as Plana, Loda, Pana, Polo, &c. A Western paper now explains that when the stations on the Illinois Central Railroad were fixed upon, it was deemed advisable, so far as possible, to give them Indian names, but so numerous were they that this would exhaust an ordinary Indian vocabulary. Accordingly, to obviate this difficulty, a quantity of vowels and consonants were written on slips of paper, and placed in a hat. These were all stirred up, and a few drawn out at random, when a clerk was required to exercise his ingenuity in forming them into a word.

Discovery of an Underground Dwelling in Ireland.—A curious discovery has been made on the farm of Kilonot, about two miles from Malin Head. While two men were raising a stone they found a large opening underneath. To the south of the opening there seems to have been a refuse-room, which is about 10 ft. in length, and filled with limpet shells, beef bones, and ashes. North-west from the entrance is an apartment 12 ft. long by 9 ft. wide, and 5 ft. high; at the end of which is a small round hole out in the rock, just large enough to creep through, which leads by a passage 50 ft. long, by 3 ft. wide, into a fourth apartment, running with a kind of curve, and 20 ft. by 6 ft. Passing through this, the fifth division seems to have been a kind of water-room, with a clear spring in one end of it. The room is 12 ft. long, 9 ft. wide, and 6 ft. high. To the left is a kind of cellar by 3 ft. of a drop, the entrance of which is very small; but the cellar is 45 ft. long and 5 ft. wide, at the end of which is another entrance, built up with a stone.

New Church at Barton-le-Street.—Mr. Maynell Ingram, the chief land-owner in Barton-le-Street, near Malton, has had the old church demolished and a new one commenced in its place at his cost. The new church will be from designs by Mr. Perkin, architect, Leeds. The whole of the sculptures in the old church are being rebuilt in the new walls. The builder is Mr. Barton, of Slingsby. The late structure was of great antiquarian interest, in consequence of the number of sculptured stones walled into it. In this respect it was very rich in Early Norman work. The church was evidently built from the ruins of some other, and antiquaries have never settled the point as to whether St. Mary's Abbey, at York, or the Church of the Holy Trinity, at York, was used as the quarry. A third party hold that neither of these churches, but a still earlier Norman building, furnished the materials.

Public Spirit in Hindus.—The visit of the Duke of Edinburgh to Western India will be commemorated by many munificent public gifts from the native princes and chiefs. The Guicowar of Baroda has given 20,000*l.* for the erection of a sailors' home at Bombay; the Rao of Kutch 15,000*l.* for the erection and endowment of schools throughout his dominions; the Hon. A. D. Sassoon 10,000*l.* for the erection of a new High School in Bombay; and 2,500*l.* to purchase an organ for the Bombay Town-hall; the Chief of Jumbhudee, 10,000*l.* to secure a water supply for his capital; the Ranees of Jumbhudee, 1,000*l.* to the Alexandra Native Girls' Institution; the Nawab of Joonaghur, 10,000*l.* for public works; the Chief of Bhownagur the same amount for the same purpose; and many smaller sums have also been given which are to be devoted to public works.

East Meon Church.—The restoration of this church is now near completion. The *Portsmouth Times* says,—"In spite of great difficulties, owing to the high winds rushing through the valley, a handsome spire has been erected. Mr. Smith, contractor, of Lion-terrace, Portsea, has had the entire management of the work."

St. Mary's, Exeter.—It is proposed to erect a tower to St. Mary's Church, Exeter, in memory of the late Bishop of the Diocese.

White Lead.—An improvement in the manufacture of carbonate of lead, by the action of the soluble acid carbonates of the alkalies on litharge, hydrated oxides of lead, or insoluble basic salts of lead, has been patented by Messrs. Dale & Milner, of Warrington. The inventors mix litharge, hydrated oxides of lead, or insoluble basic salts of lead, with an equivalent of bicarbonate of soda, together with sufficient water to form a stiffish paste. This mixture is ground in a suitable mill, small quantities of water being from time to time added as may be found requisite, until the change of the lead bodies into carbonates is complete. The paste is now well washed with water, and the supernatant liquid which contains the carbonate of soda is separated from the white lead by filtration, and boiled down to dryness, and disposed of as soda-ash; or it may be crystallised, or may be again converted into bicarbonate of soda by treatment with carbonic acid, and used to convert further quantities of lead oxides or insoluble basic salts of lead into carbonates.

Unsanitary Condition of Fenryn.—A startling report has been made to us concerning the unsanitary condition of Fenryn. We hear that the existing drainage works are utterly insufficient; stagnant pools and decomposing refuse are in the streets; there are no water closets, and everywhere the most utter sanitary neglect; the streams running through the town are open sewers; the slaughter-houses are in confined localities, and undrained; the river is offensive and revolting; disease, destitution, and death have resulted; and the district in Budock parish is, if possible, more filthy than that within the municipal boundary. Certain members of the town council are owners of some of the worse properties.

A "Day's Work."—A novel case occurred in the Glasgow Small Debt Court on Friday, in which the number of hours necessary to constitute "a day's work" was the point in dispute. The employer contended that the workman having commenced the work at mid-day and stopped at six o'clock, he was bound to work the next day till mid-day before he could claim the day's work. The sheriff, however, repelled this plea on the ground that the man having been allowed to commence at mid-day, had worked till the closing hour, and thus completed his day's work.

The East End Museum of Science and Art.—Earl de Grey says, in reply to inquiry as to the proposed museum at Bethnal-green:—"The erection of the buildings connected with the Science and Art Department, including the East-end Museum, has been transferred to the Board of Works, and is therefore no longer under my control. I learn, however, on inquiry, that a sum of 5,000*l.* has been proposed in the estimates for the present financial year for that museum; and I have every reason to believe that it is Mr. Aytton's intention to proceed with the completion of the work."

Royal Italian Opera, Covent Garden.—In "Lucrezia Borgia," last week, a new *Moffeo Orsini*, in the person of Mdlle. Cari, made a very favourable impression. Her opening song was charming in purity and accent, and the over-popular *brindisi* raised a considerable enthusiasm. Her appearance in other parts will be looked for with interest. Signor Graziani, as Duke Alfonso, was grand. Mdlle. Sassi, who grows rapidly upon her admirers, has played Maria, in "La Figlia del Reggimento," with great success. She sang delightfully throughout. Signor Ciampi's *Supplico* is also a good performance.

Artists' General Benevolent Institution. The annual dinner in aid of this society will be held on the 7th of May, under the presidency of the Duke of Argyll. Most of our readers know that the object of this institution, founded in 1814, is to afford relief to distressed meritorious artists (whether subscribers to its funds or not), whose works have been generally known and esteemed by the public, as well as to their widows and orphans. Seventy-nine applicants were relieved during 1869, with 1,255*l.* Mr. J. E. Millais, R.A., is the hon. secretary.

Inquiry as to the Utilisation of Sewage. The subscriptions to the fund for defraying the expenses of the proposed inquiry by the British Association Committee on Sewage amount to upwards of 12,000*l.*, and the committee has decided that the inquiry shall be commenced at once.

Glazing with Rods.—A New York paper speaks of a new contrivance for preventing people looking into a room, while light is not excluded. It consists of a number of glass rods arranged either vertically or horizontally, and secured together by appropriate frames, forming a series of cylindrical lenses which break up the light, and throw it into every part of the room, thus producing a soft and diffused glow, which is very beautiful and pleasant. The glass rods may be of any colour, and by an arrangement of the colours very beautiful effects can be produced. The contrivance is the invention of Mr. Demuth.

Fall of a Cornice.—According to the *Kensington News*, about two o'clock in the afternoon of Sunday, the 10th inst., the cornice of a line of eight houses belonging to the Kilburn Estate Agent, Mr. H. Allen, and erected by Mr. Richard, fell simultaneously and without previous warning, literally crashing in the cellars below. Bad building is said to have been the cause of the catastrophe. One of the houses was occupied by the Rev. Mr. Cocking, and the reverend gentleman and his family think that the parish would be nothing the worse for a district surveyor.

Building with Paper.—According to the *Scientific Review*, building paper now forms a regular article of commerce in the United States. It is a hard, compact paper, like an ordinary book-cover, and is saturated with tar, and used on the outside of frame buildings, under the clapboards, also under shingles and floors, to keep out damp and cold. It is also used on the inside, not saturated, instead of plastering, and is said to make a warm and cheap wall. The Rock River Paper Company of Chicago are doing a large business in it.

Northumberland Architectural Society. The annual general meeting of the Durham and Northumberland Architectural and Archaeological Society was held last week in Bishop Cosin's Library, Durham, under the presidency of the Rev. W. Greenwell. It was decided that the first excursion of the society should be to Tynemouth and Seaton Delaval; the second (two days) to the Roman Wall; the third to Aycliffe, Heighington, and Walworth Castle; the fourth to Boldon and Hylton Castle; and the fifth (two days) to Rivers, Helmsley, and Gilling, in Yorkshire.

Discovery of Roman Remains in Belgium.—The Belgian journals state that some Roman remains have just been discovered in digging the foundations for a bridge over the Meuse, at Omtret. The oaken piles of a similar structure, erected by Julius Caesar during the conquest of Gaul, were brought to light, in a perfect state of preservation. Between two of the piles were also found a number of Roman coins, being the effigies of the Emperors Trajan, Vespasian, Adrian, Antonino Pius and his consort Faustina.

Filters, and Filtration.—It has recently been shown by Dr. Frankland that filtration does not only remove matter mechanically suspended in the water, but comprises also a chemical alteration of dissolved material. In some experiments ordinary London sewage water was purified to such a degree that, in respect of organic substance, it actually equalled in purity the water supplied to London for domestic purposes. A committee has, therefore, been organised for the systematic examination of water-filters, and to report fully upon them.

The Industrial Classes in Foreign Countries.—Her Majesty's diplomatic and consular agents abroad, to whom we are periodically indebted for a large amount of information as to the trade and manufactures of the countries in which they reside, have transmitted to this country a fund of valuable intelligence. Their reports have just been presented to Parliament in an octavo Blue-book of nearly 600 pages, and have been forwarded in reply to a circular from Her Majesty's Secretary of State for Foreign Affairs.

Another Speaking-Machine.—Professor Faber's speaking-machine is to be exhibited at Hamburg during the continuance of the International Horticultural Exhibition. It is said to articulate various words, and even to answer questions and simple sentences, with wonderful distinctness. This is by no means the first invention of the kind that has been exhibited, but it is said to be more perfect than any previous invention of the kind.

Cathedral Improvements at Durham.—The Dean and Chapter of Durham have commenced important contemplated improvements in the cathedral, under the direction of Mr. C. Hodgson Fowler. Nearly a century and a half ago the whole of the structure was at intervals internally "whitened," and this the capitol authorities have, by way of experiment, decided upon removing. To this end, therefore, scaffolding has been erected, and the entrance of the west end of the north aisle has been enclosed and the cleaning begun.

An Ancient Stone Relic.—A curious stone, believed to be Druidical, has just been discovered in a field near Dingle. It is 8 ft. long, 4 ft. broad, and about 2 ft. in thickness. In the middle of it is a hole, 14 in. square, and as many inches deep, which is neatly cut with a chisel, and the lower end of it coming to a point, or tapering from top to bottom. Such stones are believed to have been used in ancient times to consecrate marriages and other contracts by the joining of hands through the hole in the stone.

Ely Cathedral.—It appears, from an examination made by Mr. G. G. Scott, that the south-east transept of this cathedral is in a critical state, and the dean and chapter have accordingly directed this portion of the building to be shored up. The whole of the foundations will be renewed with large stones from the rock foundations, which are several feet below the rail. The works are intrusted to Messrs. Freeman, of Ely, and will be carried out under the direction of their manager, Mr. E. Loft.

Public Park for Bradford.—There is a prospect of Bradford becoming possessed of another public park. Mr. S. C. Lister has offered his estate at Manningham to the Corporation for public purposes for 60,000*l.*, this being 11,000*l.* less than the sum at which it has been valued. In addition, Mr. Lister has intimated his willingness to subscribe 20,000*l.* towards the purchase money, and he will allow the Corporation to sell some fourteen acres, on which villas may be erected.

Statue of Lord Palmerston.—In execution of an order from her Majesty's Government, Mr. R. Jackson, sculptor, has just completed, for erection in Westminster Abbey, a full-length statue of Lord Palmerston. The figure, which is 8 ft. 1 in. in height, and is to stand upon a pedestal upwards of 6 ft. high, has been hewn out of a block of Carrara marble. The deceased Premier is represented as wearing the robes of a knight of the Order of the Garter, with mantle, collar, "George," and badge complete.

Wide Tenders.—Sir: For Nottingham-road, Wandsworth-common, the following tenders were opened:—

Crocker	237 15 0
Lane	326 10 0
Porter	295 0 0
Hampton	235 0 0
Rough	220 0 0
Noel & Robson	146 0 0
Neale	137 0 0

the lowest of which was accepted. Where will it end?—CONTRACTOR.

Ripon Fine Art Exhibition.—This exhibition was opened on Tuesday by Earl de Grey and Ripon. The exhibition has been promoted for the benefit of the Ripon Scientific Society and Mechanics' Institution. It consists of specimens of fine arts contributed by the gentry and nobility of the county. It also contains a collection of pre-historic relics from the Yorkshire tumuli, which have never been exhibited before.

Telegraphic Progress.—Some interesting experiments have been made in London, with a view of testing the speed and efficiency of the service established by the Indo-European Telegraph Company. Direct communication was opened with Teheran, in Persia, a distance of 3,700 miles, and answers to questions were received within an incredibly short time.

Royal Horticultural Society.—A show of azaleas, araucarias, cyclamens, and other plants was held on Wednesday in the gardens of the Royal Horticultural Society. The weather was exceedingly fine, and there was a numerous attendance of visitors. The show may be generally described as a good one, embracing some very beautiful specimens.

Royal Society.—The President's conversation will be held this (Saturday) evening, the 23rd inst.

Carbonised Wood.—Mr. Sidot, by carbonising wood in a vapour of sulphide of carbon, obtained a charcoal which, when struck, is as sonorous as a piece of metal. He then got a bell turned in wood, carbonised in the same way, and has now an instrument which gives a sound like that of a silver bell. The carbonisation is only superficial.

Society of Antiquaries.—The Fellows will be recommended by the council, at the anniversary meeting on the 26th inst., to alter the statutes so that the meetings may be held twice a month during the season instead of every Thursday as now. It is hoped that each meeting may thus be made more interesting, and induce the members to attend.

Ball, Dulwich College.—The large windows are filled with stamped and pressed glass from the Sekford works, not "Stamford" glass as accidentally misprinted. The clock in the tower has just been completed by the firm of Messrs. B. B. & J. Moore.

Basingstoke.—The church of St. John the Evangelist at Hartley Wintney, near Basingstoke, has been consecrated by the Bishop of Winchester. It is built in the Gothic style of architecture, and will accommodate upwards of 700 persons.

TENDERS.

For alterations and repairs to dwelling-house and premises, High-street, Watford, for Mr. Frederick Dyson, Messrs. Lavender & Son, architects:—

Andrews	£738 10 0
Allen	760 0 0
Harley	769 0 0
Waterman (reduced to 670 <i>l.</i> *)	834 0 0

* Accepted.

For alterations to the Rose and Thistle Tavern, Camberwell. Mr. Murphy, architect:—

Cole & Son	£483 0 0
Sharpe & Cole	483 0 0
Sutton	375 0 0
Shapley & Webster	380 0 0

For alterations and additions to the Heaton Arms Tavern, Peckham Rye. Mr. Cotton, architect:—

Shapley & Webster (accepted)	£690 0 0
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For the erection of an infirmary and new east wing to the Merchant Seamen's Orphan Asylum, Sharnbrook. Mr. G. Somers Clark, architect:—

Myers	£13,970 0 0
Brown & Robinson	13,620 0 0
Mansfield, Price, & Co.	13,381 0 0
Nightingale	13,234 0 0
Kirk & Parry	12,970 0 0
Markwick & Thurgood	12,880 0 0
Corder	12,740 0 0
John Kirk	12,740 0 0
Bayes & Ramage	12,672 0 0
Manley & Rogers	12,557 0 0
Brass	12,395 0 0
Chappell	12,170 0 0
Pattinson	11,990 0 0
Kilby	11,987 0 0
Perry & Co.	11,980 0 0
Hill, Keddell & Waldram (accepted)	11,784 0 0

For ironwork, main drainage (contract No. 5), for borough of Brighton. Mr. N. C. Lockwood, borough surveyor:—

Morgan & Co.	£230 0 0
Weeks & Son	742 15 0
Walker	739 0 0
Barnburgham	686 0 0
Spence & Archer	684 3 0
Reed & Co.	687 10 0
Whitemore & Hinge	646 17 9
Jakes, Condon, Stokes, & Co.	605 0 0
Stone & Co.	585 0 0
Harrison & Co.	586 0 0
Lees & Graham (accepted, subject to the approval of sureties)	573 18 0

For villa residence and out-offices, for Mr. W. H. Brookes, at Walsall, Messrs. Nichols & Chamberlain, architects:—

Trow & Sons	£266 0 0
Taylor	917 11 0
Adkins	890 0 0
Wilkes	875 0 0
Moore	860 0 0
Rowley (accepted)	790 0 0

For re-building Nos. 48 and 49, Bishopsgate-street, for Messrs. Barker & Sons, Messrs. Tolley & Dale, architects. Quantities by Mr. Birdseye:—

Sewell	£8,576 0 0
Abby & Co.	8,460 0 0
Emmott	8,374 0 0
Johnstone	7,745 0 0
Rivett	7,681 0 0
Howard	7,460 0 0
Little	7,437 0 0
Patman	7,385 0 0
Browne & Robinson	7,270 0 0
Newman & Mansel	6,980 0 0
Corder	6,980 0 0
Nightingale	6,947 0 0
Manley & Rogers (accepted)	6,437 0 0

BRADFORD CEMETERY, YORKSHIRE.

WANTED A MANAGER for the above Cemetery, to superintend the same as a settling out of the graves and vaults, also to take the management of the Company's business generally, and to have the Office in taking the orders and keeping the accounts. A suitable residence on the premises, and a salary of 150l. per annum will be given. Applicants to apply by letter stating age and references. All letters to be addressed to Mr. GAY, Secretary to the Company, Exchange Buildings, Bradford—By order of the Directors.
Bradford, April 12th, 1870.

BUILDER'S-CLERK WANTED, who can superintend repairs, trace, and keep books. Commencing wages on-quinta per week. Apply by letter only, stating age, salary, and experience, to LEVELL, care of Mr. Brooks, 51, Lime street, E.C.

CARPENTERS AND BLIND MAKERS.—A YOUNG MAN REQUIRED, to TAKE CHARGE OF ORDERS AND WORKMEN. He must be capable of doing the work and making out accounts. Wages 30 per week, with room rent free. A cash deposit of 25l. required, and good security with interest at 5 per month, and on a monthly notice on either side. Address, 512, Office of "The Builder."

GLASS CUTTER.—CONSTANT EMPLOYMENT.—A competent Man with good references, required.—WILLIAM N. FROX, Birmingham, L. do. A JUNIOR CLERK, with a knowledge of weights and measures, required for the Office.—WILLIAM N. FROX, Hamme-smith, L. do.

MANAGER FOR GAS WORKS.—WANTED, immediately, for a small Gas Works in a Country Town. Salary, 18s. per week, with house on the premises and coal and gas. With further particulars to the BRICKLEY & Co. Gas Light, Coal, and Coke Company, Limited, Oxford-street.

SHOP FOREMAN OF JOINERS WANTED. One who has held a similar situation, and who can be well recommended.—Apply at 50, Raffles-street, Portsmouth, W. on MONDAY morning.

Two Good JOINERS REQUIRED, to take an Oak Job. Must be well up in the kind of work and well recommended.—Address, 305, Office of "The Builder."

TOWN AND BOROUGH OF ROCHDALE.—To LAND SURVEYORS. WANTED, a competent Person to make a SURVEY and PLAN of the Parliamentary Borough of Rochdale. Salary 2l. per week. Applications to be sent to me on or before the 28th APRIL instant. ZACH. MELLOR, Town Clerk.
Packer street, Rochdale, 15th April, 1870.

WANTED, a first rate, experienced, energetic FOREMAN OF PAINTERS, for a permanent job (found suitable).—Address, with terms and references, HIGMAN, Post-office, Brighton.

WANTED, a BRICKMAKER, who thoroughly understands his business, to make bricks by machine, or otherwise.—Apply to the Messrs. WATTS, 89, Chancery-lane, W.C.

WANTED, a thoroughly practical ASSISTANT, One having had experience in wharf and warehouse erection, preferred. State experience. References and terms, addressed to ARCHITECT, care of Messrs. SPRAGUE, 11, Sherborn-street, E.C.

WANTED, in a Builder's Office, in London, a JUNIOR CLERK. Must write a very good hand, and be quick at figures.—Address, stating age and salary required, to No. 332, Office of "The Builder."

WORKING FOREMAN OF PAINTERS required. Must be a quick and active man, and have held a similar situation before. Address, stating how long in such employ, wages, and references, to 311, Office of "The Builder."

WANTED, a SMITH FOR LIGHT T-IRON ROOFING AND BARS. Work must be accounted to the view.—Apply at COTMAN & CO.'s, 5, Wimpole-street, Off Aldersgate.

WANTED, a Man who has a knowledge of a JOBBING BUSINESS in all its branches, principally to make up colours and dyes, to the job.—Apply by letter to W. G. 17, Mitchell-street, Brompton.

WANTED, an active, experienced, and true-hearted FOREMAN'S STOREKEEPER.—Address, with references and terms, TOBES, Post-office, Ship-street, Brighton.

WANTED, for a constancy, a good PAINTER, GRAINER, and PAPERHANGER. None others need apply. Wages, 7d. per hour.—Apply, with references, to Mr. C. STAPLEY, Kent House, Whitechapel, S.W.

TO CARPENTERS AND UPOLSTERS.—WANTED, a trustworthy Mechanic, to keep Furnished Mansions in REPAIR and make himself generally useful. Ability to direct building a recommendation.—Address, A. R. Post-office, St. Leonards-on-Sea.

TO CABINETMAKERS.—WANTED, good SIDEBBOARD and WARDROBE HANDS. Steady young men may have constant employment.—Apply to W. WHITEHEAD, Notting-ham.

TO GRANITE MASON.—WANTED, ONE OR TWO good WORKMEN.—Address, GROBY GRANITE COMPANY (Limited), Gt. Ry, Leicestershire.

TO WOOD CARVERS.—WANTED, a clever, steady Man, capable of EXECUTING GOTHIC WORK from an Architect's drawing. From any church work. State terms.—Address, Box 12, Post-office, Lancaster.

WANTED, a SITUATION, in a respectable SHOP, as CARPENTER. Country preferred.—Address, W. A. G. Post-office, West Ham.

TO BUILDERS AND CONTRACTORS.—WANTED, by an experienced Builder's Clerk, a RE-ENGAGEMENT as BOOK-KEEPER and ACCOUNTANT. Fifteen years' experience in place cost and auditing work on site. Good references if required.—Address, ALFRED, Post-office, Bidegar-road, Old Ford, E.

TO BUILDERS AND PLUMBERS.—WANTED, by the Advertiser, a constant SITUATION as JOHNSON or THREE-BRANCH HAND. Can plan a job or give work.—Address, A. G. F. D. 10, Philip-street, Queen's-road, Wandsworth-road.

TO BUILDERS AND OTHERS.—WANTED, by a respectable Young Man, willing to make himself generally useful.—Address, A. B. 10, East-street, Kensington, Road.

TO BUILDERS AND OTHERS.] WANTED, a RE-ENGAGEMENT, by a Young Man, aged 25, who is thoroughly well up to the routine of a builder's office. He is fit for the Advertiser, aged 15, who is fit for an ENGAGEMENT.—For further particulars, address, 312, Office of "The Builder."

WANTED, a RE-ENGAGEMENT, as SHOP or OUT-DOOR FOREMAN, by a thoroughly practical Man, Carpenter by trade. First class reference.—Address, 312, Office of "The Builder."

TO BUILDERS.—WANTED, by a Young Man, EMPLOYMENT, to work planning, mortise, or moulding machine.—Address, W. THOMPSON, 11, Little Essex-street, Bury-street, Finsbury.

TO CONTRACTORS AND BUILDERS.—WANTED, by the Advertiser, a SITUATION, in any position of trust and confidence. Has been with a London firm several years as Cashier and Agent for very extensive works. Well acquainted with the business. Good references and security if required.—Address, 311, Office of "The Builder."

TO ARCHITECTS AND BUILDERS.—WANTED, by a practical Man, an ENGAGEMENT as CLERK OF WORKS, GENERAL FOREMAN, or FOREMAN of a JOB, on keep account, measure, draw, &c. Carpenter by trade. Age 31.—Address, W. J. 21, St. Thomas's-parish, Finsbury-park, Holloway.

TO ARCHITECTS AND BUILDERS.—WANTED, by a thoroughly practical CLERK OF WORKS, a RE-ENGAGEMENT, or a SITUATION as Managing Foreman. Competent to prepare plans, working and detail drawings, measure up work, and take out quantities.—Address, D. 43, Grafton-road, Kentish-town, N.W.

TO BUILDERS AND CONTRACTORS.—WANTED, a RE-ENGAGEMENT, as ESTIMATING, MEASURING, QUANTITY TAKING, and GENERAL MANAGING CLERK, to be in competition.—Address, J. R. 4, Chapel-place, South Audley-street, W.

TO PLUMBERS AND BUILDERS.—WANTED, by the Advertiser, a CONSTANCY. Is a good plumber, and can do plumbing and glazing, or a WORKING FOREMAN. Has held a similar situation, place, Bantol-street, Regent's-park, N.W.

TO BUILDERS AND CONTRACTORS.—WANTED, by an experienced, thoroughly practical and energetic Man, a SITUATION as MANAGER or GENERAL FOREMAN. Ten years' first class reference. Country preferred. Just completed a heavy contract.—Address, BEA, 130, Great Portland-street, London, E.

TO BUILDERS AND CONTRACTORS.—WANTED, by the Advertiser, BRICKWORK or POINTING, by the Rd or otherwise, with or without scaffolding.—Address, A. B. C. 343, Albany-street, Cambridge.

TO BUILDERS AND CONTRACTORS.—WANTED, a RE-ENGAGEMENT, as GENERAL FOREMAN, CLERK OF WORKS, or Charge of a Job, by a thoroughly practical and energetic Man (11 years by trade) aged 42, well up in all branches, measure up work, detail and other drawings, setting out work, &c. First-class testimonials and references.—Address, 292, Office of "The Builder."

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TO DECORATORS, BUILDERS, &c.—WANTED, by an ARTIST, Decorative and Practical Draughtsman, an ENGAGEMENT, to take the entire management, or otherwise, of decorative department of a permanent engagement only. Also a specimen of work.—Address, 225, Office of "The Builder."

TO BUILDERS &c.—WANTED, a RE-ENGAGEMENT, as WORKING FOREMAN OF BRICKLAYERS, or to take Charge of a job, or to take it by the Rd, by a thoroughly practical Man, aged 31. Good references.—Address, W. J. 21, St. Thomas's-parish, Finsbury.

TO BUILDERS AND CONTRACTORS.—WANTED, by a BUILDER'S FOREMAN, a RE-ENGAGEMENT as GENERAL or SHOP FOREMAN. Carpenter and joiner. Good draughtsman; well up in every branch of the building trade. First-class references from London builders. Town or country.—Address, ALFRED, 15, Prince-street, Walworth-road.

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WANTED, a RE-ENGAGEMENT, as FOREMAN of JOINERS, or the Charge of a Job. Has a practical knowledge of all branches. He will take the work by contract. Has carried out good jobs under London Builders & Architects. No spots in his life in any firm.—Address, FOREMAN, Finsbury, High-street, Stoke Newington.

WANTED, by a Young Man, a constant PLACE as PLUMBER, ZINCWORKER, &c. Wages and references.—Address, S. R. 2, Drury-park, Russell-street, New Church-road, Cambridge.

TO WRITERS AND GRAINERS.—WANTED, to ARTICLE a Youth to a good WRITER and GRAINER.—Address, A. Z. 1, Post-office, Cathedral Square, asking no remuneration and no particulars.

WANTED, an ENGAGEMENT, by a draughtsman, a capable and experienced DRAUGHTSMAN, experienced in preparing a situation, W. & C. and detail drawings, and able to work in any of the above departments.—Address, M. 37, St. Paul's-terrace, New North Road, Finsbury, N.

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TO BUILDERS, PLUMBERS, DECORATORS, &c.—WANTED, by an experienced PLUMBER, a SITUATION as FOREMAN, having for several years past acted the same in a large firm. No objection to supervising other branches or take charge of a business. Can measure and keep accounts. Understands plans and taking out quantities. First-class references as to ability and integrity.—Address, FREDERICK, 27, Office of "The Builder."

WANTED, an ENGAGEMENT as FOREMAN OF MILL or MACHINERY and a Dress Joiner, by a young man, of good skill and a practical experience. Joiner by trade. Age 30.—Address, 292, Office of "The Builder."

TO BUILDERS AND DECORATORS.—WANTED, by a respectable and experienced Young Man, a SITUATION as JOHNSON or PAPERHANGER and PAINTER. Town or country.—Address, JOSEPH FARRIS, 35, Hastings-street, Brompton-crescent, W.C.

TO BUILDERS AND CONTRACTORS.—WANTED, by the Advertiser, a SITUATION as CLERK to the above. Thoroughly understands the routine of the office. Good references. Age 27.—Address, W. L. 207, Bedford-street, Cambridge-street, E.C.

TO BUILDERS, &c.—WANTED, by the Advertiser, a SITUATION as CLERK to the above. Well up in all the office duties, including plan cost, &c. Age 25. Good references.—Address, F. Y. 9, Dorset-street, Liverpool-road, N.

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TO MASTER MASONS AND OTHERS.—WANTED, JOB by MASON of considerable experience in a London firm. Letter calling for any description of ornamental masonry.—Address, A. Z. 1, Post-office, St. Mark's, Westminster.

TO SMITHS, &c.—WANTED, a SITUATION, by a first class Workman, as above. Good references.—Address, T. EVANS, 59, Post-office, Shepherdess-walk, City-road, N.

WANTED, a RE-ENGAGEMENT, as WORKING FOREMAN OF BRICKLAYERS, or Charge of a Job. Used to management and brickwork in all its branches. No objection to country. Leaving employer through sickness of work. Age 32.—Address, C. F. 10, Faber-street, Epsom, Surrey.

TO BRICKLAYERS AND BUILDERS.—WANTED, by a YOUNG MAN, aged 21, EMPLOYMENT as IMPROVED in the BRICKLAYING. Has had two years' experience in laying bricks. The Advertiser is the son of a Builder, but forced to seek employment through pecuniary losses. Can also measure up work, estimate, and keep books. Wages moderate.—Address, B. F. TAYLOR, Pickwick House, East Barnet-road, West Barnet, Herts.

TO BUILDERS' FOREMEN, &c.—WANTED, a SITUATION as an IMPROVED in the BUILDING LINE, Finsbury, &c. by a Young Man, who has served five years at good jobs in London. No objection to handwork at any time. Wages, &c. agreed upon after the first week. Good references if required.—Address, No. 345, Office of "The Builder."

WANTED, by the Advertiser, a SITUATION or JOB, as WRITER, GRAINER, and MILLAR. Can do embroidery if required.—Address, G. O. 5, Marlborough-road, Essex-road, Islington.

WANTED, by a thoroughly practical PLUMBER and HOT-WATER-FITTER, a constant SITUATION, or as THREE-BRANCH HAND. Good reference if required.—Address, W. W. 46, Queen-street, E.C.

TO BUILDERS AND OTHERS.—WANTED, a RE-ENGAGEMENT, as BUILDER'S CLERK and ASSISTANT, or as Clerk of Works, on or off the job. Age 25. Good references.—Address, H. W. C. 8, Grosvenor-street, Finsbury.

TO BUILDERS.—WANTED, by the Advertiser, a RE-ENGAGEMENT, as CLERK. Is thoroughly acquainted with the whole routine, estimating, bookkeeping, price cost, making out accounts, &c. quick at figures, and a good penman. Aged 28.—Address, A. B. 10, Hunter-street, Brunswick-square, W.C.

TO ARCHITECTS AND SURVEYORS.—WANTED, a RE-ENGAGEMENT, by a thoroughly well qualified and practical ASSISTANT, accustomed to the various office duties, and superior evidence of works. Good draughtsman. References.—Address, No. 311, Office of "The Builder."

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WANTED, by a steady, practical CARPENTER and JOINER, FIREWORK, or a SITUATION as WORKING FOREMAN.—Address, T. W. 38, Union-street, Clerkenwell-square, N.W.

TO BUILDERS AND OTHERS.—WANTED, by the Advertiser, a SITUATION as GAS-FITTER, BELL-JANGER, or HOT-WATER HAND. Can work the job if required. No objection to a country. Age 34. Good references given.—Address, W. K. W. 5, Stamford-street, White Hart-street, Tottenham.

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WANTED, a RE-ENGAGEMENT, as GENERAL FOREMAN or CLERK OF WORKS, by a thoroughly practical and energetic Man in town or country. Thoroughly conversant with the management of all trades, measuring up work, &c. First-class references and testimonials.—Address, 2nd, Office of "The Builder."

WANTED, by a PLUMBER, a JOB or a CONSTANT PLACE. No objection to fill up his time in the other branches.—Address, S. W. Post-office, Harrow-road, West.

The Builder.

VOL. XXVIII.—No. 1421.

Piccadilly and Pall Mall.

IN the days when Charles II. sauntered and loitered in St. James's Park, feeding the ducks at the decoy; chatting with Storey, at Storey's Gate, about the necessary "wyer," reeds, "polles," and baskets for their island; passing on to the antelopes, Arabian sheep, Guinea goats, and other zoological items newly presented to him, and located in an inclosure there; watching the 300 workmen expeditiously forming the canal at his command; glancing at the orange-trees in boxes, that reminded him of his continental exile; approving the long, smooth, mall strewn with cockle-

shells for the game of pall-mall, and sending, too, the ball flying often, as Waller sings, "as from a smoking culverin 'twere shot;" planting trees; or passing into the palace garden, watering the acorns planted from the Boscobel oak, and shocking Evelyn with light talk with Nell Gwynn over the top of the garden-wall—two hundred years ago, in fine, Piccadilly and Pall-mall, with the district lying between the Haymarket and Hyde Park, with its surroundings northwards and southwards, were undergoing the process we have seen carried out in our own day in Belgravia, Westbournia, Tyburnia, South Kensington, and Notting-hill, among other places. The broad green pastures north of St. James's Park were laid out in streets; and St. James's Fields, with the hay-scented Hay-hill Farm, were swiftly covered with mansions. Streets and houses spoken of as the westernmost of the new buildings, within a short period were hemmed in with fresh erections. A new court suburb, in fact, arose, which extended as far as Berkeley House, on the road to Hyde Park; the intermediate space between the toll-pike at this spot and a cluster of cottages at Hyde Park-corner being occupied with the "figure-yards" of staturaries.

Lord Clarendon was the first nobleman who built himself a residence in this new district. His example was followed by Lords Burlington and Berkeley, who built to the east and west of him on the same highway leading into Hyde Park. At the same date the Earl of St. Alban's planned St. James's-square. Shortly afterwards, the widow of Lord Berkeley built Berkeley-street and Stratton-street. A church was required for the new district, and accordingly St. James's Church was built, on ground belonging to the Earl of St. Alban's, with its front to Jernyn-street, then a more important place than "ye highway unto Hyde Park" we now call Piccadilly; for the Duchess of Richmond and Colonel Churchill lived in it. Sir Christopher Wren designed this edifice, Gibbons beautified it with his carvings, and Evelyn wrote of it, "There was no altar anywhere in England, nor has

there been any abroad, more handsomely adorned." Archbishop Tenison was the first rector; and a large and fashionable congregation immediately filled it. Closer to St. James's Palace the dainty Duchess of Cleveland built Cleveland House, and sold land round about it, on which more houses were built. Good houses were erected in Pall-mall, and inhabited by persons of fashion, Nell Gwynne being one of them. St. James's-place, Park-place, Arlington-street, Sackville-street, known as the longest in London without a turning; Bond-street, called after Sir Thomas Bond, of Peckham, comptroller of the household to the queen-mother and friend of James II.; Albemarle-street, Dover-street, besides all the streets departing from and surrounding St. James's-square, rose on all sides. The house newly finished by Lord Clarendon was speedily taken down that streets might occupy its site; and building operations were the fashion of the day. The noblemen who had shared the fortunes of Charles, or kept up communication with the royal exiles on the Continent, were possessed, as it were, with reminiscences of the splendour of foreign palaces, and strove to produce an approximation to them. Evelyn wrote of Berkeley House, "It is very well built, and has many noble rooms, but they are not very convenient, consisting but of one *corps de logis*. They are all rooms of state, without closets. The staircase is of cedar; the furniture is princely." And of Clarendon House, "I pronounce it the first palace in England, deserving all I have said of it, and a better economist." And again, when he deplored the demolition of the one and the building on the grounds of the other: "To such a mad intemperance was the age come of building about a city, by far too disproportionate already to the nation: I having in my time seen it almost as large again as it was within my memory."

The site of this "mad intemperance" has now been made the subject of an interesting volume entitled "Round about Piccadilly and Pall-mall."* Mr. Wheatley shows us the London of Evelyn and Pepys; of Sir Charles Sedley and Henry Jermy; of Sir Peter Lely and Sir Godfrey Kneller; of Moll Davis, Mary Knight, Nell Gwynn, and the rest; of Arabella Churchill and Sarah Jennings; of Philibert Grammont, Charles Sackville, Roger L'Estrange, of the credulous who consulted Lilly, and of the *savans* who looked up to Boyle. His picture is dated after the Restoration; and there are the new streets, compared with the gabled painted over-hanging timber houses of the City before the fire, clean, cool, wide, and straight. He tells us who built them and who lived in them: in plain terms and neutral tints; rather, perhaps, too plain and too neutral; for brighter colours might have been used with advantage, as, by right, the subject is entitled to more than mere catalogue precision. It was a period of magnificence and art-patronage as well as of licentious gallantry, and the brush must be often steeped in brilliant hues that would rightly depict it. Intermixed with the outskirts of this new district are the extensions made in the next century, which covered Mayfair, created Berkeley-square, continued the line of houses in Piccadilly to Hyde Park-corner, and crept down Park-lane; the London of Addison, Steele, Pope, Gay, Swift, Prior, and Prior's Kitty, of Garrick and Hogarth. In the *Weekly Journal*, of June 1st, 1717, there is a paragraph:—"The new buildings between Bond-street and Mary-le-bone go on with all possible diligence; and the houses even let and sell before they are built. They are already in great forwardness." Defoe, in his "Tour," wrote, "Several fine new streets, as Hill-street, Charles-street, &c., are built near Berkeley-square and

Mayfair, in a place which herds and herdsmen, very few years ago, only inhabited. But now the residence of many of the first gentry, equally splendid and convenient." And Horace Walpole declared, November, 1759, "I stared to-day at Piccadilly like a country squire; there are twenty new stone houses." Over and above the information connecting these districts with these times are further extensions and supplemental facts that bring the work in parts up to the present day.

Piccadilly is first described with the streets to the north and south of it; then Hyde Park, the Green Park, St. James's Park, St. James's and Buckingham palaces, Pall-mall, and St. James's-square.

Most of the houses of Piccadilly are identified with interesting associations. The three first great houses,—Clarendon House, Burlington House, and Berkeley House,—have three chapters set apart to them, in which are given a large number of facts relating to their building, builders, residents, and visitors. Clarendon House, we know, was pulled down in the lifetime of Evelyn, as he records the prize paid for the purchase and realised by the old materials, and the intention to build a new town and most magnificent piazza upon the site. Burlington House is now more widely known than ever; and Berkeley House, afterwards called Devonshire House, burnt down in 1733, and rebuilt by the third Duke of Devonshire, from a design by Kent, is to the full as glorified by association with wit, rank, and beauty as it has ever been. The less important houses are taken in rotation, beginning with Swan & Edgar's, on the north side, and coming round past Fortnum & Mason's, which Melibœus said, so appreciatively, would have been better named as Savory & Moore's, to the White Bear Inn, on the south side. In this double row of houses have lived or visited celebrities almost without number. Handel, Kent, and the *danseuse* Violette (Mrs. Garrick) were domiciled in Burlington House in the time of the celebrated third Earl. Fox lodged at an oilman's in this street; and his father, Lord Holland, also lived in it, in 1771. William Beckford, the author of "Vathek;" George Selwyn; Verrio, the painter; the Earl of Sunderland, described by Queen Anne, passionately, as the "subtillest workingest villain that is on the face of the earth;" Sir Francis Burdett, Lord Byron, Sir Thomas Lawrence, Sir William Coventry, who married the beautiful Miss Gunning, the Duke of Queensberry, and Lord Palmerston, are mentioned by Mr. Wheatley as having, at various times, occupied houses in Piccadilly. In the Albany, too, have lived Lord Byron, Canning, Macaulay, Smirke, Gell, Luttrell, and "Monk" Lewis, among other notabilities. But it is as the Great Western-road, with toll-pike at intervals; highwaymen scarcely farther apart; "figures yards" adjoining one another; groups of "fine gentlemen" passing along it to "take the air" in Hyde Park or try their luck at the gaming-house, either at bowls or cards; coaches full of the "quality" stuck fast by reason of the badness of the ways, or on their road to race each other in Hyde Park; with knots of passengers staring at the calash the Count de Grammont had had made in Paris and presented to the King, and which Lady Castlemaine and La Belle Stuart both importuned him to lend them as soon as they saw it; or at the Duchess of Cleveland, standing up in her chariot to call Wycherley a rascal; or at Kynaston, the handsome youth the actor of female parts, who, dressed in his stage costume, was made much of, and driven round the park by ladies of fashion directly the play was over, that we find most contrast to its present condition. Mr. Wheatley goes into the question of the origin of the name Piccadilly, and, after arraying all the facts he has been able to gather,

* "Round about Piccadilly and Pall-mall; or, a Ramble from the Haymarket to Hyde Park, consisting of a Retrospect of the various Changes that have occurred in the Court End of London." By Henry B. Wheatley. London: Smith, Elder, & Co. 1870.

comes to the conclusion that the district was called Piccadilly, and the principal house on it Piccadilly Hall, which was a distinct building to Shavers' Hall, or the great gaming-house, which was, also, from its situation, spoken of as Piccadilly. He believes Higgins the tailor, mentioned in Blount's "Glossographia" as the builder of the gambling-house, to have been a myth. Yet we find it written in the "New World of Words," compiled by Milton's nephew, as a definition of the word Piccadilly, "the hem about the skirt of a garment; the extremity or utmost end of anything: whence a great gaming-house, built by one Higgins, a tailor, famous for making such old-fashioned skirts, was called Piccadilly, and a street in the suburbs of London is still known by that name:" showing the myth was taken to be a fact at that date. The pickadille was a name also given to a particularly shaped collar, alluded to by Colgrave, Barnaby Riche, Overbury, Middleton, Fletcher, and Drayton.

Speaking of the "Junior Athenæum Club," at the corner of Down-street, the author says the Club bought the house "from Mrs. Hope for 5,650*l.*, and in addition they have to pay a ground-rent of 590*l.*" This is not quite correct. The sum paid to Mrs. Hope was 45,000*l.*, the remainder of the amount named was the cost of furniture, fittings, repairs, and alterations.

When we come to Pall-mall, the highway between St. James's Palace and Charing-cross, we seem, more distinctly still, to step back into the days of the Stuarts. It was then a roadway, bounded on the south by the wall of the park, and on the north ran an avenue of trees forming a mall, with a few small houses on the south side. A grant was made of a piece of ground 1,400 ft. in length, and 23 ft. in breadth, to Dan O'Neale, groom of the bedchamber, and John Denham, surveyor of the works, "between St. James's Park and Pall-mall," and the new street was commenced forthwith. It was at first spoken of as Catharine-street, in honour of Catharine of Braganza, but on the formation of the new Pall-mall in the park, was distinguished as the Old Pall-mall. In the Act for creating the parish of St. James, 1685, the transition is indicated in the title, "Catharine-street *alias* Pall-mall-street." Dr. Sydenham appears to have been one of the earliest and longest residents. To his house flocked the "quality" with their conflicting complaints, amongst which the spleen was as troublesome as any; and if there were courtiers not upon his list of patients, we may conclude that these, some time or other, consulted another resident in the same street, Dr. Haworth, physician to James II., when Duke of York. A sedan-chair stand became one of the institutions of the street, and many a bright "toast of the town" has been carried in these conveyances through this pleasant thoroughfare. We may be sure scores of sedans set down their occupants at Joseph Clarke's, the postmaster, whose extraordinary flexibility enabled him to puzzle surgeons and tailors alike; and at Lord Bolingbroke's, when he returned from exile; and at Mrs. Delany's. Gay came often to Lord Bolingbroke's, and he wrote of the street, entranced:—

"Oh, bear me to the paths of fair Pall-mall,
Safe are thy pavements, grateful is thy smell;
At distance rolls along the guided coach,
Nor sturdy cismen on thy walls enroach," &c.

Steele, Sterne, Gibbon, Quin, Mrs. Abington, were among the later celebrities who lodged in the street temporarily; and Defoe wrote in 1708, "I am lodged in the street called Pall-mall, the ordinary residence of all strangers, because of its vicinity to the Queen's Palace, the park, the Parliament House, the theatres, and the chocolate and coffee houses, where the best company frequent." Mr. Wheatley quotes, too, the lines of Charles Morris as another indication of the esteem in which this thoroughfare has been held:—

"In town let me live, then, in town let me die;
For in truth I can't re-lit the country, not I.
If one must have a villa in summer to dwell,
Oh give me the sweet shady side of Pall-mall."

As a specimen of the mode in which the different subjects are treated, we will quote a portion of Mr. Wheatley's description of another celebrated mansion, Chesterfield House:—

"The chief glory of Mayfair is the fine mansion, Chesterfield House, in South Audley-street, which was built by Isaac Ware, for the great Earl of Chesterfield. Its present position, surrounded by streets and houses, is very different from what it was 120 years ago. The earl's friends were surprised at his having chosen so desolate a place, and he himself said that he re-

quired a house-dog, as he had situated his house among thieves and murderers. This, however, was soon changed, for Chesterfield House became a centre, and the fashionable world came and settled round it. Although the exterior of the house is pretensions and without elegance, the interior is fine, and the earl was justly proud of it. He watched its progress with the greatest interest, and wrote lovingly about it to his friends. . . . He was proud of the large courtyard in front, and the large garden behind, two things rare in London, though then common in Paris. In March, 1749, he writes to his friend, Solomon Dayrolles:—'I have yet finished nothing but my boudoir and my library; the former is the gayest and most cheerful room in England, the latter the best.' . . . One room had a large looking-glass made up of pieces, but with all the joints painted over with Cupids and roses; another had its candle-branches constructed to represent gilt tasselled ropes. The Italian drawing-room, besides its splendid glass chandelier, had a noble marble mantelpiece, with standing figures." Mr. Wheatley denies that this house is about to be pulled down.

The author, though not giving very clear architectural descriptions, makes special mention of the marble staircase as the great feature of the house. This was originally at Cannons, but was purchased from the Duke of Chandos by the earl when that seat was taken down. The ill character of the neighbourhood alluded to in the requirement of a house-dog is borne out by the fact that Jack Sheppard lodged in Mayfair; but we must consider it gilded, if not altogether changed, when we count up the number of royal personages who have since lived in South Audley-street. Louis XVIII., Charles X., Egalité, Duke de Chartres, and Queen Caroline have all been residents.

The parks are always pleasant subjects for comment, and Mr. Wheatley places them in their usual agreeable light. There are several illustrations giving views of different portions and objects in them. In a plan of St. James's Park in the reign of Charles II., reduced from a plan in Kip's *Théâtre de la Grande Bretagne*, we can see the palace, with Cleveland House nestling close against it, and the Mall stretching out on both sides of it as straight as an arrow, the canal crossing the park horizontally, and, equally straight, Rosamond's Pond at the head of it, divided from it only by avenues of trees, the Duck and Deasy Island at the other end, and the Admiralty, Horse Guards, Till-yard, and Cock-pit close by. There is a good account of the famous pond in which so many sixteenth-century suicides took place. It is rightly stated that it was filled up in 1770; but it might have been added that another pond in the Park received the name, and bore it for seventy years after that date. A view shows Constitution-hill in 1748, an open piece of country, with a carriage and four, horsemen, and a few foot-passengers on the unfenced road. Mr. Wheatley reminds us it was the scene of the meeting between Charles II. and his brother, when the former, in reply to the congratulations of James, remarked,—"No kind of danger, James, for I am sure no man in England will take away my life to make you king." We are shown, too, the Ranger's Lodge in the Green Park, and the Cheesecake House in Hyde Park, taken down in 1835. This last the author identifies as the "Grave Maurice's Head," famous for cheese-cakes, tarts, and syllabubs in the reign of James I., and mentioned twice in Shirley's play of "Hyde Park," one of the characters declaring a bottle had been sent for from the "Maurice"; and another, that the wine was good, because "it comes from his excellence's head." Our fashionable forefathers were fond of pastry: not only did they consume "maids of honour" at Richmond in large quantities, but they gave the nicknames of Tart Hall to a house in Piccadilly at this time, and were not long before they furnished a large trade to the Chelsea Bun-house. Very acceptable were the syllabubs, doubtless, to the visitors in Hyde Park, if the fashion long prevailed to hunt the most distinguished visitors, as described in a letter to Mr. Scudamore from "J. B." quoted by the author from *Notes and Queries*.—"When my Lord Protector's coach came unto y^e park wth Col. Ingoldsby and my lord's daughters only (three of them all in greene, &c.), the coaches and horses flocked about them like some miracle, but they galloped (after y^e mode court-pace now, and wth they all use where-ever they goe) round and round y^e parke, and all y^e great multitude hunted them, and caught them still at y^e turns like a hare, and then made a lane with all

reverent haste for them, and soe after them againe, that I never saw y^e like in my life." There were 1,600 coaches present,—a fact the writer easily ascertained, because each paid an entrance-toll of 2s. 6d., and every horse was charged 1s. The ostling of the ladies Cromwell at the turn is explained by the Frenchman Mission, who relates, in his mention of the "diversion of the ring," that the coaches of the company drove round and round; but "when they have turn'd for some time round one way, they face about and turn t'other: so rowls the world." Things have little changed.

As we have mentioned the illustrations of the parks, we will add a list of the houses shown in ours. First, there is Hyde Park-corner with Apsley House in 1800; then come Melbourne, or York House, now the Albany; Hertford House (formerly Barrymore House), which is No. 105, Piccadilly, built on the figure yard of John Van Nost, described by his widow as the "late famous sculptor"; Old Apsley House, 1828, when it was a red-brick mansion as designed by the brothers Adams, and innocent of the facing of Bath stone it has since put on; three views of Burlington House, the original structure, set in its long prim garden, and showing the slip since converted into Burlington Arcade, the front, as left by the third earl, taken from a photograph in 1869, and a view of the colonnade, saved only just in time from being dispersed as old materials and now waiting its fate in Battersea Park; with a fourth out of the old brick curtain wall, now demolished, that was one of the curiosities of London in its time; Queensberry House, where Gay enjoyed ducal hospitality so long, its present representative Urbidge House; Marshal Wade's house, in Old Burlington-street, built by the third Earl of Burlington, and said to be too small to live in and too large to hang to a watch chain; Clarendon House, 1667-83; Devonshire House, 1808; Chesterfield House, Buckingham House in 1718; Schomberg House; and the scene of Carlton House. The old Haymarket Theatre, and the entrance to the Opera House previous to 1820, are also shown; and there is a map of the district surveyed, and a view of one of its principal features, St. James's-square.

Half the frail ladies of the court seem to have flocked to the piazza, as this last-mentioned square was first called, directly it was built. Arabella Churchill and Molly Davis lived next door to one another in it; Nell Gwynn, and he who is said to have received an edictum for giving her up to the king, Charles Sackville, Earl of Middlesex, also lived in it; and Catharine Sedley, when sent from court, had a house furnished for her here, and, showing how cautiously open sin of one sort was considered compatible with religious observances, "a seat taken for her in the new consecrated St. Ann's Church." The memories of other ladies with equal charms and superior reputations are associated with the new piazza; for at No. 6, lived John, Lord Hervey, who married the lovely Molly Lepell, and his son, who married Miss Chudleigh; and at No. 10 lived "Ada! sole daughter of my house and heart," the Countess of Lovelace. Scarcely indeed, is there a house in the square that has not been inhabited by some well-known personage. It has been, too, a focus of curious and splendid assemblies. One hereditary Prince of Tuscany was lodged in the Earl of St. Alban's house here in 1669, and in honour of the king's birthday gave an exhibition of fanciful fireworks to the populace, and distributed several oaks of Italian wine and beer to the admiring crowd. William III. snipped with Earl Romney "in St. James's Great Square," that he might see the grand display of fireworks there soon after his accession; and again, a second display, before the house of the Dutch Ambassador, with a bonfire of 140 barrels of pitch, and a great distribution of wine, in commemoration of the peace. When the Earl of Ormonde was recalled from Ireland by James II., he was escorted to his house in this square by a great greeting multitude; and a less friendly mob stoned Lord Castlereagh's house in it. Another great crowd came pouring into the square when Mayor Percy arrived with the three French eagles that were substantiations of his news of the victory of Waterloo; and others to see Queen Caroline pass in state daily to the House of Peers, in 1820, from the house formerly occupied by the reputed author of "Janus" and let her Majesty by his widow. Brilliant gatherings there have been, too, of literary and artistic celebrities in several of the houses here—notably, those of the Earl of Blessington and Earl de Grey; not to be eclipsed, even in point of fashion, by the gay

company with high heels and powdered hair, that made Almack's their head-quarters in its best days. The character of the place is best ironically expressed, perhaps, by the fact that Richardson placed the residence of Sir Charles Grandison in it. It was linked to the domains of art by Wedgwood, who had his show-rooms here. Leigh Hunt tells us he has walked down Sackville-street more than once, that he might tread the same stones Mrs. Inchbald trod as she watched the light in Dr. Warren's window. Surely, with the same regard for what is worthy, we might linger in this square for a summer's day, and not exhaust its associations.

Mr. Wheatley has done much to intensify our enjoyment of this district; more, even, than the Earl of Burlington did when he painted the railings before his house with ultramarine at a guinea per ounce. Nevertheless, there will be readers of his work who will miss several requisites. Like the salad that required three persons to make it, including a maniac for the mixing, the treatment of such a subject calls for many gifts. We must be content if the materials furnished are full and correct; and be ready to throw in, as we read, the feeling and fancy they evoke. We promise our readers many momentary realisations of old times and pleasant reverberations from them before they have walked in half the footsteps pointed out.

THE SIXTY-SIXTH EXHIBITION OF THE SOCIETY OF PAINTERS IN WATER-COLOURS.

It is impracticable, within the limits at our disposal, to attempt anything like a classifying criticism of the 261 water-colour drawings, or, as most of them may more appropriately be called, "paintings in water-colours," which compose the attractive exhibition of the present season. All we can attempt is, to point out a few of those which most readily strike the attention of the visitor, or which, in our judgment, have the highest claim to something more than a passing glance of admiration. The general character of the drawings is good; and there are several works, by different well-known hands, which call for the careful study of the student, not less than that of the critic.

Of those masters of their craft whose works speak so distinctly from the walls of the Pall Mall Gallery, the first name that occurs is one which is professed with the sad words "the late." It is in death alone that the hand of George Rosenberg has lost its cunning. Independently of this special claim on our regret and our sympathy, the purely artistic qualities of many, not to say of all, of the seven drawings exhibited under the name of this artist, are of a very striking character. We see ample evidence of a rare power, first to seize a special aspect of nature, to apprehend it in its very essence, and then to project it upon paper. The scenes are not like reflexions in a mirror, fixed by the arts of the chemist, but they are life-like reproductions, in which the master-thought of the scene gives tone to the whole. Thus in the "Ice Plough—the Glacier at Bawr Bræ, Norway" (126) the dark, transient, sapphire hue of the riven ice is a marvel of artistic felicity. The dark green of the foliage that clusters round the double-pointed gateway of "Goodrich Castle" again looks like a bit of ivy brought into the room and hung by the side of pictures. The "Interior of Tintern Abbey" (55) is a less accented production; but as a specimen of a pure, broad, level touch, filling a large surface with a fine representation of a noble ruin, it affords an admirable study.

Among artists now happily living, one of the first places in the present exhibition must be awarded to Carl Haas, who contributes four pictures of rare and striking merit. We have no room to enter into the question of the new style of art which is developing out of what was once water-colour drawing. Whatever it may hereafter become, we can trace not only change, but progress, within the last twelve months. And it is with the more hope that we regard the issue of a very hazardous experiment, when we see it in progress under the hands of a master who can, at all events, when he chooses, produce a water-colour drawing, pure and simple. Such is the "Entrance to Ancient Samaria" (171). Such is the architectural landscape, glowing in the hues of the Eastern sunlight, that forms the background to the gorgeous robes, and striking physiognomy of "Sheik Michael el Muerab," at Falmira (68). The fine bearded face (9), with

the play of iridescent colour on the stick and the folds of the robe, and the dark-eyed "Semitic Belle" (38), are portraits that refuse to leave the memory.

Of the two contributions by Mr. Holman Hunt we can only remark that, proceeding from the pencil of an artist of such acknowledged power of minute and elaborate finish, they ought to be labelled "Note on Colours," "Rough Sketch," or "Pictorial Memorandum," or designated by some title to show that they were only intended to enrich the artist's own memory, and serve for the basis of future paintings. The glow of the "Sunset at Chimadilly," audacious and violent as it must seem to English eyes, is not an impossible effect. It twinkles and shimmers on the paper till you almost withdraw the eye. But in the queerly-drawn foliage in the foreground, the light shines on the wrong side of the plants. They must have been drawn in the morning, and would have had a totally different visual effect when interposed between the eye and that purple glory of sundown. Again, the strange, Medieval—almost Japanese—conventional halo which represents the sun, in the "Festa at Fiesole" (71), does produce on the eye the effect of that disc peeping through foliage. But how much is requisite in order to form this hint into a picture? Why should the head of the little boy who drops his drum be so grotesquely disproportioned? Why should trees, and girls, and musicians, be lined in by heavy touches like the efforts of a child with a brush? No artist can escape the penalty of taking liberties with his own fame.

Mr. C. J. Pinwell's "Elkirk of Love" (114) is one of the pictures that first catch the eye. It possesses much merit. The expression of the faces is often very tender,—always very true, and the sentiment is very pleasing. But the composition has not been kept within the limits of probability. Some stirring central attraction, the want of which is instinctively felt, alone could have brought these forty figures together in that scene. The cathedral is built of large stones, made of terra cotta. The ground is of no terrestrial material at all. This clever artist must give his imagination truths to work upon, to take the rank his powers entitle him to reach.

Mr. Gilbert's "Arrest of Guido Fawkes" (No. 104) is, it is unnecessary to say, very clever, and tells the tale well. The defiant stare of the bound ruffian, and the frightened look of the shrinking king, are admirable; and the soft cheek and well-tended locks of the young man who is straining the cords heighten the ruggedness of the prisoner. But the king, although sufficiently contemptible, is not James VI., who, by the way, was not hump-backed, as Mr. Gilbert's sovereign appears to be.

Mr. Branwhite has some remarkable instances of power over the pencil. His "Early Moonlight, a Black Frost" (No. 29) is a perfect photograph; and we think that in this, and perhaps one or two other instances, the artist has called in the aid of photography to assist in his rendering of nature. Mr. Birket Foster's "Weald of Surrey" requires to be seen at a certain distance, and then gives the swell of a rich English landscape. We have by no means exhausted the list of pictures that stand on the same line of merit. But we must claim admiration for No. 229, "Lighthouse, Messina, Calabria," by Mr. T. M. Richardson. Of what a water-colour drawing should be, in the opinion of those who hold with the early method of the art, we consider this the best specimen in the room. The scene is admirably chosen, lovely in itself, well arranged as a composition on the paper, and produced by those clear, glowing touches of pure colour, with exactly the right amount of detail and of finish that were the pride of the grand old draughtsmen who founded the English school of water-colours.

Mr. B. Burne Jones shows, with some eccentricities, qualities of very high order. His "Phyllis and Demophoon" (154), and "Love disguised as Reason" (64), will gratify others besides his own circle of unequalled admirers.

Mr. Gastineau, the Nestor of the Society, exhibits some pictures that all must think remarkable when the number of years during which he has practised the art is remembered; and few persons will visit the gallery without noticing (24) "Waiting for the Ferry-Boat," Walter Goodall; (84) "Evening," Brittan Willis; (86) "Castel Nuovo, Naples," E. A. Goodall; (94) "Vessels running for Yarmouth Roads," Duncan; (145) "Interior of Milan Cathedral," S. Read; and others.

THE ART-UNION OF LONDON ANNUAL MEETING.

THE 34th annual general meeting of the members of this institution took place on Tuesday last, on the stage of the Adelphi Theatre (by the kind permission of Mr. Benjamin Webster), for the purpose of receiving the council's report, and for the distribution of the amount subscribed, with a view to the purchase of works of art during the year 1870; Lord Houghton, the president, in the chair.

Amongst the company were—The Dean of Canterbury, Professor Donaldson, Mr. John Martin, Mr. J. Fahey, Mr. G. Reid, Mr. J. B. Butterworth, Mr. J. Hoppod, Mr. Lewis Pocock, and Mr. E. E. Antrobus (hon. secretaries), Mr. Lumb Stocks, A.R.A., &c.

Mr. Lewis Pocock read the following

REPORT.

The Council of the Art-Union of London, in presenting their thirty-fourth Annual Report, have the satisfaction of stating that, in spite of the depression existing in all mercantile operations, not only in this country, but in the colonies and abroad, the popularity of the work presented to the subscribers has raised the amount collected to 10,710 10s. 6d.

The engraving to be presented to the subscribers for the ensuing year, "Light and Darkness," from a picture by Mr. George Smith, is of a subject differing in many respects from those which have been hitherto selected, being of a domestic character, and eminently calculated to awaken sympathy, not only for the Blind Girl, but for the good work she has undertaken.

A Scripture-reader, deprived of sight, she endeavours, by means of that simple but admirable invention which modern science has discovered, to impart to those around her the truths which she herself has learnt to appreciate. The subject has been ably treated by Mr. Smith; the countenance of the blind girl is earnest and impressive, while the effect of her teaching and enthusiasm upon the faces of the several members of the family by which she is surrounded, is excellently depicted. The aged grandfather and grandmother, deep in thought,—the sorrowful countenance of the young mother, the energetic appeal of the sister, are in strong contrast with the undecided expression on the countenance of the husband, wavering between the influences of a drunken associate and of the words of the reader. The engraving, the Council believe, will prove extremely popular, and acceptable to the subscribers of the Art-Union.

The Council have secured for the Society a very fine copy in chromolithography, by Messrs. Kell, of a drawing by Belagio-Como, by Mr. Birket Foster, a number of impressions of which will be distributed on this occasion.

Vacancies in the Council, caused by the retirement of Thomas Bell, esq., F.R.S., and James Anderson Rose, esq., F.R.S.L., have been filled up by the election of the Hon. Alfred Bagot and the Rev. Dr. Mortimer.

The Council have, as usual, to return their warm thanks to the local honorary secretaries and agents in every quarter of the globe for their continued zealous endeavours to spread the influence of the Society.

In spite of the depression in almost all our colonial dependencies, and the almost prohibitory amount of the duties, and dearth of money in the United States, they have to record very fair returns. Amongst a large number who merit our thanks, Mr. Darg, of Yokohama; Messrs. Ryra, Franks, Hawkes, Sherriff, and Wilkin, in Australia; Messrs. Potter, of St. John, and Wetmore, of Halifax, deserve particular notice as sending good returns; and, notwithstanding the troubles in New Zealand, good lists have come from our representatives in that place.

The accounts have been audited by three members of the Finance Committee and two gentlemen from the general body of subscribers, namely, Mr. G. J. Fearn and Mr. W. Wright, to whom the thanks of the Council are offered.

The Reserve Fund now amounts to 15,462 12s. 9d. The following is a brief summary of the receipts and expenditure; a detailed account will, as usual, be printed in the Report:—

Amount of subscriptions.....	£10,710 10 6
Cost of prints of the year, report, exhibition, and almanack, including reserve of 2½ per cent.....	4,191 13 6
General printing, rent, salaries, &c.....	2,493 17 1
Set apart for prizes.....	4,990 0 0
Total.....	19,710 10 6

The amount available for the purchase of works of art will be thus allotted:—

23 works at.....	£10 each.
20 ".....	15 "
10 ".....	23 "
13 ".....	25 "
10 ".....	30 "
8 ".....	35 "
0 ".....	40 "
6 ".....	45 "
4 ".....	50 "
2 ".....	60 "
2 ".....	75 "
2 ".....	100 "
1 work at.....	150 "
1 ".....	200 "

There will also be distributed:—

20 Bronzes of the Nelson Column.
200 Chromolithographs, "Religio."

Thus, with the parian busts given to all who have subscribed for ten years consecutively without gaining a prize, there will be 370 prizes, in addition to the work given to every member.

The works selected by the prizeholders of last year were, as usual, exhibited in the Gallery of the Institute of Painters in Water-colours, and large numbers visited the rooms; although, from the greatly increased number of exhibitions open to the public in the present day, our gallery does not attract the throng of visitors which, in former times, on the evenings when it was open, made Saffolk-street well-nigh impassable. The Council have much satisfaction in stating that the quality of the works

selected fully sustained the improvement in point of merit mentioned in last year's Report; and they would urge those who will, to-day, become possessed of the right of selection to take care that the character of the Association, in this respect, does not suffer at their hands. It is most important not to be too precipitate in making selection of a picture: the prizeholder has to remember that he is choosing something which is to hang always before his eyes, and which should tend to educate the taste as well as to please the eye.

It is not to be supposed that this principle applies only to large and expensive works. A simple small picture may exhibit, in its degree, as much truth, beauty, and artistic knowledge as a large canvas. Apart from these considerations, too, it is undeniable that a picture judiciously bought, is a valuable investment, and will at any time realise its cost.

An anecdote or two relating to the operations of this Society as an art-teaching institution for promoting the love of art may not be out of place here.

A lady subscriber, about the year 1839, gained a small prize, and, not having the least knowledge of art, consulted a member of the Council, who, after going the round of all the exhibitions, advised her to take a drawing at the New Water-colour Society for 20*l*. Being much pleased with her new acquisition, a new sensation, it may be called, she paid several visits to the gallery, accompanied by members of her family, and before the close of the season purchased three other drawings, and from year to year, almost ever since, the family have made other purchases, and, from being without a single work of art on their walls, are now possessors of a valuable and important collection. About the same time, a young gentleman, 20*l*. purchased a marine subject at the Old Water-colour Gallery. In his case, too, it was the first work of art he had ever possessed. Since then he had accumulated with great judgment a collection of drawings which may be valued at between 5,000*l*. and 6,000*l*. Many similar instances might be mentioned.

We say, then, emphatically, make your choice with care and deliberation; and if you distrust your own judgment, apply to the Selection Committee, who hold frequent meetings at the galleries, and are always ready to afford advice and assistance.

The field of selection open to the prizeholders has been extended by the addition to our list of two new public galleries lately established in Bond-street.

Since the Council last had occasion to address you, the magnificent suite of rooms built for the Royal Academy, in the year of Burlington House, has been opened; and it is no exaggeration to say that, by the unanimous consent of all who have had opportunities of forming an opinion, there are not anywhere to be found galleries better adapted for their purpose, or in which the works exhibited may be more advantageously studied; and particularly it is to be remarked that the decorations, while rich and in perfect keeping, are so disposed as not, in any way, to mar the effect of the pictures, or to distract the attention of the spectator.

It is to be hoped that the increased facilities of exhibition thus afforded, will stimulate the artists of England to greater efforts to maintain a foremost place amongst their European brethren; and especially that they may not be led by facility of production to sacrifice quality to quantity.

In their Report of the year 1869, your Council, echoing the sentiments of all lovers of art—who feel how much the artists of this day are benefited by the study of the great masters of old times—expressed their regret that the exhibitions of the British Institution, and of the Academy, are not more judiciously selected. It is a matter of sincere congratulation that the Royal Academy has, during the past season, lent a portion of its fine galleries for the exhibition of a most interesting collection of old masters.

The collection was widely comprehensive and well-balanced, and if some works were absent which we could ill afford to lose, it is to be hoped they are only reserved for a future occasion. In no country but England could private resources yield so rare and varied a collection. As a general rule the private galleries of other countries are rich in the series of portraits of kings and queens, and the ancestral families of Britain have been either more catholic in taste or more fortunate in opportunity, and thus it happens that the only landscape which has by revolution and never plundered by invasion has accumulated art-wealth wholly beyond parallel.

The removal of the Royal Academy from Trafalgar-square has placed at the disposal of the British Institution, the National Gallery building hitherto occupied by that body, and has secured, not only an improved arrangement of the national pictures, but the introduction of others for which there had not before been space.

A third event of much importance has also taken place during the present year, namely, the removal of the national collection of portraits from Great George-street to the building bounding the southern side of the Horticultural Gardens at South Kensington. These works form a collection of portraits of very great historical interest, and are for the first time seen to advantage; every care has been taken, as far as possible, to secure for each picture the light best adapted for its due appreciation.

On the subject of education—and art-education is one of the leading topics of the day—the Council may be permitted to refer to some interesting remarks made by Sir Stafford Northcote while presiding at the distribution of prizes to the successful students of the Female School of Art in Queen-square, Bloomsbury. In his address Sir Stafford said, that it was not to be regretted that the Government, some years back, had been somewhat lax in the support of these institutions, for he was happy to think that, from the differences of opinion which then prevailed, many excellent principles had been evolved, and great improvements introduced into the teaching of art in this country. He urged the students to remember that greater responsibility rested upon them now in making use of the additional facilities which had been conferred upon them. The old proverb, that one man might take a horse to the water but twenty could not make him drink, was applicable to education. Unless the students themselves were disposed to take advantage of the appliances incidental to schools of art, all the efforts of the teachers would be nugatory.

Those who can remember the time before the Art Union was established, know well how few works of art were to be met with in the dwellings of the middle-classes. The art-ornaments of a lower class consisted then, chiefly, of painted plaster "images," as they were called—sold by Italian boys so profusely over the country. What the public opinion in respect of the arts now is, as compared with what it then was, it is unnecessary further to point out.

The Council, in their last annual report, referred to the

valuable means of instruction in art that are yearly becoming larger, and more important, and more especially to the munificent bequests of the late Mr. Felix Slade; they have now the satisfaction of being able to state that the trustees, acting under his will, have taken the three very important steps required within two years of his death. Firstly, by the appointment of John Ruskin, esq., M.A., as Professor at Oxford; secondly, by the appointment of Sir Digby Wyatt as Professor at Cambridge; and thirdly, by making arrangements to apply so much from the trust in their hands as will amount to about 7,000*l*. to the erection of a building for a school of art in connexion with the University College, London; and it is understood that a site for this purpose will be given by the College on its own land. These lectures at Oxford and Cambridge may be considered the forerunners of a new era in university education. Professor Ruskin, in commencing his course at the Sheldonian Theatre, Oxford, said the study of fine arts was theretofore introduced at Oxford, and the lecturer enlarged upon the beneficial effects of the study of art upon the character of a nation. The attendance was one of the largest ever seen at an Oxford lecture, a great many ladies being present. The presence of unusual numbers of undergraduates also testified to the interest that Mr. Ruskin's proposed lectures had excited. Sir Digby Wyatt, the Cambridge Slade Professor, commenced his course in the Senate House, Cambridge, on the 9th of March, by paying a graceful tribute to the memory of the late Felix Slade, who, in gratitude for the pleasure which he himself had derived from the lectures of these Professors in order to promote the study of the theory and practice of the fine arts.

It will also be remembered that a most interesting collection of prints formed part of the munificent gift of Mr. Slade, a portion of which has been carefully arranged and placed in the library of the British Museum. Great care has been taken in the selection, and will send how closely artistic pursuits may be associated with works of industry.

The forthcoming Annual International Exhibitions, the first of which will be held at Kensington next year, are a subject for congratulation as a means for the cultivation of a growing taste for the fine arts, and will send how closely artistic pursuits may be associated with works of industry.

The late Earl of Highness Prince Christian, as Chairman at a conference held at the rooms of the Society of Arts, pointed out how beneficially works of art-manufacture could be collected under the same roof with those of pure art, and how beneficially the study of the latter could be connected with the ornamental. Another important feature connected with this exhibition is that the artists associated with it, knowing the value of having the works of others placed in a just position with their own, have concluded that there shall be no absolute division as to nationality, and thus an opportunity will be afforded of seeing the works of native artists placed side by side with those of other countries; and the result looks for it to get them out of the habit of working in any particular mode, because it is English, while perhaps rejecting the better means of a foreign country.

Let us hope that with so many conceptions of fine works, and other means of culture which ought to have the effect of elevating the public taste, there may result such a demand for beauty of design and elegance of form in all our manufactures, textile, bottle, or others, as will certainly induce the supply. Such supply, with the many existing appliances for the cultivation of the eye and the hand of the workman, ought to be forthcoming, and ought to place England in as good a position as regards the taste of her productions as she has generally held in respect of the quality of her work.

LEWIS POCOCK, } Hon. Secs.
E. R. ANTONIO, }

The Chairman, in moving that the report be adopted, observed that its object was to recommend to the interest and goodwill of the meeting the purposes of this society, and he thought that the writer of the report had very judiciously touched upon the matters connected with it which had taken place in this country since they last met. He had pressed upon them a remark as to the importance which attached to the character of the work which the prize-holders might select at the forthcoming exhibition of the Royal Academy. It was impossible to estimate the importance of a right public judgment in these matters; because, considering the enormous circulation which was given to the prints of the Art-Union, it was most essential that the subjects selected should be equally high and noble in character as the works the society attempted to recommend to the public. The association was guided by two principles,—first, that the work should be a good specimen of art in itself; and secondly, that it should be interesting to the community. They desired to extend the sphere of the society's operations, and therefore it was of the utmost importance that they should keep these two considerations in mind. He had reason to believe that they should have an admirable exhibition at the Royal Academy this year; but it was deeply to be regretted that one of our artists (Mr. Leighton) had been prevented by the state of his health from contributing to the collection; and it was also to be deplored that Mr. Macleod had been removed by death from the scene in which he had so often distinguished himself. Mr. Macleod had been greatly associated with the Art Union of London, notably in regard to his valuable work, "The Sleeping Beauty," which, it would be recollected, was one of the prize pictures many years ago, and for which only 300*l*. were paid. A few years afterwards the same work was sold for 1,200*l*., and there

was no doubt that at the present time it would command even a larger amount. He congratulated the council upon the successful result of their continued exertions, and warmly commended the report to the attention of the meeting.

The Dean of Canterbury seconded the motion, which was adopted.

Professor Donaldson proposed, and Mr. Butterworth seconded, a vote of thanks to Mr. Lewis Pocock and Mr. Antonio, the honorary secretaries, which was carried.

Thanks were then voted to Mr. Webster, for granting the use of the theatre, and to Mr. John Kinloch, for the complete arrangements he had made for the purposes of the meeting.

Other resolutions of a formal nature were passed, and the distribution of prizes was then proceeded with.

- 200*l*.—Mellick, C. T., St. John, N.B.
190*l*.—Wray, A. B., Kilburn.
180*l*.—Baker, W. H., Nottingham; Elliott, J., Kapunda.
170*l*.—Pepps, W. H., Cologne; Richardson, Henry, 60*l*.—Clark, George, St. John's-wood; Hunt, S., India Office.
50*l*.—Ellis, C., jun., Maidstone; England, W., Bush-lane; Taylor, A. A., Welling-street; Thomas, G. E., Barbadoes.
45*l*.—Argent, A. C., Mauritius; Dangar, F. H., Great Britain; Dickinson, J., Islington; Drew, W., W. Dale; Haddon, D., W. W., W. W., jun., Black-heth.
40*l*.—Alston, J. A., Westbury; Butterworth, J. W., 30*l*.—Haskell, Dr. J., London.
30*l*.—McLaren, John, Bedford; Newton, E. J., Fleet-street.
30*l*.—Baker, C., Herbert-street; Coard, H., Arbours; Dargson, Rev. W., Clare; Hearn, John, Bristol; Moses, B. M., Shanghai; Ridout, G. P., Toronto; Powell, H., Ruston-road; Wyld, R. G., South Kensington.
25*l*.—Strand, F., Smyrna; Fraser, J. A., Yokohama; Ferguson, T., St. John, N.B.; Gregg, E., Kensington; Garsden, Nash, W., Strand; Nossela, Mr. Wellington-street; Richardson, R. S., Ann's Bay; Scott, W. M., Durham; Sharpe, R. K., Westminster Bridge-road; Sutherland, R., Handsworth.
25*l*.—Aldred, W., Halesworth; Cooper, J. B., Canterbury; Duffield, John, Manchester; Edmonson, J., Dawson-place; Harrison, J. S., Sydney; Martin, W. H., Throgmorton-street; Moore, Capt., Winchester; Sprague, J. D., Sherborne-Jane, Tricker, Spinks, & Co., Whitaker, J. W., Manchester; W. Q., Oldham; Yates, John, Chorley.
20*l*.—Ansell, J., Aries; Dandison, N. J., Barnsley; Fraser, A., Edinburgh; Green, T., Dalton-in-Furze; Hendrick, M., Port Elizabeth; Houghton, Mrs., Newton; Norton, G. S., Streatham; Nugent, G. H., Aries; Romans, H., Halifax; Nova Scotia; Wilson, J., Horncastle.
15*l*.—Arnold, Mrs., Brompton; Budock, D., Fanton; Batchelor, T. B., Newport, M.; Bond, W. T., Bexley-heath; Cameron, Mrs., Duke-street; Christie, George, Welling; Kervey, R. S., Ashborne; Healy, Rev., Teyford; Laro, G. G., Spa-road; Lohb, Mrs., Holland-terrace; Marshall, Rev. B., Sandford; Mason, L. T. M., Junior Carlton Club; Moody, Mrs. E. B., Yarmouth, N.B.; Peacock, C. J., Scarborough; Rogers, J., Lewisham; Russell, E., Walsall; Stennett, W. C., Bedford; Sutcliffe, J., Grimsby; Taylor, R., Ipswich; Van Reed, E. M., Yokohama.
10*l*.—Arnold, R., Port Elizabeth; Arnold, Mrs., Wellingford; Coey, Sir B., Belfast; Dewar, E., Gordon-street; Edwards, F., jun., Great Marlborough-street; Eisdell, A. R., Rye; Hearn, W. S., Ashborne; Healy, Rev., Teyford; Laro, G. G., Spa-road; Lohb, Mrs., Holland-terrace; Marshall, Rev. B., Sandford; Mason, L. T. M., Junior Carlton Club; Moody, Mrs. E. B., Yarmouth, N.B.; Peacock, C. J., Scarborough; Rogers, J., Lewisham; Russell, E., Walsall; Stennett, W. C., Bedford; Sutcliffe, J., Grimsby; Taylor, R., Ipswich; Van Reed, E. M., Yokohama.
A copy in Bronze of the "Nelson" Column.—Baumer, C. H., St. John's-wood; Boreman, J., Sheehane; Cass, J. D., Little Hampton; Charrington, E. L., Carabanth; Day, T., Canonbury; Henderson, J. McC., Dumfries; Howie, C., Brentford; Kemp, S. V., Laureston; Leeds, T. W., St. John's, N.B.; Middlemiss, Geelong; Morris, W., Ross; Neale, J., Birmingham; Newton, F., Maida-hill, W.; Northampton, Marquis of, Piccadilly; Ogilvy, C. F., Lee; Smith, H., Mill-street; Stafford, E., Steyning; Tucker, R. C., Anbuston; Warburton, J. J., Haddington; Wootton, Wootton W., Readington.

Thanks were then voted to Miss Nisbet and Miss Woodman, to the sortinners, and to the chairman.

The British Museum.—Under the auspices of the council of the Working Men's Club Union Saturday visits have been made,—one to the Egyptian Department of the British Museum, another to the geological collection; and on Saturday last Professor Flower, conservator of the magnificent museum of the Royal College of Surgeons, received about fifty of the working men of the metropolis, to whom he delivered three lectures, explanatory of human and comparative osteology. The visits paid on Saturdays to the British Museum force the repetition of the inquiry, why is the British Museum not open to the public on Saturday always? It is the only day on which a large number of persons have any chance of going about. The officers of the British Museum should seek to keep up with the times.

PAROCHIAL ASSESSMENTS.*

THIS paper contains a description of the various kinds of property in respect of which poor-rates are levied, and the manner of valuing that property for the assessment. Property, to be expressly liable to the poor-rate under the statute of Elizabeth, must be "locally within the parish;" "visible within the parish;" and, "productive of a private profit within the parish."

Briefly, it may be described as—

1. Lands (in occupation) in the parish.
2. Houses (in occupation) in the parish.
3. Tithes impropriate and appropriations of tithes arising within the parish.
4. Coal mines (in occupation) in the parish.
5. Saleable underwoods in the parish.

All the lands in occupation in a parish, except woodlands, are rateable; but, the word "lands" in the statute does not appear to carry the usual legal meaning of that word, because it cannot include houses, as they are separately referred to therein. The words "lands and houses" together, have been held to include all descriptions of landed property used for any purpose above the surface of the ground, excepting that of growing wood and timber. These products of the land have always been held to be exempt, because "saleable underwoods" are specially made liable.

In the same manner, as regards things below the surface of the soil, the Courts of Law have always held that all mines, other than coal-mines, were intended to be exempted from poor-rate, because "coal mines" are specially by name made liable (*Rex v. Sedgley*, 2 B. and A., 73).

This specialty has raised a difficulty. It has been necessary for the courts to determine where land, which is rateable, ended, and a mine, which is not rateable, began. In the case of *Rex v. St. Austell* (reported in 5 B. and A., 693), it was held that a part of the produce of a mine (not a coal-mine) reserved to the owner was subject to the rate; not as a mine, but as a reservation of the soil or land itself, and the owner was held to be rateable as occupying the land. In the case of *Rex v. Sedgley*, Lord Tenterden thus described the difficulty he felt in attempting to reconcile the judicial dicta on this subject:—"The whole mine not being a coal-mine is exempt. If the owner works the mine and takes the whole produce, he is not rateable for it, either as mine or land. If he lets it to an occupier, reserving a rent, the occupier is not rateable for it either as a mine or land, nor is the owner liable, no one being rateable for a mere rent. But, if the owner lets it, reserving a part of the produce, that part is held to be land, although the whole mine, or the whole of its produce is not land, and the owner is rateable for this part of the mine as occupier of land, though he would not be rateable for it if he occupied and worked the whole and took directly the whole produce."

In the case of *Rex v. Earl Pomfret* (5 M. and S., 139), it was held that ore of a lead-mine, reserved by the owner, which had to be smelted before it was rendered, was not a portion of the soil, and not subject to the rate. And in the case of *Rex v. Tromayne* (4 B. and A., 162), it was held that where the reservation to the owner was the value in money of a portion of a mine, other than a coal-mine, the owner is not rateable for that.

In the case of the Telargoch Mining Company v. St. Asaph Union, it was held that the appellants were rateable to the poor-rate in respect of the occupation of a stream, which they had diverted from its natural course for the purpose of working the machinery connected with a lead-mine which is not rateable. The water-course was about a mile and a half in length, being partly open, partly tunnelled, and for about 350 yards in pipes. The Company were owners of part of the land occupied by the water-course, and part of it they rented. The land was held to be enhanced in value by its capability of conveying water, and not exempt from rateability by reason of its connexion with a lead-mine.

Operations involving the consumption of the soil itself, but which do not amount to mining, render the land operated on subject to the rate. For example,—stone quarries, lime works, slate works, salt works, potteries, brick-fields, pits of fullers' earth, sand, marl, and gravel, have all been held to be rateable; but, with this

distinct qualification, that if the minerals cannot be got without involving a mining operation, then they are not rateable.

To enumerate all the purposes for which lands can be so occupied as to be rateable, would, in these days, almost amount to an impossibility. There are lands used for agricultural purposes, accommodation lands, building lands, railways, private roads and ways, canals, reservoirs, docks, gas-works, water-works, markets, yards, wharves, bleaching-grounds, fisheries, &c.

As regards navigation and fishing, a mere right over the water without an interest in the land is not rateable.

The right of shooting over land occasionally complicates questions concerning the rateability of the respective occupiers of the land and the shooting. It was clearly laid down in the case of the Queen v. Battle Union (*L. R.*, vol. ii., p. 8), that, where an owner retains in his own occupation woodland, but lets the right of shooting over it with a neighbouring mansion, he is rateable for the land and the shooting, on the ground that the right to take game is an incident to the occupation of the land, and that he derives a benefit, not from taking the game himself, but from a pecuniary recompense made to him for allowing some one else to take it. His occupation of the woodland is productive to him of a value enhanced by the rent which he receives for the shooting. The case of *Reg. v. Thorlerton* was of a different character. The landowner had let a farm to one man, and had granted the right of shooting over the farm to another. It was held that the occupier of the farm is to be rated only for the bare occupation of the land (28 L. J. M. C., 106).

The right of shooting alone without the occupation of land, or without connexion with some rateable subject, is not rateable. This was decided in the case of the Overseers of Hilton and Wakefield, and the Overseers of the Township of Bowles (*L. R.*, vol. i., p. 359). It was there laid down that, in order to make a person rateable to the poor-rate, he must be the occupier of some subject matter which is itself rateable; but, the rateable value of the subject matter may be enhanced by something which is incident to the occupation, though not in itself rateable, such as the right of shooting. The case was a very peculiar one. The wastes of a manor had been converted into a stinted pasture under an inclosure award; but, the rights of minerals and of shooting were left in the lords. Thus the right of shooting has been severed from the ownership, as well as the occupancy of the soil.

Springs of water are rateable in the sense that they enhance the value of the lands in which they arise. In the case of *R. v. Miller* (3 Cowp., 69), Lord Mansfield said,—“The value of the four acres of land arises partly from the building and partly from the spring that produces the mineral water.” In the case of *Rex v. New River Company*, the land in the parish of Amwell was of the value of £1 only; but it had a spring in it, which enabled the company by means of pipes to bring water to London, and which increased the value of the land. The land with this spring in it was, therefore, rated at 300*l.*, although the water alone would not have been rateable at all, and the land alone would only have been rated at 5*l.*

The rateability of "lands" may be very fairly summed up by the "rule of thumb" of our ancestors, viz., that everything in the parish which can be seen is rateable except woods, other than saleable underwoods, provided always that there is a beneficial use and occupation made of them, and that they do not belong to the Crown.

"Houses" being expressly mentioned in the Act, in the same way that coal-mines and saleable underwoods are mentioned, it might have been supposed, as in the case of other mines and other woods, that houses only are rateable, and other buildings exempt. But, if ever such a construction had been contended for, it has not been held to be law. All houses, whether the dwellings of men, cattle, or animals, are subject to the rate; so are barns and granaries for the housing of corn or produce, warehouses, lighthouses, machine-houses, and the like; so also are kilns, furnaces, factories, mills, bridges, and erections of every kind, with the following exception, viz., property occupied for the purposes of the Crown. Neither the Crown, nor the king, nor the queen, being named in the Act of Elizabeth, is bound by the Act; and it has been held to follow that lands or houses occupied by

the Crown, or for the purposes of the Crown, are not liable to be rated. This principle exempts from rates, not only royal palaces, but also the offices of the secretaries of state, the Horse-guards, the Post-office, and many similar buildings. Police-courts, county-courts, and even county buildings occupied as lodgings at the Assizes for the judges, have been held to be exempt, on the ground that, in effect, the Crown is in occupation by public servants, carrying out the purposes of the Government of the country. The queen is the fountain of justice to all subjects of the realm, and buildings which are necessarily occupied for the purpose of administering justice and cognate objects are within the exception, as buildings really occupied for the discharge of duties arising out of the prerogatives of the Crown. The Queen v. St. Martin's, Leicester (*L. R.*, vol. ii., p. 493). The Queen v. Castle View, Leicester (*L. R.*, vol. ii., p. 497).

But, nevertheless, in the case of the justices of Lancashire and the overseers of the township of Cheetham (*Law Reports*, Q. B. cases, vol. iii., p. 14), it was held that buildings used as courts, lodgings for her Majesty's judges and other officers, lock-ups, and all other accommodation necessary for carrying on the civil and criminal business of the Assizes, but out of which a profit is made by letting portions of such building to the corporation of a town, notwithstanding the corporation use the building for public purposes, are liable to be rated in respect of and to the extent of the profit received, whatever the occupation may be.

Churches, chapels, and other places exclusively appropriated to public religious worship are also exempt. But the exemption does not apply to any part of such churches, chapels, or premises which are not so exclusively appropriated, and from which parts not so exclusively appropriated some person receives rent, or derives profit or advantage (3 & 4 Wm. IV., c. 30).

Tenements and hereditaments, including lands, which are the property of and in the occupation of a municipal corporation, in which the limits of the parish are co-extensive with the limits of the city or borough, and in which city or borough the poor are relieved by one entire poor-rate, are exempted from poor-rates, because it was considered that the imposition of the rate on the borough property would be of no advantage to the borough, as the same parties would be both receivers and payers of the rate (4 & 5 Vict., c. 48). But, although this view was correct as regarded the particular parish or borough, yet, if such parish now forms one of a union of parishes assessable to the rateable value of the union, according to the rateable value of the property comprised therein, under the Union Chargeability Act, 28 & 29 Vict., c. 79, there are reasonable grounds of complaint on behalf of the other parishes in the union, as the exemption of the corporation property in one parish disturbs the equality of the basis upon which the contributions of the several parishes are founded. Notwithstanding this, it has been held in the case of the Queen v. Mayor of Oldham (*L. R.*, Q. B. cases, vol. iii., p. 474), that such property is still exempt, so that it is probable that the question will be litigated again, and this particular exemption will soon be abolished.

Societies established exclusively for purposes of science, literature, or the fine arts, are especially exempted by statute from county, borough, parochial, and other local rates; provided, nevertheless, that each of such societies shall be supported, wholly or in part, by annual voluntary contributions, and shall not, and by its laws may not, make any dividend, gift, division, or bonus in money unto or between any of its members; and provided also that it obtain a certificate from the barrister appointed to certify the rules of friendly societies (6 & 7 Vict., c. 36). But it has been held that the statute exempts the society and not its property; so that, if the society is rated, its members must appeal (*Q. v. Justices of Birmingham*, 18 L. J. R. M. C., 63).

The Linnean Society, incorporated for the cultivation of the science of natural history and for the promotion of every kind of improvement in arts and sciences, has been held to be exempt (*Linnean Society of London v. St. Anne's, Westminster*, 23 L. J. R. M. C., 149). So also has an institution for the collection and maintenance of a library of books for the use of the members and of persons who subscribed for the occasion only. But, an institution established partly for the amusement of its members, such as a concert-hall, built and supported by subscription; or a library, a part of which is applied to the reading

* By Mr. Edward Ryde. Read at the ordinary general meeting of the Institution of Surveyors, April 25th, 1870. Mr. Robert Collier Driver in the chair.

of newspapers, is not exempt (*Q. v. Brandt*, 20 L. J. R. M. C., 119; *Q. v. Gastell*, 21 L. J. R. M. C., 29; *Russell Institution v. St. Giles-in-the-Fields*, 23 L. J. R. M. C., 65).

A mechanics' institution, some of whose rooms are occasionally let out for concerts, lectures, and public meetings, is not exempt (*Porvix v. Trail*, 18 L. J. R. M. C., 57); nor is a subscription library, if a part of its premises is let off to another scientific society (*Earl of Clarendon v. St. James's, Westminster*, 20 L. J. R. M. C., 218).

National schools, hospitals, dispensaries, and other similar properties held for public purposes only, where the trustees derive no personal pecuniary profit for themselves, have, until very recently, been considered to be exempt from rates; but the case of the Mersey Docks and Harbour Board v. Jones and Another (30 L. J. M. C., 239), carried by appeal from a judgment of the Exchequer Chamber to the House of Lords, has established the contrary rule. Six of the judges assisted the Peers when the argument was heard, of whom five expressed opinions that the exemption could not be supported. The remaining judge considered that the exemption had been established by a long current of authorities, and could not now be rejected. Since this decision was given, the "Sunday and Ragged Schools (Exemption from Rating) Act, 1869," has been passed, by which every authority having power to impose or levy any rate, may exempt from the payment of any rate for any purpose whatever any building or part of a building used exclusively as a Sunday school or ragged school.

Much litigation has arisen, in connexion with the assessment of buildings, concerning the rateability of fixtures, trade plant, and machinery. It was decided in the case *Reg. v. Southampton Dock Company* (20 L. J. M. C., 162) that buildings to which machinery is attached for the purposes of trade, are assessable to the extent of their existing value, as combined with the machinery, whether such machinery be real or personal property. In the case of *The Queen v. North Staffordshire Railway Company* (30 L. J. M. C., 68), it was decided that "things so attached to the freehold as to become part of it," and "things which, though capable of being removed, are yet so far attached as that it is intended they shall remain permanently connected with the railway or the premises used with it, and remain permanent appendages to it, as essential to its working," are rateable.

In the case of the *Queen v. The Phoenix Gaslight and Coke Company* (L. R., vol. i., p. 241), it was decided that the retorts, purifiers, gas-holders, steam-engines, and boilers are parts of the works which are absolutely necessary to the manufacture of gas, which is the purpose of the company's undertaking; that it was intended, when those things were erected, that they should remain permanently connected with the premises, and that they should remain permanent appendages to it, as essential to its working; and, if not forming part of the freehold, they are still so far connected with it as to be intended to be permanently attached to it, and, therefore, they ought to be taken into account in determining the rateable value of the land and premises. Without the retorts, purifiers, steam-engines, and gas-holders the premises would be worthless for the purpose for which they were erected—the building would not be a gas manufactory at all. All these things are fixed, and so far annexed as to be intended to be permanent, and being really necessary for the use of the premises as gasworks, they therefore form part of the rateable subject.

So in the case of a railway, although the sleepers are in no way fastened to the ground, but are laid on and packed up in ballast, and the rails are laid on and bolted to the sleepers only, nevertheless it has been held that they form as much parts of the rateable hereditament as does a house, the foundations of which only rest upon a bed of concrete (*Great Western Railway v. Melkham, J.P.*, vol. xxiv., p. 102).

Utensils in trade and furniture are not rateable. The meters of a gas company were held, in the *Phoenix Gas* case already referred to, to be mere ordinary chattels, kept for the purpose of measuring the gas, and in no sense part of the gasworks. In the *North Staffordshire railway* case, things moveable, such as office and station furniture, were held to be chattels, and not rateable. In many cases, such things as a mirror fixed to a wall have been held to be furniture, and not rateable; but, a billiard-table fixed to a floor has been held to enhance the value of the house to which it was attached, and

in that way to become rateable. Power-looms in a silk-mill, portable and continually moved from place to place, but secured by their feet being screwed to the flooring, are not rateable (*Reg. v. Overseers of Halstead, J.P.*, 1867, p. 373). It was held that, although such fixtures are no doubt fixed to the freehold, they are, nevertheless, not so fixed as to make them part of the freehold, so that on a demise they would pass with the premises.

"*Tithes improprie*" are those which have been severed from a benefice, and are now payable to some lay person or corporation.

"*Propriations*" or "*appropriations of tithes*," are tithes severed from a benefice, and annexed to a spiritual corporation.

These are the only description of tithes expressly referred to in the statute of Elizabeth; but, all tithes arising within the parish are rateable, and, every rent-charge payable instead of such tithes, is subject to all rates and taxes, in like manner as the tithes commuted for such rent-charge have heretofore been subject (6 & 7 Wm., c. 71, s. 69).

Coal Mines, in occupation in the parish, are rateable for what they produce; that is to say, at such a sum as they would let for. But, as has been already explained under the head of land, all other mines have been held to be exempt, because coal-mines are especially made liable.

Sealeable Underwoods.—The statute of Elizabeth especially refers to sealeable underwoods, and specially makes them rateable. In the early cases, sealeable underwoods were defined as being "wood which grows expeditiously, sends up many shoots from one stool, the root remaining perfect, from which the shoots are cut, and producing new shoots, and so yielding a succession of profits." But, in a recent case, *Lord Fitzhardinge v. Pritchett* (Law Rep., Q. B. Cases, vol. ii., p. 141), Mr. Justice Mellor has very clearly defined what woods are sealeable underwoods within the meaning of the statute of Elizabeth. He says,—"The question does not depend upon whether the woods consist of what are timber trees, either by general or local custom; the nature and quality of the wood is not the test; but, wherever the woods are treated so as to raise successive crops from the same roots and stools, and, whether the crops ripen, and are cut at intervals of ten, fifteen, or even thirty years, is immaterial; or, whether the woods consist of oak, ash, or elm, which are universally timber trees; or, of beech, which may be timber by custom; or, willow, the stools of which can be and are so treated as to procure a succession of sealeable crops: in such cases, the woods are sealeable underwoods."*

ON CHIARO-SCURO IN ARCHITECTURE.†

THE chief cause or source of beauty and power in a building is the light and shade, as it is in a picture of that building. It is a more essential element in architecture than it is in painting and sculpture, in which arts there is more to stone, in some measure, for its partial absence or deficiency than there is in architecture, which is absolutely dependent for legitimate effect upon the compositions of forms and reliefs. With a view to light and shade, all planning has been conducted in all great buildings. All buildings celebrated for their beauty present the eye with large masses of shade brought up against and heightening the value of the important and prominent parts illuminated, and give strength and power of effect to the whole.

Light and shade were a prime element in the Egyptian and Greek temples, more especially in the provision of the deep and solemn pronaoes, or front portico. Indeed, neither Egyptian nor Greek ever erected a building in which it was not a prime element of effect. It is the chief charm in the beautiful courts of the Alhambra; it is the beauty of the Italian loggia, in all which the openings and depth of recesses express the primary idea of shelter, grateful to the mind in Oriental lands, from heat, and in occidental and hyperborean climes from damp and cold. In interiors, the beauty of St. Stephen's, Walbrook, is its exhibition of plan or form within form. It is the same in St. Sophia's, at Constantinople, and in the Roman Pantheon, and in all great interiors. But breadth and depth of light and shade are embodied in all great buildings,

ancient, modern, or Mediæval, Oriental or occidental. We see this in Gothic minster, in Moorish palace, in Indian tomb, in all architecture aspiring to excellence, to excite the loftier emotions. In all such, I believe, this must ever be a prime element.

The same principles of uniformity and variety, or of variegated unity, which guide the historical painter in planning the figures and general forms of a picture, with a view to a broad distribution of light and shade, are to guide the architect in arranging the masses of his building, so that they shall form an effective and harmonious whole. There should be in an extensive architectural composition, as in painting, groups and masses of light, half light, darks and half darks, and reflexes; and of these lights and darks one should be principal, the rest subordinate, and all generally co-operating to produce a totality and completeness in the work; and, as in painting, the principal light is generally so disposed as to give the greatest lustre to that part where the action and personages are of the greatest consequence, so in architecture the highest light will be generally in the central entrance, portico, or porch, and fall on entablature, column, arch, vault,—that is, on the brightest, richest, most delicate and graceful forms; while the deepest shade will be brought up to enhance their value, and throw out these richest and brightest forms in the design.

In great architecture the darks must be extensive, and must greatly preponderate over the lights and middle tints; and the grandest can only be had where a round-arched style gives the opportunity for openings of any breadth and height consistent with grandeur of concomitant parts and arrangement,—that is to say, it is more in the power of an arched than of a trabeated style to arrange for large and deep masses of shade, producing the greatest breadth and brilliancy of effect; and the Byzantine and Romanesque styles seem better than the Gothic. It is only in such, I believe, you can have the utmost measure of what is properly called breadth of effect, which may be defined as abundance of one thing in one place, or, as Ruskin says, "mass of everything—of bulk, of light, of darkness, of colour, not mere sum of any of these, but breadth of them; not broken light or scattered darkness, nor divided weight, but solid stone, broad sunshine, starless shade."

If you are under the necessity of having a square or oblong block, with a number of small equal openings—if you are not allowed to group or deepen some of the latter, recess others, and bring out a third—you may produce a pleasing building, but you cannot produce a powerful building or such as will excite high emotions in the breast, because it will lack some of the essentials of architectural greatness.

What Reynolds says of finish in painting will apply to detail and sculptural decoration in architecture:—"The highest finishing is labour in vain unless there be at the same time preserved a breadth of light and shadow." You may have beauty of colour to atone in some measure for want of form, and I believe in flat blocks of building, which cannot, from their nature, position, and purpose, as great street rows, have much variety or relief from shadow, it should be sought in opposition of colour in the materials, as in pictures painted on a light key. But that is a lower element of architecture, as it is in painting.

Where the artist is at liberty to relieve by light and shadow, variety of colour is of little consequence. But where he is necessarily restricted, here coloured brick is of great value. It should, I think, be employed to assist shadow, or repair the shortcomings of chiaro-scuro.

Colour in architecture, say what you will about it, as it arose in the East, so it belongs to the East and South, to brighter climes than ours, and can never be a prime element in northern architecture. But be this as it may, let me say distinctly that I consider the charm of beautiful form,* greater than any arising from colour or rich material, and that it is, and must ever be, the chief merit of architecture.

While the greatest buildings chiefly owe their beauty to it, some could be pointed to which owe their failure to a want of it: St. Peter's, at Rome, and the new Houses of Parliament, at Westminster, may both be cited with advantage as a warning on this head—as failing of legitimate effect, the former from the non-employment of detached columns, and the latter from the division into too minute openings of windows and doors.

The superiority of St. Paul's Cathedral to

* To be continued.

† From a paper by Mr. S. Huggins, read at the Liverpool Architectural Society.

St. Peter's at Rome consists chiefly in the superior provision for light and shade in the colonnades of the western front and transepts and dome tower, which are wanting in the Roman edifices. The latter is equal to St. Paul's in beauty of outline, and superior to it in size and sculptural embellishment and magnificence, and in simplicity of design, being of one order, while St. Paul's is of two. But its designers ignored the chief source of poetic beauty and power in architecture, namely, provision for play of light and shade by the projection and reception of parts. It has not one detached column; all its columns are attached. It is without porticoes, which give it a blockish effect, which is aggravated by the colonnades of the area or front courts.

This building has been the subject of strange remarks. It has been praised for what are its faults; it has been blamed for what are its beauties, as, for example, the attic order, which is one of its greatest merits, however treated or proportioned. But none, I think, have ever pointed out what is its great defect. St. Peter's Church at Rome not only cannot be void of merit, it cannot be without great qualities, coming as it does from under the mighty hand of Michelangelo, who, of all concerned in it, had perhaps most to do with it; but it has the great defect of being without any adequate provision externally for light and shade—a defect which Wren, who must have been greatly indebted to that building, carefully avoided, for the chief merit of St. Paul's is plentiful display of light and shade in its west front.

The greatest merit of St. Paul's is the arrangement of the portico of the west front for bringing up the deepest shade to heighten the brilliant light of the columns and the half light of the flanking west towers, of which Wren has made the best possible use in his design. Yet strange to say, this chief merit of St. Paul's is seldom mentioned, and in buildings that owe most to it is not acknowledged. St. Isaac's Church, at St. Petersburg, a gigantic plagiarism from St. Paul's, ignores this feature, or, at least, makes no attempt to emulate it, and fails utterly in achieving the poetic power and unity of St. Paul's. I suppose so important and costly a commission, under imperial patronage, for the metropolitan church of a great empire, was never executed with so little of architectural genius as this spoiled reproduction of St. Paul's Cathedral at St. Petersburg, which is good, at least, for showing that breadth of light and shade cannot be got by merely sticking on Greek porticoes to a square block of building.

The one thing opposed to this quality in the northern Gothic—the style chosen for the Houses of Parliament—is the non-employment of the detached column on a full scale on the exterior, which I look upon as the great defect of the style, excluding from it much of the sensuous beauty that charms us in the Classic. The column, wherever it occurs in the Gothic in its integrity, with cap and base, and detached, and even where, as in door and window reveals, it is not entirely detached, is among the redeeming beauties of the style. The miniature arcade galleries in the thickness of the walls, originated by the Lombards, and which were not superseded by the Gothic, as Mr. Fergusson asserts they were, but continued into the Pointed style, and appearing in the Cathedral of Paris, and in many others, forms the most beautiful ornament of that or of any style. In the towers of Leon Cathedral, in France, where the detached column is liberally introduced, and occurs here clustered, there single, it gives a magical and romantic effect of lightness, and a poetic play of light and shade that is truly charming. Beasts are seen looking out from between these columns as from between the bars of a cage. But it nowhere occurs on the great scale as in the interiors or in some cloisters, where its exceeding beauty shows what it might have done for the west fronts of cathedrals had it been there applied, and embodied in a porch or portico,—a feature which seems to have been more nearly approached in the Romanesque and Byzantine styles than in the Gothic. The Cathedral of Pisa is an attempt at the complete Greek Periptery, which was too much. It is only in the fronts it would be admissible in the style, and there it would be an immense improvement; and nothing would mark a nobler step in advance by the modern Gothic school than the development of a detached columnar portico, or porch of clustered or grouped columns for the fronts of their churches.

Chiaro-scuro in architecture, as in painting,

must always remain from its nature difficult to teach, or bring under the government of rules. The student should watch the finest examples under their best effects of light and shadow, and try to get at the seat of their charm; a good deal of sketching, and even of modelling, should be directed to this end.

Nothing would have a happier result upon our architecture than the successful study and application of the principles of light and shade by architects, and the uniform aim on their part at breadth and depth of effect in public if not in private buildings; nothing, I say, would have a happier result upon our architecture than this. It would at once become noble and real; for only in proportion as a building has depth and reality can it have this breadth of light and shade.

This principle applies to interiors as well as to exteriors; for this we had best go to some of the great buildings of the middle ages on the Continent,—the French Gothic cathedrals,—which I consider among the master-pieces of the world in the kind or character of architectural beauty proper to Gothic, or, in fact, in any kind. There is a chaste classic simplicity in the plans of these edifices,—Paris, Amiens, Evreux, Chartres, Beauvais,—which, by the way, show more sympathy with the Greek temple plan (often exhibiting the cylindrical shaft of quite classic proportions) than the English, which are quite the antithesis of it.

In the whole of this great group of edifices the architects seem vying with each other for the production of the greatest and most beautiful interior; of which they seem to have had the truest conception,—a higher and truer than the English; for in some of these, at Rheims, Amiens, Beauvais, which latter I suppose to be one of the most glorious apartments on earth, some of the highest notes of architecture have been struck. In all these the principle of depth, or of plane behind plane, has been exhibited to perfection, and the amplest provision made for breadth and power of light and shade, by arrangement of the side aisles and disposition of the light, which in these are carried to the utmost perfection of conceivable beauty by the circular or multangular apse, which it is truly wonderful the English architects should have omitted;—a feature so necessary to combine the side perspectives and give the highest interior unity and grandeur; of which the French architects had so true a conception; and which the Arabians also sought in their great mosques by circular and domed terminations. If the French architects sacrificed exterior to interior grandeur, they made the sacrifice on the right side, the enclosure of interior space in the grandest manner being the highest object of our art. But the expression of internal length is what was chiefly aimed at by the English architects, and the fine effect of the colossal stained window at the altar terminating the vista, which was also favourable to external grandeur; though, with some contrivance, the same degree of the latter quality could, I believe, have been had along with the French internal arrangement.

While Salisbury is designed for length, Amiens is designed to look great by greatness of parts and greatness of treatment. If Salisbury Cathedral looks long through being in many parts or bays, so does a street by consisting of a great number of small houses; but it does not for that reason look great. Salisbury is not so great a building, though it looks longer than Amiens, the interior of which strikes at first sight, not so much with an appearance of vastness as of a noble simplicity and majesty, arising from greatness of scale, greatness of module, and grandeur of treatment. Salisbury Cathedral might have been less adapted to give effect to scenic processions, but it would have been a greater building, finer and more meritorious architecture, had it been designed on the principle of Amiens.

I have heard the French cathedrals accused of being shapeless outside, though beautiful within; but if a building is designed for greatness of internal effect, and truthfully constructed, it cannot be shapeless outside. For the same reason that Amiens is a much finer building inside than Salisbury, it must be finer outside, for being of greater parts and nobler proportions, as I have already asserted it to be in speaking of composition.

But there is one great interior in the East where these principles are illustrated, which I must not omit to notice,—St. Sophia's, at Constantinople,—which is in every respect one of the most noble and beautiful apartments on the earth,—satisfactory in every respect. Most other

great buildings—Egyptian or Greek temples, or Mediaeval cathedrals—were more or less a series of great avenues, but this is one great apartment, with every concomitant of greatness and beauty. It is better proportioned than that of St. Peter's, at Rome, and than the centre compartment of St. Paul's, at London, or of any Gothic cathedral; while it has as much unity, with infinitely more variety and picturesque than the Pantheon at Rome. Such an assemblage of grand and beautiful architectural features—domes, semi-domes, colonnades, arcades—harmoniously combined in one great interior, appears nowhere else. It is the most beautiful covered area on earth, and had it been united to a worthy exterior—an exterior in keeping with it, and expressive of it—the whole would have been the greatest building in the world, the some of architectural perfection. But it is married unfortunately—as is St. Stephen's, Walbrook—a Venus to a Vulcan—to an exterior monstrosity.

This quality of breadth inheres to a great extent also in the architecture of Sicily, which, like the clime that blends the Oriental palm and aloe with the orange tree, the fig, the olive, and the vine, unites and blends the architecture of the East and West in the most artistic and beautiful manner. But in no buildings is it better illustrated than in many of the domestic buildings of the Middle Ages, with their open-work fronts or arcaded loggias, so favourable to true architectural beauty, and reminding us of the Chester rows. Among these I would particularise the Venetian Gothic palaces. I am not referring particularly to the ducal palace, in which building I for one can see nothing of the surpassing beauty that some can see, or affect to see, in it—but to the Cà d'Oro, Foscarini, and one or two others. In these I see exceeding grace and beauty. The Cà d'Oro Palace carries to the extreme of grace and delicacy the open-work principle which charms us in many more northern lands, of which the house of Francis I. and some of the Hôtels de Ville are examples, among which the façade of the Hôtel de Ville at Arras deserves special mention.

Composition and light and shade are the most important parts of architectural design. Many of the greatest buildings of the world are, like the oratory of Demosthenes, undorned; and the rest owe their impressiveness, not to their sculptural decoration, but to their great proportions and beautiful and harmonious forms—their graceful contours and provision for breadth of light and shade.

It is in this lies the power of architecture, and not in its sculptural ornament, or hair, like Sampson's strength. Sculptural decoration belongs to the department of detail, and is analogous to diction in poetry, and colour in painting, and cannot therefore be anything but a minor element of art, which seems to have been the impression of the greatest minds that have written on architecture—Goethe, Schlegel, Lamartine; the latter speaks of St. Peter's "swelling out in the proportions of a god," and "a monumental transfiguration of the religion of Christ." "Fall down the pictures," he adds, "carry off the statues—it is still the house of God."

In a general survey and contemplation of great edifices and styles of architecture, my strongest impulse is always to speculate on or scheme out what I conceive to be the utmost possibilities of architectural grandeur and expression, and what the future course of architecture is likely to be in England and among European nations generally. Michelangelo's conception of architectural greatness was the enthronement of the Pantheon, which itself combined the two most graceful of classic features, the colonnade and dome on the Temple of Peace; and it was a perfectly legitimate combination. The qualities of certain buildings combined in one would make the ideal of architecture; and the noblest and most perfect building would be one combining the chaste columnar beauty and elegance of detail and decoration—all that so captivates us in the Greek architecture, with as much as possible of the soaring composition of the Middle Ages. My own conception of the grandest possible style of architecture, or of that turn or modification of the classic style, applicable to great monumental works, is a combination of trabecation and arcuation, or a blending of the vertical and horizontal principles.

Than such a pure classic style, by which I mean not a florid Italian, but a pure Greek or Græco-Roman style, I can imagine no style of

architecture more suited to enshrine the pure simple worship of Christianity. No architecture expresses, to me, or stands so well in my mind, as a type of moral truth and purity, as those pure forms of an architecture in which purity and beauty of form give the charm and merit independently of ornament. The beautiful volutes of the Ionic capital of the Erechtheum is to me a striking image of chastity or purity of soul. Freely treated—that is, combined with arch and dome, not Romanised—no style would produce a more truly solemn and sublime, and, at the same time, perfectly adapted interior, than pure Greek architecture: and in a paper published in the *Builder*, now nearly twenty years ago, I expressed these views. They were opposed to the prevailing notions of the time, as they are to the present ones, and I know no one who holds exactly similar opinions to myself on this point; but it is some conclusion and support to find the French architects animated but by one spirit in working out a style, though not applying it at present to ecclesiastical purposes, from the same elements.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

ACCORDING to the report of the council which is to be read at the annual meeting, May 2nd, the total number of members, of all classes, is now 517. The receipts, in consequence of many liberal contributions to the library fund, have been exceptionally large, and the president, Sir William Tite, M.P., with a munificence which has always marked his connexion with the Institute, has recently contributed 100l. to the "Travelling Fund." This sum, together with accumulated interest on the fund since 1866, amounting in all to 127l., will now be invested in guaranteed Indian Railway Stock. The subject of the Voluntary Architectural Examination has received renewed attention. The rules of the examination have undergone a revision, which, while it has modified them in certain details, has left unaltered the general principles of the scheme, as drawn up in 1866. The council, however, consider that the labours of the examiners and moderators ought not to be unremunerated, and they have therefore recommended that fees should be paid in future to all the gentlemen who may consent to undertake those arduous and responsible duties.

In accordance with the resolutions passed at the closing general meeting of last session, a list of books recommended to the architectural student has been drawn up by Professor Lewis and A. Waterhouse, Fellows, and has been appended to the rules lately re-issued. A form of certificate has also been prepared, and will be granted to those candidates who may pass, or have already passed, in the respective classes of proficiency and distinction. A preliminary examination has also been devised for such students as have been at least one year in an architect's office.

The labours of the Professional Practice Committee have of late been chiefly directed towards the consideration of a request made by the London Builders' Society, that the Institute would aid that society in drafting certain conditions of contract, which it was proposed should be annexed to specifications and accepted in professional practice. This request has led to several meetings of the committee, and interviews with the London Builders' Society. The details resulting from the discussions on this subject have, however, been so numerous and diverse in their bearings, and have evolved such varied interests and responsibilities, that the Professional Practice Committee consider it expedient to limit their endeavours to a mere definition of those specific heads under which the conditions of a contract might advantageously be framed. As soon as a conclusion has been arrived at on this point, it will be made known.

The attention of the Council having been drawn last Session to the Fine Arts Copyright Consolidation and Amendment Bill, then before the House of Lords, a petition on the subject, praying that the copyright contemplated in the Bill might extend to architectural designs, was drawn up by the council, and presented to their lordships by the Earl Stanhope, in June last.

The past session has witnessed a steady accession to the Library and Collection. Since May, 1869, ninety-one volumes have been presented, besides forty pamphlets, and transactions of societies, exclusive of the regular donations of English and foreign periodicals. The money

donations of 1869 amounted to 106l. 12s. Twenty volumes, including "Dagdale's Monasticon," Coate's "Monuments du Kaire," and other useful works have been purchased.

It will be remembered that last year the president contributed a liberal sum to the library fund, for the purchase of a series of drawings illustrative of ancient ecclesiastical decorative painting. The council have now the pleasure of stating that several of these drawings have been completed by Mr. George Wardle, the artist entrusted with this commission.

Adverting to the general prospects of architecture, and the condition of public works in England, the council notice with satisfaction the progress of many important structures recently erected in London, but view it as a matter of regret that, at a time of severe distress among the building operatives, the Government have not proceeded with certain works recognised as requisite for public service, and the execution of which is called for by the public voice. The delay thus occasioned must necessarily have a baneful effect in other directions, and especially on the encouragement of architecture by corporate bodies and private patrons, who are indirectly, but no less surely, influenced by the example of the State.

The report concludes thus:—

"It is sincerely to be trusted that whatever principles of public economy may be advocated by her Majesty's Government, they may not degenerate into parsimony (which too often entails a heavy burden of expense on the future), and that whatever course may be adopted under the present system, those who are in authority will not forget that to encourage the arts of a great empire is not only to administer to its intellectual enjoyment, and to develop its taste, but also to foster its science, its industry, and commercial welfare."

A list of the subjects for which medals and prizes are offered is published, and may be obtained at the rooms of the Institute.

BRIGHTON AND ITS FUTURE.

THE *Brighton Times*, good-humouredly commenting upon our recent remarks in this direction, says:—

"We have relied too much, the *Builder* tells us, upon the favour and countenance of the fashionable world—an unstable foundation to build upon. We want more local trade and manufacture, to give us solidity. We want more back-yard accommodation and drainage—more attention from the local authorities to sanitary matters—more ladies to transform themselves into ministering angels to the poor. We want more uniformity of style, and less presentation of plaster, in our buildings—more opening for the centre of the town, by a few wide leading thoroughfares. We want old streets to be widened, and new streets to be not made narrow. Lastly, we want a little more shipping interest, by means of a port or harbour, to be constructed at or near Brighton. To this last consideration, by the bye, it has often been objected that fashion and gentility would never stand a rough intermixture with sailors and shipping-masters; and that, to make a port here, would be to scare away all that is elegant, and refined, and well-paying, from amongst us; but, be that as it may, we happen to know of a speculative gentleman—and it will perhaps gratify the *Builder* to be informed of this—who is actively contemplating in his mind's eye such a harbour, and hoping to mature the vision into a reality."

LECTURES ON MUSIC.

IN PURSUANCE of the scheme of instruction in science and art for women, which has for some months been working well at the South Kensington Museum, under the direction of a committee of ladies, assisted by the Hon. and Rev. Francis Byng, Mr. Arthur Sullivan commenced on Tuesday last, in the Lecture Theatre of the Museum, a course of twelve lectures on the Theory and Practice of Vocal Music, to be continued on successive Tuesdays and Fridays.

As preface, he stated the main object he had in view, namely, not to transform his auditors into Nilsons and Trebellis; but, by elucidating many of the difficulties of the science of music, to make them more appreciative and intelligent critics and listeners, both of the compositions and execution of others; the intelligent auditor doing as much to raise the standard of criticism and assist the progress of art as the inferior performers, often heard, lower and retard them.

Though the taste for music has increased so

visibly among all classes, as may be seen by the innumerable concerts given at the present day,—150 to 1, fifty years ago,—yet the actual study of music as a science is more neglected. A fine voice is more appreciated than good singing. The average standard of instrumental performances is extremely high, and one aiming at becoming a virtuoso has greater difficulties to overcome than formerly. In connexion with the study of harmony, he quoted from a work of Mr. Thomas Horley, a madrigal writer of the fifteenth century, a dialogue between a distinguished diplomatist and a friend, the former finding himself so disconcerted at his inability to take part in a vocal production at a reunion of the members of the cabinet, that he determined on an amusing analogy between this scene and a similar reunion of cabinet ministers of the present day. He deprecated the style of modern sacred music, instead of the grand old unimpassioned chants that left more expression to the sacred words than the jingling tunes in modern use, and paid a tribute to the monks of old as the fathers of harmony.

A choice selection of part songs has been made, to illustrate the next lectures, to be performed by the ladies attending them; and we feel convinced that much will be gained from the instruction of the able composer of the almost Handelian production, "The Prodigal Son."

THE ICONOGRAPHY OF WELLS CATHEDRAL.*

THIS is a subject replete with difficulty, although there is abundant matter on which to dilate. The task has been attempted by one of the great authorities of our age, now passed away, and he has set forth a most elaborate plan and detailed description of this work of art, and has attempted not only to describe the west front of Wells generally, and to set forth its leading characters, but he has attempted to assign to each tier of statuary its particular object, and to each statue its own particular character and name. This certainly was a grand attempt, and well worthy the great mind and the talent and taste of a highly gifted man; but on careful examination of his description, and reference to his authorities, we are compelled to admit that too much is the result of mere conjecture, and that he has exposed himself to the just criticism that has been passed upon his work by very competent authority. The elegant and highly-interesting and instructive work of Professor Cockerell, "On the Iconography of the West Front of Wells Cathedral," has been very learnedly and ably criticised by Mr. Planché, in the *Journal of the British Archaeological Association*, for March, 1857. This appeared six years after the publication of Mr. Cockerell's work in 1851. The attention of the Somerset Archaeological and Natural History Society was called to this subject at their meeting in Wells, in 1850, by our much-revered friend, Dr. Markland, who then read a paper on the subject, the notes of which had been furnished him by Professor Cockerell, and are given in the volume of the *Proceedings of the Society* published in 1851. The Professor's explanation of the sculpture is there given in brief, and some particulars are added by Dr. Markland. When the Archaeological Institute visited Bristol in 1851 (July), one of the places visited was Wells, on which occasion Professor Cockerell gave an admirable discourse upon the sculptures, and those who had the privilege of hearing it will well recollect the impression it made, and the flood of light that seemed to be poured upon the history there set forth in stone (see *Journal of Archaeological Institute*, vol. viii., p. 327). If many of the explanations were doubtful, or seemed to be far-fetched and fanciful, yet the whole discourse conveyed such a noble idea of the end and design of the plan, and grandeur of the subject, that a new and lasting interest was awakened which is now beginning to bear its fruit. I shall ever look back to that day as one of the most interesting and profitable I have ever spent.

The history and architecture of Wells Cathedral have so lately been given in a series of lectures by Mr. Froeman, which have been published in the *Bath Chronicle*, and are now being republished separately, and these so fully and ably detail all that pertains to its erection and historical interest, that my own observations may be

* From a paper by the Rev. Prebendary South, read at the meeting of the Bath Philosophical Association.

strictly confined to the ornamentation of its west front and such statuary as is carried round the north-western angle. This is supposed to be the work of Bishop Jocelyn, called also Jocelyn Trotman, not only Bishop of Bath and Wells, but said to have been also a native of Wells and partly educated there. He died in the year 1249, but his work was dedicated A.D. 1239, so that it was finished previously to that period, and is a noble monument of the work of the thirteenth century, *i.e.*, the earlier portion of the century. The episcopate of Jocelyn lasted thirty-one years after the settlement of the Glastonbury controversy, and over forty-two from his first consecration. The west front of Wells is in the same style of architecture as Ely, Lincoln, Salisbury, *i.e.*, Early English or First Pointed. The west front of Wells consists of a central portion (or nave with side aisle) and two side towers incorporated into the front. This arrangement gives great space for the display of the statuary, and the doors and windows are small and almost insignificant. This is totally different from the arrangement of some of the west fronts which are most distinguished for the grandeur of their design, as Amiens, where the portals are of huge dimensions, very deep, and filled with the statuary, which at Wells is distributed over the whole surface. The width of the west front of Wells is 147 ft., while that of Amiens is only 116 ft. This length of surface is broken by six buttresses, which are enriched with statuary in the front face and at the sides. The statuary may be divided into nine tiers, and these again into two divisions, north and south of the principal entrance, the north (left hand) being the temporal side, the south (or right hand) the spiritual, according to Professor Cockerell's arrangement.

If we begin with the first or lowest tier, we shall find it, in the front face, almost entirely denuded of statuary. We can therefore only restore these conjecturally; there are sixty-two niches (all but two vacant) which bear evidence of the work of the Iconoclasts of the sixteenth and seventeenth centuries, and of the Somersetshire riots in 1685, when, as Professor Cockerell observes, "the archives of the cathedral were miserably burnt." The loss of these probably prevents us ever recovering a record of what these figures represented. The only two remaining figures do not present sufficiently characteristic features to enable the antiquary to state confidently what the series may have been. The practice in the French cathedrals and elsewhere was to place the most sacred characters to the south. On the north and east face of the north tower the figures of this tier remain. They are male and female. The male figures are episcopally habited, but I will not venture to assign a name or attribute to any.

When the west front of Wells was executed, learning, both human and divine, art and science, were in the hands of the few. The multitude of the people had to be guided by outward expressions, or by traditional and oral teaching. Painting and sculpture were used as books are now, and we learn from the Venerable Bede that in his day it was accounted a great acquisition when these could be exhibited in churches as a means of instruction. Sermons were preached to the people not only inside the churches, but outside, when the state of the weather permitted, and to have a series of illustrations at hand was no mean help to the preacher of that day. The subjects of the Old and New Testament, arranged by way of type and anti-type, are still to be found both in painting and sculpture in our churches, and we have a striking instance of this at Wells.

But in the west front of Wells, not only have we a series of sculptured subjects from the Old and New Testaments, but the mind is carried onward and upward, through the estates and degrees, the ranks and conditions of this world, to the dread day of judgment and its appealing realities; and we see, as it were, all ranks and degrees brought before the supreme tribunal! Here was a theme for devout contemplation before entering the portals of the church, or before engaging in its solemn services. These sculptures were not intended to be looked upon as mere matters of art or of idle curiosity, but were intended to suggest very solemn thoughts, and inspire such meditations as might make the mind more fitted for devotion inside the church. What may now appear to us rude and grotesque, produced no such feelings in the men of that day. They saw their own dresses, arms, habits, and other characteristics strikingly delineated.

The king on his royal throne, the counsellor and senator in his robes of office, the lady in her flowing mantle, the supreme pontiff, or the bishop with crozier and mitre, the abbot, the priest, and monk, each in his peculiar habitations, were at once known and recognised as realities of the time! To us they have become rather a matter of antiquarian interest than of actual life. They have lost their intended lesson, but become instructive in another manner. If we do not contemplate them with religious interest, we can contemplate them as full of the history of a bygone age, and this is rather the aspect in which we should regard them this evening. They are striking examples of the costume of that period (I mean the 4th and 5th tiers). On the south, or what Mr. Cockerell supposes to be the Spiritual side of the west front (divided into two parts by the principal entrance), are 42 statues in which the number of ecclesiastics predominates. We have also female figures, habited as nuns or as ladies of rank. On the north or temporal side we have a like number, but here the kingly and crowned figures predominate, and intermixed are the figures of queens or royal ladies: one (No. 58 on Mr. Cockerell's plan) holds a book in her hand; and with these we have also figures of bishops and priests. A similar intermingling of characters is carried round the north and east side of the N.W. tower, where we have females as well as royal and ecclesiastical figures. The number of statues on the north side of the west front, and on the north side round the corner towards the Vicar's Close, amounts to 68, and may be taken as very interesting illustrations of the military, civil, royal, and ecclesiastical costume of the twelfth and early part of the thirteenth centuries. Eighteen are crowned kings, eight are crowned queens, seven armed knights, fifteen are male figures without crowns—nobles or princes, and nine are females, four mixed ecclesiastics, three without mitres; some are defaced.

"The female regal costume [says Mr. Planché] is represented with as much variety as it is capable of. On the north side of the second buttress stands a Queen, holding in her right hand a book; she wears the long robe, or super tunic, falling in folds over her feet, and with the ample open sleeves so characteristic of the twelfth century, the tight sleeves of the kirtle appearing on the left arm, which is raised in the lace of her mantle. Her head and neck are enveloped in the vest and wimple, worn by females of all ranks at that period, and which afterwards became by its retention a distinctive portion of the conventual habit."

I instance this statue as an excellent example of the dress of the lady of rank of that period. Of the seven armed knights, which are exceedingly illustrative (says Mr. Planché) of the military costume of the twelfth century, three are in the west front, and four in the north-west tower. Five are in complete mail, with the surcoat without sleeves, and bear the long Norman shield, unsculptured with armorial bearings. It would be very desirable to ascertain, if possible, whether any device was ever painted on these shields. That many if not all the statues were painted is very probable, as patches of blue, vermilion, and gold, are still stated to be discovered in the niches, and of all portions the shield was most likely to be so ornamented. Nothing could assist so materially to fix the actual date of their execution, as well as to arrive at some fair knowledge of whom they were intended to represent, as the discovery of such ornamentation. If they were executed under the direction of Bishop Trotman, heraldry had at that period become a science. It is precisely the date at which rolls of arms first appear, and if these warriors were meant to represent historical personages they would most probably have displayed their armorial bearings on their shields, and perhaps their surcoats. In corroboration of this Mr. Planché instances the effigy of William Longespée, Earl of Salisbury, in Salisbury Cathedral, which is of this period, and where the lions are sculptured on his shield and painted on his surcoat.

As the restoration of the canopies and niches of the west front is now begun under such excellent auspices, we cannot doubt that every pains will be taken to examine most minutely the details of each figure and every trace of colouring which may be left; and if, indeed, the series of figures could be found to be really historical, it would form one of the most, if not the most, valuable of historical records which we possess,—such a record, indeed, as any country may be proud of. At present it is only the intention to restore the canopies, niches, and columns which support the canopies, and the pedestals on which the figures stand, and to

support the figure itself, where needed; but it may be hoped that where the figure itself is damaged, and where the design can be recovered, or the portion be exactly reproduced, the figure or the part may be restored. I speak now my own opinion; I do not wish to advocate any attempt to restore the whole, or to remove any portion that will stand; but I believe it will be found that many statues are now so far decayed, that unless they are strengthened, or the figures reproduced, they must soon perish, and some of the most interesting works of the thirteenth century be for ever lost. I do not think that the identical reproduction of a figure, while it may be truthfully restored, is its destruction. How few of our oldest monuments could have existed had they not been reproduced! About the year 1850 one of the statues fell; it was the one supposed by Professor Cockerell to represent Edward the Elder; in its fall it was dashed to pieces, and therefore its exact reproduction rendered next to impossible, and this may be the fate of others which may now be saved. Our very worthy and much lamented citizen, Dr. Markland, restored and replaced this figure. It had been drawn by Carter, and happily Professor Cockerell had also previously made a drawing of it; but in Carter's time the figure had already lost both arms. The work of reproduction was effected by Mr. Richardson, the sculptor, and as Mr. Planché, in his comment on these figures, pronounces no word of condemnation, I think we must admit that it is satisfactory, as any defect of costume or inaccuracy of representation would have been certainly noticed by him. Another figure was replaced about twenty years ago by Archdeacon Brymer. In writing to Dr. Markland on the subject of the sculptures, and noticing the fall of that supposed to be Edward the Elder, Professor Cockerell observes—"I grieve to hear of the fate of Edward the Elder, which is indeed ominous, as the founder of the Episcopal Church of Wells. I earnestly hope the fragments are preserved, and have not suffered much. It would be scandalous to leave it unrestored." Surely the heart of the Professor, as well as that of Dr. Markland, would have been gladdened had they foreseen the steps now taken to prevent any further decay. I find a note in the proceedings of the Somerset Archaeological Society, vol., 1851, which says, "It is earnestly hoped that the Dean and Chapter, and the gentlemen of the county will come forward, and that a special subscription may be entered into for their preservation." This hope is now realised after a lapse of nearly twenty years. A strenuous effort has been made to carry out this object, and the best architectural knowledge has been enlisted in the persons of Mr. Gilbert Scott and Mr. Ferrey, the former of whom has issued his report and suggestions. The cost of the restoration of the west front will be from 6,000*l.* to 8,000*l.*, and happily the money already subscribed amounts to the former sum; so that we may trust, when all have come forward, an ample sum will have been raised to do the work in the best possible way.

In treating of the sculptures of Wells Cathedral something ought to be said of the state of art at the period of its probable execution. If the west front is the work of Bishop Jocelyn, it is of the age of Henry III., who displayed a taste for architecture, sculpture, and painting, and rebuilt and restored the royal residences and took special care of their decoration.

"In the thirteenth century the progress and enterprise which exhibited itself in all the arts, was equally developed in sculpture, and it was then historical and religious sculpture in great profusion attempted to rival works of classical antiquity. . . . The literary and poetic faculty, which in the twelfth century had been fostered by Henry Beaufort and his accomplished and virtuous queen, now infused itself into the sister arts of painting and sculpture, and the knowledge of the Scripture imparted a dignity and authority to the works of those days which entitles them to our highest veneration and study" (see Icon, of W. F. of Wells, app., pp. 6, 7). At that period in this country art attained a merit which has never been duly appreciated. For example, the beautiful crosses raised by Edward I. to the memory of his Queen Eleanor appear to have been executed mostly by English artists (see "Archæologia," vol. 20).

We have, therefore, a noble example of the decorative taste of this period. If the west front of Wells cannot be quoted as a fine example of architectural design, it is unrivalled as a monument of sculptural skill. When contrasted with the west front of Amiens, we see at once its architectural shortcomings. We have no grand portals, of themselves the recipients of a series of sculpture, and capable of accommodating a considerable body of people, who could therein be taught the elementary truths of religion before

entering the church itself; but we have a much more perfect and complete display at Wells of the great verities of religion. The sculptures at Wells are not incumbered by apocryphal legends; but, where they treat of Scripture, represent Scriptural verities.

The sculptures at Wells are supposed to be the work of native English artists, or artists trained in this land. This fact will probably be more clearly brought out while the west front is in process of restoration; at all events, ample opportunity will be given for mastering the details of every figure, and, if needful, reproducing it. It may not be known to some here that a great work is being done at Canterbury. I have not been able lately to visit that most interesting cathedral, but a friend has sent me particulars of what is being done there. Many of the vacant niches have been filled with figures, where these had never before been placed, or, if placed, been destroyed. The south face of the porch and the eastern side of it have already been supplied with historical figures, and it is intended to carry on this work till the original design is perfected. Now, to accomplish such a work, the study of the Wells figures is invaluable. A list has been published of all those persons who have generously undertaken to supply figures, which are to be executed by Mr. Pfyffers, at a cost of 24*l.* each.

We believe that the day is past when any superstitious feeling could be attributed to restoring a work of this sort, or that it could lead any one away from the fountain of holy truth, or fix the mind in adoration of the work itself. Where a people have so long been accustomed to be taught from the written Word of God, and can now read that Word for themselves, and are taught to contemplate art for its own sake, or as a means of expressing reverential and devout feeling, or conveying historical ideas, there is little cause to dread a return to superstition or idolatry. There is, indeed, a very different lore to be gathered from a right contemplation of these works of what are sometimes called the "dark ages;"—dark, it may be, in some points, but certainly not in transforming into holy uses that which had been so sadly misused in heathen times. A very slight acquaintance with classic art shows us that the sculptor's chisel in the best days of ancient Greece and Rome was employed to delineate subjects either warlike, or voluptuous, or licentious; but when the chisel was transferred into Christian hands; when it was thought wise and good and devout to employ art no longer as a stimulant to passion or to licentiousness, but as a means to purify and exalt and spiritualise the feelings; then came forth the noble figures of the great and the good, the wise and the learned, holy men and holy women, and the embodiment of great religious ideas, instead of war, licence, and sensuality. The subjects of Christian sculpture are all great and ennobling and refining, instead of corrupting and enervating, and nothing, as it appears to me, shows the power and influence which Christianity exerted over society, more than the change which it wrought in art. In early and in Mediæval times it became a means of inculcating great religious ideas, instead of unholy passions. If this, art's glorious mission under the Christian dispensation, was for a time perverted and abused,—if the great power which sacred art had acquired over men's minds became perverted to superstition,—if it has rarely been chastised, and been chastened and cleansed of its errors and corruptions, and may, under good guidance, still be applied to great, and to useful, and to holy purposes. It was the opinion of our early reformers—Cranmer, Ridley, Redman, and other learned men (see "Necessary Doctrine and Erudition for every Christian Man," published by the authority of Henry VIII.),—that pictures and statues might be placed in churches, and ought not to be despised, but used reverently; and the injunctions of Queen Elizabeth and Edward VI. are directed against "monuments of feigned miracles." For the opinions of our leading divines and laymen on this subject, see Dr. Wilson's "Ornaments of Churches Considered."

CARVED STALLS IN GERMAN CHURCHES.

WE add to our examples of chancel stalls from German churches* a view of those in the Church of St. Catullus, in Moorburg. These belong to the end of the fourteenth century.

* See p. 45, ante, &c.



STALLS IN THE CHURCH OF ST. CATULLUS, MOORBURG.



CARLISLE MEMORIAL COLUMN, CASTLE HOWARD.—MR. F. P. COCKERELL, ARCHITECT.

THE CARLISLE MEMORIAL COLUMN,
CASTLE HOWARD.

The column of which an illustration is given has been erected by public subscription as a memorial of the late Earl of Carlisle, who, through a long life one of the most conspicuous and useful men in his county, is best known to the general public as Viceroy of Ireland, which high post he occupied for eight years. The committee appointed to carry out the memorial invited privately designs from four architects, and that of Mr. F. P. Cookerell was selected.

The column is erected upon Bulmer-hill, at the edge of the Castle Howard estate, about two miles and a half from the Castle, and facing the magnificent avenue which traverses the park, and about twelve miles from York. The hill, forming nearly the last descent from the wolds to the plain of York, commands a magnificent view of the country surrounding the city.

The total height of the monument, from the foot of the steps to the top of the gilt urn, is 110 ft., and the diameter of the column, 7 ft. 4 in. The shaft of the column, though hollow, is without a staircase, as the height of the monument would add little to the extensive view enjoyed from the already elevated position. Access for repairs is provided by means of a wire rope inside. The four pedestals at the corners of the platform are surmounted by knightly helmets, and carry each on one face a sword and a shield, bearing alternately the arms of the Howard family and the Royal arms, in allusion to the viceregal dignity of the late Earl.

The materials used are, for the foundations and the face of the platform and the sub-pedestal of the column, Castle Howard stone of a reddish brown tint; the rest of the work being executed in Whitley white stone. The tripod is executed in terra cotta, cored and braced with wrought iron. The urn and fames are of copper, gilt. The work has been carried out by Mr. Bailey, of York. The carving and modelling of the tripod are by Mr. Kelsay, of London. The whole was superintended by Mr. Chick, resident agent to a neighbouring estate. The total cost of the works was 2,061l.

ST. MARY REDCLIFF CHURCH AND THE
FREEMASONS.

The Freemasons of Bristol having previously restored the external stonework of the Lady Chapel of Redcliff Church, have more recently contributed funds for handsomely paving the chapel and for decorating the vaulted ceiling. At the anniversary meeting of the Canynge Society, on the 21st inst., they mustered in force, and the Earl of Limerick, P.G.M., accompanied by Bro. W. A. T. Powell, D.P.G.M., and members of the Grand Lodge and of the other lodges of the province of Bristol, proceeded to the Lady Chapel, where they were met by the vicar (the Rev. Canon Bandall), the churchwardens, and other officials of the parish of St. Mary Redcliff. Bro. J. R. Bramble, Prov. G. Registrar, read an address setting forth the part taken by the Freemasons of the province of Bristol in the restoration of the Lady Chapel and other parts of the sacred edifice, and concluding with the aspiration that it might shortly become perfect in all its parts, and the efforts for its restoration be crowned with complete success. The vicar made a suitable reply, and the Bishop of the diocese having thanked the members of the craft for the good work they had so materially aided, the company adjourned to a luncheon at the Royal Hotel, at which Mr. W. A. T. Powell presided generally.

Mr. C. S. Clarke, in the course of his report as hon. sec. of the society, read the following note from the architect, which serves to show what has been done during the past twelve months:—

"Brompton, April 9th, 1870."

My dear Sir,—I have received your request, on the part of the Redcliff Restoration Committee, that I should send you a memorandum of the progress of the works since the last meeting of the Canynge Society, and I hasten to comply with it. Pressure of occupations, however, forces me to be brief. The chief efforts have been directed to the restoration of the tower, and considerable progress has been made. The four turrets at the top—beautiful works with ch. having become dangerous, had been removed, have been completely reproduced. Considerable advances too, has been made towards the completion of the uppermost story of the tower. It is proposed that the clock shall be illuminated for night, and the clock-face, arranged with that end in view, is now being proceeded with. The parishioners and subscribers will doubtless be glad to hear that the works required in the chancel, so long neglected, have been taken in hand. The north and south screens have been restored, and the eastern termination, with reredos,

is commenced. A fitting pavement for the chancel, and the lighting of the church generally, are works that should be immediately attended to when funds are available.

In the Lady Chapel a tile pavement, with marble steps, has been laid down at the cost of the Freemasons of Bristol, by whom the external stonework of the chapel had been previously restored. The same body, not unmindful of the connexion of the craft with the building, guilds of the Middle Ages, have also provided funds for the decoration in colour and gilding of the groined vaulting of the chapel, which will, it is hoped, be completed by the day fixed for the meeting.

Several additional stained glass windows have been set up with great advantage to the general effect of the church, and others are in progress that will call for note, especially one intended to fill the large window of the north transept as a memorial of Edward Colston, a name dear to Bristol.

I desire to mention, in conclusion, the continued devotion of Mr. William Rice to the work in hand, and to subscribe myself, dear Mr. Charles Clarke,
Your very faithful servant,
GEORGE GODWIN."

Mr. Sholto Hare and others took part in the proceedings. The sermon, which was preached by the Rev. E. J. Simpson, produced about 100l.

The decoration of the vaulting was the work of Messrs. Clayton & Bell; the pavement was executed by Messrs. Simpson & Co.; the cornices were provided by Messrs. Hart & Co. Four of the windows are filled with stained glass (three by Wailes and one by O'Connor); one yet remains to be filled, and the panelled walls require to be treated with colour.

PHYSICAL COMMOTIONS.

ATTENTION having been turned, in rather a startling manner, to this subject by the tremendous manifestations within the last two or three years, every new indication is apt to be rather too carefully recorded, though, under ordinary circumstances, many might have transpired without particular notice. Making every allowance, however, for this, it does seem as if such commotions were much more frequent than usual; and we therefore present a new batch of them, collected within the last few weeks.

A letter from Trieste says that three shocks of earthquakes have been lately felt there. The town has suffered no damage, but some places in Dalmatia have suffered severely. At Cians, in the district of Volosia, 140 houses have been damaged and 87 destroyed. The population had to pass the night in the open air, exposed to a severe frost, for during the night fifteen shocks of earthquakes occurred. At one moment the village was in danger of being destroyed by two immense masses of rock, which rolled down from a neighbouring mountain.

Two distinct shocks of earthquakes were felt in Kingston, Jamaica, on the morning of the 22nd of February, about seventy minutes or half an hour after midnight. They were unaccompanied with any of the phenomena usually attending such visitations. The motion seemed to be rather of a rotatory than an undulatory nature. The first shock was of very short duration,—about three or four seconds. Then, after a pause of about a couple of seconds, the second and more distinct one was felt, lasting about from ten to fifteen seconds. The entire heavens were overcast with dense black clouds. These earthquakes are becoming more frequent than welcome of late, according to the *Jamaica Morning Journal*.

The *North British Mail* states that a pretty severe shock of earthquake was recently felt at Comrie about midnight. The noise was like the rumble of distant thunder, and was heard by numerous people beyond Comrie. Slight shocks have of late years been pretty frequent, and they generally occur in peculiar states of the atmosphere.

The French Academicians have evidently an eye upon the commotions. At a recent meeting of the Academy, as reported in *Scientific Opinion*, amongst the correspondence of the day presented by M. Dumas was a paper relative to the earthquake which occurred at Anconea on the 8th of February.

Another communication was from the Peruvian Consul, stating that on the 7th of last December, at 7 a.m. and at 7 p.m., shocks of earthquake were felt in Peru, and were again repeated on the 28th.

M. Bousseingault remarked, on this subject, that the volcano of "Copayan," after a long period of the most complete repose, had again become active. M. Bousseingault was disposed to think that there is a relation of cause to effect in these two phenomena.

A curious phenomenon was witnessed last month at Malta. The sea suddenly rose two or

three feet above its usual level, receded, and then rose in a similar manner a second time. This may have been occasioned by some submarine volcanic eruption in the vicinity.

New York was visited on a recent Sunday by an equinoctial storm of unusual severity. It is believed that many shipwrecks have been caused along the coast.

A Tripoli (Barbary) letter, in the *Levant Herald*, reports the fall of a monster aerolite in the neighbourhood of Monrzonk, weighing, it is said, 1,800 ckes, nearly 5,000 lb. This must, of course, be only a rough guess; but if it be even tolerably approximate, the mass is one of the largest meteoric bodies on record. Be its actual size what it may, the Minister of Public Instruction has ordered the fragment to be sent to the capital, where it will probably be placed in Mr. Gould's Museum.

The enormous size of recent sun spots—16,000,000 square miles—is naturally reviving speculations as to the nature of such phenomena.

A strange statement has appeared in more than one paper to the effect that astronomers are perplexed and astonished by a new and, it is supposed, magnetic emanation from the sun, which is said to have reached nearly half way to the earth's orbit; but there is a very doubtful look about the statement.

Since all the above was prepared, about a fortnight ago, the following new collection of incidents has been made.

The New York papers of the 3rd publish the following:—"San Francisco, April 2. At 11:50 a.m. to-day, a sharp, wicked shock of earthquake occurred here. Its duration was six seconds; the direction from south-east to north-west, and the motion vertical. There was no damage to life, limb, or property; but there was intense excitement. The streets swarmed with people in a moment. It was raining at the time. Prior to the shock the barometer was seen to fall very rapidly."

A Panama despatch says, much damage has been done in the vicinity of Quito, in the province of Imbabura, and in many other places, by earthquakes. On one occasion continued shocks were felt from noon till morning of the next day, when a shock of extraordinary violence occurred.

"The inhabitants," says the *Panama Mail*, "were terrified, and rushed from their dwellings, fell on their knees, and implored for mercy. During the latter part of the day thirteen distinct shocks were felt in Jipijapa, each one being accompanied by a violent wind-storm. Several times since many shocks have taken place, but none created great alarm until March 2nd, when there was one of unusual severity at about mid-day; but the most terrifying one of all took place on the 3rd, when, between Federal and Culo Pessado, the earth was seen to open and emit a hillock of stones from 30 ft. to 40 ft. high. Behind or near the spot where this occurred stood an earth-hill about 60 ft. high, which suddenly and entirely disappeared. Around the base of a hillock is a circular pond of salt water, and for a long distance surrounding that the earth, which before was hard and solid, has become soft and spongy. The inhabitants of the locality have become positively terror-stricken, and no inducement will take them within a very long distance of the spot."

The St. John's (New Brunswick) *Telegraph*, of March 18th, describes an extraordinary phenomenon which took place in the harbour of that city on the previous day. Early in the morning a strange noise, similar to that accompanying the earthquake on the 22nd of October last, was heard by the residents near the harbour. The tide was nearly down, and though it was quite dark it could be seen that the old ferry, which should be several feet above water, had vanished. Messrs. Littlehale & Coram's wharf had nearly disappeared: a piece about 20 ft. by 70 ft. broke off and settled squarely down into the water. A frontage, several hundred feet in extent, running from the line of the demolished wharf towards the breakwater has gone down, leaving a steep embankment, and less than 100 ft. from it, into the harbour, in the place where the old ferry-landing was. On this spot soundings were made, and where the old ballast or reefer was the day before rising above the water 8 ft., were found 6 fathoms of water, showing that even so near the shore as that, the bottom had settled just 32 ft.

The American papers state that unusually severe weather has prevailed in many parts of the country. The *Buffalo Express* of the 17th of March says that the two previous nights rivalled anything that was ever known for inclemency. There was great suffering among the mountains of Utah.

In South America, too, there have been terrible hurricanes and floods; and both in the Pacific and Atlantic many ships have been lost; so that the prediction of a correspondent in the *Builder* of the 19th March as to disturbances

about that time already appear to have been pretty well fulfilled.

In reporting the great storm at Buenos Ayres of the 9th ult., a local paper says:—"People in Europe will read with amazement of men and horses drowned in the streets of Buenos Ayres, of parlour floors giving way, of sailors being washed ashore on planks, or their corpses collected on the beach." Either in this or a subsequent storm,—the severest that was ever known,—100,000 sheep were destroyed by floods. The rainfall is described as having been the most dreadful that ever was experienced in Brazil.

Under the title of "Something the Matter with the Sun," a letter from the Rev. F. Howlett, who is well known as an astronomer, appears in the *Times*, in which he says of the "unusually disturbed condition of the solar surface" that the total area of the whole of the spots (on April 3rd) cannot be estimated at less than three billions of square miles. He has never during a period of twenty years seen so great a disturbance. The spotting of the sun, however, is periodical; but on this occasion the spots have been far more numerous and extensive than on any known previous occasion. They have now mostly disappeared.

The latest announcement of physical commotion is under date 23rd April, from Ocelonte, to the effect that a violent shock of earthquake had occurred at Dacca.

THE SOAP AND ALUM PROCESS FOR BRICK OR STONE WALLS.

ALTHOUGH much has been said on this subject in the *Builder*, we are every now and then requested to repeat particulars of the process, which is quite simple. The proportions are, three-quarters of a pound of mottled soap to one gallon of water; this composition to be laid over the brickwork steadily and carefully with a large flat brush, so as not to form a froth or lather on the surface; the wash to remain twenty-four hours to become dry. Mix half a pound of alum with four gallons of water. Leave it to stand for twenty-four hours, and then apply it in the same manner over the coating of soap.

In one case the soap seems to have given a bluish tint to the red bricks, which may have arisen from some peculiarity in the soap.

Strong evidence has been given in our pages of the advantage derived from this process in various localities. We are bound to say, at the same time, that in a case within our knowledge, where it was applied to a stone front (the stone very absorbent), it did not succeed. It must be applied in dry weather, and carefully.

A NEW PROMENADE FOR BLACKPOOL.

THE inauguration of the new promenade, together with the opening of a new entrance to the north pier, and the unveiling of a colossal drinking-fountain in Talbot-square, was celebrated on Easter Monday.

The sea-fence consists of a sloping breast-work, pitched with stones on a thick bed of clay puddle, the interstices between the stones being filled in with asphalt or cement concrete. The slope of the breastwork is curvilinear, and one in four on the average. Next to this breastwork, and running the entire length of the town, are the promenade and carriage-drive. The promenade, on an average, is seven yards wide; it has an even surface of asphalt, and is separated from the carriage-drive by a line of side stones. For the purpose of obtaining space between the houses and the sea for this promenade and carriage-drive, a part of the shore has been regained by an embankment along South Shore, and along the northern district, extending round Bailey's Hotel, by an iron viaduct, which projects over the sea fence. The floor of the viaduct is formed with Mallet's patent buckled plates, filled in with concrete, and finished with asphalt. The plates are fixed to rolled joists, and carried on cast-iron columns, which are screwed down into the solid. The carriage-drive, twelve yards wide, runs parallel with the promenade the entire length, and is formed of shingle, clay, and macadam. It has a footway along the frontages of the adjoining property, and the whole is drained and lighted with gas.

The works, which were designed and carried out by Messrs. Garlick, Park, & Sykes, civil engineers, Preston, were constructed in three

sections, two of which were given to Mr. Robert Carlisle, contractor, Blackpool, and the third went to Mr. Henry Chubb, of Preston. The ironwork was supplied by Mr. Joseph Clayton, Preston.

The works have cost upwards of 60,000*l*. They comprise, amongst others, 135,000 cubic yards of earthwork, 15 acres of stone pitching in the sea fence, 5½ miles of piling and planking in the sea fence, 21 acres of asphalt and cement concreting, 560 tons of wrought and cast ironwork, 40,000 square yards of carriage-road, with the palisading, railing, draining, and lighting.

YE DREAMING BUILDER.*

"Uzro Saint Austin will I build a shrine!"
And with this thought the holy Prior is fill'd;
The glow of ardour brightens in his eye
And quickens all his soul. Much is he skill'd
In all the lines and cunning crafts which build
The massive piles of Norman masonry;
But one thing greater in his mind is wild,
A lighter plan of structure doth he see,
Where strength and beauty blend in perfect harmony.
On this he dreams as the sweet eve-tide
—Meet hour for dreaming—mellows all around;
And from his quiet cell with listless stride,
Amidst the grass bending on the grassy ground,
—No thought of earth, no sense of sight or sound,
—He wanders forth, and in his dreams arise
The tapering spire with golden Roode beacon'd,
—A guide the watchful seaman oft shall prize—
A finger to lift up the emblem in the skies!

And in the woods the stately trees assume
The forms of rounded shafts, whose slender grace
Delights the sense, and meeting boughs become
High vaulting groins, in which his mind can trace
How intersecting lines may well embrace;
And through the opening of the leaves the light
Of glowing sunset falls upon his face;
Then suddenly there rises in his sight
Wrought mullions fill'd with glass with colours rich
Bedight.

Now, in his dream he trends on holy ground,
And in the solemn chanting of the wind
He hears deep, mellow voices sweetly sound
(As under lofty domes the ear may find,
When godly monks, with voices all com'd in,
Chant o'er their vesper low at even-tide)
"Lo! here," he cries, "where God doth show my mind
The way to build, the lofty spire shall climb,
And tongues shall sing His praise from vesper until
bedight."

"Our blessed Lady shall a chapel have,
Arcaded round with many a reely mould;
And Wilfred, with his cunning skill, shall carve
The story of her life, and shall his mould
In stone how He, by Judas basely sold,
Gave up His Life, and died upon the tree;
How, in His loving arms He doth enfold
The humble heart, no rocks of woe degree
Or birth he be who craves His blessed charity."

"This seeing, shall the poor oppress'd hide
Take heart again and lightly bear his wrong;
This seeing, shall the baron bring in mind
How glorious is mercy in the strong;
How gracious deeds to gentle birth belong,
And crest the helmet with a brighter ray
Than his own won in lists, or deeds among
The hurly-burly of a feudal fey,
For mercy springs in God, and pride is born of lay!"
JOHN RUSKIN.

CONSISTENT TENDERS.

SIR,—I send you with this another pretty specimen of contractors' tenders:—

For new roads, &c., on an estate at Staines, for Mr. E. Woodroffe. Mr. E. Gover, surveyor:—	
Turner & Cole	2355 10 0
Harding	295 0 0
Streckson	250 0 0
James	268 13 0
Clarke	213 0 0
Napleson	229 15 0
Goodrich	227 10 0
Coker	212 0 0
Bunart	178 0 0
James & Taylor	165 0 0
Sheeter & Co.	153 0 0
Rogers	151 0 0
Bloomfield	150 0 0
Hancock	115 0 0
Ayres	139 0 0
Cook	137 3 9
Young	125 0 0
Porter	85 0 0

The works comprise about 1,770 ft. formation of new roads and footpaths (40 ft. wide), inclusive of stripping off turf, levelling, wheeling, and filling inequalities in same; 1,600 cubic yards gravel metalling to be dug, screened, carted a quarter of a mile, and spread; 50 ft. lineal 2 ft. barrel culvert, 9 in. brickwork in mortar (about 1½ rod); 72 feet lineal oak wrought post and rail fence, four times painted in oil, and keeping in repair six months.

What does it mean? Such tendering must make the name of contractor a by-word and reproach!
W.

* It has often occurred to me that the bold leap from the heavy Norman work to the graceful Early English must have been a source of infinite delight to the great men who worked out that transition; and this is the idea I have tried to convey in the following little sketch.—J. B.

"POST AND PAN HOUSES."

In the Assize of 1189, London, *panna* is used for the wall-plate laid upon a party wall of stone to receive the posts of an upper story of wood. See Hudson Turner's "Domestic Architecture of England," p. 19.—"And he who giveth the land shall have the clear moiety of the wall, and put his *panna* upon it, and build."

In Yorkshire, *pan-pieces* is still wall-plate. In Lancashire, a *pan* is a purlin. In France, *panne* is purlin. See "Violet-Le-Duc," under that word, and under "*charpente*." Also under "*dalage*," he uses "*pannes de pierre*." *Pan*, in French, is another word altogether, as may be seen in the same author under "*Pan de bois*." W. R. CORSON.

TIMBER STACKS AND THE PROPOSED NEW BUILDING ACT.

A MEETING of timber merchants, builders, and others, has been called for (this) Friday, the 29th inst., to consider the 11th clause of the Bill, which runs as follows:—

"It shall not be lawful for any person to erect, rebuild, place, or replace a building built of wood for the purpose of floor-plate manufacture or a pile or store of cut wood or timber, on the ground or on the top of a building or elsewhere, nearer to a street than the buildings forming the general line of building thereon, or nearer to a building in different occupation than 25 ft., unless in every case there is a proper wall or fence or party wall or party fence wall (as the case requires) to separate such wooden building, or so different timber, throughout its whole height, from the street and from every adjoining or neighbouring building."

It is quite right that the parties whose interests would be affected by the clause should give it consideration, and obtain for themselves as much latitude as may safely be afforded; but we have too often pointed out the danger of the clause now pursued in many timber-yards, and urged the necessity of supervision, for any of our readers to suppose that the principle of the clause will find an opponent in us.

SEWAGE FARMING.

WILL you allow one who has given considerable attention to the "sewage question" to explain his views on the subject, in the hope that the following statement may at least lead to impartial investigation on a most important point connected with this subject.

That irrigation is the best and most profitable mode of disposing of sewage is, I think, now fairly admitted by all who have investigated the matter in all its bearings. This being admitted, it is established, beyond a doubt, that Italian ryegrass and mangold wurtzel are the two most productive and profitable farm crops that can be grown from sewage. Italian ryegrass must, under any circumstances, always form a large feature in sewage farming, because it is essential to have a large area, upon which the overflowing sewage can at all times be applied, and Italian ryegrass is the only crop which will admit of this constant application. Mangold wurtzel is, however, essentially the irrigation farmer's true crop. Its yield is immense. Fifty tons, at least, to the acre may be grown, to a certainty. The facility of transplanting (where plants fail), in consequence of moisture at hand, renders a mangold crop a positive certainty in sewage farming.

The difficulty hitherto with mangold has been, not to grow it, but to know what to do with it. Where a large breadth of mangold is grown, it would be difficult to feed at a profit, more especially as all dry food would have to be purchased, and equally difficult to sell it at a remunerative price. Demand and supply regulate price in all things, but more particularly in an article whose bulky nature confines its distribution to a limited area. The mere fact of such a large supply being known to be on the market would bring down the price to a minimum.

By my process this difficulty is entirely obviated. I convert the mangold into a cake, resembling linseed cake in appearance, in which state it is as easily transported as any other artificial food throughout the kingdom. It will keep perfectly good for years; linseed cake deteriorates in a few months. Most carefully authenticated trials have proved that it is equally fattening as the best linseed cake.

Let us look at the profits of manufacturing it. Fifty tons of mangold will make 6 tons of cake. Analysis and feeding experiments have proved this cake to be worth 10*l*. per ton; 1 acre, therefore, will give a gross profit of 60*l*. Not

as to cost of growing the roots, securing the crop, and converting it into cake. I will at present omit the question of rent. The cost of cultivating an acre of mangold, and securing the crop may be put at 6*l*. This is high. The cost of converting 50 tons of mangold into cake is 7*l*. 4*s*.: total cost per acre, 13*l*. 4*s*., against a gross profit of 60*l*., to be divided between rent and profit.

I do not ask those interested in the sewage question to take for granted one word I have said, although I pledge my word as to the *bond fides* of all that I have asserted. All I ask is that they should thoroughly investigate the subject.

I have every faith in the correctness of the analysis as given by Dr. Voelcker, and of the feeding experiments, which have been and are still being carried on.

I am prepared to offer every facility for the most crucial test that this food can be subject to. I fully believe that the manufacture of mangold cake will be the keystone of success to sewage farming. HUGH SMITH.

METROPOLITAN DISTRICT RAILWAY.

At Thursday evening's sitting of the House of Commons, the third reading of the Bill for a line by Queen Victoria-street to the Mansion House was passed by a majority of 20 in a full house. This settles the matter in so far as the House of Commons is concerned, but it is believed that the City authorities will repeat their opposition in the House of Lords.

BELLS AT ST. PAUL'S CATHEDRAL.

IN the patronage bestowed on the Great Bell, it is rather remarkable that his friends should have paid little or no respect to the single service bell which hangs in the north-west tower. I would therefore request to be allowed to send you the statement which has just been worked off for my forthcoming "Great Tome of Belles Lettres." I believe it is in the main correct; if not, I shall be thankful to any courteous reader who will do me the favour to prove that I am in error, and so the press shall be corrected.

H. T. ELIA-COMBE, M.A.

"We come now to the great bell in the south-west tower of St. Paul's Cathedral, London, inscribed 'Richard Phelps made me, 1716.' It is 6 ft. 10 in. in diameter, as lately measured by Mr. Tysen, and also by Messrs. Warner; the weight is 5 tons 4 cwt. The key note of the bell is A flat, but the sound when heard at the greatest distance is E flat, or a fifth above the key note."

This bell is never used except for the tolling of the hour, and for tolling at the death and funeral of the Royal Family, the Bishop of London, the Dean of the Cathedral, and the Lord Mayor should he die in his mayoralty.

There is a bell in the north-west tower, used for the daily service, inscribed "Made by Philip Wightman, 1700." The diameter is only 40 in., and 3 in. thick. This may have been cast from the metal of the bell in the clock tower opposite Westminster Hall gate, which, before the Reformation, was named "Edward" after the Royal Confessor; subsequently to the time of Henry VIII., as appears by two lines in Eccles's "Glean," it was called Great Tom, as Gough conjectures, by a corruption of Great Tom, from its deep sonorous tone.

On August 1, 1869, the clock tower, or clock tower, was granted by William III. to St. Margaret's parish, and was taken down, when the bell was found to weigh 82 cwt. 2 qrs. 2 lb., and was bought at 10*l*. per lb., producing 82*l*. 17*s*. 6*d*. for St. Paul's. While being conveyed over the boundary of Westminster, under Temple Bar, it fell from the carriage; it stood under a shed for some years, and was at length recast, with additional metal, by Philip Wightman, December 15th, 1708. There is an engraving of that bell in "Antiquarian Repertory," 1st edit., vol. ii., p. 284. This was probably the second bell, the inscription stating it to have been "brought from the ruins of Westminster." The engraving is from a drawing originally in the possession of Dr. Ducarel.

A further account is given in vol. ii. of the same work, p. 32 ("Antiquarian Repertory"), by which it appears that the original bell was first hung for the clock at St. Paul's, but it was soon cracked and new cast, but with such bad success that it was cast again; the writer was at the lowering of it, and the inscription on it, copied from the old bell, ran thus:—

Cervus aptavit me Rex Edwardusque beatorum.
Sancti beatorum Edwardi signatur ut bona.

As for the name of Tom, now so universally given to great bells, the writer, "M. X," considers it a Reformation name, suggested by the tone, and anything to get rid of a name given by Roman Catholic dedication or baptism. The name appears in a catch by Solomon Eccles:—

"Hack! Harry, 'tis time to be gone,
For Westminster Tom, by my faith, strikes one."

It was the Westminster Great Tom which the sentinel (John Hatfield) on duty at Windsor Castle, during the reign of William III., declared to have struck thirteen

instead of twelve at midnight, and thus cleared himself of the accusation, by the relief guard, of sleeping upon his post. The story is told of St. Paul's bell; but the cathedral had no heavy bell until the above grant by King William, who died 1702. The circumstance is recorded in the *Public Advertiser*, Friday, June 23, 1770."

VICTORIA PATENT OFFICE PUBLICATIONS.

Two Australian Blue Books have been issued by the Registrar-General of Victoria, Mr. W. H. Archer. One is a volume of "Patents and Patentees, from 1854 to 1866, both inclusive." The other is the second volume, for 1867.* They were compiled from specifications lodged in the Patent Office attached to the Registrar-General's Department at Melbourne. The number of patents in the first volume is not stated, but there are considerably more than 200 small folio pages in all, and the publication does not contain the abstracts of specifications, with drawings, which are not yet issued. Part I. of the first volume, contains a long list forming the "subject matter, index of patents applied for, and patents granted from August, 1854, to the end of 1866," and is of a very miscellaneous description. Part II. is an Alphabetical Index of Patentees, and Applicants for Patents of Invention, from August, 1854, to the end of 1866. There is also a key of terms and phrases in titles, &c. The second volume is arranged much in the same way, but contains also a "Chronological Index of Patents applied for, and Patents granted, 1867." The actual number of patents applied for during 1867 was 99. Of these, 61 were granted, the rest having been refused, or else allowed by the applicants to lapse.

Considering the long period between 1854 and 1866, there are not many patents for building and building materials. Six pages contain them all; but there are others scattered about here and there. Bricks, bridges, cements, floors, girders, roofs, &c., form the chief subjects patented, and there are some as to artificial stone. Of gold-digging patents, of course there are plenty. In the second volume there are only five patents under the head of building and building materials. These relate to bricks and tiles, cements, roofs, and windows. Of patents under the head of food, there are a good few; but that brings us to another compilation by Mr. Archer. This is a pamphlet titled "Abstracts of English and Colonial Patent Specifications relating to the Preservation of Food, &c." This pamphlet has been compiled from original documents or their printed copies, lodged in the Patent Office, Melbourne. Considering the interest which the subject of food-preservation has been exciting in Victoria, this is a well-timed publication; and it must have cost a good deal of labour in condensation and compilation. It contains brief abstracts of numerous patents for the preservation of food by various processes; with a list chronologically arranged, and index of patentees' names. It has also illustrations of apparatus.

SCHOOLS OF ART.

The Birmingham School.—A lecture has been delivered, in connexion with the local Art-Students' Literary Association, by Mr. W. D. Rainbach (the head master), the subject being "Schools of Art." The lecturer gave a brief sketch of the various schools of art in which he had studied, taught, and visited; and, among the latter, he described several of the principal Continental schools, and spoke in favour of the system they adopted in drawing from casts and from nature, in preference to the English system of drawing from flat copies. In the *École de Beaux Arts* in Paris, and most of the French and other Continental schools, the admission was entirely gratuitous, and great facilities were afforded for teaching design, as applied to industrial purposes. At Nuremberg, in their antique studies, the students made the figure life-size, which were prevented from doing chiefly from want of room. The students were also taught wood-carving, die-sinking, engraving, and many other branches of art-workmanship; but he thought that, in original design, they were excelled by the students of the Birmingham School of Art.

The Leamington School.—The report of the Local Philosophical Society says:—

"The council have to announce a serious loss, in the resignation of the head-master of the school of art, Mr. Charles Ryan, who is compelled to give up public teaching

on account of the delicate state of his health. The council cannot allow Mr. Ryan to resign the management of the school of art, which he has so long and so successfully conducted, without expressing, on this public occasion, a hope that his health may be soon restored, so that he may be enabled in future to devote his comparative leisure time to the more lucrative pursuit of independent work in his profession as an artist, in which they heartily wish him success."

CHURCH-BUILDING NEWS.

Child's Wickham.—A restoration of the parish church is about to be effected under the direction of Mr. G. Hunt, of Evesham, architect. The church has been sadly neglected, its roof is almost coming down, and its walls are bulged and much dilapidated. The chancel belongs to Sir Thomas Philipps, and the work of restoration will probably only proceed as far as the chancel arch. The works comprise the taking down the greater part of the nave, and rebuilding the same; new open timber roof, pitch-pine seats, oak pulpit and reading-desk, tile floor, new chancel step, newrings' door, new entrance doors, and repairing tower from parapet to base. Mr. Frith, from Coventry, better known as "Steeple Jack," will repair the spire. These works will probably cost nearly 1,000*l*., over 800*l*. of which have been obtained. The stone is from the neighbouring quarries, excepting windows and roof corbels of Bath stone.

Watford.—The work of lowering and levelling the churchyard has been completed, and the restoration of the church will now be commenced. It is intended that the chancel and aisle shall have battlements, and that skeleton doors shall be placed at the west, north, and south porches. Mr. Gibson's contract, amounting to 4,500*l*., has been accepted. The estimated total cost of restoration is 5,000*l*.; the cost of levelling the churchyard, &c., 234*l*. Upwards of 1,000*l*. are still required. It is intended to erect an iron church in the churchyard, between the church and the free school, for the performance of divine service during the restoration, for the carrying out of which it is believed the parish church will have to be closed for a period of eighteen months or two years.

Datchworth.—The church here has been reopened. The architect, whose designs for the restoration have been carried out, is Mr. A. Blomfield, and the work has been executed by Messrs. Lawrance & Son, of Datchworth-green, builders. The floor of the edifice is paved with Staffordshire tiles, except that portion upon which the feet rest; this is boarded, whilst the seats are of stained wood. On the north side of the church a new window has been put in, corresponding with one at the east end of the aisle. The other windows have been newly glazed, and the stone framework put in repair. The original roof of the church has been retained, and a course or two of new colouring has given freshness to the appearance. A spire, with a 54 ft. rise, has been added to the tower, the upper story of which is new to the set-off; it has four new windows of 22 ft. square, and the spire roof contains 16,000 oak shingles, and has four new dormer windows, which were contributed by three of the workmen engaged in the building. Much improvement has been made in the interior of the tower, by the removal of two floors, as well as an old gallery in the front.

Chelmsford.—It has been resolved at a public meeting, to put the fabric of St. Mary's Church into a state of repair. It is proposed to expend 4,000*l*. if subscriptions can be got. A committee has been formed.

Harrogate.—The foundation stone of All Saints' Mission Church has been laid at Harlow-hill. The site was given by the Earl of Harewood, and also land for a burial ground. The architects are Messrs. Shutt & Thompson, Harrogate and Leeds; the design is in the Continental style of Gothic; and the edifice will contain nave, transept, and chancel, organ-chapel, and vestry, the roof being open timbered, with a tower surmounted by a spire. The church is intended to seat 217.

Wivelsfield.—The old Sussex church of Wivelsfield has been restored and re-opened. The restoration of the ancient part has been confined to putting it into repair, but as additional room was required, a north aisle was added, harmonising generally with the early work, reinscribing the ancient features. The chancel has been extended to the east, to the proportion which it ought to have been in the fourteenth century. A large window has taken the place of the early triplet, which is more suitably placed at the east end of the new north aisle. During the repairs of the roofs, it was discovered that the south

* Builder, March 10, 1855.

† See an engraving in Beverell's "Les Délices de la Bretagne, 1707," vol. iv., p. 840.

* Published by authority. John Ferres, Government printer, Melbourne.

aisle in the fifteenth century had a nearly flat roof covered with lead; the decayed ends of the principal beams were found embedded in the wall. In later times, when repaired, it was raised for the sake of economy, and covered, like the nave roof, with Horsham stone, the sale of the old lead probably covering the cost of the repairs. During the progress of the restoration, on removal of the gallery, Hebrew texts in distemper were discovered upon the southern and western walls of the nave, over which later Early English texts had been introduced.

"Laud Deo." "Floreat Ecclesia."

The work has been carried out under the superintendence of Messrs. Slater & Carpenter. Their plans were commenced by Mr. Stanbridge of Lindfield, and completed by Messrs. Fuller & Longley, of Turner's-hill. The total cost of the work will closely approach 1,400l.

Longdon.—After undergoing various alterations and repairs, the parish church of Longdon has been re-opened for divine service. The whole work has been carried out from the vicar's own drawings. Mr. Blomfield, the architect, was first consulted. He sent drawings which involved a cost of more than 2,000l. This plan included the removal of the nave and the erection of a chancel, in character with the tower, but the rebuilding of the nave was left till some future day. Mr. Griffiths, of Eldersfield, was the builder engaged. The sum expended was about 650l.

Ancoats.—The church of St. James-the-Less, the erection of which has recently been completed, in Newton-street, Ancoats, has been opened for public worship. The new church, which is a plain brick structure, has been erected at a cost of 3,700l, towards which 3,200l. have been subscribed.

Margaretting.—The church of Margaretting has been re-opened for divine worship, after having undergone a restoration, which has been carried out by Mr. Brown, of Bocking and Chelmsford, under the superintendence of Mr. Chancellor, of Chelmsford. The walls, arches, and columns have been divested of layers of paint and whitewash. The roofs, of the nave, aisle, and chancel have also been restored by the removal of a ceiling of laths and plaster. A gallery, which spanned the west end of the nave, has been removed, and has enabled the architect to reveal a pointed arch, in brickwork, which opens into the tower, the ground floor of which can now be used when necessary. The wall at the east end, which was partly of brick, and into the interstices of which the ivy had insinuated itself, has been rebuilt in rubble, at the cost of Mrs. Straight, widow of the lay improver. The windows throughout have been fitted with new glass. Only the stonework of the window in the north wall was restored; all the others were in so dilapidated a state that new stone was required. The tower and spire, of timber, have been restored in oak shingle, fixed with copper nails. All the strong timber-work of the interior of the tower has been preserved.

A mass of high-backed pews has given way to rows of open benches, in stained Norwegian deal. The cost of what has already been done, irrespective of those parts of the work the expense of which has been privately defrayed by Mrs. Straight, is about 940l., viz., 630l. for the repair and restoration of the roof, walls, tower, &c.; 200l. for benching and restoration of the chancel-screen; 200l. for chancel fittings; and 50l. for subsidiary improvements. The sum already obtained and promised is 840l.

DISSENTING CHURCH-BUILDING NEWS.

Wike.—The foundation stone of a new Wesleyan chapel has been laid at Wike. The new edifice, from the designs of Messrs. Andrews, Son, & Pepper, architects, Bradford, will be in the Gothic style, 53 ft. long by 25 ft. wide, with an internal extreme height of about 30 ft. The chapel stands on 610 square yards of land, facing the Bradford and Huddersfield turnpike road, and is estimated to cost about 700l., inclusive of land. Entrance is gained by a doorway in front, having a circular window in the gable, and the other end of the building is octagonal, lighted by three lancet windows, and by double mulioned windows at the sides of the building. The whole of the pews will be open, and a place is left for an organ at the east end. A small vestry will accommodate the minister, and the chapel will be heated by hot air.

Leigh.—The foundation stone of a new chapel for the Wesleyan Methodists of Leigh has been

laid. The site is in King-street, about 200 yards from the existing chapel. The building is estimated to cost about 10,000l., towards which sum the subscriptions already promised amount to about 7,000l. The design of the building is Gothic, in the Early French style, and it will have a tower and spire, rising to the height of 150 ft. The chapel is calculated to seat 960 persons, including ample provision for free sittings and accommodation for school children attending public worship. The architect is Mr. C. O. Ellison, of Liverpool; and the builders are Messrs. Burroughs & Sons, Liverpool.

Liverpool.—The foundation-stone of a new chapel for the Wesleyan Methodists of the Seacombe Circuit has been laid at New Brighton. The chapel is designed in the style of architecture which prevailed during the first half of the thirteenth century, adapted to requirements. The plans were selected in a limited competition, the successful competitor being Mr. Henry H. Vale, architect, Liverpool. The contractors for the works are Messrs. J. & T. Mason, of Egremont. The ground-plan will be in the form of a Greek cross, the arms of the cross forming the transepts to the main body of the building. The chapel is to be terminated at the end beyond the pulpit by a large semicircular apse, with sedilia, having shafts of polished Irish marble, above which there will be traceried windows filled with stained glass. As the levels of the site fall considerably from south to north, the architect has taken advantage of this to place a lecture-hall and school-room beneath the northern end of the chapel. The main entrance is by a large porch underneath the tower, which will be placed on the west side of the church. This tower, if erected, will rise to the height of about 80 ft., and will be finished with a saddle-back steeple. The materials used in these buildings are to be principally local grey bricks, with white stone dressings, and ornamental carvings and bands of parti-coloured brickwork. Inside, all the roofs will be open timbered. The chapel will hold about 350 people, and the school-room 300.

Tikley.—A Wesleyan Chapel has been erected and opened here on a site between the Wells-road and the Wells Promenade. It has a school and class-room underneath, and the minister's house is in the rear. The style of architecture is Early Decorated Gothic. In the principal front of the chapel there are three entrances, and over the centre one a four-light window is placed, the framework of which is of geometrical tracery. At the south-west angle of the building stands a tower, containing a staircase to the gallery, provision being made for a spire; and a corresponding staircase, in the form of a circular transept or porch, occupies the south-west angle. The sides of the building have two large three-light windows with traceried heads, surmounted by gables; and besides these there are three two-light windows with traceried heads. The committee have not seen their way to the erection of the spire. It was intended to be 120 ft. in height, but the tower has only been carried up a portion of the distance, and covered with lead. The length of the chapel inside, inclusive of the vestibule and organ chamber, is 78 ft., which could be increased by the absorption of the house to nearly 100 ft., and the width is 41 ft. The galleries are supported by light iron columns extending to the roof. The roof is formed in the centre by curved ribs, and rises at the crown to a height of 36 ft., leaving a sufficient space above the plaster ceiling for ventilation. The seats are all open benches. The whole of the woodwork of the building is stained and varnished. The chapel is lighted by means of two pendants, and brackets placed along the walls, all of which are of wrought iron, illuminated. The windows are filled in with fluted glass. The chapel, with its galleries, affords accommodation for upwards of 600 adults. The schoolroom underneath the chapel is 41 ft. by 36 ft., and the basement contains besides two class-rooms, the minister's vestry, a room for the heating apparatus, and appliances for tea meetings. The total cost of the building executed is about 4,500l., inclusive of the site, and the completion of the spire is estimated to cost 500l. The architects were Messrs. Andrews, Son, & Pepper, Bradford; and the contractors, Messrs. Richard Crabtree & Mason, Bradford; joiner work, Messrs. Weddington & Mason, Burley; plumber work, Mr. Wm. Hunter, Bradford; slater work, Mr. John Tattersall; plasterer, Mr. Thomas Bailey; painter, Mr. Henry Briggs; ironwork, Messrs. Richworth & Thornton.

Manchester.—A new Congregational Chapel has been opened at Patricroft, near Manchester. The chapel is situated at the junction of Franklin-street and the Crescent, opposite Liverpool-road. It is in the Italian style of architecture, and is built of bricks. The main entrance is from a portico in front, with an entrance on each side, which lead into a vestibule, from the ceiling of which depend two one-light gas suspenders. There are two large sunlights in the ceiling, and three-light brackets projecting from the walls on each side, and at the ends of the building. The chapel is estimated to seat 700 persons, and the total cost will be over 4,000l. Mr. Southern, of Salford, was the contractor; and Messrs. Woodhouse & Potts, of Oldham, were the architects.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Tunstall.—The new chapel in Sun-street, Tunstall, has been opened for public worship. The chapel is a Gothic building, capable of seating 450 persons. It is 66 ft. long by 25 ft. wide, and has an open-work roof. The altar and reredos are of wood, and the seats are open. The principal materials employed are red and blue bricks, with stone dressings. The chapel and clergyman's house adjoining have cost in erection about 1,000l., and the land on which they stand was purchased for 630l. Messrs. Goldie & Child, of London, were the architects; and Messrs. Bennett & Cooke, of Burslem, the builders. The enrichment of the altar was done by Mr. W. Harvey, of Chaele.

Lewes.—The Roman Catholics at Lewes have for some time assembled for worship in a private house in the Priory-crescent, Southover, but they have lately purchased the residence of the late Mr. William Cotton, in St. Ann's, opposite the eastern entrance of the parish church; and the east wing being pulled down, an appropriate site was secured, upon which a little chapel has been built, connected with the other portion of the property, in which the Rev. H. Wood, the priest for this district, is in residence. The architect was Mr. Crisford, of Eastbourne, and the builder, Mr. Fisher, of the same town. It is a plain building of yellow brick, with red facings, and window-frames and dressings of Bath stone. The interior of the chapel, exclusive of the chancel, is 36 ft. long and 25 ft. wide, and has sittings for 150 persons. The chancel is 18 ft. long and 15 ft. wide, terminating in an apse. The interior is lighted by ten windows. In the front,—the south side over the doorway,—is a large window, and on each side of the doorway are narrow lancets. On the eastern side are three windows, and the chancel is lighted by four windows of crimson glass. The sittings are open benches, and the walls are tinted. In the chancel there is some carving, by Mr. St. Clair, of Lewes, the first carver in wood who has been established here for some centuries. The corona lamp hanging from the centre of the chancel was presented by the congregation. The altar cross, of enamelled brass, was manufactured by Messrs. Hardman & Co., of Birmingham. The brasswork generally, was supplied by Messrs. Burns & Co.

SCHOOL-BUILDING NEWS.

Worcester.—The parishes of St. John and St. Clement have commenced operations for the erection of infant schools, and workmen are now employed in laying foundations for the same contiguous to the existing school buildings in each parish. For St. John's a site has been obtained in a field on the right hand side of the Bromyard-road, just beyond the toll-gate. The site is 105 ft. square, and will be enclosed by a brick wall. Within this space, standing back from the road, will be the school, presenting to the front a pointed gable with wings. The principal school-room will be in length co-extensive entrance will be by a porch built at one of the ends the frontage—that is to say, 48 ft. The end. Behind this room, which will be 22 ft. in width, there will be two class-rooms, each 20 ft. by 14 ft., and the intermediate space is to be covered over, and will be useful as a playground in wet weather. The height from the floor to the wall-plate will be 14 ft., and to the top of the pointed roof in the centre about 35 ft. Behind the porch, which will be 9 ft. by 7 ft., there will be a book-room, 7 ft. by 6 ft. The building will be of brick, with white stone dressings. Provision has been made for ventilation,

and the school will be heated in cold weather by means of hot air. Mr. Perkins, of the cathedral, is the architect; and Mr. Warner, of Malvern Link, the builder. In St. Clement's parish the new infant school is to be built on a space adjoining the present schools, hitherto used as a playground. It is somewhat irregular in shape. The architect is Mr. Ernest A. Day. The front wall will be close up to the line of Church-walk, and the entrance will be at the end near to that by which access is obtained to the existing schools. A space of 9 ft. at that end will be walled off to provide the porch and a cloak-room, and the remainder will be the school-room, the dimensions of which will be 47 ft. by 20 ft. The roof will be an open one, the interior height being 12 ft. to the wall-plate, and 28 ft. to the apex. The dressings of the building are to be of stone. Messrs. Joseph Wood & Sons are the builders.

Books Received.

"PALESTINE Exploration Fund: Quarterly Statement, No. 5. January 1st to March 31st, 1870. Society's Offices, 9, Pall-mall East." These quarterly statements become more and more interesting, and the one under notice excels all previous statements in that respect. Besides the general progress, and the Moabite stone, with an illustration, it gives an account of temples in Coles-Syria, the summit of Hermon, the rock tombs of El Medjeh, and various other interesting matter.—"Report on the Means to be adopted for permanently and beneficially Disposing of the Sewage of the Borough of Leicester. By Mr. Baldwin Latham, C.E. (Spencer, printer, Leicester)." Mr. Latham's scheme for irrigation at Leicester, of which we have already spoken, is here reported on. He estimates the cost of the proposed works as follows:—

Proposed high-level intercepting sewer to irrigation area 5 ft. by 3 ft. 6 in., 22 in. iron pipe for present pumping engines, with sluice valves, &c., complete	£9,600 0 0
Laying down 650 acres of land with all culverts, &c.	4,000 0 0
Alteration of existing engines	7,000 0 0
Sewage extractors and buildings	500 0 0
2,000 0 0	
Making a total of	£23,000 0 0

The total annual expenses are estimated at £3,121.; and the total annual value of the produce at £9,750.; leaving a net profit of £3,000.

"Report of the Sanitary Committee of the Borough of Nottingham for the Year ending December 31st, 1869." (Allen, printer, Nottingham.) From this report it appears that the annual rate of the mortality for 1869 was twenty-three deaths to 1,000 persons living. Latterly, the town has been becoming more unhealthy. The increase of dwellings built below the flood level in the meadows is deprecated. The report is signed by the chairman and vice-chairman of the committee, and by Mr. W. Richards, the sanitary inspector. Two useful tables, one of meteorological observations supplied to the Registrar-General by Mr. M. O. Tarbotton, C.E., F.M.S., &c., surveyor to the corporation, and another on rainfall, also by Mr. Tarbotton, are appended to the report.—"Report on the Maritime Canal connecting the Mediterranean at Port Said with the Red Sea at Suez. By Capt. Richards, R.N., F.R.S., Hydrographer to the Admiralty, and Lieut.-Col. Clarke, C.B., R.A., Director of Engineering and Architectural Works, Admiralty. February, 1870." This report has just been issued. The general conclusions to which both officers come are favourable to M. de Lesseps's great undertaking. With reference to Port Said they observe that, though incomplete as a harbour, the rate of accumulation of the deposits which are carried eastward from the Nile is so slow that any practical inconvenience to navigation from this cause may be considered remote, and, when it arose, might easily be remedied by an extension of the breakwater. Of the canal they say that most of the physical difficulties which, it was anticipated, would operate prejudicially on it, have proved to be fallacious. They state that, for all steam-vessels, or vessels towed, ranging between 250 ft. and 300 ft. in length, with 35 ft. beams, and a draught of 20 ft., it will be a convenient highway; but for the transit of larger vessels special arrangements, such as are made on a single line of railway, should be enforced. They then give calculations to show the advantages to England

which the canal will offer over the route to the East by the Cape; and selecting Galle as a standard of comparison in point of distance common both to India and China, they show that the difference in favour of the canal is 5,135 miles, equivalent, in point of time, to thirty-six days. Taking a vessel of the *Voyage* class as an illustration, they find that the special cost of sending her by the canal, including all charges, and the extra coal which would probably be consumed, would be 895*l.*, to be placed against a saving of thirty-six days, leaving out of consideration the wear and tear of a voyage round the Cape; and they accordingly think it would be desirable to send all small or moderate-sized vessels through the canal. The widening of the canal they consider an essential to its final success, but think the present company are not likely to carry this out. They point out the difficulty in the way of doing so while traffic is going on. Appended to the report are maps and numerous sections of the canal. We may here remark that an interesting example of the facilities to trade and traffic presented by the Suez Canal has just been afforded by the last voyage of the *Danube* steamship from Bombay to Liverpool with 4,000 bales of cotton. She sailed from Bombay on February 12th. Bales of the cotton arrived at mills in Huddersfield on March 25th, and on the 29th yarn manufactured from it were sent out by the *Danube*, on her return voyage, in forty-five days from her departure from Bombay. The voyage by the Cape usually averages 100 to 120 days.—*Science Gossip*, Nos. 63 and 64. (Hardwicke). This periodical sustains its interest as a monthly medium of interchange and gossip for students and lovers of nature.—"First Quarterly Part of the Family Friend." This is a new household journal of a superior description, to which Mary Howitt, Mrs. S. C. Hall, and other known writers contribute. It is well illustrated, and is intended to aid in superseding the pernicious literature which is now finding its way to the homes of England.—We get a paragraph from the current number of *The Quiver*:—

"If we have attained any social standing, or made a little money, we shrink from apprenticing our sons to any handicraft. We would rather send them to starve in an overcrowded profession, or to earn a scanty pittance as clerks, than let them 'sink' into working men, although as carpenters or coopers, builders or engine-makers, they might soon earn three times as much as a clerk, and hope, by industry and economy, to become masters and employers. They may work as hard as they like at their sports,—at cricket, at boating, at gymnastics,—but directly hard muscular work earns bread or wages, it is voted low, ungenteel, degrading. This absurd prejudice has never yet found a congenial soil in the East. To this day, for instance, among the Turks, a handicraftsman often rises to offices of state, and now and then to the very highest offices. And even in the Sultan's seraglio, I believe, all the young princes are taught some handicraft, in order that, if misfortunes should befall them, they may have the means of earning their own bread. Among the ancient Eastern races this sensible, manly custom was more prevalent than it is in modern times; and in no nation was it more strictly observed, or more honoured in the observance, than among the Jews."

Miscellaneous.

Society for the Encouragement of the Fine Arts.—On Thursday, the 21st inst., Mr. Henry O'Neill, A.R.A., gave a lecture on "The Influence of Art on Civilisation, Music and the Drama, and the Influence of Fashion on Art." From the influence of music on art he proceeded to that of the drama, which he considered gave the clearest insight into the moral and intellectual being of a nation. He regretted the present lavish expenditure upon dramatic trifles, the taste for dramatic realism that destroyed all scenic illusion, and the vicious sensationalism that degraded the stage. The remedy which he suggested was an efficient censorship of the drama, such as existed at Athens in the time of Phrynus. Mr. T. R. S. Temple said that English dramatic art had rather improved than declined of late, and that Dr. Westland Marston and Mr. T. W. Robertson must be excepted from the general condemnation of dramatic authors; whilst Mr. Sadler attributed the decline of the higher forms of dramatic art, in part, to the incompetency of actors.

Antill's Stench-Trap.—This patent stench-trap, with Stidder's Patent Lock Gate, is a trap whether the lock grating be on or off. It is made from pig lead, and is perfectly smooth inside; can be easily cleaned out, and can be soldered to a lead pipe, or fixed where glazed pipes are used. It is recommended for the top of waste pipes in cisterns.

The Kist-Vean of Wendron, Cornwall.—One of the most interesting spots in this district is the summit of a circular pyramidal hill, which lies to the east, and within a mile of Wendron church-town. Here is a curious cave or kist-vean, on the highest part of the hill, surrounded by a circular inclosure of earth and stones. The *Cornish Telegraph* thus describes it:—"Discovering a small path sunk 2 ft. below the surface, I followed the direction it led to, and presently found myself in an underground chamber, perfectly square, with the walls very evenly and regularly built of stones, snugly built together without mortar or cement. These stones were generally of one size nearly, though one upright and thin slab was 5 ft. long by 4 ft. wide. On measurement, I found the walls to be 5 ft. 9 in. high and 8 ft. across. The doorway was remarkably narrow,—1 ft. 3 in. across and 5 ft. 9 in. high. The roof of this building is one flat rock of granite, 10 ft. in length and 8 ft. 6 in. in width, averaging 1 ft. in thickness. This is supported in its position by the upper stones which form the walls. On the exterior is an artificial barrow heaped up against the wall. It appears to have surrounded the whole cave at one time, when the doorway was blocked up. At the north-west corner of this room is a curious recess, 2 ft. each way, and very systematically arranged. This, when viewed from the summit, appears not unlike a chimney, but its original purpose cannot be determined. [Was it a ventilator?] Within the memory of the oldest natives of this locality there has not been current a single legend, not even the remotest tradition, which in any way decides the primitive use of this solitary object."

Value of Land in the City.—Some plots of land in Queen Victoria-street, City, the new thoroughfare from the Poultry to Cannon-street, have been let, at the Auction Mart, by Messrs. Foster, of Pall-mall, by direction of the Metropolitan Board of Works, on building leases for terms of eighty years. Lot 1. The plot on the north-east corner of Queen Victoria-street and the Poultry, with frontages to each, amounting together to about 150 ft., and containing a superficial area of about 2,352 ft. There are two houses on this plot, in the occupation of Mr. Goode, tobacconist, and Mr. Brown, tailor, who are both under agreements to quit at a month's notice. This plot was eagerly contested, and was ultimately knocked down to Mr. Wheeler, of the Poultry, at the price of 2,400*l.* per annum. Lot 2. The plot adjoining the preceding, westward, with a frontage to the Poultry and another to the new street. The portion next the Poultry is in the occupation of Messrs. Wheeler & Co., and is subject to a lease (6½ years), but possession of the portion of the plot facing the new street can be had immediately. This plot was disposed of to the same person at 850*l.* per annum. Lot 3. The plot on the south side of the street, near the Mansion House, having a superficial area of about 6,296 ft., with a frontage to the new street of nearly 105 ft., a frontage to Charlotte-row of nearly 95 ft., a frontage to Bucklersbury of about 86 ft., and a circular frontage to the Poultry of about 20 ft. This lot was knocked down at the price of 6,400*l.*, but not sold, being under the reserved price fixed upon by the Board of Works.

The Royal Society's Conversazione.—Sir Edward Sabine gave his second *conversazione* on Saturday night, the 23rd, at Burlington House, Piccadilly, and numerous objects of interest were exhibited, including, by permission of her Majesty, some beautiful drawings by Leonardo da Vinci, Michelangelo, and Raffaele; and an interesting ancient MS. from Abyssinia, the subject being "Discourses on the Virgin Mary;" each page of the vellum is emblazoned in colours. Natural History was illustrated by the marvellous series of echinoderms, sponges, and foraminifera, illustrative of deep-sea life, dredged by Dr. Carpenter; by M. Tegetmeier's singular living examples of the development of the Mexican scotyl into a salamandroid amphibian; and Dr. Palmer's very nice drawings of surface animals from the China Sea, and the Indian and Atlantic Oceans. Mr. Hayland's valuable and instructive maps of the distribution of diseases excited considerable interest.

Preservation of Stone.—M. Betincoourt writes to us from Boulogne, asserting that he has discovered a means of promptly staying the action of the atmosphere on limestone buildings susceptible of absorbing water. We are so often told this that we need something more than mere assertion.

A "Royal Amphitheatre" for Brighton.—A party of enterprising gentlemen purchased the Old Circular Bath, which forms the break in the Marine-drive at the Junction-parade. This, in four days, they have got converted into an amphitheatre, and opened to the public. The remodelling was done by a well-known contractor, Mr. Blackmore, and was superintended and carried out by his son, Mr. John Blackmore, junr. Within the limits of the old bath, a ring of 37 ft. in diameter, surrounded with four rows of seats, covered with crimson cloth, has been made. On the north side, where the bathers' rooms formerly stood, have been erected a promenade and some private boxes. Its seating capacity is estimated at 600. A commodious bar has been erected in the lobby to the original entrance to the baths, and as Clarendon mansion has also been purchased, it will most probably, before long, be fitted up as a hotel or club. The panelling of the dome has been decorated by Mr. Blaker, the other decorations having been executed by Mr. B. Bonner. Round the base of the cupola runs a circle of jets, serving to illuminate the ring, and nearly the whole plane. It is to be hoped that in this rapid conversion all due care of the public safety has been taken.

Sant Grinstead.—The Moat Church, which has been built by Mr. E. Steer, of East Grinstead, from his own designs, at a cost of 1,000l., raised by voluntary contributions, has been opened for public worship. The church is intended to be conducted on the Free Church principles, and in accordance with the Congregational form and order. It is situated upon a portion of the Moat Estate, at the junction of the Moat-road, within a few minutes' walk of the railway station, and is built in the Early English style of architecture, with native sandstone, in random courses, carved quoins, rubbed window-limbs and mullions, and roofed with slates; it has a tower with a stone spire on the north side, about 70 ft. high. The interior consists of a nave and side aisles, timber-framed clerestory, with side lights supported on iron columns. The eastern end terminates with an apse and vestry; and at the western end over the lobby is a gallery, which is reached by stairs in the tower ascending from the lobby. In the tower is hung one of Vicker's patent steel bells. It is estimated that the church will seat 400 persons.

Sanitary State of Monmouthshire.—The state of some parts of Monmouthshire, as regards sanitary arrangements, is reported to demand serious attention. The want of privy accommodation, which prevails to an extent that will scarcely be credited, the defective drainage, and the proximity of pigsties to dwelling-houses have done just what might be expected. Pontnewydd and Cwmbran, villages between Newport and Pontypool, have suffered frightfully from typhoid fever. Blaenafon, a town numbering some 8,000 inhabitants, is in a deplorable state; and messes are carrying off the children at the rate of six or seven a day. Such was the number of deaths there last week that it is computed that the death-rate had risen to the frightful figure of 163 per 1,000, instead of the usual proportion of about 22 per 1,000.

Roots in Drains.—Mr. Crabtree writes:—"Some root fibres have been taken from the water-pipes laid for supplying Radcar with water. The most bulky one filled up the 5-in. glazed earthenware pipe as compactly as a plug of wood could have done, so that no water could pass it. We found a great many pieces of smaller growth. They appear to be all of one character, and are probably the roots of some elm trees which are growing not far distant from the pipes, and would first insinuate themselves in microscopic lines into very minute openings, and then swell, spread, and ramify to the extent shown." A knowledge of this circumstance may be useful.

Kent Archaeological Society.—At a meeting of the council of this society, held on Monday, the 11th inst., at Chillingham House, Maidstone, the Earl Amherst, president, in the chair, several preliminaries were settled as to the annual congress of the society, to be held this summer at Sittingbourne. After the meeting many of the members inspected the remains of the Roman villa on the estate of Mr. G. E. Sayer, at the end of Stone-street, now being excavated by the society, under the superintendence of Mr. W. J. Lightfoot, their assistant secretary.

The Architectural Museum.—Sir Bartle Frere, one of the Council for India, will lecture here on Wednesday evening, May 25th.

Memorial of the Greek Revolution.—The King of Greece, we see from the *Morning Post's* Greek correspondent, has issued an ordinance authorising the erection of a national monument to the memory of the services and exploits of the Greek Revolution. M. Tsilier, a well-known architect, has been charged with the design of this monument, which is thus described in the *Courrier d'Athènes*:—

"The monument will be erected in the Place de la Concorde, one of the most beautiful squares of Athens. The principal figure is a woman standing, who represents Greece. Four other female seated personify the Peloponnese, the islands of the Aegean Sea, and those of the Ionian. Four statues will represent—in front the Archbishop Germanos blessing the flag of liberty; on the right, the siege of Missolonghi; on the left, the combat of Navarino; and, behind, the arrival of Capodistria, of immortal memory, and King Otto. The rest of the principal personage will bear on the face the inscription, 'The Nation to the Liberator of all Countries; and on the back, 'Union is strength.'"

Completion of the Clerkenwell Police Station.—This station, which is situated in the King's-cross-road, is from designs by Mr. T. C. Sorby, late surveyor to the Metropolitan Police. The amount of the contract was about 8,000l. The building is five stories high, and has accommodation for ninety-six constables, two inspectors, one superintendent, and one district superintendent. There are eight cells. Each of the floors is on an average 11 ft. high. The station is built with stock bricks, and the front windows and doorways have Portland and Tisbury stone dressings. The builders are Messrs. Latchey Brothers, of Battersea.

Waste Pipes in Cisterns.—In making the sanitary examination of the Highgate Schools, it was discovered that the waste-pipes of all the water-cisterns communicated directly with the drains, and that the water was contaminated in consequence. Twenty-seven children have been treated in the Fever Hospital, and it has been determined to remove the whole of those remaining to Bath-street, in order that further improvements in the building may be made. It is also proposed to erect a reception-ward and infirmary. There have been no fresh cases during the last ten days.

A Pseudonym.—Sir: *The Builder*, in a paper on "Easter Island," which appears at p. 322, gives an extract from a lecture delivered at our antipodes, in which the lecturer speaks of "Mr. Herman Melville, an intelligent American mariner." Permit me to inform such of your readers as may not be aware of the circumstance, that the above name is understood to be a pseudonym for Mr. Herman Melville, C.B., Under-Secretary of State for India. I presume that he has sowed all such wild oats by this time.—A. H. GENT.

The Operative Bricklayers and the National Education League.—The Operative Bricklayers' Society has become a subscriber of 100l., in ten years, to the funds of the Sheffield Branch of the National Education League. The society has forty-four branches scattered all over the country; and of its members, 655 voted in favour of the subscription, and 180 against it.

The Saving of Life at the Thames Embankment.—When the Embankment wall was built, the placing of chains along the wall so as to aid in the saving of life, was suggested in our columns. In a recent verdict of a coroner's jury, we observe a recommendation to this effect was appended to the verdict.

A Grammar School for Banbury.—A movement is on foot at Banbury to found a Grammar School, and towards the object Mr. Samuelson, M.P. for the borough, offers 1,000l.; Colonel Nelson, M.P., and Lord Saye and Sele (the High Steward), promise each 100l.

Freemasons' Hall, Lincoln.—This building, which is to be erected upon land in Newland, will very soon be commenced. We are informed that in addition to the ordinary requirement of a Freemason Lodge, a room 70 ft. by 32 ft., and 20 ft. high, is to be erected at the back.

Albert Museum, at Exeter.—At Exeter, the Albert Memorial Museum, which is now finally completed, was handed over to the town council of the city by the trustees. A view will be found in a previous volume of the *Builder*.

The late Mr. Macleise, R.A.—The death of this great artist will have been heard of by most of our readers, and with regret. We may find an opportunity to speak of him.

Fine-Art Exhibition in Ripon.—This exhibition has been opened by Earl de Grey and Ripon, who delivered an address on art-education on the occasion.

TENDERS.

For roads and other works at Tronville. Messrs. Nelson & Harvey, architects. Quantities by Mr. C. A. Gould.

Compagnon	223,263 0 0
Young	20,855 0 0
Bracher & Son	19,000 0 0
Roberts	17,481 0 0
Jocstead	16,000 0 0
Coker	14,384 0 0
Louchard	14,283 0 0

For erection of a shop, with basement, at 300, Strand, for Mr. T. H. Ferris. Mr. J. H. Rowley, architect. Quantities supplied by Mr. T. T. Green.—Scriveners & White (accepted).....2,674 0 0

For new stabling and additions to Stoke Hotel, Guildford. Mr. Henry Peck, architect:—

Structures	£631 5 0
Mason	618 0 0
Smith	681 10 0
Polla & Son	407 0 0
Feather	425 0 0
West (accepted)	425 0 0

For house for Mr. Edwin Bostock, Stone, Staffordshire. Mr. Samuel Dorman, architect. Quantities supplied by Mr. Mansel.

Freckley	£1,166 0 0
Inskip (Longton)	1,167 0 0
Dalens	291 0 0
Mercer	1,088 0 0
Inskip (Dilworth)	1,088 0 0
Mitchell (accepted)	1,090 0 0

For alterations and additions to the residence of Miss Bromhead, Bedford. Mr. F. T. Mercer, architect. Quantities supplied:—

Joy & Carter	£321 0 0
Spencer	316 10 0
E. Haynes	298 18 0
Mercer	295 0 0
Potter	284 3 0
Richards	282 8 6
Dalens	281 0 0
Mercer	280 4 0
W. Haynes	288 19 6
Smith	288 18 0
Conry	288 0 0
Willms	284 6 0
Wootton	287 6 6

For new schools for St. John's Foundation Society, Leatherhead. Messrs. Benjamin Ferrey and J. H. Good, architects. Quantities supplied by Mr. Northcroft:—

Ebbs & Sons	£15,168 0 0
Hill, Keddell, & Waldman	15,712 0 0
Myers & Sons	15,974 0 0
Jackson & Shaw	15,740 0 0
Batchell & Co.	15,046 0 0
Mansfield, Price, & Co.	15,011 0 0
Dave, Brothers	12,725 0 0
Sherbourne	12,574 0 0
Goddard	15,480 0 0

* * * We are asked to mention that Messrs. Ebbs's tender included by accident an addenda bill of omissions, 2,020l.

For the erection of a dwelling-house and stable at Chislehurst, Kent, for Mr. C. J. Cotterell. Messrs. Scoury & Wright, architects:—

Candler	£2,800 0 0
Robertson	2,568 0 0
Holland & Hansen	2,476 0 0
Brown	2,445 0 0
Taverner & Son (accepted)	2,440 0 0

For erecting iron railings, on a Portland stone curb, on two sides of the grounds of the Seamen's Hospital, late Infirmary, Greenwich:—

Coker	£1,139 0 0
Featherstone & Walker	1,076 0 0
Topham & Co.	1,040 0 0
Turner & Co.	1,008 0 0
Cottam & Co.	988 0 0
Boyd & Co.	935 0 0
Slidman & Co.	920 0 0
St. Francis Ironworks Co.	893 0 0
Hood & Co.	893 0 0
Victoria Ironworks	875 17 6
Hall & Smith	857 0 0
Smith & Co.	825 15 0
Barnet	795 0 0
Selden	780 0 0
Hannum	772 0 0
Stoas	771 10 0
Barnard	740 12 0
Hobbs & Seth	722 7 0
Jukes, Coulson, & Co. (accepted)	710 9 3

Accepted for building a pair of semi-detached villas in the Park Hill, for Mr. W. B. Bilton. Mr. R. G. Smith, architect. Quantities supplied by Mr. G. W. Ranwell:—

Bricklayer	
Goates	£1,100 0 0
Mason	
Swearing	178 0 0
Slaters	
Dawber & Son	58 14 0
Carpenter and Joiner	
Clarkson	620 0 0
Smiths and Founders	
Latham & Co.	57 13 0
Plumber, Glazier, and Gaffer	
Goldman	390 0 0
Painter	
Dreyer	37 18 0

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The Builder.

VOL. XXVIII.—No. 1422.

Father Nile.



S we pass along the banks of the famous river which are bordered as far as the eye can reach with waving crops of green maize, interspersed with the bursting

ing pods of cotton, and overtopped by groves of date-palms,—as we wind along the narrow paths spared by the rapidly-increasing waters, and listen to the Arabs rejoicing as the flood mounts higher and higher,—we cannot but contrast the effects produced upon the soil by the annual inundation of the Nile with that produced by floods in other countries; nor can we help being struck by the cheerfulness it produces amongst the population here, while elsewhere a flood is a great calamity, and is the cause of confusion, mourning, and lamentation. We particularly remember when at one period of our lives it was our fate to reside on the top of a mountain in Asia Minor, overlooking a vast plain, which was intersected by a river noted in ancient history; that after a few weeks of constant rain, we were one night roused from our slumbers by a combination of apparently unearthly noises, by an incessant stamping of hundreds of hoofs on the rocky road which led to our dwelling, mingled with bleating, neighing, baying, hoarse shouts and occasional shots, such as might have led us, had we been Easterners, to believe that our lonely hut was besieged by a legion of jins and demons. Upon rushing out, revolver in hand, we were as much mystified as before, for we saw in the dim light a number of black forms approaching by a series of leaps. When, however, our trusty and very watchful guards had been aroused from their slumbers, they explained to us that these leaping forms were those of droves of horses from the plains, hobbled to prevent them from running away, accompanied by goats, sheep, and oxen, all compelled by the rising flood to take refuge on our mountain, and that the shots and cries were signals made by those drovers who had already escaped to warn their fellows to follow them to the heights. The next day we saw that the ancient river had burst its banks, and that where yesterday there were farmyards, homesteads, and cultivated fields, there was to-day but a lake of sluggish water some four or five miles broad. Days of labour of ploughing and sowing had been rendered useless, and all these sown in the fields swept away in one night. All communication was cut off from the opposite side of the valley for at least a month, and both peasant and proprietor suffered considerable loss. But in Egypt, on the contrary, the higher the water the greater the crop, and a good high flood means a year of plenty. The bounteous alms of Father Nile fertilizes the otherwise arid sand, and makes it bring forth all green things in abundance. We reflect on this as we pass along his banks, and we sum up how much the whole world, and even we ourselves, owe to this parent of streams. Not a little, truly; for the germs of the entire family

of the arts and sciences were, so to speak, engendered in his alms.

All great cities were in ancient times founded upon rivers which bore their argosies upon their bosoms, and supplied them with water for drinking, for ablation, and for purification. No wonder, then, that such a prodigy of a river, which, in addition to these benefits, fertilized the country near it every year, attracted one of the earliest of peoples to settle on its banks. Their territory, by its very shape, that of a long strip of land on the borders of the river, 500 miles long by about 15 broad, surrounded by deserts at the sides, and difficult of approach from the sea, protected the inhabitants from invasion, and allowed them to cultivate the arts of peace century after century. On account of the excessive clearness of the atmosphere in this region, and the consequent brightness of the heavenly bodies, these early settlers were induced to study them, and thus became the originators of astronomical science. Although they did not learn to map out the stars with the signs of the zodiac, as the zodiacal table carved at Dendera would at first sight lead people to suppose, but learned the signs from the Greeks, yet they must have been acquainted with them from the earliest time; for we find that they symbolised the rising of the Nile by that mysterious figure, the Sphinx, which is half woman, half lion, to represent a combination of Leo and Virgo, because the inundation occurs when the sun passes through the houses of these two constellations.

Again, when the Nile deposited his annual load of mud he destroyed all boundaries and removed all landmarks: therefore the owners of fields had to make observations, so that when the water had subsided they could, by means of triangulation, establish their former boundaries: hence the origin of Geometry or the measuring of the earth, and hence the business of the Land-surveyor.

But more important than all to them was the management of the irrigation. They soon found out that if Father Nile rose 18 cubits they should roll in plenty, but that if he rose only 8 cubits they should be pinched by famine: consequently, long before the time of Joseph, engineers constructed vast dykes, drains, lakes, reservoirs, canals, and locks, to regulate the supply of water. One of their kings constructed the lake Moeris, to receive the superabundant water in years of great floods, in order that it might be conveyed to the fields by means of canals and locks when the flood was low. Everywhere in the valley of the Nile may be seen traces of these works. Who can doubt, then, that the Egyptians were the inventors of Engineering? Their road to the Pyramids and the machines used in their construction are other proofs that they had some science amongst them; and if further evidence is required, can we not assert that the Suez Canal, which has just been reopened through the energy of M. de Lesseps, was originally their work? Hear what Herodotus says about it:—This prince (Necho) was the first that began the canal leading to the Erythrean Sea, an undertaking which Darius the Persian in later times continued. The length of this cut is a voyage of four days; its breadth is made such that two triremes may pull abreast. It begins a little above the city of Bubastes, and ends in the Erythrean Sea, not far from the Arabian town of Patumos.

Strabo gives further particulars respecting it. He says, that Darius desisted from the work when it was nearly finished, "influenced by an erroneous opinion that the level of the Red Sea was higher than Egypt, and that if the whole of the intervening isthmus were cut through, the country would be overflowed by the sea." We see that history repeats itself, as far as erroneous opinion goes. Would that our engineers, who reported on the feasibility of making the canal, had read Strabo before penning their re-

port, for he goes on to say, "The Ptolemaic kings, however, did not through it, and placed locks upon the canal, so that they sailed when they pleased without obstruction into the outer sea and back again."

Other feats were performed by their engineers. A chamber, hewn out of a solid block of stone measuring 21 cubits outside, by 14 by 8, was conveyed from Elephanta to Saïs, a twenty days' voyage in those days. It took two thousand men ten years to effect its transport.

As to the fine arts, Herodotus tells us that the Egyptians were "the first to erect altars, images, temples, and to invent the carving of figures in stone;"—the first architects, painters, and sculptors;—and their works still remain in the stupendous temples of Thebes, Dendera, Edfon, and Philæ, and are likely to remain when our more scientifically constructed structures have crumbled into dust. At first the cells of their temples were roofed with single stones; as the temples increased in size they required columns for the support of these roofs. These columns, at first square and short, became polygonal and round, and shot up by degrees, till at last they were crowned with capitals representing the lotus and the palm. Subsequently the one cell was multiplied to three or four, approached through courts and by a *dromos* bordered by sphinxes.

The Greeks borrowed the *dromos*, or sacred way, from Egypt. The Temple of Apollo, near Miletus, was approached by such a "via sacra," lined with seated figures, quite Egyptian in character, and resembling the statues of Memnon on the plain of Thebes in general style. Several of these figures are now to be seen in the British Museum. The Greeks also borrowed from the Egyptian temples the Temenos, or outer court, and the Pronaos and Naos, but they departed from the original type in placing their columns outside, instead of inside, their temples.

One of the most extensive architectural works of the Egyptians was the Labyrinth, near Lake Moeris, which was used as a house of assembly for the representatives of the different divisions of the country. There were 3,000 chambers in it,—1,500 on the lower and 1,500 on the upper story. Twelve courts surrounded it, and a single wall bounded it. Remains of the Labyrinth still exist, and have been fully described by Lepsius.

As to their sculpture, no one who has studied the Egyptian lions, bulls, rams, and human figures in the British Museum and Louvre, could deny that they are copied closely from nature, and every one must allow that though art in Egypt became conventional at too early an epoch, and was content to repeat itself for centuries, the colossi and other similar statues were great achievements for so early a period of artistic knowledge.

As to their painting, or rather the use made of it, we may learn a lesson from them. They covered the walls of their public buildings with history. We leave ours blank, or cover them with falsehoods; for a painting of an historical event, unless its costumes and accessories are as accurate as the state of knowledge can make them, are manifestly false. Some countries have learnt this lesson, why should not we? Munich, by the pictures on her Isar Thor, outside her Pinacothek, and in the arcade of the Hof Garden, reads her people lessons—pleasant, picturesque, and, we hope, profitable. But we, alas! are not artists by nature. Art amongst us is of forced or exotic growth.

We have seen that Astronomy, Geometry, Land-surveying, Engineering, Architecture, Painting, and Sculpture, had their origin on the banks of the Nile, and that even we of the nineteenth century might learn something from the ancient Egyptians. Our rulers, too, might learn something from their rulers, for in the islands of Rhoda and Elephanta are wells communicating with the river, with columns standing

in them, on which were registered the heights of the various inundations, and according to this registry the taxes were arranged on a sort of sliding scale; if the river was high the taxes for the year were raised, if low they were lowered. We fear it will be long before our Government will thus make allowances for "hard times."

Such was Egypt of the earliest times. Under the Mahometan rule its engineering works were neglected, and its canals and reservoirs became choked up. The natural fertility, however, is so great that the country flourishes notwithstanding these disasters; and there is reason to believe that under an enterprising Government it might become one vast garden for cottons and cereals. What are we about that we ignore this field for enterprise, though it is our half-way house on the road to India,—that we allow Frenchmen to have the merit of opening the way for us, and of gaining that influence in the country which a successful undertaking will always give the nation that carries it through, among Eastern people? We are but poor slow coaches after all. It is thirty years since Professor Wheatstone's then novel invention for spelling words slowly by means of electricity was exhibited in the Adelaide Gallery, and we have not yet girdled the earth with our electric telegraphs. It is fifty years since railways were invented, and yet we have not constructed one by Bagdad, across the easy desert to our twin empire in the East, though we were in a sad strait for one eight years ago, and almost lost possession of India for want of it. *En attendant*, and while it is being constructed, let us shorten the journey to India by a few days at least, by making a railway on the banks of the Nile as far as Thebes, and then across the desert to Kossair; let us dig up the harbour of Berenice, of Albus Portus, or the Myoshoromos of the ancient world, and spare our travellers the dangers and *désagrément* of a voyage up part of the Red Sea at least; let us build our winter villas on the banks of the Nile, and follow the noble pioneer, Sir Samuel Baker, in the conquest and civilisation of the savages of the interior of Africa.

ARCHITECTURE AT THE ROYAL ACADEMY.

THE retreat from the crowd, talk, and bustle of the larger saloons of the Academy Exhibition on the first day, to the comparatively monastic seclusion of Gallery No. IX., affords a certain appreciable relief which may be taken into account as the one compensation for the despondency into which the architectural mind is prone to fall, in regarding the discrepancy between the numbers and apparent interest of the spectators in this as compared with the other galleries. A young lady or two attracted by the view of "a very nice house," and a few monastic architectural draughtsmen studying solemnly in duets and trios, and letting out scattered bits of laconic criticism, seem to form about the average retinue to the architectural designs. We speak here more in sorrow than in anger. It would be scarcely reasonable to bring any definite complaint against the mass of visitors for their indifference, for (as we observed recently when advocating the retention of the separate Architectural Exhibition) drawings representative of architectural design stand on quite a different footing from other drawings, as being only a means and an illustration to an end; whereas the latter are themselves the end and completion of the artist's idea. We cannot expect the average of visitors to draw this distinction, and therefore must be content to find drawings which, as mere drawings, are no doubt for the most part less effective than those in the water-colour room adjoining, or than such things as Mr. Haden's clever and effective etchings on the opposite wall, looked upon with less interest by those who are not accustomed to trace in their minds the connexion between an architectural drawing and the final result which it shadows forth, much less to consider how very important a part many of these works, if executed, will have on the civic or domestic life, as well as on the outward aspect, of the neighbourhood in which they may be erected.

One thing is, at all events, evident on looking at the drawings (all perspective views, with two or three exceptions) representing architecture at the Academy, that Gothic is in the ascendant, so far as this display is taken as a typical one. Out of seventy-eight drawings classed in the catalogue as architectural, only seven are in any style generally accepted as Classic, and of these only five are of works executed or

proposed to be executed. We may roughly class the whole under the heads Ecclesiastical, Civic or Public, Domestic, and Decorative design. Among the first are two churches, by Mr. Street, in course of erection, "St. John's, Torquay" (806), and "St. Peter's, Swinton, near Manchester" (818). Each of these exhibits the characteristics we have come to associate with this architect's ecclesiastical designs,—breadth of wall surface, picturesque effect obtained rather by the disposition of solid masses of stone in various planes than by moulding or surface decoration, general appearance of repose and stability, marred, however, by a studied plainness in external design, which may even be called affectation; as, for instance, in the meagre wall arcade, without impost or moulding save a mere chamfer, in the tower of St. John's Church. In the other design, the effect of letting the outer member of the archivolt mouldings of the aisle windows die into the side of the buttresses is questionable, as tending to give the appearance of the wall being weakened below this point, the line of the buttress being continued up to what should be the second plane of the jamb mouldings. Both these drawings, however, exhibit the true feeling for the art of Masonic design, as distinguished from mere surface ornamentation; and in one of them we may notice the solidity of expression obtained by keeping the base of the tower flush with the aisle wall, without any break,—a treatment more common in Italian than in Gothic design. Much of the same sort of merit belongs to the "Interior of St. Peter's, Deptford" (766), by Mr. Marrable, which, indeed, is not so much solid as ponderous, but is in keeping throughout. Here the mural construction is partially carried into the roof by brick arches, with nearly solid spandrels thrown across, in lieu of timber principals, and with, of course, a much more monumental effect. The corbels supporting the shafts from which these arches spring are, however, somewhat ungainly, and might have been brought further down on the wall, with constructive and artistic advantage. Messrs. Ordish & Traylen's "Church of St. Paul, Leicester" (742), is worth remark as a boldly-treated exterior, shown in an effective Indian-like drawing. The straight, unbroken mass of masonry forming the main portion of the tower shows a feeling for breadth of effect; but the junction of tower and spire is less successful, and wanting in refinement, the heavy quasi-turrets, with their tops scarcely clearing the base of the spire, are not at all satisfactory, and spoil an otherwise good design. Beyond these there is little in church architecture calling for special remark. Some admirable drawings there are certainly, such as Messrs. Banks & Barry's restoration of "Helmeley Church, Yorkshire" (772), and Mr. Pearson's "Chancel of St. Mary's, Freeland, near Oxford" (785), the latter showing its architect's usual solidity of design, and true sympathy with the best class of Gothic work, but neither presenting anything beyond careful working out of well-known materials. Mr. Waterhouse's "St. Matthew's, Blackmoor" (792), is a picturesque design of an ordinary Early Decorated type (the tower very ordinary), and Mr. T. Bury, in his brick and stone church of "St. Barnabas, Cambridge" (799), narrowly escapes vulgarity in his imposition of massive and cabbage-like finials. Mr. Emerson's "Interior of the Cloister at Allahabad Cathedral," in course of erection (793), reminds us strongly of "Cork Cathedral," and exhibits no indication, practical or æsthetic, of having been considered with special reference to a hot climate. The same architect's "Chancel of Girgaum Church, Bombay" is an admirable little drawing of an interior, but the design belongs to, as we will take leave to call the "stumpy-column" school, of which we are tired.

Coming to civic or public buildings, Mr. Street sends his now well-known original competition drawing for the "Law Courts," the bird's-eye view of the whole group (788), and his later design for placing the building on the Thames Embankment. Viewing it simply as a design, and leaving out of question the site, we certainly prefer this, in general effect, to the earlier one. A far greater repose and length of unbroken line would indeed have been our choice for a long river front, but no one can deny to this design a charm and picturesqueness of foreground (if we may so speak), rarely surpassed in its own way, and to which the mass of the central hall behind forms an effective and contrasting background. Two defects in it (waiving the main defect, as we consider

it, of breaking up the front into so many small portions) are the interposition towards the right, of the immense semicircular arcade, which is not only out of keeping with, but which, being of the height of nearly four stories, completely outcascades the rest of the building; and, secondly, the nearly equal height of the principal tower and the two cupolas over the central hall. These latter are most picturesquely designed in themselves, but being totally distinct in design from the tower on the right, and emulating the latter in height, the eye is puzzled which to select as the principal and dominant object in the grouping. If it were not convenient to carry the tower higher, the cupolas should, we think, have been kept lower, and in subordination thereto. The same architect sends also two of the competition drawings of parts of the original design enlarged, showing us (*inter alia*) niches and statues of saints learned in the law, as we suppose. The contrast between design, which, whatever its faults, is artistic, and what is not so, could scarcely be better illustrated than by comparing with the drawings just mentioned the large view submitted in competition for the Bradford Town Hall, by Mr. Nevill (775). A hydrocephalous clock-tower, windows without design or grouping, and a huge flat segmental arch forming the principal entrance, with insufficient abutment, and with a pier bearing directly over its centre on the story above, are the main features of the design, which we may certainly congratulate Bradford on not having selected. Messrs. Lockwood & Mawson's accepted design for the same building is represented by drawings 796, 797, and 798, the execution of which is most careful and admirable, though in a somewhat conventional style. Mr. Seddon's perspective view sent in for the same competition (778), shows a fine, free, sketchy touch in indicating detail, and is a very pleasing design on the whole, all the better for the fact that its author has for once given way to uniformity a little, and condescended to a front of which the two sides are symmetrical in the main. The treatment of the windows is very picturesque; but we do not like the rather solid front of the centre tower (the line of which rises only from the roof), immediately super-imposed upon the lighter array of windows and niches of the story beneath. His centre tower is, however, more pleasing than the machicolated and battlemented erection which frowns over Messrs. Lockwood & Mawson's front. Messrs. Salomons & Jones's design for the "New Reform Club in Manchester," already illustrated in our pages, is somewhat *outré* in appearance, as their designs unfortunately often are, the angle towers being corbelled over to an extent which rather surprises than pleases the eye, and deprives the design of what repose it might otherwise have, which, to say truth, would not be much. Mr. Barry's frame of small drawings, illustrating a proposed enlargement of the House of Commons (794) must not be passed over. The plan shows the superfluous space in what would be the over-large private lobby (the present "House") made available at the angles for secretary and ex-secretary of Treasury, post-office, and refreshments. The new House, as shown in the perspective view, looks, however, dangerously large for any but strong-lunged speakers. Views are also given of the new division-lobby and reading-room. The new House, it should be observed, is lighted from above through stained glass. Mr. Porcher shows a regulation design (811) for the "Charing-cross Branch of the Union Bank," with the usual pilasters, consoles, and pedimented windows which seem proper to banks. Mr. Wild, in his quiet and unpretending drawing of "New Consulate Buildings," for Alexandria (813), shows to our thinking one of the most original and best-considered designs in the room. This may be called Italian architecture, adapted to a certain extent to another climate and country, a degree of Egyptian feeling being imparted to it by the square columns of the long verandah on the first floor, with the deep shadow which would be formed between them; the feature being on a small scale similar to Mr. Cockerell's treatment of the west flank of St. George's Hall, Liverpool, on a larger scale, but that the latter colonnade wants the roof and the consequent deep shadow. Mr. Wild's treatment of the windows on each wing, set in the centre of a slight projecting break in the masonry, and with a stone pent-roof on brackets over the upper window, is also very refined and pleasing. The one fault in the design is in the *rococo* garlands in the frieze, a commonplace feature which we regret to see clever architects indulging in.

In domestic architecture, Mr. Edis shows us a very good little drawing of a "Mansion at Petersfield," built in brick, with square-headed mullioned windows with stone dressings; a thoroughly unpretentious and solid-looking little house: the battresses and gable to the porch seem, however, unnecessarily heavy. A more important-looking design is Messrs. Salomons & Jones's drawing of "Kenwood Tower, Highgate," in course of erection; a design combining dignity with a certain degree of picturesqueness, but rather wanting in unity of treatment; a form of cusped window-head characteristic of debased Gothic coming rather ill between quasi-classic pilasters and under a square head; the use of wooden barge-boards and stone copings to gables in the same house appears to us also a want of keeping.

It is worth noting that Mr. Brooke, the owner of this house, now in progress, and an illustration of which we shall shortly publish, has purchased Mr. E. M. Ward's fine picture, "Judge Jeffreys and Richard Baxter," now in the Academy exhibition, and Mr. Friih's charming portrait of "Mrs. Rousby as Princess Elizabeth in 'Twixt Axe and Crown,'"—the first for £1,500, the second for 350 guineas.

Mr. E. M. Barry's "Additions and Alterations to Thorpe Abbots, Norfolk," is interesting as recalling so much of his father's manner of dealing with these kind of commissions, in which he showed his abilities as much as in anything he did. Mr. Barry gives us a sketch of the house as at present, with scarcely an architectural feature; he dominates it with a modillion cornice, throws out a bay in the centre of the garden front, and adds a tower with open arched upper story very much like some of those which Sir Chas. Barry added to some of the houses he took in hand to improve. We do not felicitate Mr. Barry so much in his Gothic "Villa near Egham" (803); it is heavy without being picturesque, and the conical lean-to roof over the semicircular bay is not a happy feature. Mr. Norman Shaw's views of "Leyes Wood, Sussex" (763 and 779), are admirable specimens of the peculiar style in which he is a proficient, embodying so much of old English sentiment; a revival of the past which it is more lawful to indulge in a private country-house for the gratifying of a man's own taste, than in more public places. The drawings are, as might be expected, capital specimens of pen-and-ink etching, but Mr. Shaw's long brick chimney-stalks are excessively ugly and indefensible, upon any but archaeological grounds. The same kind of interest attaches to Mr. David Brandon's large drawing of the Marquis of Camden's "Mansion at Bayham Abbey, Sussex" (806), a complete and careful reproduction of Elizabethan domestic architecture. But can we with the old style reproduce the old sentiment? Perhaps Mr. Brandon's client thinks so; at all events, the experiment has been well carried out so far as the architect is concerned. Mr. Truett's "Bank and Residence at Altrincham" is another of those fashions of old times, in the shape of a veritable old English house in that "post and pan" style, about the nomenclature of which we do not seem quite to agree just now. Mr. Edis's "New Warehouse, Bridge-row, City," is a very good bit of modern Gothic street architecture; the only thing in it that displeases the eye is the heavy pier above the first floor string, with a thinner and narrower pier under it, the latter being, no doubt, started to ensure the ground-floor shop its orthodox area of plate glass. Mr. Edis should knock off the little rosettes on certain portions of the piers; small ornaments like these, projecting beyond the face of the masonry, and which require an additional thickness of stone to cut them from, are foreign to real masonic design. "Dobroyd Castle," by Mr. Gibson (766), which we illustrated some time since, is a powerful design, standing well in the midst of the landscape in which it is placed, and deriving much character and expression from the simple expedient of battering the walls of the ground-floor story; and Sir Digby Wyatt's (771) "House at Uckfield, Sussex," is what may be called an eminently sensible and quiet Gothic design. The "New Portion of the Château de Martinvraël," by Mr. White, is a peculiar and characteristic design, consisting of rubble masonry, with ashlar dressings: the general design is of an Early Gothic type; but the architect has ventured to use square instead of pointed heads to the windows in the semicircular bay, with short intermediate shafts supporting the stone lintels; and, the constructive advantage in such a position being obvious, the effect is piquant, without appearing unmeaning.

Among smaller decorative details of domestic architecture, Mr. F. P. Cookerell contributes a design for a marble chimney-piece (814), in a French Renaissance style, and with large marble figures, not altogether satisfactory as to conception, though the execution of the whole is very good. Mr. Kerr's "Chimney-piece and Buffet at Bearwood" (791) looks very good as a specimen of design in wood-carving, but is placed too high for proper inspection. Mr. Talbert gives an "Elevation of Dining-hall, showing Decoration and Fittings" which we are glad to see are less bizarre in outline and idea than some other things of the same kind which this admirable draughtsman has turned out. Mr. Burges, however, almost outdoes Mr. Talbert in this line, in his "Designs for the Decoration of the Winter and Summer Smoking-rooms at Cardiff Castle" (744 and 752), which are truly fearful and wonderful, with dragons indescribably disporting themselves on the walls; and surely, surely, Mr. Burges, the colouring, the *tout ensemble*, is not the most harmonious in the world! Did some other hand, in a little fit of sarcasm, introduce the occupying figures in Medieval costume? Certainly, none but "ye men of ye periode" could seem at ease in such rooms. Among drawings purely illustrative, we may mention "Interior of the Church of St. Gomar, Lierre, near Antwerp," by Mr. Chase (747), as an example of fine architectural drawing not excluding effect; and Mr. George's "Transept of Burgos Cathedral" (774), as an equally good specimen of picturesque effect, not excluding architecture. Mr. Spiers sends "The Mosque of Kaiteby, Cairo" (784), and Mr. Emerson a "View of the Taj-Mahal, Agra" (776), a very good and not laboured drawing, showing the white marble dome against an intensely blue sky, and in the archways the cool, greenish shadows peculiar to white marble in shade; it is a very effective sketch. Mr. Goodchild's "Restoration of the Piscina in the Baths of Diocletian, as suggested by the late Professor Cookerell," is a most admirable specimen of purely architectural drawing—hard, precise, and finished, though not so pleasant to look at as many others in the room, owing to the prevailing red-brick tint and the not very interesting character (architecturally) of the design.

Taking the contents of the Architectural Gallery on the whole, the exhibition appears to us better than that of last year. In point of mere drawing there is little that is not admirable, and much that all young draughtsmen would do well to study. In point of design, the general impression left on us is, that there is too much mere archaeology; and that those designs which exhibit any marked individuality or novelty are mostly somewhat abnormal in style and manner; in some instances almost grotesquely so; and that in not a few instances some of the time which has been bestowed on elaborate drawing and colouring (pleasant to look at when it is done, certainly) might have been better employed in the consideration and evolution of better or more original design and detail.

STAGE ARCHITECTURE.

COVENT GARDEN.

The production, at Covent Garden, on Tuesday night, for the second time, of Cherubini's grand tragic opera, "Medea," suggests a remark on the treatment of architectural features, especially of the classic order, on the stage. Stage architects almost invariably attenuate the columns of their classical buildings to a degree which robs the scene not only of its dignity, but even of its verisimilitude. This was the case with the scenes, otherwise very effective, of the first and second acts of "Medea" and another practical mistake in the spacing of the columns so wide, that no stone lintel could possibly carry from one to another. But in the case of the opera in question, there was an historical error also with regard to the architecture, and that of a double nature. In the first place, we should scarcely have been presented, at the same period, and in the same neighbourhood, with full-blown and fully-developed Corinthian and Ionic capitals respectively, in two consecutive scenes; and the practice of fluting the column on the lower portion, and leaving the rest plain, is a corruption, and not a Greek feature at all. But the serious lapse with regard to archaeology was this, that the story of Medea belongs, if we affix it to any historic period, at all events to the very earliest Greek period; and with such a fable, so essentially old-world in its associations and nature as that of Jason, the finished and elegant

Ionic and Corinthian architecture of civilised Greece has no affinity, either historically or æsthetically. The one piece of architecture which harmonised with the story was the temple-front in the third act, with its short Doric columns of only four or five diameters in height, which at once carry us back to the period of early and undeveloped Greek architecture. Had all the architectural scenery been of this style, unity and probability would have been given to the whole, and the mind would have been carried back to the early "heroic" age to which the fable belongs. It is not to be objected that if the music and scenery are fine, we ought to be content with the *tout ensemble* without caring for such correctness of combination. Opera is not satisfactory unless all its constituents,—music, dress, and scenery,—go to assist and support one another in feeling and in effect; and those who think otherwise we may remind of the reply of Goethe on the subject, recorded by Eohermann,—"I cannot understand, my friends, this bit-by-bit enjoyment of yours. How can you be really enjoying yourselves through the ear, when the equally powerful sense of sight is offended by an incongruous spectacle?" It is just this sense of congruity which English theatrical audiences are so deficient in, and to which they should be educated.

We ought scarcely to mention this performance at all without a word of recognition for Mlle. Titians's splendid presentation of the arduous part of *Medea*, a part to the adequate execution of which she alone, perhaps, of living soprano singers, is physically equal, and her conception of which artistically was almost all that could be wished. Dr. Gunz, as Jason, also showed himself a thorough and painstaking artist, achieving a noteworthy success with less of natural advantages of voice to aid him than are enjoyed by some tenor singers of more brilliant reputation, but of inferior æsthetic perception and cultivation.

THE FALLEN ARCH AT BLACKFRIARS.

THE attention with which not only our habitué readers, but, thanks to the courtesy of the most influential of our daily contemporaries, the great bulk of the reading public, have followed our investigations of some of the most important engineering questions that have lately assumed prominence, has made us feel it to be proper to pay an early visit to the scene of the recent collapse at Blackfriars. We are chary as to the use of the word "accident." In any disaster of the kind, the first thing to ascertain is whether it really comes under the category of unavoidable mischance or not.

The accounts which were given on the 30th ult. of this fall were, in our view, far from intelligible. Every one in any way familiar with building is aware of the difference between a tunnel and a bridge. For any English engineer, at the present day, to attempt to tunnel through "made earth," or to construct a brick arch, with a tunnel section, through or under such material, would be a folly of which we hope no persons intrusted with the control of any of our public works are capable. Yet no other explanation seemed consistent with the first reports of the disaster.

The account of the inquest on Patrick Hearn, held on the 2nd inst., does not throw very much light on the matter. The manager of the Metropolitan District Works deserves honourable mention for the straightforward candour and courage with which he stated, as to the unequal weighting of the arch,—"speaking after the event, if any one is to blame, I am." One gentleman, who writes the letters C.E. after his name, "could not state the cause of the accident." Another "thought the accident was an exceptional one. A hundred arches had been constructed and treated in the same way, and not one of them had given way." At a time when it is beginning to be admitted on all hands that education is a necessity, it is lamentable to see any member of a liberal profession treating a simple statical question as an inexplicable mystery. The engineer of the company seems to have confined his evidence to a contradiction of the statement that some of the men had refused to work, from an instinctive sense of danger.

The site of the arch in question is in the small interval existing, on the line of the underground railway, between the new Blackfriars-road Bridge and the Railway Bridge that crosses the Thames immediately below. The tunnel for the low

level railway has already been driven under the Blackfriars-road. The station for this river-side line is rapidly rising immediately under the Railway Bridge. Wrought-iron girders, about 5 ft. 4 in. deep, of some novelty of detail in their construction, form the roofing of the line at the station. But between the face of the ordinary section of tunnel under the road, and the commencement of the station, occurs a length of some three bays of brickwork, of the full width required for the station, which have been covered by a brick arch instead of by the girders and jack arches which they carry,—a very unfortunate piece of economy.

The span of this arch, judging from pacing over very rough ground, is about 45 ft.; the versed line some 11 ft. 6 in. The brickwork is skew, in six half-brick rings, which are increased to eight half-brick rings on the haunches of the segment. The accounts given of the piling of material on the arch are absolutely erroneous. Over the crown there is only about a foot of what looks more like clay puddle than anything else. Over the haunches, and so far as the removal of material displays the section, behind the abutments, and beyond the haunches of the arch, is made ground of a very "rubbishy" description.

Now, reverting to what we before said as to the difference between the section proper for a tunnel and that fitted for a bridge, we are fully aware that, in this country, the rule of practice in our railway works has not been to make our bridges perfect as masonry structures, or, in other words, so to construct them that they would stand alone. The great works of our masters in engineering, the Romans, were so constructed. For that reason the *Cloaca Maxima*, 2,500 years old, is now standing. We have been guided by the principles of an economy which may not, in the long run, prove a sound one; and have made the stability of our arch-bridges depend in great measure upon their earthwork backing.

In bridges with abutments in the solid earth, as in those over railway cuttings, this mode of structure may be perfectly safe, as, in every instance, the earth has to bear the weight of the arch; so, when the earth is undisturbed, and is not likely to be disturbed, it may be relied on to bear the thrust of the arch.

But with bridges under embankments the case is different. The stability of these structures, although they were strengthened with buttresses, or, as they are called, counterforts, depends to a great extent on the care and fidelity with which the earth-backing is punned behind them. Hence, in point of fact, a much larger number of them than engineers cared to report to half-yearly meetings fell down. It will be fresh in the remembrance of those who survive, out of the largest engineering staff in England thirty-five years ago, how intelligence came one morning to an office, which was then in the country, but is now in London (owing to the growth of the metropolis), of the fall of "another bridge." Every eye was directed to one of the subs (he is a great man now), who seemed, however, quite unconcerned. "So-and-so,"—at last came the attack,—"that must be another of your bridges." "Oh, no!" "But it must be." "No, it is not." "What will you wager?" "My dear fellow, I should only be robbing you—my last bridge fell down last week." This is a literal fact.

Now it is evident that when, in the drawings that form the record of existing and of former works, it is impossible to represent certain elements of stability, the value of the experience derivable from such drawings is impaired. No drawing can show the amount of punning actually given to backing. No drawing can give any satisfactory detail of the earthen backing of a bridge. The masonry is distinct enough. As matter of calculation it may be evident that it would not stand as an independent structure. The minus quantity has to be made up by the resistance of the earth backing, partly dependent on its weight and partly on the mode in which it is artificially consolidated,—that is to say, the stability of the bridge depends, after all, on the rule of thumb.

It is this rule of thumb alone which admits of "accidents which are exceptional." In the present case the material of the backing, as far as we said to be already paid up, promises to be brought rapidly to completion. We understand that the building is to be a permanent one, and after the exhibition is over will be devoted to the uses of a conservatory, botanical and zoological gardens, and to the general education of the masses.

section to which we should have considered it safe to trust. The abutment-walls should at least have been carried up to the level of the soffit of the crown of the arch, either as a solid spandrel, or as spandrel-walls with cross arches, which even the loading line of the arch might have indicated to be proper. Had less been left to the questionable exactitude of the earthwork backing, we should not have been reduced to the dilemma of extreme instability of equilibrium in structural design, or of great negligence in the unequal weighting of a skew arch, as matter of execution. A little more statal precaution and a great deal less trust reposed in rule of thumb, and such an "accident" as that which proved fatal to Patrick Hearn would have been rendered, as it ought to have been rendered, impossible.

We observe that, in the busy eastward extension of the works of this subterranean line, the chain-pump is merrily at work. We also observed, on passing under the river front of Somerset House, the large iron washers, disfiguring Sir W. Chambers's fine ashlar, which terminate the bolts by which that noble building is now tied and bound together, in the hope of preventing a second edition of the catastrophe that befel the dining-room of King's College. We beg to call the attention of the Very Rev. the Dean of St. Paul's, or of the architect to the chapter, or of the responsible person, whoever he may be, to these points. We do not say there is danger; but we do say that there is extreme need of watchfulness. The engine that moved the entire river front of Somerset House, as far at all events as the facade is concerned, is drawing nearer and nearer to our noble metropolitan cathedral. Dean Bockland's recently cited remark to the workman on a sewer,—a vastly unimportant matter in comparison to the great metropolitan tunnel, must not be forgotten. "Pumping water! You mean pulling down St. Paul's!" We are not aware whether the now head of the cathedral chapter possesses the geological knowledge of his lamented brother dean, or the loving care for the fabric entrusted to his care of which the (happily) living historian of Westminster Abbey gives such constant proofs. But in any case his anxiety for the stability of the fabric committed to his responsibility must be susceptible of excitement. We wish to call attention to our former remarks on this head,—to the unmistakable confirmation of their truth given by the King's College catastrophe,—to the fact that the activity of these powerful pumps is now directed towards spots that will soon lie in a direct line between St. Paul's and the river,—and to the circumstance that a serious "exceptional accident" has occurred eastward of Blackfriars Bridge. Clearly the Metropolitan Railway cannot be left to burrow its own course in its own way, unwatched by any independent engineering authority, if we are to sleep soundly without dreaming of St. Paul's.

Messrs. Bateman & Révy, in a letter which we had pleasure in publishing, as it so implicitly, if not explicitly, confirmed our remarks as to their scheme, came at last to the forlorn argument that if anybody should blow up their submarine tube, France and England would make this aggressor pay for it! Perhaps the Dean and Chapter of St. Paul's might have the same moral claim against the Metropolitan Railway Company, in case of any damage to the cathedral. For ourselves, not being lawyers, we hold that prevention is better than cure, and we shall think that the catastrophe of the 30th ult. is not without some compensation, if it lead to a careful and adequate investigation of the possible effects of the works now in progress east of Blackfriars Bridge upon the stability of St. Paul's Cathedral.

A Crystal Palace for New York.—The Bill incorporating the Industrial Exhibition Company, which was organised in this city to erect a permanent Crystal Palace, has passed the Assembly, and, having already passed the Senate, only requires the governor's signature to become a law. The project is one of great magnitude, and as the capital—seven millions—is said to be already paid up, promises to be brought rapidly to completion. We understand that the building is to be a permanent one, and after the exhibition is over will be devoted to the uses of a conservatory, botanical and zoological gardens, and to the general education of the masses.

THE SOCIETY OF ARTS CONVERSAZIONE.

THE managers of South Kensington Museum will entirely lose the confidence of the public in any power they may possess of providing for the reception of a large number of visitors, if they allow a repetition of the inconveniences inflicted on their guests on the 4th of May. If on any plea it can be urged that the arrangements were not discreditable, it can only be by showing that there were no arrangements at all. The doors were simply opened to a sufficient number of persons, provided with tickets, to fill the courts. The cloak-room was a positive man-trap, only to be approached by a fight, and only to be left by a still more severe fight. It was not only inaccessible, but recessed so as to insure the utmost amount of struggle; and we have no doubt that minor personal inconveniences, sprains, and bruises, were many.

The royal visitors walked through the courts, and were thus visible to those of the visitors who immediately lined the path. But the seats in the tribune set apart for their reception were so arranged, contrary to all precedent and to all expectation, as to render the occupants entirely invisible to the large number of persons who had come for the express purpose of being able to look at the pleasant features of her Royal Highness the Princess of Wales. A moment's glimpse of a head was all that these expectant glances obtained. The disappointment was general and intense. Then came the renewed fight for the cloak-room door, and how the six or seven thousand guests got home is more than we can say.

THE THIRTY-SIXTH EXHIBITION OF THE INSTITUTE OF PAINTERS IN WATER COLOURS.

A CRITICAL notice of the Exhibition of the "Institute of Painters" in Water Colours must, in the present season at all events, bear a strong family likeness to a notice of the Exhibition of the "Society of Painters" in Water Colours. Country visitors, and, still more pathetically, foreign visitors, helplessly ask what is the difference between a Society and an Institute? In the absence of either any definite reply to that natural question, or of any marked distinction of style, of method, or of excellence, between the collections in the two galleries, we must content ourselves with the satisfactory reflection that the division of the water-colour drawings which solicit the public approval during the ensuing month or two, into two galleries,—one containing, as we showed last week, 261 pictures, and the other, on which we have now a word or two to say, 253,—is much more favourable to the interests of the artists, as well as more agreeable to the visitor, than the crowding together of 500 works of art on the same spot. In fact, it is much more satisfactory to be obliged to devote separate visits to an adequate number of pictures, than to run the risk of having the visual nerves fatigued, or to have to make the heroic resolution to stop at No. 250 to-day, and recommence with No. 251 to-morrow.

There is another respect in which we think a reform might be instituted with advantage to all parties. The number of pictures which any artist is allowed to exhibit ought to be curtailed, and definitively fixed. In this respect the "Institute" is no less a sinner than the "Society." The latter body displays on its walls eleven pictures by one artist, twelve by another, sixteen by each of two others, and no less than twenty by a fifth. The "Institute," to say nothing of those who send five or six drawings, admits seven from each of seven artists, eight from four, nine from three, and thirteen from one. We are convinced that this is a mistake. However great a gift facility of production may be, and actually is, the sleight-of-hand which produces it is a quality different from, even if not inconsistent with, those excellences for which we purchase a picture. We think, for instance, that the pencil-mark of admiration which we find scored against Mr. J. H. Moles's "Watermill at Chagford, Devon" (No. 156), would have been elicited by other productions of his pencil, had they been fewer than a dozen.

One of the first points that strike the reflection on a visit to most of our galleries is, how rare it is for an artist to take the trouble of considering what a picture ought to be, before he begins to draw. In the selection, not only of the object, but of the best mode of putting that

object on the canvas, lies one main secret of the painter's art. It is that same instinct which is also a chief requisite for the success of the photographer—the true art-conception of form, and of the appropriate method of isolating the chosen form from others, without harsh or artificial severance. We can contrast in this particular the drawings of two artists in the present gallery. We are not disposed to undervalue the skill and taste of Mr. Skinner Proulx. He handles a truthful pencil. He selects picturesque or otherwise striking scenes, and represents them with fidelity, and often with very happy effect. Look at his "Chartres" (187), his "Rouen" (272), his richly-coloured and faithful "St. Nicholas, Ghent," with the busy commercial life of the most Romanist city in Europe,—the ancient town that still heads its municipal papers S.E.Q.G.—the senate and people of Ghent,—with all the stir and chaffer going on under those wonderful umbrella booths in the street. Each of these is good,—but it is only as a good "bit." You see no reason why either picture should include so much and no more. It might be almost indefinitely increased, or perhaps reduced, in size, and yet be neither more nor less of a picture than it is. It is like a set of numerals written down, correctly, indeed, but by chance—not a round number, or symbolic number, that tells of its own individuality.

This object is still more strikingly exhibited in such instances as Mr. Chase's "Entrance to the Chapter-house, Furness Abbey" (42), and his richly decorated interior of "Roslyn Chapel, sketched previously to its Restoration" (173). In these and similar pictures the artistic arrangement is positively nil. As far as the paper goes it is covered, and very well covered, with good representation of architecture of great interest and beauty. But whether the number of square inches before us have been cut out of a larger picture, or why, if otherwise, that bit, and no other bit, of the building should have been portrayed upon them, appears a mere matter of chance. The bit of work is good, but it is not a picture.

In contrast to this mode of cutting out a part of a landscape as if with a pair of scissors (which finds especial favour with the painters of beech woods), let us look at Mr. B. Green's "Remains of Walsingham Priory, Norfolk" (140), his "Remains of the Convent of the Grey Friars, Lynn, Norfolk" (146); his "Caister Castle, Great Yarmouth," or his beautiful ruin of "Castle Acre Priory, Norfolk" (207), with its Norman west front cut into, as is the case in the very similar façade of Rochester Cathedral, to admit of the insertion of a much later pointed arch. In each of these drawings, to which others may be added, there is the first element of a good picture. Not only is there a well-selected object, but this object is so treated, with reference to the means of representation at the disposal of the artist, as to make a good picture, to lay hold on the mind by its individuality. Enlarge or diminish the surrounding landscape, and you injure the effect of the drawing, independently of balance of colour. Sketch the scene in pen-and-ink on a sheet of letter-paper, preserving the same proportions of area and of object, and you have an artistic sketch. It may be a design not of the highest order as to what it represents, only a ballad in water-colours; but such a ballad is far more contenting to the mind than a line or two cut out of an epic such as "Roslyn Chapel."

Justice to other demands on our columns involves positive injustice to many of the artists whose works will be regarded with much pleasure by the visitors to the Institute. Here, as we think in every exhibition this year, the mean level is more closely kept,—we do not mean a paltry level,—than perhaps has previously been the case. If artists were to be classed by marks, like students at a competitive examination, the average number of marks would show an increase on former seasons, with fewer exceptionally high numbers, and many fewer very low ones. In landscape we have some fine works. Look, for instance, at "The Carrara Mountains from Spezia" (143), by C. Vacher, lost in a misty purple haze. A still deeper veil of the same southern tint is cast over the "Evening on the Nile" (103), by the same artist, with its weird details of Saracenic architecture cutting on the sky. The distant mountains in the view of the "Lago di Garda" (30) form another lovely scene—a complete picture, not a mere scrap of landscape. The view from "The Arab Tomba Desert, South of Cairo—the Pyramids of Memphis

in the Distance," for the contrast of life and of repose, of bright colour in the stirring bustle of the Arabs, and misty harmony in the far expanse of the eternal desert, grey with the more than "forty centuries" that brood over the Pyramids, is very fine. "The School at Thebes, Egypt" (159), by Carl Werner, with fiercer colour than the views we have referred to, is a perfect miracle in its mere depiction of stone work. Mr. John Absolon's bright sketch of "Sir Roger de Coverley" (217), almost disarms criticism by the pleasant sentiment of the good old country scene, and the glow which lights up the old-fashioned hall-room, which is, however, far brighter than the three chandeliers, aided by the fire, could have produced. If part of the time spent on the other eight contributions of this artist had been devoted to a higher finish of this pretty sketch, it might have been better for everybody.

We can only add, from among a number of other marked pictures, a word as to Mr. Augustus Bouvier's "Garland Makers" (79). The scene, the arrangement, the black background, are evidently taken from Pompeii. The three lovely girls, in their tender buff and peach-coloured dresses, are not, however, Campanian, but French,—French with the marks of English culture on the mouth. Nothing is more striking to a connoisseur, on return from a long stay abroad, than the indescribable effect of cultured grace given as a general rule by the outlines of the lips of educated English women; it is a charm peculiar to our island. Mr. Bouvier's larger picture, marked perhaps rather more by classical sentimentality than by classic sentiment, is also pleasing; but we confess, in spite of criticism, to such a lingering partiality for the "Garland Makers" as to wish to leave the Gallery with their pretty faces and figures fresh on the memory.

PAROCHIAL ASSESSMENTS.*

Mode of Valuing Property liable to be Rated.
There are two estimates required by the statute 6 & 7 Wm. IV., c. 96, which regulates parochial assessments, viz., "gross estimated rental" and "rateable value."

The former is the rent at which the property might reasonably be expected to let from year to year, the tenant paying all usual tenant's rates and taxes and tithe commutation rent-charge (if any), the landlord bearing the cost of repairs and insurance and other expenses (if any) necessary to maintain the premises in a state to command such rent. The rateable value is so much of the gross estimated rental as remains after deducting therefrom the probable average annual cost of the repairs, insurance, and other expenses necessary to maintain them in a state to command such rent, as aforesaid.

The actual words of the statute are very simple when understood; but, it is probable that no words in any statute were ever more misunderstood, or ever caused more confusion and gave more trouble than they did. They are as follows:—

"No rate for the relief of the poor in England and Wales shall be allowed by any justices, or be of any force, which shall not be made upon an estimate of the net annual value of the several hereditaments rated thereunto; that is to say, of the rent at which the same might reasonably be expected to let from year to year, free of all tenants' rates and taxes and tithe commutation rent-charge (if any), and deducting therefrom the probable average annual cost of the repairs, insurance, and other expenses (if any) necessary to maintain them in a state to command such rent."

Soon after the passing of this statute, viz., on the 3rd of March, 1837, the Poor-law Commissioners issued a circular defining gross rent as the rent which would be paid to a landlord who himself undertakes to pay all the usual tenant's rates and taxes with which the hereditaments or premises rented by the tenant are chargeable, together with tithe commutation rent-charge, the expense of upholding the buildings in tenable repair, insurance against loss by fire, and any other expenses, if any shall exist, necessary to maintain such hereditaments in a state to command such gross rent. Net rent they defined as the amount which is received by or which remains clear in the hands of a landlord after all such taxes, charges, and expenses, as are above enumerated, shall have been provided for.

* By Mr. Edward Ryde. See p. 341, ante.

Acting upon these definitions, many surveyors included in their estimates of gross estimated rental the whole of the rates and taxes usually paid by the tenant. For example, in the case of a house worth 100*l.* per annum to a yearly tenant, the rates and taxes upon which amounted to 20*l.* per annum, and the average cost of insuring, repairing, and maintaining the property 20*l.* per annum, they called the gross estimated rental 120*l.*, the rateable value 80*l.*

So far as regards the mere payment of poor rates no injustice was done to the ratepayer; but, in the case of other uses made of the gross estimated rental, it became apparent that the intentions of the Legislature had been misunderstood; moreover, valuations so made seemed to estimate the value of property in a parish unfairly and unnecessarily high. It very early became the practice to disregard the instructions of the Poor Law Commissioners, and to omit all consideration of rates and taxes in making valuations; and, in 1859, the Poor Law Commissioners were advised by the then law officers of the Crown (Sir Fitzroy Kelly and Sir Hugh Cairns) that the term "gross estimated rent" meant the rent at which the property might be expected to let, the tenant taking the burden of rates and taxes and tithe upon himself. In other words, they were of opinion that the word "free" in the statute must be considered as referring to rent and not to hereditaments.

An attempt was made in the Union Assessment Committee Act, 1862, to remove the doubts which had existed; but without much success, so far as ordinary ability can comprehend it. Nevertheless, the opinion of the law officers in 1859 is now universally acted upon and generally understood.

It must always be borne in mind that the rateable value is not the actual rent at which a property may be let; but that rent at which, after taking all things into consideration, it might reasonably be expected to let. Moreover, it must be remembered that the circumstances to be taken into consideration in estimating the value must always have reference to the period at which the valuation is made.

A house which, on the completion of a railway or some other public improvement, will be worth 100*l.* a year, may, at the present time, be worth only 50*l.* a year. While it is worth 50*l.* it must be assessed at that sum only; but, as soon as the improvement takes place, the assessment must follow the increased value. Again, the rent reserved in a lease may not be evidence of rateable value. A property may possess a gradually increasing value, extending over many years. A lessee, in agreeing to pay a fixed constant rent, would average those circumstances. The rate must be made on an estimate of the small value from time to time; low, when that value is small, and higher as it increases. Again, property may, from unforeseen circumstances, increase or decrease in value during the term of a lease. If it should increase, it would be unfair to the other ratepayers, who might not be similar lessees, if the assessment upon it were not increased; and, if it should decrease in value, it would be unfair to the lessee not to decrease the assessment. The term from year to year must not be misunderstood, as it sometimes is. It does not mean a letting for a year only, nor a letting on a yearly tenancy; but it means that changeable circumstances must be taken into account from year to year as they arise.

Valuation of Agricultural and Accommodation Lands.—In addressing the Institution of Surveyors, it is quite unnecessary to attempt to explain the mode of valuing agricultural or accommodation land. Nevertheless, it is well to again point out that the rateable value is not the rent actually paid either on a yearly tenancy or under a lease; but, that it is the rent which, all things considered, a tenant might be reasonably expected to pay for the year next following the making of the valuation. The late Lord Denman, whose judgments were always as clear as it is possible for judgments to be, in delivering judgment in the case of a brickfield appeal, says:—"It may well be that, although at the end of the year the lessee has made so many bricks that he can afford to pay 150*l.* in royalty to his landlord, yet he could not prudently at the beginning of the year, contract, at all events, to pay more than 100*l.*, and if so the latter rather than the former will be the sum at which the land may reasonably be expected to let from year to year."

So, in the case of accommodation lands, a piece of meadow land may be situated in the middle of another estate and in front of the

drawing-room windows of the occupier's house. It is reasonable to suppose that in such a case the occupier of the house would give more rent for the meadow land than its value for agricultural purposes would justify; and, therefore, it possesses a corresponding rateable value; but, if such land becomes by purchase a portion of the other estate, it then possesses no greater rateable value than the adjoining lands, of which, in fact, it has become part. Small pieces of land adjoining a town will often let at rents quite disproportionate to their agricultural value, and their rateable value is such a rent as they may, in that way, be reasonably expected to fetch, notwithstanding that exactly similar adjoining lands which form part of an adjacent farm can only be reasonably expected to let at their agricultural value.

The difference between the gross estimated rental and the rateable value of land is very small, and, in practice, it has hitherto, for the most part, been disregarded; but the Valuation (Metropolis) Act, 1869, fixes the allowance, in metropolitan districts, at 5 per cent., and, therefore, it is presumed that such an allowance will very generally be made in all places in the future. It may be mentioned that, in the case of lands subject to tithes, the amount of the rent-charge should be deducted from the estimates of both gross and rateable value, the tithe rent-charge being itself rateable as a separate hereditament.

Valuation of Houses.—The gross estimated rental of a house is that rent which a tenant might reasonably be expected to give for the right to occupy it for one year, assuming that the landlord bore the expense of insuring, repairing, and upholding it. The net rateable value is the rent which a tenant might be reasonably expected to pay, who took upon himself the expense of insuring, repairing, and upholding it.

The rent is the rent to be expected for the year following the making of the rate; but the allowance for repairs is to be the probable average annual cost. To give but one instance: general painting, which occurs only once in seven years, is not to be allowed in the year in which it actually is done to the exclusion of all other years; but a fair average annual charge on account of it is to be taken. In addition to the allowance in respect of indispensable repairs, an allowance is to be made in respect of contingent or future renewals. In the case of the Queen v. Wells (Law Reports, Q. B. Cases, vol. ii., p. 548), the most recent decision upon this point, Lord Chief Justice Cockburn stated that there seems no distinction in principle between a sum annually laid by to make good, when it shall become necessary, an inevitable loss by the destructive agency of time, and a fund laid by for an indemnity against a loss by fire or storm, or other peril, insured against.

Valuation of Farm Homesteads.—In estimating the rateable value of farm homesteads, several matters have to be taken into consideration. For example: the buildings may be very much in excess of the actual requirements of the lands of a farm; but it is obvious that a tenant can only be reasonably expected to pay such a rent as the buildings which he actually requires would command. Even that rent may have to be diminished instead of increased, from the fact that the repairs and insurance of the larger buildings are more costly to the tenant than the repairs and insurance of buildings of the proper size would be.

It may, however, happen that the occupier of such a farm may also occupy, as a separate rateable hereditament, land, either wholly without buildings, or otherwise deficient in that respect, in which case the rateable value to him of the buildings previously alluded to will be increased.

Valuation of Trade, Premises, Mills, Factories, &c.—In estimating the value of trade premises, such as a factory fitted up with machines, a foundry with furnaces and forges, or a brewery with fixed steam-engines and vats, the value of the machinery as enhancing the annual value of the freehold, of which it forms part, is to be taken into consideration.

An important decision in respect of the rating of mills was given in the case of Staley and Another v. Castleton (33 L. J., M. C., p. 178). The mill was fitted to its full capacity with the machinery useful and necessary for a cotton-mill; a steam-engine was fixed for the purpose of turning the machinery, and steam-pipes from the boilers were carried through all the rooms in the mill for the purpose of warming them. Some of the machinery was fixed to the floors in order to

its steadier working, while, in other instances, it was merely placed upon the floors of the mill. According to the custom of the trade, the machinery was in the nature of tenant's machinery, or fixtures. Before the American war, the property had been of considerable annual value as a cotton-mill; but, in consequence of the state of trade during the war, the mill was closed. Nevertheless, the machinery was kept in it, and a man was employed to attend to the fire for the purpose of keeping up a proper degree of warmth, and to keep the machinery in a state of repair.

The Court held that the mill was thus used as a storehouse for the valuable machinery that it contained, and was to be valued for assessment to the extent of the rent which it would command as such storehouse.

Following this decision came another important case, Harter v. Salford, 34 L. J., M. C., p. 206). The appellant for many years carried on the business of a silk manufacturer; but, in 1863, he gave up business with the intention of never resuming it. The mill and premises were advertised for sale. The decision was that, although not in use as a mill, the buildings were to be valued as storehouses for machinery.

Hotels, refreshment-rooms, Epsom and other race-stands, canteens, and similar trade premises, which, by reason of their special situations, command rents in proportion to the extent of the trade which can be carried on in them and nowhere else, must be valued in connexion with their trade receipts, &c., from the gross receipts must be deducted the working expenses necessary to earn the receipts, allowances for trade profit to the tenant, for interest on the capital which he must necessarily employ, and for risks and casualties. The balance is the rent which he may reasonably be expected to be willing to pay to his landlord as rent.

In valuing all descriptions of house property, the question constantly arises,—is cost ever the measure of the rateable value of property? In giving his decision in the Mile-end Old-town case, Lord Denman says, "The outlay of capital might furnish no criterion of the rent a property should yield, since such capital may have been injudiciously expended, and what was costly may have become worthless by subsequent changes." It should be observed that Lord Denman did not there say that cost was never the measure of value, and, obviously, it sometimes is. Assume, for example, that the guardians of a Union are in want of a work-house, and that some landowner within the Union is possessed of a building exactly suited for such purpose, but that he requires a rent of 1,000*l.* a year for it. The guardians find, upon inquiry, that they can build a new workhouse and provide the land at a cost of 10,000*l.*, and that they can obtain the money at the rate of 5 per cent. per annum, which will equal a rental of 500*l.* per annum. They elect to take the latter course and build the workhouse, the rateable value of which is 500*l.* per annum, because that sum is the highest rental which it would be reasonable to expect them to give. Assume, however, on the other hand, that the landowner was unable to get a tenant for his building, for any purpose, at a higher rent than 250*l.* instead of 1,000*l.* a year, and that he therefore would be willing to let it to the guardians at 250*l.* In this case the rateable value would be 250*l.* per annum only, because it would not be reasonable to suppose that the guardians would pay for any other similar building a higher rent than that at which they had been able to take this from the landowner.

In estimating the rateable value of bridges, as in the case of railways, it does not follow that any direct receipts arise in the parish which is the subject of the valuation. The case of the Queen v. The Hammersmith Bridge Company is one in point. It was there held that, although the whole of the receipts were in the parish of Hammersmith, yet the bridge itself was the direct source of the rateable value, and that such net rateable value, when duly ascertained, was to be apportioned between the parishes according to the length of the bridge in each.

Valuation of Tithe Rent Charges.—The rateable value of a tithe rent-charge is the rent which a hypothetical tenant might be reasonably expected to give for it annually, such tenant having to pay the usual tenant's rates and taxes upon such tithe rent-charge and to derive some remuneration for his time and attention in collecting it. (Queen v. Capel.)

In the case of a clergyman, whom by reason of the number of parishioners and the value of

the incumbency the bishop of his diocese could compel to keep a curate, the reasonable salary of such a curate was, in the case of the Queen v. Goodchild, directed to be allowed; so also in the case of the Queen v. Lamb, where the duties of the incumbent were greater than one man could perform, the curate's salary was directed to be deducted; but, this allowance for a curate has, by the recent case, the Queen v. Sherford, been overruled, so that it must now be taken that such a deduction cannot be allowed.

Valuation of Coal-mines, &c.—Coal-mines, brick-fields, clay-pits, slate-quarries, &c., which involve the removal of portions of the soil, must be valued according to the rent and royalty which it is reasonable to expect the occupier would pay the landlord for that species of occupation. In the case of the Queen v. Westbrook it was held that a royalty so paid must be considered as a portion of the rent.

Valuation of Saleable Underwoods.—Saleable underwoods must be valued at the rental at which they might reasonably be expected to let, according to the quality of the wood and the situation of the land.

The valuation of railways, gas, and water-works involves considerations so special that the subject is reserved for a separate paper.

MODERN PARIS.

Among the improvements of Paris which are postponed for the present is the continuation of the Boulevard Saint-Germain, which it was proposed to extend from the Rue Hainfeulle to the Rue Saint-Dominique.

As some compensation, however, works are being rapidly carried on near the Port Saint-Paul for the new bridges which are to connect the easternmost point of the Ile Saint-Louis with both banks of the Seine. These two bridges, with the piece of roadway lately formed on the island on the site of the gardens of the Hôtel Bretonvilliers, will serve as connecting links between the Boulevard Saint-Germain and a new street which is to open out upon the Place de la Bastille. This latter street, which runs into the street first described, will be 30 metres (98 ft.) wide, and its axis will be an imaginary line drawn between the dome of the Pantheon and the Column of July. It will cut at an angle the promenade in front of the Boulevard Morland, skirting the Barrack des Celestins, crossing the Rue de la Cerisaie, shortening the Rue Castex, running across the Rue Lesdiguières and the Rue Jacques-Cœur, finally emerging on the Place de la Bastille at a point which was marked out last year. The new street, passing through the ancient *quartier de l'Arseuil*, which was called in the time of Francis I. the *Champ aux plâtres*, will very considerably alter the features of this distant portion of the fourth *arrondissement*. In the Rue de la Cerisaie, it will obliterate what little remains of the sixteenth-century house built by the architect Philibert Delorme for his own residence; and will also destroy some of the buildings belonging to the Hôtel Lesdiguières, where Peter the Great lived during his sojourn in Paris in 1717. This hôtel, having been sold by auction in the year 1760, was bought by some speculators, who built the Rue Lesdiguières upon the garden.

The continuation of the Boulevard Saint-Germain (on the right bank of the river), which will be called the Boulevard Henri IV., cuts obliquely through the gardens of the Palais St. Paul, and just touches the western point of the ancient Ile Louviers. The Ile Louviers, now joined to the right bank of the Seine, was named after Nicholas Louviers, *préfet des-marchands*, in 1468.

A committee is now sitting to discuss the desirability of constructing a new street 12 metres wide between the Rue Montmartre and the Rue Saint-Fiacre.

The Government finance committee inspected last week the works of the New Opera House. Besides the amount already allocated for the purpose, the committee decided to appropriate a sum of 20,000*l.* to complete the building, and the works are to be pushed on with all possible despatch.

Those who have not explored the interior of the Palais de Justice in Paris can form but a very imperfect notion of its extent, and little imagine the numerous relics of bygone times which are entombed below the present surface of the soil. The extraordinary manner in which the ground becomes raised in the neighbourhood of ancient

buildings is familiar to all who take an interest in archaeology, and the Palais de Justice forms no exception to this general rule. In order, however, to appreciate the enormous difference of level between the present surface of the ground and what it was at the time the first buildings on the site of the Palais were commenced, it is necessary to place oneself below the level of the *terre-plein* of the Pont Neuf, on which stands the statue of Henry IV., in order to estimate the height of the quays and the elevation of the ground above the low water-mark of the Seine.

As the superstructure of the Palace of Philippe Augustus and Saint-Louis was raised on the remains of buildings of the Roman era, the foundations of this edifice were below the level of the river, and the ground-line was level with the shore. In spite, however, of the ravages of fire and the numerous repairs and alterations which from time to time have been executed to the building, the ancient ground-floor has, thanks to the raising of the ground all around, been preserved in a remarkable manner, and now forms a kind of basement under a portion of the palace, and is in very good preservation.

If, in passing by the quay which runs on the left of the Conciergerie, you look through one of the small square windows, which are placed almost upon the ground, you perceive a kind of crypt, supported upon columns, with semicircular vaults. This is the basement story of the famous *Salle des Pas Perdus*, and is all that remains of the original building. The *Salle des Pas Perdus* having been destroyed by fire in 1618, was rebuilt by Louis XIII., under the direction of the architect Jacques Desbrosses, who, as was the fashion in those days, instead of attempting to restore the ancient features of the palace, swept the whole of the upper part away, and carried out the rebuilding in the Italian style. The basement having escaped the fire, was not rebuilt, and remains almost intact. By the side of the Quai de l'Horloge is a vaulted room, about 53 ft. square, the roof carried by nine columns, with four enormous fireplaces, nearly 15 ft. wide; one at each angle. This chamber is popularly called St. Louis's Kitchen, and belongs probably to the end of the thirteenth or the beginning of the fourteenth century. The arch over the chimney openings forms an obtuse angle on plan, and the keystone is stratified in a very curious manner against a column in front. A plan and perspective view of this building are given in *Violet-le-Duc's Dictionary*, pp. 475-6. Le Duc believes that this kitchen had originally two stories, the lower story,—that which has been preserved,—serving for the retainers, and the upper one for the king's table.

To the right of the Conciergerie some buildings of a Gothic character are now going on, which are intended to connect the *tour Montgomerie* with the *tour Bon-Bec*, which latter has been entirely re-modelled. In carrying out these works the ancient buildings of the time of St. Louis surrounding the courtyard of the Conciergerie, formerly used as cells for prisoners, have been respected.

In this courtyard are the dungeons of the unhappy Marie-Antoinette and the celebrated *salle des Girondins*, the interiors of which have been carefully preserved. The outside casing has, however, undergone some modifications, as well as the lower courses of the front next the quay, as far as the *tour de l'Horloge*.

The height of the Church of Notre Dame de Paris has been lately ascertained, and an inscription recording it has been engraved upon a metal plate fixed at the north-west angle of the building, about 3 ft. from the ground. The following are the particulars. Height above the mean level of the sea, 35 m. 99 c. (117 ft. 9.425 in.); height above the water level at the Pont des Tournelles, 9 m. 74 c. (31 ft. 10.516 in.); height above the datum level of the capital, 65 m. 50 c. (214 ft. 4.363).

As a point of comparison, it may be mentioned that the top of the spire of Strasburg Cathedral is 142 m. (462 ft. 8.727 in.) high from the ground. The distances on the routes *impériales*, which were constructed, for the most part, during the long reign of Louis XV., are all computed from the west door of the Church of Notre Dame. A column of bronze gilt, similar to those employed by the Romans in their forums for a similar purpose, is about to be erected in front of the doorway at the actual point from which these measurements are taken.

Apocryphal of marking the houses inhabited by

distinguished men, the Municipal Council of Mâcon have determined to affix a black marble commemorative tablet on the front of the house in the Rue des Ursulines, in which Lamartine was born in 1790.

SOCIAL ASSOCIATION.

THERE lurk in the breast of every man some ambitious longings. They may be silent, they may be trumpet-tongued; his goal may be afar off, the path rugged, the mountain steep; ere reaching it he might have to skirt bogs, avoid crevasses, but he still bears onwards, though sometimes driven from his path. We, I take it, have ambition—I hope noble; we have been toiling, may-be silently, for many a year, driven to many a shift, crushed, dispirited almost, but still unsubdued. We could exist upon the margin of any swamp, we could remain inert at the brink of any precipice; but our mission would be unaccomplished. We must still on: to stop is to recede, for the world moves forward; a step not taken is a step irretrievably lost. Such is the journey of life. In this journey we often require assistance, advice, a cheerful word; but fellowship, good fellowship, is that which smoothes the road and diminishes the hills. Social intercourse is a vast stimulus. We are borne on our way easily and without effort if we have good companions; with these we live, we do not simply exist. We travellers, therefore, having met upon the road, fall into conversation. We fear, from what each says, that a vast deal of existence has been done and is doing. The pathway being difficult, may I say dangerous, is uninviting to a solitary traveller. He fears he can make little or no way. One has lost his chart, one his compass, one his weapons, one his cash; but between them they can muster all the necessities of travel. So long, therefore, as they are bound in the same direction, they determine to lend each other aid and enliven the journey by sociality and brotherhood. Along this paper, as along the journey, I am continually falling—into metaphor. But in all societies these bandings together are continually occurring, under different names, for very different purposes.

A good answer to the cowardly query of what is the use of living, since we are so ephemeral,—since we cannot live longer,—is this, that if we lived to a million we should still be as far off eternal existence here on earth as now, and at the end of the million we should wonder at the shortness of this "transitory life." But, in the words of a deep thinker, "Why should the present race of mortals monopolise the blessings of existence, after they have had their share in the business, the enjoyments, the miseries of life. Is it not reasonable that they should be removed from the stage, to give place to others who may taste the same pleasures?" In so far as the wisdom and goodness of the Almighty are concerned, these attributes, we may safely affirm, are more conspicuously displayed by his giving life to these countless millions of animated beings than if the blessings of life were confined to the existing generation of men and animals.

As things are at present ordained, by the wisdom of the Almighty, countless myriads of creatures appear in succession to taste the blessings of existence, or to celebrate their Maker's praise. Nay, the compensation of death, which we so generally deplore, furnishes scope for some of the purest pleasures which man can experience here below; for the constant waste of the species is supplied by children born in our own image, in whose happiness we are deeply interested, whom we view as our representatives to other generations, and in whom our lives are so bound up that death can scarcely appear even a natural evil, when we have transmitted, as it were, our existence and our comforts to others, whom we love as our own souls.

Take time by the forelock in all things; never let go your hold, hang on like grim death itself; for, once you relax your grasp of that grizzled bit of hair, hundreds of ready hands are there on the instant to take your place. Alas for that man whose heart is willing, but whose flesh is weak! He retains his hold, may be; he feels, drop by drop, his strength ebbing from him; but a rude jostle, and a sigh, and the poor struggler drops behind, and is for ever lost sight of and forgotten. But stop; see, there is a strong arm stretched forth, the fainting man is supported, a cheerful voice advises courage, words of hope are spoken, temporary assistance rendered, and the worn and drooping traveller recovers

strength and spirit. His preserver lives two lives instead of one; the good and ready deed of his has not only been the means of preserving to the world a fellow-creature, but he has gained confidence in himself, and, let us hope, a willing ally.

All men are pretty well ballasted with the cares of this life; many can hardly keep afloat; any legitimate means we can use for the lightening of these storm-tossed backs the better. Oftentimes, when these means are effective, most extraordinary phenomena occur. We will suppose a witty lecturer exerting his influence upon these craft; he need not have been at work long before the waters of life seem all in motion; one vessel bobs up against another; this one pitches and rolls, as if not a grain of care were aboard to steady her, and the whole fleet present looks like a mass of rolling, rollicking porpoises, who care neither for wind nor tide, and whose hulls are so light as to have little immersed in the waters. Now, this lightening of the cares of this life invariably takes place where numbers do congregate for discussion, for friendly intercourse, for mutual amusement; all such meetings ought, therefore, to be encouraged. It is by intercourse with each other that ideas are exchanged, creeds propagated; anything which tends to discountenance these gatherings is an evil to be eradicated. Man is, above all the animals, sociable; and it is when in company that he fully indulges in that one attribute which he possesses exclusively, so it is said,—laughter. It is when mixing with others that he can show his generosity, indulge his hospitality, prove his valour, exhibit his sympathy, exercise his charity; not one of which he can do locked in a place by himself. That man who is in such a position as to be debarr'd this intercourse with his fellows, has but a sorry existence; he is a wheel out of gear; his aspirations, hopes, longings, finding no healthy outlet, are as daggers turned against his own breast. He is stabbed to the heart, and although no wound may be visible, the internal hemorrhage may be none the less fatal. How soon such a one's mind is apt to become morbid; and instead of putting forth green and vigorous shoots of knowledge, grows only rank and worthless weeds of distrust and discontent. How gloomily does he view life and its surroundings; with what regret does he look to the past, with what hopeless despair does he look to the future. Hope is the great mainspring of action—"Dum spiro spero."

Life, however one may look at it, is always shifting, no matter whether we view certain phases of it in the cottage or the palace, in the metropolis or in the village. As the seasons alternate, as the waters of the ocean ebb and flow, as the pulse of man throbs, as the rivers of his blood alternately swell through his veins and thence into his heart, to be again propelled through the ramification of his system of arteries, so does the apparent life of society ebb and flow; and, to carry out the great laws of nature, it should be so. Ever and anon some great social agitation takes place: something has to be remedied, something taught. Now local government is at fault, great Bumbledom has achieved something so outrageous that society cannot possibly shut its eyes to the blunder. Local government has to be governed, societies are started, meetings held, and a vast amount of talking done. Whether from the sins of Bumbledom having been wiped out, or from love of change, a new subject is soon started, and people exclaim, "Ah! I said it wouldn't last; I knew the matter would die a natural death," leaving all to imagine the subject ought to have been murdered, or have had a perennial existence.

Bumbledom might not be in disrepute, but our greatest blessing, the working man, might. He might have exhibited a depth of ignorance and depravity so unfathomable as to appal the stoutest heart. Society sets about reforming him in the most agreeable manner. He has had mechanics' institutes, he has had schools provided for his children, he has had Paradise set before him if he would only stretch forth his hand to take it; but we discover we have been dosing him with too heavy food; his stomach is not fit for such rich viands as we have in our good-natured ignorance put before him; he must be looked upon as some shipwrecked mariner who has been for months without sufficient nourishment, often without any,—he must therefore be treated accordingly. His diet must be of the lightest kind, and given just when the system is capable of digesting it. The treatment is no sooner prescribed than your good-natured public carries it out to the letter; and, like the tale in

the "Arabian Nights' Tales," the cork is no sooner out of the vessel, than the whole place is filled with the good or evil genii. The public, whom I will call the Fisherman, is soon appalled by the magnitude of the giant he has let free, he fills every place, and threatens at no distant time to swamp, or, in other words, clear the Fisherman off the face of the earth. After some little talk, this grand agent is induced to get into the bottle again, and then your B. P. or P. F. (poor Fisherman) claps the cork in, and the danger is passed for the time. Now this formidable affair, which the P. F. might have let out of the bottle, may be "lectures for the working man," "working men's societies," "sixpenny benefit societies," or "penny readings." Such things come regularly on the flood of social life, and all tend to a good end. Oftentimes in a small place, when the working man has taken up his share of attention, has been fêted and feasted mentally, the donors of the feast are sometimes induced to look upon themselves, and to discover that they are capable of improvement; nay, I say very capable. Up springs a debating society, an orphonic club, a didactic society, a beef-steak club, or a whist club; all serve a purpose,—they serve to make life lively and to lighten existence. For the class of ne'er-do-weels, or grumpers, to say that because such things have but an ephemeral existence, they answer no purpose, is to prove that they have not thought over the matter. All these movements are good in themselves, and show a healthy tone in society. Some movement or other in a small place is absolutely necessary, both for the physical and mental health of many. Without some such incentive to action the mind and body both become rusty; and although directly all such movements may not be philanthropical, they must by no means be condemned on that account. Indirectly they may be the source of much good. The way to keep our unions empty, and to turn our goals into storehouses, is to teach health of body, and to put the poor man in the way of obtaining and keeping it. It is from our overcrowded, pest-ridden, fever-stricken dens that a seething army of criminals is belched forth. Sickness brings want, breeds ignorance, fosters crime. Your strong, healthy, hale man never turns foot-pad or pickpocket: it is the scrofulous half-fed, spiritless coward who filches and robs; and his children,—for children are born to such,—not only inherit the sins of the father, but his diseases also. Man, I take it, is not naturally vicious; his vices are taught; and hence, give him health and strength, he will get his living honestly. Any one to live, as I understand it, must have health; and at the present day the laws which govern this greatest blessing are so well known as to render any one culpable who neglects them. The man who is confirmed invalid has but a sorry existence himself; he is generally unfitted for this work-a-day life; he is incapable of performing those duties which should devolve upon him; he becomes something less and something more than a cypher. As Longfellow sings in the "Blacksmith," let us,—

Some task begun, "Each morning see
Each evening see its close;
Something attempted, something done, to earn a
Night's repose."

Or, as it is even more beautifully expressed in one of the odes of Horace:—

"Lord of himself, to whom
'Tis given to say, as each day ends, 'I have lived';
To-morrow let the Sire invest the heaven
With darkest cloud or purest ray serene;
He cares not what has been,
Nor from life's cloud blot out one fleeted hour."

M. U.

A CONCRETE FROM GAS LIME.

It is well known that gas companies turn out of their works a quantity of lime which has absorbed certain impurities from the crude gas. Hitherto, the only use found for this offensive smelling gas-lime, has been the very limited one of spreading it on the land and at the roots of trees for killing insects hurtful to vegetation. Of course this is out of the question in the case of the large City gas-works, whose plant is too far removed from fields and orchards, and, although it is acknowledged that gas can be better purified by lime than by any other material, the trouble of removal of the waste product has forced the adoption of other methods which do not involve so much expense in carriage.

As we mentioned some time ago, Mr. Thomas

Prideaux, of Sheffield, has been exhibiting blocks of concrete, mouldings, artificial stone slabs for hearthstones, and other objects, all made from this refuse gas-lime; and as it is now the subject of a patent, and promises to furnish a useful material for building purposes, a short account of the results obtained up to this time may be useful. The gas-lime is ground under edge stones, and presents at first a uniform green colour. In this state it forms the raw material for making plaster or cement of various qualities and capabilities. According to the purpose required, it is used in this state, or it is calcined and re-ground and mixed with silicious matters. A wall may be covered with a smooth coat, which hardens free from cracks, for interiors; basements may be covered with a dry coat of cement, impervious, it is asserted, to damp, and quite obnoxious, be it remarked, to cockroaches. A hearthstone may be formed, and sets in a few days into a hard block of stone, as well as mantel-pieces and jambs, which, without any colouring matter, present a neat and stonelike appearance.

It is remarkable that the peculiar odour of the gas-lime is no longer to be detected when the cement has set. The sulphur compounds are oxidised rapidly, and some of the adhesive qualities of the cement are no doubt due to the formation of calcium sulphate or plaster of Paris throughout the mass of the material in the process of hardening. A rubble wall can be built up and plastered over to resist the action of water in the interval of a tide, as the properly prepared cement will set even under water. The latter property has induced Mr. Prideaux to propose its use for building sea-walls.

Mr. Baker, of the County Analyst's Office, informs us that a number of houses in Sheffield, where trial has been made of this material, have been visited and inspected since its first application to walls, floors, and hearthstones, now about twelve months ago, and that time only appears to tell in favour of its durability.

ROCK-WORK AND ALPINE GARDENS.

THE amateurs who spend small fortunes on hothouse plants, and who generally have not a dozen of the equally beautiful flowers of northern and temperate regions in their gardens, might grow an abundance of them, in and about well-designed and artfully-built rock-work, with a tithe of the expense required to fill a glass house with costly Mexican or Indian orobids; and to that end a pleasant volume on "Alpine Flowers," by Mr. W. Robinson, F.L.S., the author of "The Parks, Promenades, and Gardens of Paris," already noticed in our pages, had better be consulted. "Our botanical and great public gardens," says Mr. Robinson, "in which alpine plants are usually found in frames, in obscure corners, or perhaps a few dozen of indifferent kinds on some absurdly-formed rock-work, half hidden under trees and shrubs, or a canvas roller-blind, as if very properly ashamed of itself, might each exhibit a beautiful alpine-garden, at half the expense and trouble they now bestow on some tropical family displayed in a single glass house." In a word, there is not a garden of any kind, even in the suburbs of our great cities, in which they may not be grown and enjoyed.

Although hundreds of brilliant alpine flowers may be grown without a particle of rock near them, yet the slight elevation given by rock-work is very congenial to numbers of the most valuable kinds. The effect of a tastefully disposed rock-garden is very desirable in garden scenery. It furnishes a home for many pretty native and other interesting plants, which may not safely be put elsewhere; and therefore it is most important that the most essential principle to be borne in mind, when making it, should be generally known.

The chief mistake generally made is that of not providing a feeding place for the roots of the plants that are to embellish the rockwork. In a wild state, alpine may be seen protruding their stems, crowned by dense tufts of leaves and flowers, from very narrow chinks—as narrow, in fact, as those left in the singular structures which we denounce; but if we try to take up the wild alpine, it is found that its tap roots descend down by the side of the moist stones and under them, and then, perhaps, run on one side under the debris, and on the other into a fissure of soil or through a mass of broken rocks

several feet deep. Now this is impossible in the rock-works generally made. On them even the coarsest British weeds cannot find a resting-place, simply because there is no motherly body of soil or matter into which the descending roots may penetrate, and find nourishment sufficient to keep the plant fresh and bright and well in all weathers. It is not only those who make their "rock-work" out of spoilt bricks, cement, and perhaps clinkers, that err in this respect, but the designers of some of the most expensive works in the country. At Chatsworth, for instance, and also, to some extent, at the Crystal Palace, you see rock-work satisfactory so far as regards its distant effect in the garden landscape; but, when examined closely, it might well be imagined that rock-work and rock-plants were never intended for each other's company, so bare are many of these large works of their proper and best ornaments. It is generally a pavement of small stones, huge masses of rock, or imitation rock formed by laying cement over brickwork, and in none of these cases is it adapted for the cultivation of high mountain plants.

It is quite possible to combine the most picturesque effects of which rockwork is capable with all the requirements for plant-growing; but, in the case of extensive rock-work-making, the owner must either call to his aid a landscape gardener of some skill in this way, or possess much taste and knowledge of the work himself. It is easy to use the largest stones, and make the boldest prominences, and leave at the same time rather level intervening spaces and fissures, in which rock plants may luxuriate; but Mr. Robinson does not recommend ambitious attempts of this kind—at least at first. It requires great taste to do it well, and the higher and bolder the attempt the more conspicuous will be a failure.

The best type of rock-garden is that in which, in addition to low-lying, stony, and rocky banks and slopes, where numbers of hardy and vigorous species may be grown, there are miniature peaks, cliffs, and ravines, with, perhaps, bog and water.

The most usual and deplorable of the faults in making rock-work is that of so arranging the stones that they seem to have as little connexion with the soil of the spot as if thrown out of a cart,—indeed less so. Instead of allowing what may be termed the foundations or apparent foundations, of the rock-garden to barely show their upper ridges above the earth, and thereby suggesting much more endurable ideas of "rock" than those arising from the contemplation of the bold and unnatural-looking masses usually seen, the stones are often placed on the ground with much the same idea that animates a bricklayer in setting bricks. Figs. 1 and 2 will explain exactly what is meant; both are accurately engraved from photographs; both represent small portions of artificial rockwork; the ugliest of the two was much the most difficult and expensive to make. A few loads of well-selected stones, allowed to peep from some gentle isolated mound or open sunny spot, and arranged as shown in fig. 1, would produce a better effect than several hundred tons placed as in fig. 2.

An important principle to bear in mind in both making and planting is that, as a rule, much more vegetation than rocks should be seen. Where vast regions are inhabited by alpine plants, acres of crag with a stain of flower or fern here and there, are very attractive and imposing parts of the picture, but in gardens where our creations in this way can only be Lilliputian, an entirely different method must be pursued, except in places where great cliffs are naturally exposed, and even in this case an abundant drapery of vegetation is desirable (fig. 3). A rock-work is rarely seen in which plants predominate as much as they ought.

Rock-works made on the margin of artificial water are very often objectionable—rigid, abrupt, unworn, and absurdly unnatural. In no position is an awkwardness more likely to be detected; in none should more care be taken not to offend good taste. Charming effects may be produced on properly made rock-work near water, by planting it with a combination of choice moisture-loving rock-plants, Yuccas, Pampas, Grass, and like subjects; but even the grace and beauty of the finest of these will not relieve the hideousness of the masses of brick-rubbish and stone that are frequently placed by the margin of water.

It is the fashion to make the hardy fernery in some obscure and sunless spot, in which it would be impossible to grow alpine plants, but

* "Alpine Flowers for English Gardens." By W. Robinson, F.L.S. London: Murray, 1870.

there is no reason whatever why it should not be made in more open positions, and in connection with the rock-garden. No plants adhere more firmly to hard vertical surfaces, or better sustain themselves in perfect health, without any soil, than ferns. In a wild state you find the Maidenhair fern and many other species so rooted into mere little fissures in the hardest rocks, that no effort can get out a particle of root. Some of our own small British wild ferns are found on the face of dry brick walls when they are not to be found elsewhere, growing spontaneously, in the same neighbourhood.

It is reasonable to assume that many ferns which in a wild state frequent half-shady spots would, in our colder climate, flourish best if permitted to enjoy all the sun of out cloudy skies, while ferns that inhabit sunny rocks in countries not much warmer than our own should always have the warmest positions we can give them on the rockwork. And in the case of the species that require shade, it is quite possible to grow them in the recesses of the rock-garden and in deep passages or miniature ravines leading through it, even if a portion be not specially designed as a fernery. (Figs. 4 and 5.)

Rockwork is, as a rule, made for the display of mountain plants, or those which by their dwarfness fall into the class commonly known as alpine. Some cover rockwork with climbing shrubs and dwarf bushes, but in every case, unless where a rock is introduced for its own effect in the landscape, the object is to grow plants. Now, as very few of the subjects above alluded to like shade, or even tolerate it, it follows that this is an ignorant and bad practice. Many persons who arrange such things doubtless fear the sun burning up their plants; yet the sun that beats down on the Alps and Pyrenees is fiercer than that which shines on the British garden. But, while the alpine sun cheers the flowers into beauty, it also melts the snows above, and water and frost grind down the rocks into earth; and thus, enjoying both, the roots form perfectly healthy plants. Fully exposed plants do not perish from too much sun, but simply from want of water. Therefore it cannot be too widely known that full exposure to the sun is the first condition of perfect rock-plant culture—abundance of free soil under the root, and such a disposition of the soil and rocks that the rain may permeate through and not fall off the rocks, being also indispensable.

In connexion with alpine gardens, the masses of rockwork occasionally made of brick-rubbish, concrete, and cement, demand some notice.

There can be no doubt that as picturesque effects may be produced in this way as in any other, and that this variety of artificial rockwork may be admirably associated with shrubs and trees, and vigorous climbing and trailing plants, but it is utterly unsuitable for true alpine vegetation. When properly constructed, care is taken to make the interior of the cemented masses with deep beds of earth, leaving holes here and there in the face of the structure from which plants can peep forth, while the top is left open, and may be planted with shrubs or trees.

One of the simplest of all ways of cultivating alpine plants is in small rocky beds, arranged on the turf of some parts of the garden, out off by trees or shrubs from the ordinary flower-beds, without any of the pretensions of the ordinary rockwork; one of these will give much greater satisfaction than many an ugly and extensive mass, and by the exercise of a very little judgment is readily constructed so as to not offend the nicest taste.

A satisfactory window rock-garden can be made outside of a window to which light has free access, by forming a miniature alpine garden on the sill. It is simply done by putting a few irregular stones along the front margin, and packing a few small bits of turfy peat or loam inside them to prevent the fine soil, afterwards to be added, from being washed out. Then fill in the hollow with sandy loam, mixed, if convenient, with morsels of broken sandstone. A few mossy or ancient-looking stones should be half buried on the upper surface, and then the whole should be planted, the best time to do this being April. It is not merely possible to keep alpine succulents in this way: it is easy to grow a multitude of the most interesting and beautiful kinds! The attention required is very trifling,—some little taste in forming and planting, a judicious selection of plants, and thorough waterings during the dry season. Small and brilliant spring bulbs might be employed to light up this tiny garden in spring. It would

also be desirable to plant subjects of a drooping character on the outer margin. The alpine succulents are all thoroughly hardy, and would remain in good condition during the winter, but a little changing and re-planting every spring would be desirable.

The work to which we are indebted for these illustrations and instructions as to rockwork and alpine gardens has numerous other illustrations and much useful information on the subject generally. The second part of the volume consists of an alphabetical enumeration of choice alpine plants, with full particulars as to appearance, habits, culture, and selections for various purposes.

SCHWÄBISCH-GRMÜND.

DOORWAY, CHURCH OF THE HOLY CROSS, GRMÜND.

ABOUT twenty miles from Stuttgart, on the way to Nördlingen, stands the interesting little town of Schwäbisch-Gründ. The situation of this place is most charming, surrounded on every side by lofty hills, valleys richly wooded, and watered by clear mountain streams. The many towers and spires of Schwäbisch-Gründ rise up above a belt of rich foliage, and form a picture that is more like a dream than a reality. Upon inspecting the town more closely one is not disappointed, for it is quite full of antiquities and curiosities. Unfortunately the walls have been nearly destroyed, but the gates and towers for the most part still exist, and show by their size and number that the place must have been far more important in the Middle Ages than it is at present. There are many fine examples of timber houses, some of which date as early as the fifteenth century. The Corn Hall, the Hospital of the Holy Ghost, and the Schmalz Hall are the most remarkable amongst the secular buildings. We should here mention, for the information of our readers who are unacquainted with the German language, that *schmalz* is clarified butter, which, during the Middle Ages, and even down to the last century, formed the staple commodity of Schwäbisch-Gründ. The Schmalz Hall is a remarkable building, entirely of stone, with solidly vaulted cellars in two stories.

The Franciscan church at Schwäbisch-Gründ has been a good example of German First Pointed work, but is so terribly modernised that little of its original beauty is now left. It consists in plan of a large, broad nave, without aisles, and a long chancel, which is about half as wide as the nave. The windows have all been single lancets, except at the east end, which was originally lighted by a triple lancet window (the church is, of course, square-ended).

The doorways are simple, but good. They are treated in rather a singular manner. The base-moulding of the building is carried round them so as to form a kind of framework to the arch. The only portion of the interior which is not modernised is the vaulting of the choir, which is very rich and beautiful, and is supported upon corbels ornamented with very fine early foliage. It is difficult to say how the very broad nave was originally ceiled; at present it has a coved plaster ceiling. It could never have been vaulted, as there are no buttresses, and the walls are of no great thickness. It is to be hoped that this interesting church will shortly undergo as careful a restoration as that which is now being carried on at St. John's.

The great glory of Gründ is the magnificent church of the Holy Cross. This superb building was commenced in the year 1351, as we are informed by the following inscription on the north doorway of the choir: "*Anno Dom. 1351 ponatur primus lapis pro fundamento hujus Chori XVI. Kal. Augusti.*" The nave, which was the last part of the church erected, was not completed till the year 1410. What makes this church of particular interest to the antiquary is the fact that it was designed and carried out under the direction of the two celebrated architects Henry and Peter von Arler, who also erected the churches of Kalm, in Bohemia; the cathedral bridge, Rathhaus, and gates at Prague; the churches at Nördlingen, Hall, and Dinkelsbühl; and who are amongst the reputed architects of the cathedral at Milan. There was also a third member of the same family, Henry Arler, the younger, who assisted his father Peter in the designs for Milan Cathedral. There is a tradition at Gründ that the Certosa at Pavia was also designed by a member of the same family, but there seems to be very little foundation for this report; and the fact that the Certosa is so

very Italian in character would strongly militate against the idea of its having been designed by a German architect. The church consists of a nave and aisles, the same height and under one external roof, and a choir and aisles also under the same roof. The choir is terminated with an apse, the aisle being carried round the same height. The choir is surrounded by eleven radiating chapels and two porches. There are also transeptal chapels, but as they are low they do not affect the general appearance of the church, which is what is called in Germany a "*hallenbau*;" that is to say, a hall-shaped building. The nave has eight bays, the choir four. The entire length of the church is about 280 ft., the width of the nave internally 74 ft., and the height to the vaulting is about the same. There are five great doorways—three to the nave, and one on each side of the choir; that on the south side is singularly beautiful (see engraving), and bears a strange kind of resemblance to some portions of the cathedral at Milan, nor is this kind of family likeness between the church at Gründ and the cathedral at Milan confined to this doorway, for the general effect of the interior of this church is wonderfully like the great Italian cathedral. We have here the lofty side-aisles, the slender columns, and that general look of space and height so remarkable at Milan. In one respect the church at Gründ is superior to Milan, and that is in the detail, for here there is none of that overloading with ornament, nor do we find that horrible cabbage-leaf foliage which is so offensive in the great Italian church. This is easily to be accounted for by the fact that in Germany Gothic architecture was indigenous, and the commonest workmen understood it, whereas in Italy it was at best only an exotic, and never thoroughly understood; and thus Italian workmen carrying out the designs of a German architect would be sure to give to the detail that clumsiness and want of elegance so peculiar to all Italian Gothic work.

Before leaving this church we must not forget to notice the quality of beautiful and interesting furniture which it contains. In the north transeptal chapel is an altar with a splendid carved oak reredos, about 30 ft. high; in general form it is a lofty semicircular arch, filled in with a representation of the "tree of Jesse." The figures, which are very numerous, are coloured and gilt, and all the carving is most delicate and beautiful. Above the arch is a series of very intricate canopies; the centre one rises above a crucifix, life-size, on either side of which are the figures of St. Mary and John. Within the semicircular arch or border are four seated female figures of great beauty; each has a child in her arms. They are thus explained by Herr Pölzer, the energetic and learned rector of this church:—

"The first figure represents Sarah bearing in her arms the infant Jesse, as 'Son of Abraham'; the second is Mary crowned, with the infant Saviour; the third is Anna teaching the child Jesus to walk; and the fourth is Bethesda, with Christ as David's son." Above these, in the branches of the mystical vine, are nearly a hundred small busts of prophets and characters from the Old Testament. The exact date of this superb work of art is unknown, but it is probably the end of the fifteenth century. We are informed that this reredos or shrine was originally over the high altar of the church, which would well account for its great size and importance; but that it was removed to its present position in the seventeenth century, on the introduction of the "Roman rite," which requires that the tabernacle should be on the altar.

The chapel, or transept, in which this wonderful altar now stands, formed no part of the original design for the church, but was added by Haas Böllinger (the celebrated architect of the tower of the cathedral of Ulm), after the fall of the two towers which originally flanked the choir of this church. These towers appear, if we may judge from an old picture still in one of the side chapels, to have formed portion of an earlier building, and were Romanesque in character. Over a doorway near this chapel is a complete suit of armour given by the Emperor Charles V. to Ranchbain, who attempted to defend the town against the Schmalkaldic army; and near this latter is a cannon-ball half imbedded in the wall, with the following inscription below it, in old German:—

"In 1546, on the 26th of November, in the Schmalkaldic-Protestant league against the Emperor Charles V., John Fredrick, Duke of Saxony, bombarded and took this town of Gründ, and shot this ball into the church, but the church remained otherwise uninjured. God be praised."

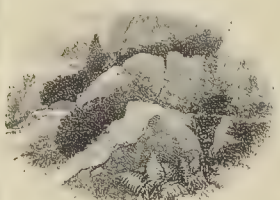
ROCK-WORK.



4. Ravine in Rock-garden (artificial), with Alpine Flowers in every Crevice.



5. Entrance to Cave for Killarney Fern in Rock-garden.



1. Right.



3. Rude Stair from deep Recess of Rock-garden; every Chink and Crevice Mossed over with Alpine Flowers.



2. Left.

The ten chapels which lead out of the aisle surrounding the apse contain many interesting works of art: two of them have ancient altars of great beauty. The one dedicated to St. Anna is a singular example of minute sculpture, and that of St. Sebald is a fine work by Veit Stoss. The life-sized statue of the saint carved in wood is very noble and full of expression. Below the statue is a large triptych, the doors of which are painted with subjects from the life of St. Sebald by Martin Schaffner, of Ulm, in 1524. The middle portion of the shrine or triptych is filled with elaborate sculpture, richly painted and gilded. All the other altars are modern Gothic work. Some of them are not without considerable merit. One of these has old painted wings attributed to Hans Baldung Grün, a native painter, of Gmünd, at the commencement of the sixteenth century.

The eastern chapel, which would in England have been the "Lady Chapel," does not contain an altar, but has instead a life-sized representation of our Lord's Entombment, with eight attendant figures. The whole is carved in stone, and decorated with colour. It is a work of the fourteenth century. On the side walls of this chapel are two very interesting frescoes of the same date as the Entombment. They are said to be by a Cologne artist of the fourteenth century, and represent the "Crucifixion" and "Deposition."

There are some curious monuments in these chapels, and several fine old escutcheons, some of which date as far back as the fourteenth century. They are all circular, and carved out of wood. The choir stalls are good Renaissance work, with very striking figures of prophets and apostles standing on the screen at the back.

These figures appear to be of an earlier date than the stalls and screens themselves.

In the nave of the church is a beautiful little monument, in form like a churchyard cross. (We shall give a drawing of this in a future number.)

The treasury of this church is well worth seeing, as it contains all its ancient presses, with wonderfully complicated and elaborate locks and hinges. When the French came here in the year 1796 this church possessed 10 cwt. of precious metal in the form of church plate; and even now it is very rich in works of art of this description, the most remarkable of which are the following:—

A cross (crucifix), with figures of Mary and John, in silver, 4 ft. high. The emblems of the Evangelists are at the ends of the arms. The work is very elaborate; date 1420.

A remonstrance, of silver, ornamented with tabernacle-work; about 3 ft. 6 in. high. Early sixteenth-century work.

A remonstrance, of silver Renaissance work; sixteenth century. A pair of silver cruetes, with basin. Augsburg work; date 1600.

A silver cup or chalice, given to Rauchbain by the Emperor Charles V., with the following inscription engraved upon the cover:—"Carolus V. me dono dedit;" and on the foot, "Calicem hunc a pio Carolo V. Ro. imp. in festo Epiphaniæ anno 1552 (Læponti (Innsbruck) oblatum et senatui Gmundensi (of Gmünd), constanti obedientia et perpetua memoria grā (gratis) donatum honestissimus vir Joannes Rauchbain, consul impetravit."

A thurible, of silver; a pix, of Early Romanesque work; a reliquary, fourteenth-century work; and a silver statue of the Madonna, for which a

sum of 300l. was lately offered, and we are glad to say refused.

This church has no tower or spire, but there is a small flèche, of bad design, on the roof; and a few yards from the north side is a quadrangular structure of stone, bearing a belfry constructed of huge beams of timber, and terminated with a tall pyramidal roof covered with green, purple, and yellow glazed tiles. This contains the bells, one of which is called "Hosanna." It bears an inscription with the names of the four Evangelists, and the date 1456. Another bell weighs 75 cwt., and bears the date 1595. A third bell bears upon it the words, "Avo Gratia Plena," in thirteenth-century characters. It is said that this bell originally hung in one of the towers which fell in, and that the bell remained uninjured. The belfry is a most picturesque object: it was probably erected soon after the fall of the before-mentioned towers.

This church has been very satisfactorily restored, and the yellow wash with which every part of the interior was disfigured has been scraped off. The only unsuccessful portions of the restoration are the high altar, which is too large, and rather heavy in detail, and the stained glass, which is amongst the worst we have ever seen, and is in glaring contrast with the little old glass that exists in the church. However, the people of Gmünd, and, in fact, the kingdom of Württemberg, are to be congratulated upon possessing such a noble church, and are to be greatly praised for the condition in which it is kept, and the great care bestowed upon it.*

* To be continued.



CHURCH OF THE HOLY CROSS, SCHWÄBISCH-GMÜND.

ON MEDIEVAL TRIPOD COOKING-POTS OR MARMITES.

In Halliwell's "Dictionary of Archæic Words," a marmite is described as a "pot with hooks at the side." This, however, is hardly a correct definition, a marmite being more properly a metal two-eared cauldron standing on three legs. In the present paper, therefore, we wish to confine our remarks exclusively to the Mediæval cooking-pots of that form, specimens of which have been exhumed at different times in many parts of Great Britain, Ireland, and France.

Tripod cooking-vessels or marmites, appear to have been formerly in common use, and even at the present day culinary vessels, very similar in appearance, are not unknown in certain districts. In shape, marmites "differ from modern iron pots in their greater height and narrowness, and in some examples by the length of the upper member; a few, however, are quite globular. In size they vary from a capacity for holding one quart to nine gallons of fluid."* They are usually made of bronze or bell-metal, though occasionally of iron or brass. Tripod-vessels of this form are generally considered to have been in use between the twelfth and sixteenth centuries, and thus must be classed with relics of the Mediæval period. By some, however, they have been designated "Roman camp-kettles," principally on account of their having been sometimes dug up near the sites of Roman encampments, or other traces of that people. But if we examine the quality of the metal of which they are composed, it will be found to be of an inferior kind to that used by the Romans; also there is in most of these pots a want of classic art, of which, says Dr. Wilson, "the commonest Roman urn or amphora rarely fails to betray some traces."† Besides, it should be borne in mind, that tripod cooking-pots have never formed a part of any hoard of Roman antiquities; and that in the many representations of domestic and other objects on Roman altars, and suchlike lapidary remains, they are entirely unknown. When we add to these objections against their Roman workmanship the fact that Mediæval inscriptions have in some instances been found on these very pots, it seems pretty conclusive that they were used in the Mediæval kitchen for culinary purposes.

A very highly-figured marmite, with inscriptions, was exhibited before the Society of Antiquaries in 1801. It is formed of bell-metal, and probably belongs to the fourteenth century. The ornamentation is at once elaborate and unique, consisting of the symbols of the four Evangelists, various animals, and devices relating to the chase. Round the vessel are the words—

Je su pot de graunt honhur
Eiunde a fere de bon sabhur.

Below we read—

Vilhelmus Angtel me fecit fieri.

Three elaborate plates of this marmite may be seen in the *Archæologia*, vol. xiv.

On a gravestone of the fourteenth century preserved in the museum at York, there is a curious representation of one of these pots. A cross fleury extends the length of the stone, and on one side of this cross is a bell, and on the other a marmite. The stone was probably erected to the memory of some metal or bell founder; and M. l'Abbé Cochet concludes, from a figure of a marmite appearing under these circumstances, that in the fourteenth century marmites were as common as bells.‡

Again, with the marmite found at Loges, near Fécamp, in 1845, three copper spoons were discovered, on each of which was engraved a *fleur-de-lis*. This is an additional proof that these cauldrons belong to a post-Christian era.

Of the marmites dug up in Great Britain, that found at Bodidris, in Denbighshire, is very characteristic. Its height is about 10 in., and it holds approximately nine quarts. The body of the vessel is ornamented with three bands of lines set close to each other; and there are also numerous square patches irregularly disposed on its exterior surface. This tripod-pot is made of bell-metal, and was consequently, like all other marmites, cast into its present shape.

Four marmites have been exhumed in Lanarkshire, Scotland. One was found at Pyet Knoll, in the parish of Calter; another on the line of

the Roman road, in the same parish; another near to Liberton Church; and the last in Biggar Moss.¶ Several similar utensils were also found in the Loch of Leys, in Kincardineshire, when the water was drawn off in 1850. They had sunk some 3 ft. into the soft bed of the lake.

In the north of England these tripod cauldrons are not uncommon. One, found in Northumberland, may be seen in the museum at Alnwick Castle. Bruce, in his "Roman Wall," gives an illustration of another, discovered near Haydon Bridge, in a cutting on the Newcastle and Carlisle Railway. This marmite very much resembles those found in France. He also engraves, in plate xvi., "a pan, evidently intended for culinary purposes," with a horizontal handle curved at the end. It has three very short legs.

Of the tripod cauldrons belonging to more southern counties, that found at Shady Camps, Cambridgeshire, is peculiar. It is assigned to the sixteenth century, and on its side appear the letters N. V. in relief. It has also a long flat handle, like the tripod-pan just referred to. On this handle an inscription has been traced, although not satisfactorily deciphered.

Signs of ornamentation, consisting of circular indentations, may be seen on a similar handle of a marmite discovered at Walton, near Chesterfield, in Derbyshire. This handle is 9 in. long. The pot itself is 7½ in. in height, and 5½ in. in diameter. It is globular in form, with raised cords encircling the body of the vessel. Although by some this cauldron has been called a Roman camp-pot, yet, judging from its very similar make and appearance to those known to be Mediæval utensils, it should be classed with the tripod vessels of that period. A representation of it may be seen on reference to the *Journal of the British Archæological Association*, vol. viii., p. 55.

Another very fine marmite, buried 4 ft. or 5 ft. beneath the surface, was disclosed, in 1860, by some workmen, while digging the foundations of a house at Norwich. It is of considerable size, its height being 2 ft. 9 in., and the diameter of its mouth 1 ft. 2 in. It is a globular vessel, round its largest part measuring nearly 4 ft. For the convenience of transit of so bulky a marmite, "it has a handle projecting at each side of the rim, forming an acute angle." This is probably the largest tripod cauldron hitherto exhumed in this country.

A toy-marmite, about 2 in. high, was dug up many years ago in the parish of Scalford, Leicestershire. It is made of bronze, and is exactly similar in shape to those of larger size. Its practical use for culinary purposes, however, is out of the question; possibly it served as a model, or more probably it was merely a child's plaything. A wooden of the same size as the original may be seen in the *Gent. Mag.*, Nov., 1861, p. 545.

In the museum of the Royal Irish Academy is preserved a tripod-vessel, or marmite, bearing the date 1640. This cauldron, "of compact, sonorous brass, is one of the largest and most perfect ever found in Ireland; it rests on three decorated feet, stands 26 in. high, is 68½ in. in girth round the widest portion, and 14 in. across the mouth. A large projection attached to the bottom shows where the metal was poured into the mould. The spout is 4 in. long, and the legs 9 in. high."† The date, 1640, stands in relief, and just above it are the letters E. H. It has been suggested that this vessel was used in brewing or distillation, on account of its having a spout, which is not a usual feature of these three-legged pots. This specimen is said to have been found near Macroom, county Cork.

Another marmite, discovered in a bog at Lowtown, county Westmeath, may be seen in the same museum. It is 21 in. in height, and, like the preceding example, formerly had a spout; a piece of metal now plugging up the aperture. Altogether, there are no less than sixteen of these cast metal-pots noted in Sir W. Wilde's catalogue.

A tripod vessel, having a resemblance to the second example already quoted, from Bruce's "Roman Wall," is engraved in the above catalogue. It is 6½ in. high, and has a horizontal handle bent at the end, 6 in. long. Besides this specimen, we find another represented in the *Dublin Penny Journal*, vol. i., p. 84. It has a similar handle, curved at the end.

One more Irish marmite must be noted. This

was found in a bog in the vicinity of Cookstown county Tyrone, and was preserved for a long period at Killymoon. Since then, however, it has been removed to Belfast. Its capacity is 6½ gallons, and the entire vessel weighs 81 lb. The mouth is 14 in. across, and the internal depth of the vessel the same. Outside, its extreme diameter is 1 ft. 6 in. The thickness of the metal at the bottom of the cauldron is estimated to be ½ of an inch.

Marmites are of common occurrence in France. In general appearance they are very similar to those found in our own country, judging from those now deposited in public and private collections of antiquities. There is one in the museum at Nantes which had been deposited in a marsh at Donges; there are also five in the museum at Abbeville. The late M. Houbigant, of Nogent les Vierges, had two in his collection. One of these was found near the camp at Catenoy; the other specimen came from Riaux, near Liancourt.

In a descriptive work by M. l'Abbé Cochet on the antiquities of the department of Seine Inférieure,* we find notices of nine marmites or tripod cauldrons, all of which he classifies as belonging to an uncertain period. Elsewhere, however, he assigns them to Mediæval times.† The localities and dates at which these marmites were found are—two at Lillebonne in 1836; at Loges, near Fécamp, in 1845; at St. Nicolas de la Taille in 1846; at Tourville la Chapelle, near Dieppe, in 1847; at Val de la Haye, near Rouen, in 1847; at Vatteville, near Caudebec, in 1859; at St. Pierre les Elbeuf in 1861; and at Ancretteville-sur-Mer, near Fécamp, in 1862.

Of the tripod-pots just mentioned six are preserved in the museum at Rouen; the remaining three being in private collections. With reference to that discovered at Ancretteville-sur-Mer, the following particulars may be interesting. This marmite was dug up in the garden of M. Cadinet, a merchant at Ancretteville-sur-Mer, on the 17th of November, 1862, from a depth of about 1 ft. 8 in. Its height is about 13 in., diameter across the mouth 9 in., and its circumference measures about 3 ft. 1 in. On the same occasion, a copper bowl was found without feet or ears. As to the use of both these objects, M. l'Abbé Cochet considers that by their being blacked with smoke it clearly shows that they had been used as culinary vessels. Both, when found, had their mouths downwards, and covered corroded silver plates. It seems probable that in this instance, at least, the marmite was buried by design in order to protect the valuables that had been placed within it. So, likewise, at Vatteville, and Loges, where bronze candlesticks and other household articles were concealed with the marmite. But, on the other hand, many marmites have evidently been accidentally covered with earth, which would explain why they are so often met with near the surface.

There is but one more individual marmite to which we desire to call attention. It was found in a coffin at St. Maurice de Genay, according to the manuscript catalogue of the museum at Poitiers, where it is preserved. This, we believe, is the only three-legged pot ever discovered in such a situation. The body of this marmite is almost globular, and a piece of metal, rivetted on the outside, shows where a spout was once inserted.‡

The method of using these tripod-pots is very obvious. All those that we have described, with one exception, stand on legs of sufficient length to allow of a fire being kindled beneath the body of the vessel, without suspending it by its projecting ears. It has been conjectured, however, that a semicircular metal handle was sometimes attached to these ears; but, if so, it is strange that none of the tripod vessels hitherto found have been thus accompanied. The horizontal handles, which belong to a few specimens, are quite of a different character, being something like the handles of common modern sauce-pans, only flat instead of round. Marmites, with this kind of handle, were most likely intended for a different purpose from those having two ears of the ordinary form. It must also be remembered that these ears are always fixed in such a manner as to allow of the entire vessel being turned over on its rim, if required. Vessels, similar in shape to these Mediæval marmites are still used in many country places for the baking of bread. The method employed is very simple. The cooking-

* Sir W. Wilde's "Descriptive Catalogue of the Museum of the Royal Irish Academy," p. 634.

† *Prehistoric Annals of Scotland*, Second edition, vol. ii., p. 498.

‡ *Bulletin Monumental*, 3rd series, vol. ix., p. 316.

* *La Seine-Inférieure Historique et Archéologique*, par M. l'Abbé Cochet. Paris, 1864.

† *Bulletin Monumental*, 3rd series, vol. ix., p. 316.

‡ *Bulletin Monumental*, 3rd series, vol. iv., p. 9.

pot is first turned upside down over the unbaked loaf, which has been placed on an iron platter on the clean hearth; dry furze and charcoal embers are then piled all over the outside of the vessel, so as to generate as much heat as possible within; and in this portable, yet effective, oven the loaf is soon baked. We are informed that in Cornwall, and probably in other districts of the West of England, this way of baking bread is frequently practised; but the extension of railways, and the consequent spread of modern appliances, would naturally cause this method to become gradually obsolete, although in country nooks and corners these ancient customs and ways of cooking are not likely to die out quickly. In former days, when travelling was a difficult and tedious undertaking, and the provisions had to be cooked on the road, the tripod cauldron was a necessary addition to the equipment of the party, for with it they were enabled to bake their bread and stew their meat with ease and comfort. Hence it is that these tripod-pots have occasionally been called "camp-kettles," and "hunting-pots," the name in each case denoting the use to which they were sometimes applied. The specimen, exhibited before the Society of Antiquaries in 1801, and which we have previously described, was evidently designed for the latter purpose, as the inscription and figures on its side clearly indicate. There can be but little doubt, however, that such convenient cooking-vessels would be used just as frequently in the home-kitchen as in the traveller's or hunter's camp.

In concluding this notice of tripod cooking-vessels of Medieval times, we have only to express a hope that further specimens of these culinary vessels will soon be made known. That others exist underground is beyond all doubt, and it is even probable that many hitherto undescribed may be hidden away in some of our antiquarian collections. To hunt up such forgotten relics would, indeed, be a praiseworthy and interesting pursuit for the painstaking archaeologist.

E. H. W. DUNKIN.

THE BELLS OF ST. MICHAEL'S, CORNHILL.

The massive and lofty tower of the church of St. Michael is furnished with a fine peal of twelve bells in the key of C, the weight of the tenor being about 41 cwt.

They all came from the Whitechapel foundry, and bear the following inscriptions:—

1. THOS. LESTER MADE ME. 1748.
2. THOS. LESTER MADE ME. 1746.
3. MACHINIST ASTMA. R. PHILIPS FICIT. 1728.
4. JUBILATE DBO. R. PHILIPS FICIT. 1728.
5. CAST 1785. THE REV. THOS. ROBT. WARREN, M.A., RECTOR. MESSRS. LECAR BURCH, PHILIP GREED, JOSEPH NORTON, CH. WARDENS. THOS. MEARS OF LONDON FICIT.
6. EXULATE JUSTI. R. PHILIPS FICIT. 1728.
7. CANTATE DOMINO. R. PHILIPS FICIT. 1728.
8. T. LESTER LONDINI FICIT. 1740.
9. SI DEUS NONVENIS QVIS CONTRA NOS. R. PHILIPS FICIT. 1728.
10. TO PRAYERS WE DO CALL
ST. MICHAEL'S PEOPLE ALL
WE HONOUR TO THE KING
AND JOY TO BRIDES DO SING
TRIUMPH WE LOUBLY TELL
AND BING THE DEAD MAN'S KNELL.
R. PHILIPS FICIT. 1728.
11. MESSIERS ALEXANDER GREVE, JOHN WOOD, THOMAS RILEY, JOHN SHIPSTON, WILLIAM HIDE, RICHARD RYCKOFF, WILLIAM MARSHALL, TREASURERS FOR BUYING THESE 12 BELLS. R. PHILIPS FICIT. 1728.
12. THIS BELL RE-CAST ANNO DOMINI 1785. THE REV. THOS. ROBT. WARREN, M.A., RECTOR OF ST. MICHAEL'S, CORNHILL. MESSRS. LECAR BURCH, PHILIP GREED, JOSEPH NORTON, CH. WARDENS. THOS. MEARS OF LONDON FICIT.

Richard Phelps, founder of the great bell at St. Paul's, cast these bells, which were rung for the first time on Wednesday, December 4th, 1728, on account of the arrival in Town, from Holland, of H.B.H. Frederick Prince of Wales.

The first, second, fifth, eighth, and twelfth of the peal were subsequently recast, as indicated by the several inscriptions.

This bellry has always been considered one of the favourite places of the Society of College Youths, certain members of which rang a peal of 5,126 Grandiose Cinques here November 7th, 1729; and one of 7,013 February 14th, 1731. The peal was celebrated by a composer and ringer, Benjamin Annable, of whose attainments I gave some particulars in the *Builder* of December 25th last. And here I would record an extraordinary achievement. On Saturday, April 27th, 1861, twelve members of the society ascended the tower and rang upon the bells

under notice a complete peal of cinques, on Stedman's principle, consisting of 8,580 changes, in six hours and forty-one minutes, being the greatest number of changes rung in that intricate method upon twelve bells. The performers were, H. W. Haley, composer and conductor, treble or first; Thomas Ray, second; John Bradley, third; Robert Jameson, fourth; William Green, fifth; George Stockham, sixth; Jas. E. Haworth, seventh; Geo. E. Ferris, eighth; Matthew A. Wood, ninth; Edward S. Lansell, tenth; Geo. A. Musket, eleventh; James Dwight, tenor. Attested by Messrs. Cox, Boswell, and Miller, of the Cumberland Society, and other competent judges.

Respecting the present arrangements for practice, I may add that a band of able ringers—"College Youths"—attend here on the evening of every fourth Friday.

The bells are also rung on certain festival and joyous occasions.

THOMAS WALSEY.

PRINTS AND THEIR PRODUCTION.

It may be usefully noted that the very instructive collection of engravings produced by all the various known processes, including the most recent inventions in photographic printing, made by Mr. S. T. Davenport, the excellent financial officer of the Society of Arts, to illustrate his paper on "Prints and their Production," are still accessible in the South Kensington Museum. Mr. Davenport has written an explanatory catalogue, which gives additional interest to the collection.

THE TRADES MOVEMENT.

London.—A public meeting of carpenters and joiners of Chelsea has been held in the Elsenia Lecture Hall, Chelsea, in furtherance of the movement for a reduction of the hours of labour; Mr. Maskin in the chair. The chairman said a number of meetings had been held in various parts of London, and resolutions unanimously passed, in favour of a reduction of the hours of labour to nine hours per day, and the adoption of a code of working rules, on mutual terms, binding both employers and employed. The trade was in a very bad position, owing to the number of men out of employment. They did not ask the masters to give ten hours' pay for nine hours' work, as each man under the nine hours' system would give up 4s. 4d. per week, so as to give employment to the surplus labour. It was calculated the adoption of the nine hours' system would give employment to twelve men in every hundred now out of work. The code of rules proposed had worked very well in the Manchester and Salford district, and he did not see why it should not answer equally well in the metropolis. On the motion of Mr. Harry, seconded by Mr. MacLagan, a resolution approving of the objects of the meeting was carried.

Edinburgh.—A meeting of the joiners of Edinburgh has been held in the Phoenix Hall. A new branch of the Associated Carpenters and Joiners of Scotland was formed, and fifty-six members were enrolled. The following resolutions in regard to the wages question were afterwards adopted:—

"1st. That this meeting being satisfied that the present unequal payment of wages is unjust to employers and employed, resolves to take immediate steps in order that all competent workmen shall be paid the standard rate, viz., 6d. per hour.—2nd. That a meeting of each shop and squad,—where the standard rate is not paid to competent workmen,—be at once held, and that an answer be requested from the employers to the above demand, the employers' answer to be reported to a meeting of the trade to be held on the 28th, and the demand to come in force on and after the 2nd of May."

Glasgow.—The joiners have gained their point—nine hours a day, and 6d. an hour. At a meeting of those now working on the nine hours' system, it was unanimously agreed to appoint a vigilance committee for the purpose of carrying out the following motion, viz.:—

"To call on those joiners who are still working fifty-seven hours per week, and remind them that they are doing so against the expressed wish of the trade; also to respectfully request them to adopt the nine hours' system, as contained in the acknowledged rules and regulations; and to inform them that every facility will be given towards this object by applying at the Joiners' Hall, 1, Alston-street, any time during working hours."

Perth.—At a meeting of the Perth Branch of the Operative Masons' Association of Scotland, it has been resolved to discontinue the present strike for an advance of wages from 5jd. to 6d. per hour. One of the last acts of the branch

association was to fine forty-two members in sums varying from 1l. to 7l., for refusing to continue to hold out for the advance. Only a few of the operative masons are now idle.

A *Universal Strike*.—A ridiculous and Frenchified idea of a universal strike is said to be entertained by the "Association Internationale des Travailleurs." What would they say to a universal lock-out? Surely our sensible and steady-headed English workmen are not allowing themselves to be made political tools of by those who seem to be as unfit and dangerous leaders in industry as they are in political movements.

Trade-union Outrages.—At Manchester, Mr. Johnson, builder and contractor, is secretary to the Master Builders' Association. He has been actively engaged in recent trades' disputes, and is personally at variance with brickmakers on account of making bricks by machinery. An incendiary fire has taken place in Mr. Johnston's timber-yard at Ancoats, by which 1,500l. worth of stock has been destroyed. An hour later an attempt was made to blow up his house at Levenshulme, several miles distant. A bottle encased in clay, and containing gunpowder, was dashed against his drawing-room window, but rebounded from the framework and exploded harmlessly outside. Four bottles charged with gunpowder have since been found in the grounds.

That vilest of all conspiracies—trade-union outrages—has also shown itself in Belper, Derbyshire. One of the largest nailmasters there has recently set up three "patent olivers," a great improvement in making nails, and by which, too, almost worn-out men may earn a good living. The horse-nail makers held a meeting, and decided that none of the men employed by this master must work while the "olivers" were used. Forty men were thus thrown out of employ. One man, named Esau Melbourne, continued to work. To mark his defiance of the trade, some of the secondaries fired two loaded guns through his bed-room window, shattering the window to atoms. Most fortunately Melbourne, fearing danger, had removed his bed into a back room a few days previously.

THE CLERKENWELL COURTS.

The very objectionable houses in the Turnmill-street courts (Bitt and Frying-pan alleys, Clerkenwell), upon which we have several times reported, were condemned by the medical officer of health, Dr. J. W. Griffith, under Torrens's Act, and have been partly pulled down. We are informed, however, that they are being rebuilt exactly as before, so that persons might shake their heads from the windows of the opposite houses. This should be looked into. Cannot the district surveyor or the vestry interfere?

ACCIDENTS.

Nearly the whole of the village of Broadcyst, near Exeter, has been destroyed by fire, fifty-nine thatched houses being burnt, and only eighteen remaining. The property belongs to Sir T. Acland, whose son, Mr. Acland, made arrangements for supplying the sufferers with food and shelter. It is supposed that the conflagration was caused by sparks from the chimney of an inn which was on fire.

At Bolton, two workmen had been engaged to place a new coping-stone on the chimney of the Bullfield cotton-mill. They had erected scaffolding, and, having hoisted up the stone, proceeded to place it in position. The stone became over-balanced, and striking one of the men on the chest, hurled him to the ground, a distance of 42 yards. It then fell upon and broke the plank on which the other was standing, but he fortunately managed to grasp the ropes and to step upon that portion of the scaffolding which remained intact. The poor fellow who fell was still conscious, and lived for an hour afterwards.

We learn by telegraph that a large fire has broken out in Hull, and is raging with great fury on the north side of Victoria Dock, which for a mile and a half is occupied with timber yards. One-fourth of this length was then one sheet of flame, illuminating the country for miles. Some of the shipping caught fire. Hundreds of men were engaged to throw timber into the dock to limit the fire. One youth was killed. The marines from her Majesty's ship *Wyvern* were called out to assist in subduing the fire, which originated in an adjoining saw-mill which was entirely consumed.

A fearful catastrophe is reported by the Atlantic Cable. The floor of the Court of Appeals in the capitol at Richmond had fallen through to the Hall of Delegates below. According to Renter's telegram, fifty-nine persons, including a number of members of the Virginia Legislature, were reported as killed, and 150 others as injured. Not more than about twenty remain uninjured. Among those who escaped were Governor Walker, the judges of the court, and several members of the State Legislature.

OUR COMMONS.

THE great importance of preserving the suburban commons and open spaces to serve as lungs for the overgrown and continually extending body of this our London, has frequently been insisted on in our columns; and though everybody readily acknowledges the truth of the position, yet, as it is not the business of any one in particular to look after the matter, the gradual appropriation of huge cantles of land is continually going on, depriving the public of space for exercise and healthful recreation.

From time to time it is discovered that a park is wanted in some particular quarter, and, not having wisely adopted the cheap prevention of forbidding enclosure, we are driven to the costly cure of purchasing land at building price.

Within a recent period about three-fifths of Wandsworth Common have been appropriated and sold by the lord of the manor, treating the land as if he held it in fee, and not considering that, with the homage, he ought to form an institution for the preservation of the common for the benefit of the copyholders and freeholders and the public, instead of violating every principle forming the essence of the theory of copyhold.

An attempt is now being made to check further encroachment in this direction. Mr. H. W. Peck, M.P. for Mid-Surrey, has undertaken that if a sum of 4,000*l.* can be raised he will supplement it by a further sum of 1,000*l.*, to form a fund for the purpose of instituting proceedings to take up everything irregular which has occurred during the legal term.

This is a matter which interests all classes of society, and none more than the working man, who has spent all the week in a hot workshop. We are informed that a large portion of the required sum has been already raised, and that collections are being made in every large engineering and other establishments.

There is no time to be lost, as the month of June now next ensuing is the period fixed by Mr. Peck for the acceptance of his terms. It is announced that subscriptions will be thankfully received by either of the treasurers, Mr. Jas. Dubuison and Mr. T. S. Watson, both of Wandsworth Common.

WHO SHOULD KEEP THE DRAWINGS?

IF the time-honoured adage, "*Mos legem regit*," is to exercise, as it should, its wholesome influence over Mr. Ayrton's legal advisers, I may congratulate Mr. Edward Barry on the pervading unanimity between town and country architects with reference to this question. The council of the Manchester Society of Architects, and now that of the Liverpool Architectural Society, are found to be on this question in perfect accord with the Institute of British Architects, widely though they differ in other matters of professional practice.

There is something especially remarkable about this Ayrton and Barry controversy. How is it that we have waited till 1870 to hear (as very many architects will now do for the first time) of its being raised at all? We have all heard of architects carefully hoarding up their old drawings for years—ay, for long portions of a century; of their having them dusted, re-labelled, and replaced in their nests or portfolios; and of their making, after very many years, a grand holocaust of the collection; but what architect can remember a case of a client's asserting and persisting in his claim to these documents, as *his own property*?

Writing just now with reminiscences of active architectural practice, extending further back into the present century than I care to own to, I can call to mind only two instances of such an application as this one of Mr. Ayrton's, made in each case with the mere view of retarding the settlement of the architect's claims, and at once abandoned, on the very natural rejoinder, "*Your drawings have already been supplied—*

to your builder. I have, of course, a set for my own office use and reference, and these documents I do not supply to any one." It is, indeed, the natural solution of the question.* If Mr. Ayrton inquires into the practice of architects all over the country, he will find it to be so. Surely there must be (altogether apart from any question of copyright) a time when for his mere 5 per cent. an architect's copying of drawings comes to an end! First, we have the preliminary sketches, till we are all tired of making them; and wise architects limit these very properly to one set. Then come the contract drawings, a set supplied to the builder (or how is he to build?), and a set retained by the architect, or how is he to build? This latter set he invariably retains. If he ever gives them up, it is done in courtesy, by accident, or from sheer indifference as to what in one's modesty we so often consider mere lumber; but of contract drawings delivered by right to an employer, save for special deposit in public archives, and subject to payment for the cost of preparing them, there are none known in the profession. If there were, should we not have heard of them long ago, and would it not be the universal practice of architects to get out for their 5 per cent. three separate sets of all contract drawings, viz., one for the contractor; one for my Lord So-and-So, when his Lordship's butler should call for it; and a third for the architect to reserve, "for the perpetual memorial of the thing"? Can Mr. Ayrton's advisers name a single architect's office in the kingdom where it is, or ever has been, the custom to prepare this third (triplicate) set for the author's use?

There is no such custom in the profession. It was all very smart of the Chief Commissioner to stand up in his place in Parliament and sneer (I presume in the absence of their president, the honourable member for Bath) at the Royal Institute of Architects, as "certain architects who had met together and agreed," &c.; but the Institute had merely demoted it (*pace* Monseigneur Dupanloup) "opportune" to declare what was the received and invariable practice and mind of the entire profession; and a very "opportune" declaration it was. There is nothing out of the way or abnormal about it. Here is a clause taken at random from a printed office-form of general conditions at hand; and one annexed for years to architects' specifications. Architects all over the country would easily supply Mr. Ayrton with other such clauses, *totidem*, if not *ipsissimis*, *verbis* :—

"The original contract drawings and the specification are to be lodged with, and are to remain in the possession of, the architect, for his future reference, whether official duplicates are needed or not. . . . The architect will provide copies of all the contract drawings and specifications required by the contractor, free of expense; these are to be by him carefully preserved on the site (and not elsewhere) during the progress of the works; and if lost, stolen, or destroyed they are to be forthwith replaced at his expense." &c.

What architect would be so imprudent as to accede to any other than this obviously natural arrangement? How, if he does not retain these documents, on which peradventure (and in Mr. Barry's case really so) he may have been legislating for years, is he to prove to both client and contractor that he has acted with strict equity in all the many cases of doubt and intricacy that have cropped up from time to time during the progress of the building? It is a most grave and serious matter to officiate at all as architect of any building of magnitude; and any one who ventures on such a task had need preserve about him, to disarm suspicion (for he can't *avert* it), every contract drawing, specification, tender, balance-sheet, and document of whatever kind, as mementos of a grave transaction, he knows not what question may arise out of, any time within the next five or ten years. These documents the Chief Commissioner seems to regard as goods and chattels, delivered per invoice, "*this side up with care*," and all the rest of it. It is not so. They are papers which, having been used as tools or instruments in the performance of a very grave act of trust, are left naturally with the man who, from the first inception of the building scheme or plan to the signing of the certificate for balance of contract, has had every one—the contractors, their sureties, and the client—abiding for years. It may be in that interim his *sole arbitrament*; itself a necessary, an unavoidable condition of there being any architect at all.

In courtesy to his client, and even to his con-

tractors and their sureties, it would seem to be the duty of an architect to retain the contract documents. Are architects, who idly give them up, quite sure that a contractor or his surety, damaged by a client's retention of them, would not have in law a just cause of action for damages? These papers are not to be looked on as rows of candles, hanging up in the architect's "shop," that ought to have been sent in to the client, who has "paid for them."

Why does the Chief Commissioner ask for these documents, and persist in having them? Surely not to put them to any irregular use, to the obvious prejudice of their author.

I write in perfect ignorance of the contending parties, never having, to my knowledge, set eyes on Mr. Barry, or upon his formidable correspondent.

AN ARCHITECT.

THE DRAWINGS OF THE HOUSES OF PARLIAMENT.

MR. CORSE, the hon. secretary of the Birmingham Architectural Society, forwards to us the following resolution, passed on the 25th of April last :—

"Resolved,—That the Birmingham Society of Architects being of opinion that by the rules and practice of the profession the drawings of an architect are his own property, desire to assure Mr. Barry that they will have their support in resisting the demand of the First Commissioner of her Majesty's Works to deliver up the drawings prepared for the Houses of Parliament."

We understand that next Monday is reserved at the Institute for discussing the Ayrton v. Barry question, by the light of the correspondence just published as a Parliamentary paper.

THE BUILDING ACT.

SIR.—Sir William Tite is now introducing a new Building Act, and I take the opportunity to ask, in the interests of æsthetic architecture, why we may not have a clause to permit window-frames to be fixed flush with the exterior of walls, as in houses built prior to the Act now in force.

Probably reveals are the most distinguishing features of the houses of our time, and I do not think it is too much to say that the Act which enforced them struck the final death-blow to the picturesque in building. To explain my meaning, I will invite comparison between an old house, with its windows not marked, but treated as surface, the frames and mouldings forming their legitimate margins, and a house of our day, with its deeply-gashed windows, its tiny casings, and sashes, perhaps relieved by its grandiose cement architraves, or its paltry Gothic stonework, and its mean iron columns.

On the ground of taste only I am not ashamed to claim a space in the *Builder*, nor to appeal to the President of the Institute of Architects; nevertheless, on the score of utility, it is evident, and I believe it has been maintained in theoretical books, that the glass should be as near as practicable to the exterior to obtain the greatest light,—a grave consideration in our narrow lanes and courts.

It is scarcely conceivable that the existing rule is practically a security against fire; at any rate, it is desirable to invite evidence from persons experienced in such matters.

HORACE GUNDRY.

At the meeting held at the Surrey Commercial Dock-offices, Fenchurch-street, to organise an opposition to the Bill before Parliament "for consolidating and amending the Building Acts relating to the metropolis," Mr. Peter Rolt, who was called to the chair, said if the 111th clause of the Bill passed, the wood trade of the east and west of London would be annihilated, and it was, therefore, the duty of the trade to press the Government to withdraw the Bill. Mr. J. Sims (Churchill & Sims) would not go the length of saying the trade would be destroyed, but if it were desired to drive the trade from London, this Bill was the very thing to do it. Mr. Taggart said the dock companies were also opposed to the Bill on other grounds, and the Government, or those who had charge of the Bill, must be pressed to refer it to a select committee, where all parties could be heard. Its injustice and impolicy, however, did not admit of a moment's doubt. Ultimately the following resolutions were carried unanimously, the movers

* We do not admit even this. The builder is bound to return the drawings to the architect.—ED.

and secondors being Messrs. Chubb, Hunter, Taggart, Dyer, Gabriel (T. Gabriel & Sons), and Johnson, viz.:-

"1. That in the opinion of this meeting the passing of the Bill will injuriously affect the interest of timber-merchants, builders, carpenters, cabinetmakers, saw-mill proprietors, and all others engaged in the sale or manufacture of wood.

2. That should this Bill pass as it now stands, it would be impossible for many of the trades, which give employment to large numbers of the working classes, to continue in their present localities; by which means the existing distress, especially at the East-end, would be considerably aggravated.

3. That a committee be appointed to prepare and sign on behalf of this meeting a petition to Parliament against the passing of the Bill."

The second reading of the Bill is fixed for Monday next, in the House of Commons.

LAMBETH SCHOOL OF ART.

The distribution of gold, silver, and bronze medals, certificates, and prizes, will take place on Monday, May 9th, when the Bishop of Winchester will deliver an address. The gold medal has been awarded to Cyrus Johnson, for a life study. A silver medal has been awarded to George Brooker, for a model from the antique. Bronze medals have been awarded to Agnes Shenk, for a design for lace; George Tinworth, for a terra-cotta hand; and Cyrus Johnson, for a drawing from the antique. A book prize has been given to Robert Stocks for modelled figure design.

The committee of the Lambeth School of Science and Art are seeking aid in raising 600*l.* for the purpose of adding a story to their present building, in order to include the Modelling School. It is estimated the work will cost about 800*l.*, but towards this amount 200*l.* may be expected from the Department of Science and Art.

The manufacturing industries of Lambeth have already greatly profited by the teaching of the school; its wider range and greater accommodation would largely increase the advantages derivable by the industrial population.

WASTE OF THE BRITISH MUSEUM.

DEAR MR. EDITOR,—Pray take up your parable again against the closing of the British Museum three days of the week generally, but especially for the whole week, from the 2nd to the 7th of May, inclusive, and at other times during the year.

The numbers of ordinary visitors who are turned away is distressing to witness, and it is surely unnecessary to stop all readers, students, and visitors alike three times a year, for a whole week at a time. The Museum is closed from the 1st to the 7th of January, the 1st to the 7th of May, and the 1st to the 7th of September. The hours are from ten to four, ten to five, and ten to six, according to the time of year. The days closed each week are, Tuesday, Thursday, and Saturday, also Sunday, of course. I am this day unable to use the reading-room, as I intended.

C. C. C.

* * * We understand that, during this and the next two months the Museum will be kept open until eight o'clock in the evening. This is a commencement in the right direction.

THE TRAMWAYS.

THE Metropolitan Tramway Company have opened their line from the Brixton Railway Station to the Horns, Kennington Park, for public traffic. The cars are very commodious, and are fitted inside with velvet cushions and back. The windows are provided with sun-blinds. There are seats for twenty-two persons inside and twenty-four outside, besides standing-room on the platform. The carriages were built by Messrs. Starbuck, of Birkenhead. Access to the roof is gained by a winding ladder; the seats to which it leads are made like garden-seats. They are each drawn by two horses. The horses' bridles are provided with bells, the jingle of which gives notice to other vehicles to get out of the way. The fare is 2*d.*, paid on entering, and a ticket, with a number corresponding to the counterfoil, is given as a receipt. The same company have broken ground in Clapham, for a line to form a junction with the present at the Horns, and thence to Westminster. During experimental trials, many members of Parliament and others were present. There is also a new tramway in the east of London.—The tramways committee have re-

ported their resolutions to the House, and also the Bill with various amendments. These resolutions are to the effect that the Government Bill is to extend to Scotland; that provisional orders for the construction of tramways are to be granted by the Board of Trade and confirmed by Parliament; that the consent of two-thirds of the municipal corporation or other local authorities is to be required; that the Board of Trade may institute a local inquiry; that the Board of Trade may proceed to grant a provisional order, notwithstanding the objection to the local authority; that the Metropolitan Board be the local authority for the metropolis, except for the City; but the consent of the vestries be necessary as road authorities, subject to a resolution relating to the Board of Trade; that a *locus standi* be reserved for the owners and occupiers of property fronting a road or street, through which it is proposed to construct a tramway, to appear before referees at any local inquiry directed by the Board of Trade, and also before Parliament; that power be given to local authorities to make by-laws for the regulation of traffic, and for licensing drivers and conductors of vehicles; that power be given to local authorities to remove tramways found injurious or disused; &c.

HALIFAX BENEFIT BUILDING SOCIETY.

SIR,—Can any of your readers inform me whether any choice has yet been made amongst the competition designs for the "Halifax Benefit Building Society's Offices," which were sent in three months ago? COMPATITOR.

AN ARCHITECT'S BILL.

PECK V. LINCOLNSHIRE AND NOTTINGHAMSHIRE UNION SCHOOLS.

It will be in the recollection of our readers that the plans of Mr. Frederick Peck, of London, were selected by the managers of the proposed schools, but when the estimates were received, the lowest, amounting to 12,340*l.*, was so much greater than the amount stated by the Poor Law Commissioners that the scheme was abandoned. The *Lincoln Journal* says:—"The architect claimed 810*l.* for his services, which the managers deemed exorbitant, and offered the sum of 60*l.* or the alternative of leaving it to arbitration. The latter sum was refused by Mr. Peck, and he nominated Mr. Whitehead, of London, as his arbitrator, and Mr. Goddard, of Lincoln, was appointed by the managers. When the deed of submission was sent to Mr. Peck, he refused to acknowledge it unless his original claim of 810*l.* was abandoned and 1,118*l.* 9*s.* substituted, and even then refused to refer, but caused copies of writs to be served on Sir Glynne Earle Welby Gregory, bart., and Archdeacon Trollope (two of the managers of the scheme) for the sum of 1,118*l.* 9*s.* The cause was set down for trial in the Court of Queen's Bench for the 28th of April, but a day or two previously Mr. Peck accepted 60*l.* in payment of his bill of 1,118*l.* 9*s.*, and paid his own costs."

GOOD ROAD-MAKING.

SIR,—The communication that appeared in your last week's impression, under the above heading, showing the outcry for rolling with steam rollers, the road of Upper-street, Islington, must be used with great caution, if taken as "data for cost of road-rolling," as the work on this road was quite of an exceptional character, a large portion of the time being employed in experiments, and the cost being further increased by labour and watching, in blocking up roadway, loss of time during three weeks' frost, &c. Consequently the outcry, as there given, cannot be fairly taken as representing the ordinary cost of rolling, or the capabilities of the machine.

What is purposed being done here, is to complete three or four similar roads to the Upper-street, and then take an average of the whole for the actual cost.

I was surprised to see the statement in print, as it was prepared by me for the information of this vestry, but has not yet been submitted to that Board pending the completion of the other works as before mentioned.

Had the above explanation been given with the statement of outlay, I should not have troubled you with this. HENRY COBURN, Surveyor, Eastern District.

METROPOLITAN BOARD OF WORKS.

At a late meeting of the Metropolitan Board of Works, in reference to the proposed abolition of the Chelsea Bridge tolls, Sir John Thwaites in the chair, Colonel Hogg and Mr. Meaden introduced deputations from Pimlico and Battersea, presenting memorials praying that the Board will take steps to make Chelsea Suspension Bridge free to the public.

Mr. Wallace said that in a speech made some time ago there was a mis-statement,—viz., that 3,000 houses were empty in Battersea. As a member of the Assessment Committee for that district, he was in a position to say the correct number of empty houses in Battersea was 1,100, and there were 500 or 600 in course of erection. The retention of the toll undoubtedly prevented these houses being occupied; as a proof of that he would state that many people living in Battersea worked on the Middlesex side, who, of course, had to pay every time they crossed the bridge, and could not have their diners sent them from home like other working men without the toll being paid.

Mr. Peck said the 1,100 houses empty were almost ready for settlement—these were in Battersea. Then there were Wandsworth and Clapham, who would be very much benefited by the free bridge.

On the motion of Colonel Hogg, seconded by Mr.

Meadon, the two memorials were referred to the General Purposes Committee, and the deputations retired.

The Chairman said a plot of land in Queen Victoria-street had realised from the ground-rent of 2,350*l.*, being let at twenty-eight years' purchase, its proportionate value, in round numbers, a million and a quarter per acre.

A report was presented from the Works and General Purposes Committee, recommending the Board not to contribute to the cost of throwing into the public way a part of the ground enclosed within the railings at the western end of St. Paul's Cathedral, as the proposed improvement did not provide for the opening up of the roadway on the north side of the cathedral for carriage traffic. The report was received and adopted.

Mr. Freeman resumed the debate upon the question of municipal government, and advocated one great central authority for the government of the metropolis.

Mr. Runtz believed, that if the metropolis was divided into municipal corporations a royal commission would be necessary to settle the boundaries.

The following resolution was carried:—"That in the opinion of the Board it is desirable that there should be one central municipal government, with jurisdiction over the whole metropolis; and that there should be a readjustment of the districts into which the metropolis is at present divided for the purpose of local government; and that the subject be referred back to the committee for further consideration as to the details, with authority to communicate with her Majesty's Government thereon."

THE SERPENTINE.

SIR,—Will you kindly grant me a space in your paper to inform the public that the Commissioner of Her Majesty's Woods and Forests has decided not to remove the new gravel on the Serpentine? They are now putting gravel on the top, which, when the water comes in, will shift through the mud, and the Serpentine will be as bad as ever it was before it was begun. W. E. H.

THE MUSICAL LECTURES, SOUTH KENSINGTON.

THE first lecture, Mr. Editor, was very interesting, and justified your good words; but the whole of the second lecture was devoted to teaching the two-guinea folks part songs, so that the one-guinea people got badly off. FANNY.

Books Received.

What shall we Teach? Or, Physiology in Schools. By EDWIN LANKESTER, F.R.S. London: Groombridge.

THIS very able "attempt to advocate instruction in the laws of life as a branch of general education" was intended to be read before the educational department of the Social Science Association, but Dr. Lankester thought it rather too long, when he had done with it, for such a purpose, and prepared an abstract of it, which was read instead; and at the request of the President of the Department and others, he has had the original paper published. In this paper he urges the truly vital importance of an early and general knowledge of the laws of life and health, and of obedience to these laws, upon all and sundry, our legislators, architects, clergy, householders and servants, workmen, poor-law authorities, and others. As regards the architects and engineers, we think the doctor is rather unjustly severe. As we have often pointed out, our architects have seldom anything to do, for example, with the ventilation of our dwelling-houses. And even although this were the reverse, it is not the great and unquestionable good of ventilation alone they have to consider, but the serious sanitary evil of draughts in connexion with ventilation, as well as the question of warmth in winter, especially in the dwellings of the poor, who are no doubt often very blameable in stopping up or papering over ventilators, but not seldom, with them, there is merely a choice of evils.

To the delicate and the old, draughts are no less sanitary evils than is want of ventilation. The strong and the young often do not and cannot appreciate this rightly. Not suffering themselves from ventilation, they revel in what to others would be fatal draughts. Our paper is one of the oldest pioneers of ventilation, but we have never overlooked the difficulties connected with it; and we hope, nevertheless, that we are not likely now to be set down as opponents to it. But we must still persist in guarding the growing public opinion in favour of ventilation against its contingent and possible evils, as well as in extolling its vital good. Indeed, the public opinion, which we have materially aided in forming, in favour of ventilation, is now becoming so strong, that some run it fairly into excess. Our places of amusement are now sometimes made so unmercifully draughty that we have seen even the young and strong dodging

about to get out of the draughts, or muffling up their lady friends, and using means to protect their own necks and heads, or even replacing their overcoats. And see to our modern omnibuses! If old ones were close and stuffy, the new, or rather the re-modelled old ones, are stuck all over with "ventilators," and the vehicle, while in progressive movement, is converted into a perfect funnel, through which never-ceasing and injurious streams of air are doing their neuragic or rheumatic and consumptive work upon the passengers. Was there ever anything more idiotic than the open, fixed, stable-ventilators behind the horses, which admit the draughts and the foul steam and smell from horses, clothes, &c., winter and summer, along the heads of the passengers? The blockheads who originate and who allow of such absurdities ought to be doomed to have their own thick skulls exposed continually to such draughts.

Notwithstanding all that we have now said, however, there is much still to do in favour of ventilation, even as regards a knowledge of its importance, and the promotion of arrangements for securing it; and Dr. Lankester's advocacy of instruction for the young of all classes in this and many other subjects connected with health and life is much needed, and is capable of doing great good if well seconded and followed up in these days of educational reform.

VARIORUM.

The current number of the *Art Journal*, a very good one, by the way, contains an illustrated account of Penshurst, the home of the stately Sidneys, by the editor.—"The British and Foreign Mechanic and Scientific Instructor" is a cheap and useful periodical devoted to the spread of technical instruction in all arts and industries (40, Tavistock-street).

Miscellaneous.

The New Library and Museum for the City.—At a recent meeting of the Common Council, Dr. Sanders moved the adoption of the report of a select committee, in relation to the erection of the new library and museum in Basinghall-street, for which the Corporation passed a vote of 25,000*l*. The report submitted, for the approval of the Court, plans, designs, and model for the erection of the new library and museum, and recommended that proper munificent rooms for the archives of the Corporation should be provided in a portion of the basement of the building, at an estimated expense of not exceeding 2,800*l*. The building could be utilised for the guests of the Lord Mayor upon state occasions, and thus they would save 19,000*l*, which had been thrown away since the commencement of the present century. If the Corporation were destined to be destroyed, they would have in the new library and museum another work of public utility and beauty to point to as the work of their hands. The motion was carried unanimously.

Crystal Palace.—The new season will commence on this Saturday, May 7th, with a musical festival, under the management of the Sacred Harmonic Society. The orchestra, which will include the entire bands and chorus of the Sacred Harmonic Society and the Crystal Palace Company, and the 2,000 members of the Handel Festival Choir, as well as other amateurs and professors of eminence, will number upwards of 3,000 performers. A very large sale of the new May season tickets has already taken place. When the low price at which the season tickets are issued, and the amount (over 43,000*l*.) annually expended in providing entertainment for the delectation of visitors are considered, it is not to be wondered at that the number issued continues to increase. The attractions announced this summer are more varied and numerous than perhaps on any former season. The principal features will be a series of eight grand summer concerts, at which all the artists engaged at the Royal Italian Opera, Drury-lane (as well as other engagements still pending), will assist.

Destruction of a Palace by Fire.—Advices from Egypt state that a new palace just finished for the Viceroy at Ramieh, near Alexandria, at the cost of at least 200,000*l*., has been completely destroyed by fire.

The Marquis of Westminster and Working Men's Clubs.—A crowded meeting of the working men of Pimlico, Chelsea, and Westminster, has been held at the Pimlico Rooms, Winchester-street, Mr. W. H. Smith, M.P., in the chair. Mr. T. Paterson, one of the hon. secretaries of the Working Men's Club and Union, stated that the Marquis of Westminster had offered a plot of ground in Ebury-street, Pimlico, on which to erect a building to be used as a Working Men's Club for the district, and in addition he had offered the sum of 1,000*l*. towards the cost of the building. This offer had been made to the Council of the Union, who now laid it before the working men of the district. A resolution to the effect that the offer made by the Marquis deserved the hearty acknowledgments of the inhabitants of Pimlico, and should be met by corresponding efforts on their part to support the proposed institution, was carried unanimously. The meeting also pledged itself to co-operate in the support of the scheme by raising additional funds.

Eastern Progress.—The King of Ava is determined that his dominions shall no longer be out of the world altogether. His Majesty has offered to open telegraphic communications between his capital and Rangoon, bearing the whole of the expenditure from his own purse. The Indian Viceroy has expressed his pleasure with the proposition, and has caused his thanks to be conveyed to his Majesty. The Viceroy has also ruled that the expense of the telegraphic establishment along the line passing through British territories shall be defrayed by the Government of India.—The Japanese Government appears for the first time as a borrower in the London market, and invites the confidence of the English capitalists to the amount of one million sterling, for the purpose of constructing railways in that country.

Sheffield Architectural and Archaeological Society.—The first excursion for this year of the members of this society has taken place. A party of ladies and gentlemen connected with the society went by the new Midland line to Chesterfield. On arriving there they were conducted by Mr. Swift through the town, who pointed out objects of interest, and read a paper on the history of the town and church. The Rev. J. Stacey gave a detailed description of the church, pointing out its principal characteristics, not forgetting its curious spire, the peculiar form of which he considered to result from the action of the sun upon the green timber used in the construction of the spire. After examining the church, the party got tea together and returned home by an evening train.

Destruction of the St. Leonard's Music Hall, Shoreditch.—A fire, involving a serious destruction of valuable property, has taken place in the St. Leonard's Music-hall. The building had a frontage in the High-street, Shoreditch, and extended backwards as far as Bateman's-row. The hall had recently been entirely re-decorated, and the stage enlarged. An alarm was given, and a number of fire-engines soon made their appearance. By this time the flames had taken full possession of the lower part of the hall, including the refreshment seats, property, and dressing-rooms. The firemen therefore directed their attention to the protection of the adjoining property at the back, which was occupied principally by poor families. The music-hall was almost entirely destroyed. The proprietor is understood to be partially insured. The origin of the fire could not be ascertained.

Haymarket Theatre.—For the rustic comedy called "Barwise's Book" (oddly enough misprinted in the House Bills, "Barwick's Book"), an exceedingly good landscape, outskirt of the village of Singleton, Sussex, has been painted by Mr. O'Connor. It includes a "practicable" avenue at the side, very nicely managed. The piece is very strongly supported, including Mr. Sothern, Mr. Kendal, Mr. Buckstone, Mr. Chippendale, Mr. Compton, Mrs. Frank Matthews, Miss Robertson, and Miss Fanny Gwynne, who do everything that can be done for it, and produce an amusing result. The drawback to the piece is the little sympathy on the part of the audience that can be felt for any one of the characters. They are a scheming shifty group, that amuse but do not touch the feelings.

The Architectural Exhibition.—The collection in Conduit-street will be opened to the public on Monday; the private view taking place on, this, Saturday.

Steam Roller.—At a recent meeting of the Ipswich Board of Health, the surveyor handed in a report as to the purchase of a roller for the roads. This report embodied replies to inquiries Mr. Ribbans had made of engineers and surveyors in other towns. That of Mr. Howell, surveyor in the district of St. James, London, says:—

"There can be no doubt but in the construction of new roads a roller is of incalculable benefit: steam rollers of 20 tons are not too heavy for this work. But for the repair of existing macadam roads a roller of that weight (one of which we once had) entirely crushes the stones on the hard surface beneath. We use a roller which, empty, weighs 3½ tons: it is used when the material is first put on or spread. When the material begins to consolidate the roller is filled with water, which increases the weight to about 7 tons."

In conclusion, Mr. Ribbans says:—

"Taking the opinion of the above-named surveyor and engineers, I think that of Mr. Howell would answer our purpose best, and that a 3½ to 4-ton roller would meet all our requirements, the cost of which delivered in London (by Amies, Barford, & Co.) would be 95*l*."

It was ultimately agreed that a roller weighing 22 cwt. when empty, and 2 tons when filled with water, be purchased, which would be, including a turn-table, 50*l*.

The Proposed Erection of Public Buildings on the Thames Embankment.—A strong opposition is being organised to the proposed appropriation of a considerable portion of the land reclaimed by the construction of the Thames Embankment for public buildings, and the subject was brought under the attention of the Marylebone Vestry, with the view of obtaining the co-operation of that board. Mr. Greenwell, the vestry clerk, read a communication from the vestry of St. George's, Hanover-square, setting forth many objections to the erection of buildings as projected, and urging that as the ratepayers of the metropolis had paid for the Embankment, the reclaimed ground ought to be used for recreation by them, and by the public generally. Several parochial and other bodies agree with these views, and have requested Mr. W. H. Smith and Captain Grosvenor to bring this subject before Parliament, which will be done forthwith.

Strange Carelessness.—Last week Mr. H. Ashcroft, of Preston, contractor, incautiously put the end of a cigar which he had been smoking into his pocket, in which, as he seems to have forgotten, he had previously put a sample of blasting powder. The result was fearful. Mr. Ashcroft was hurled a considerable distance by the explosion of the powder, his clothes were ignited, and he has sustained injuries which, it is feared, will result in his death. It is stated that one of his eyes is destroyed.

The Suez Canal.—A new difficulty has occurred in the practical working of the Suez Canal. The heat is so great that the stokers cannot live through it. A Sunderland steamer has arrived out in Calcutta with every stoker dead; several others have suffered severely; and nearly all that have passed through tell the same story. Climatological maps show that although neither the Isthmus of Suez nor the Red Sea is equatorial, the "district of greatest heat" throughout the whole globe is a small space which crosses the Red Sea, Arabia, and the Persian Gulf.

Nalsea Glass Works.—The suffering resulting from the stoppage of these works is likely to soon be at an end, as the works are said to have lately been purchased by the firm of Chance Bros., of Birmingham. The works will probably be improved and extended. The locality of Bristol is eminently suited for the manufacture of glass, owing to the cheapness of coal and the easy access by water and rail communication, and inquiries at the present moment, it is said, are being made with the intention of erecting new works in the neighbourhood of Bristol.

A Chapel Burnt Down at Hyde.—A fire has taken place in the Congregational Chapel, George-street, Hyde. The alarm was at once given to the fire brigade, and two engines were quickly on the spot; but it was found there was no chance of saving the building, and the men confined their efforts to preventing the spread of fire to the adjoining school-room and dwelling-houses. These were saved, but the chapel was gutted. The cause of the fire was unknown. The building was insured for 1,000*l*.

The Belfast Albert Memorial.—The Belfast Albert Memorial Committee have, without any public demonstration, formally handed the tower over to the town council.

New Postal System in Austria.—A new mode of postal communication, suggested in this country, is being employed in Austria for short and insignificant messages. Cards are sent for three centimes, and the sender writes the address on one side, the message on the other, and throws it into the nearest letter-box, thus economising the expense and trouble of envelopes. The postal cards are stamped and circulated by thousands over the Austrian empire, and they are in universal use at railway stations, and for correspondence on journeys.

The Antwerp Exhibition.—The Exhibition to be held in Antwerp this year will be opened on the 14th of August. We believe the Society for Promoting the Fine Arts takes upon itself all charges and expenses of transmission and return of works of art, if delivered properly packed up before the 7th of July next, at the office of Messrs. Leete & Bailon, 36, St. Mary-at-Hill, Little Tower-street, London. The Exhibition will close on the 2nd of October. 80,000 francs (3,200*l.*) are usually appropriated to the purchase of works of art by the society.

A Liberal Offer.—Mr. Joshua Fielden, M.P., and his two brothers have addressed a letter to the Todmorden board of guardians, offering to hand over to trustees of their own choice 3,000*l.* for the erection of cottage hospitals for the use of the poor and infirm, and not as tests of destitution. Amongst other things, they state that they feel satisfied, if a workhouse be erected as proposed, the poor-rates will be increased in amount, and the result will be more paupers, more vagrants, more crime, and more policemen.

Newton's Observatory.—The observatory of Sir Isaac Newton being in the market for the comparatively small sum of 500 guineas, it is proposed to raise that sum by public subscription, and present the building to the British nation either at South Kensington or elsewhere. Some American speculators are also said to be desirous of purchasing the observatory.

National Gallery Enlargement Act.—Messrs. Pennethorne and Marrable, arbitrators, and Mr. John Oakley, as umpire, have sat at the Westminster Palace Hotel to decide upon the sum to be paid to the trustees of the Provident Institution Savings Bank, St. Martin's-place, for their leasehold interest and the damage to be sustained in consequence of being compelled to remove. Messrs. Brandon, Pownall, Ryde, Clifton, Rushworth, and other surveyors were in attendance to give evidence; but the case was settled by counsel at 15,000*l.*

The General Theatrical Fund.—H.R.H. the Prince of Wales will preside at the ensuing dinner in aid of this fund. It is fixed to take place at St. James's Hall, on Monday, the 16th, and will doubtless be an interesting event. Mr. Cullenford (Theatre Royal, Haymarket) is the secretary, and may be applied to as to tickets.

Sheffield Parish Church Bells.—The old peal of ten bells in the parish church has been augmented in number, and now made into a peal of twelve. A new chime barrel has been added, so that the chimes can now play upon the whole instead of only eight, as heretofore.

TENDERS.

For a house, in Tufnell Park, N. Mr. George Truett, architect:—
Beavis £1,171 0 0
Carter 1,140 0 0
Wiltshire 1,075 0 0
Emor 1,071 0 0
Williams (accepted) 837 0 0

For restoring and reseating the parish church of Chesham, near Croydon (amended plans). Mr. Houghton Spencer, architect:—

General Works. Seats.
Roberts £1,200 0 0 £163 0 0
Wright 1,169 0 0 66 0 0
Taylor 1,083 18 0 81 10 0

For new seed-sacks and stabling, at Reading, for Messrs. Sutton & Sons. Messrs. W. & J. T. Brown, architects:—

Strong £2,736 0 0
Dunn 2,530 0 0
Beale 2,501 0 0
Woodroffe 2,460 0 0
Gibson 2,463 0 0
Sheppard 2,478 0 0
Mathews 2,446 0 0
Barnicot (accepted) 2,350 0 0

For new infirmary-ward, at Thetford Union-house, Mr. R. M. Phipson, architect:—

Tooley £1,285 0 0
Cornish 1,175 0 0
Mayne 894 0 0
Hubbard (accepted) 894 0 0

For new schools and master's house, North Lopham, Norfolk. Mr. R. M. Phipson, architect:—
Downing £373 0 0
Hawes 900 0 0
Newell 774 10 0
Lacey 765 0 0
Bishop 730 0 0

For works at house, Stamford-hill, for Miss Nicholson. Mr. J. Tanner, architect:—

Eaton & Chapman £460 0 0
Hayworth 873 0 0
Mar 316 0 0
Lewis 278 0 0

For completion of premises, Nos. 3 and 4, Cambridge-terrace, Belgrave-road, Shepherd's-bush. Mr. R. A. Lewcock, architect:—
Holmes (accepted) £220 0 0

For buildings, in Chapel-street, Edgware-road. Messrs. Bird & Walters, architects. Quantities supplied:—

Gammon & Son £3,857 0 0
Newman & Mann 2,736 0 0
Williams & Son 6,660 0 0
Mansfield & Price 5,066 0 0
Ebb & Sons 7,987 0 0
Kelly Brothers 7,223 0 0
McLellan 7,620 0 0
Henshaw 7,855 0 0
Brown (accepted) 7,495 0 0

For pulling down and rebuilding No. 13, Bell-yard, Temple-bar, for Messrs. Stevens & Haynes. Mr. Edward Low, architect:—

Clemence £211 0 0
Beeton (accepted) 690 0 0
Warne 563 0 0

For repairs and alterations to No. 46, Finchbury-square, for Mr. Woolf. Messrs. Young & Son, architects:—

Colla & Son £233 0 0
Taylor & Lawdell 936 0 0
Helps 604 0 0
Messitt & Ashby 517 5 0
King & Son 443 0 0

For new granaries, at Canada-wharf, Rotherhithe, for the Ventilating Granary Company (Limited). Mr. James Edmeston, architect:—

Cowland £12,619 0 0
Lawrence & Sons 12,560 0 0
Kilby 12,548 0 0
Brass 11,968 0 0
Longmire & Burgess 11,968 0 0
Hill, Keddell, & Waldram 11,960 0 0
Brown & Robinson 11,620 0 0
Foster 11,570 0 0
Watts (accepted) 11,253 0 0

For the erection of All Souls' Church, Kensington Park, Kensington, exclusive of fittings and upper part of tower. Messrs. James & J. S. Edmeston, architects:—
Cowland (accepted) £1,300 0 0

For additions and alterations to The Poplars, Seven Sisters-road, for Mr. H. H. Wettenhall. Mr. James Edmeston, architect:—

Taylor £213 0 0
Smith 787 30 0
Vivian 725 0 0
Green (accepted) 695 0 0

For sewers, in the Netherwood and Westwick Roads, West Kensington Estate, for Mrs. Dawson. Mr. James Edmeston, architect:—

Cosh £2,129 0 0
Chamberlain 1,922 0 0
Kilby 1,922 0 0
Williams 1,900 0 0
Johnson 1,840 0 0
Kowland (accepted) 1,740 0 0
Gardner 1,680 0 0

For invalid kitchen, Sandy's-row, Spitalfields. Mr. T. Chamberlain, architect. Quantities supplied by Mr. S. B. Wilson:—

Ashby & Son £1,627 0 0
Fritchard 1,464 0 0
Brass 1,426 0 0
Newman & Mann 1,416 0 0
Hill, Keddell, & Waldram 1,400 0 0
Axford 1,394 0 0

* Accepted.

For public baths, Brighton. Mr. P. C. Lockwood, borough surveyor. Quantities supplied by Mr. Lansdown:—

Lockyer £1,060 0 0
Nightingale 943 0 0
Richardson 942 0 0
Cheeman 940 0 0
Blackmore 920 0 0

For Engineer's Work.

Woollett 850 0 0
Mills & Wellman 785 0 0
Bunby 724 0 0
Whitmore & Bunyon 722 0 0
Jennings 721 0 0
Jenkes & Co. (accepted) 657 0 0
Reed 675 0 0

For Kenwood Tower, Highgate, for Mr. E. Brooke. Messrs. Salomons & Jones, architects. The foundations put in by Messrs. Sharpington & Cole. Quantities by Mr. Bagg:—

Bird £11,191 0 0
Lawrence & Sons 1,330 0 0
Fish 11,100 0 0
Sharpington & Cole 10,777 0 0
Manley & Rogers 10,711 0 0
Dave Brothers 10,675 0 0
Myers & Sons 10,652 0 0
Jackson & Shaw (accepted) 10,167 0 0

For Holborn Valley improvements, Contract L. New street, from Shoe-lane to Farringdon-street. Mr. D. C. Nicholson:—

Hill, Keddell, & Waldram £16,115 0 0

* Accepted.

For vaults and roads, Newgate Market. Mr. Horace Jones, architect:—

Reddin £2,859 0 0
Coker 2,830 0 0
Hart 2,800 0 0
Crabb 2,350 0 0
Pearson 2,275 0 0
Marshall 2,250 0 0
Kilby 2,180 0 0
Henshaw 2,183 0 0
Maxwell 2,160 0 0
Cockrill 2,150 0 0
Booth 2,120 0 0
Newman & Co. 2,075 0 0
Hill, Keddell, & Waldram 2,048 0 0
Wier 1,968 0 0
Rich, Bangs, & Co. 1,890 0 0
Mowlem & Co. 1,868 0 0
Ladd 1,867 0 0
Bloomfield 1,870 0 0
Goodair 1,853 0 0
Wigmore 1,788 0 0

For the construction of roads and sewers, on the Woodbury Park Estate, Tunbridge-wells. Mr. W. Bruntall, surveyor. Quantities supplied:—

Kingham £4,776 15 8
Blackmore 4,471 17 9
Cole 4,287 2 6
Potter 4,148 11 2
Clarke 4,120 7 7
Cler 3,853 6 10
Woodcock 3,828 19 4
Thompson 3,781 4 4
Naylor, Brothers 3,758 3 10
Vickers & Crane 3,468 0 7
Lund 3,028 8 11
Young 2,909 0 0
Symonds 2,888 7 8
Messrs. Haynes 2,816 16 1

For public assembly-rooms, at Baldersea, Kent. Mr. A. H. Fife, architect. Quantities supplied:—

Niblett £2,400 0 0
Kilby 1,929 0 0
Pankett & Taylor 1,758 0 0
Knight 1,758 0 0
Cowland 1,780 0 0
Gambell 1,778 0 0
Hicks 1,729 0 0
Nightingale 1,717 0 0
Vicary 1,675 0 0
Boht 1,660 0 0
Blackmore & Morley 1,650 0 0
Willis 1,630 0 0
Carter & Son 1,670 0 0
Harrison & Edwards 1,620 0 0
Johns 1,397 0 0

For six terraced houses, at the Hove, Brighton. Mr. Crawford, architect. No quantities:—

Nightingale £9,150 0 0
Bayer 8,885 0 0
Baker 8,808 0 0
Symonds & Taylor 8,120 0 0
Blackmore 6,855 0 0

For alterations and additions to the Phoenix Hotel, Princess-street, Cavendish-square, for Mr. Grey. Mr. Alfred Wright, architect:—

Alterations. New counter.
Watson, Brothers £280 10 0 £128 0 0
Hyde 271 0 0 118 0 0
J. Saunders 223 10 0 75 0 0
P. Saunders 197 0 0 71 0 0
Poole 176 0 0 107 0 0
Smith 168 6 0 (including counter).

TO CORRESPONDENTS.

J. V.—R. W. A.—C. P.—W.—P.—W. H. C.—R. M.—C. C. H.—B. A. L.—W. H. G.—L. & H.—A. W.—C. F. H.—M. P.—T. L. D.—J. P. T.—J. W. G.—J. T. H.—C. J. C. W.—G.—M. R.—O. L. W. G.—T. H.—B. E. G.—T. R.—T. H.—C. J. C. W.—G.—M. R.—O. L. W. G.—F. M.—P. B.—J. N.—W. G. B.—A. W.—W. R. H.

Insertion.—In the notice of Clarendon Place Station, for "Tilbury Station," should be "Tilbury Station."

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Notes.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

ADVERTISEMENTS.

RICHMOND, SURREY.—Stock and Implements in Trade of a

Messrs. Brewer & Son are instructed

by Mr. James L. L. (who, in consequence of ill-health, has disposed of his business) to sell by auction, with out reserve, on TUESDAY, the 7th of MAY, 1870, at TWELVE O'CLOCK precisely, in consequence of the nature of the business, the valuable STOCK in TRADE, comprising a large quantity of dry deals, and cut ash, four panels and other doors, mahogany and elm, an excellent assortment of moulds to measure, iron, register and other stoves, stone in blocks and slabs, marble and other chimney pieces, bricks, slates, tiles, and drain-pipes, white lead, linseed oil, and a large quantity of a quality of paint, putty, and other materials, also a large quantity of iron, including mangle, mangle, and other tools, contractors' office, and various implements and effects—may be viewed the day preceding the sale, and on the day of the sale, at the premises, and at the Auctioneers, 2, Upper Hill-street, Richmond.

Auction Sale of about a Million and a Quarter of Bricks—Hampshire Brickfield, Downton, Middlesex.—Important to Brick Merchants, Contractors, Builders, Speculators, and Others.

MR. WOODS has been favoured with instructions from the proprietor to sell by auction, on THURSDAY, MAY 13th, 1870, on the FIELD, a quarter of a mile from the Hay's End on St. Albans Road, a large quantity of good bricks, and other bricks, and a large quantity of sand and gravel, and various implements and effects—may be viewed the day preceding the sale, and on the day of the sale, at the premises, and at the Auctioneers, 2, Upper Hill-street, Richmond.

TO SURVEYORS, BUILDERS, AND OTHERS.

WANTED, by a thoroughly efficient and practical ASSISTANT, an ENGAGEMENT. Well up in taking out and preparing quantities, measuring and estimating various rates and quantities, and building accounts generally; and a good draughtsman.—Address, SURVEYOR, 21, Everett street, Russell-square.

WANTED, by an experienced Machinist, a SITUATION in WORK BUILDING MACHINES. Can make cutters and sharpen circular saws if required.—Address, A. B. 7, Duke-street, Westchester-road.

TO BUILDERS AND CONTRACTORS.

WANTED, an ENGAGEMENT, as CLERK of WORKS, GENERAL FOREMAN, or to take Charge of a Job. No objection to country. A Carpenter and Joiner by trade.—Address, J. D. 47, Addison-road North, Notting-hill, W.

TO BUILDERS, &c.

WANTED, a SITUATION, as BUILDER'S CLERK, in the country, or General Foreman on an estate. Carpenter and Joiner. Aged 35. Good references.—Address, R. 23, St. Thomas-road, Finsbury Park, Holloway.

WANTED, to ARTICLE, a well-educated YOUTH, in a good Mechanical Trade or Business. A moderate premium will be paid.—Apply, with all particulars, to Messrs. W. FIDEL & SONS, 129, Edgware-road, W.

TO MASTER PLUMBERS, &c.

WANTED, a JOB, by a good PLUMBER, or THREE-BRANCH HAND. Aged 43. No objection to the country. Good references if required.—Address, PLUMBER, 12, Upper Clifton street, Portland-place, W.

TO BUILDERS, BRICKLAYERS, AND GASFITTERS.

WANTED, by a Young Man, a SITUATION in the above. Well used to hot-water pipes.—Address, R. 8, 24, Praed-street, Paddington, W.

TO BUILDERS.

WANTED, by the Advertiser, a RE-ENGAGEMENT in a Builder's Office, as MEASURE, BOLDING, and PRINTER'S CLERK. Two years' experience. Terms moderate.—Address, H. B. 31, Spencer-road, Junction-road, N.W.

TO BUILDERS.

WANTED, a RE-ENGAGEMENT, as SHOP or OUT-DOOR FURMAN. Nine years' experience from last employment.—Address, 62, Office of "The Builder."

WANTED, a SITUATION in an IRON MERCHANT'S OFFICE in London, by a Young Man, with six years' experience. Apply to A. B. 17, Richmond-place, Russell-road, Holloway, N.

WANTED, a SITUATION, by an experienced Man in Stone, Brick, Masonry, Building, Statues, Basins, Fountains, and the general work of a building, in Carving and Plaster, or to take the Work by the Piece. Can take charge of a Shop or Job as Working Foreman.—Address, SMITHLEY, 5, Hand-over-square, Kensington Park.

WANTED, by a respectable Married Man, a permanent SITUATION as PAPERHANGER and DECORATOR, and will do up his time as painting if required. Town or country.—Address, A. B. 2, Southdown-street, Brighton-square, W.

WANTED, by a Young Man, who has had three years' experience in writing in one of our largest Brewery firms in Town, is in WANT of EMPLOYMENT. Terms moderate.—Address, J. R. 120, London-road, N.E.

TO PLUMBERS AND BUILDERS.

WANTED, by a good PLUMBER and GASFITTER, a constant SITUATION. Understands all kinds of iron pipe, bath, and well work, and would not object to all up time in slueworking or painting. If for a constant job, Town or country.—Address, R. F. 15, Stafford-street, High street, Peckham, Surrey.

TO ARCHITECTS AND BUILDERS.

WANTED, a RE-ENGAGEMENT, as CLERK of WORKS or GENERAL FOREMAN. Excellent references given.—Address, ALFHA, 3, Seymour-place, Bryanston-square, W.

TO DECORATORS AND BUILDERS.

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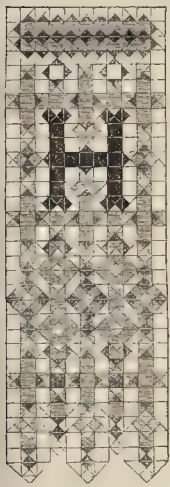
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The Builder.

VOL. XXVIII.—No. 1423.

The New Buildings for the University of London.



ER Majesty the Queen having opened the new building erected for the New University of London, this is a fitting time for saying a word as to the general merits and success of this important architectural work, of which we some time since published an elevation and plan, besides, more recently, giving a description of the illustrative sculpture which adorns it. And here let us say at once that, whatever opinions may have been passed on it by the spectators and casual critics who have noticed the building from time

to time, one thing is certain, that the real merits of the design as a whole are very much obscured by its position, so close to a comparatively narrow street, and opposite to the end of another (Old Burlington-street), which is not on its centre axis. Many designs of the modern school, which depend for their effect on a picturesque multiplicity and even confusion of parts, and which eschew uniformity, may produce almost as good an effect in a confined street site as on a more extended one, depending as they do on parts and not on the whole design for their effect. With a building so essentially Classical in type as the London University, and so completely regular and symmetrical in design, the case is quite different; it requires to be viewed as a whole, and to be so placed that its centre and principal feature may be symmetrically disposed with regard to other buildings or principal objects of whatever kind adjoining it. In this respect, there can be no doubt that Mr. Pennethorne's new building is most disadvantageously placed for the exhibition of the design, there being, in fact, no point of sight whence the whole can be well seen at once; while Old Burlington-street gives a view, for its whole length, of one of the sides only of the centre portion of the building, deprived of its adjacent parts, and appearing in unmeaning divorce from the rest. It may be said that the architect should have designed his building for the site and for the view and aspect which it was to enjoy; but although this is undoubtedly correct as a general principle, it would scarcely have been reasonable in the present instance to expect the architect to have modified his whole design in regard to the position of a very inferior class of buildings opposite, or to have provided for a vista down a street which, whatever its former importance, is not safe from the changes which are now so continually taking place, and may for a long time take place, in the line and position of streets and street property in the centre parts of London.

In plan the University building has the great merit of simplicity and symmetry, and will not

be one of those too numerous public institutions on entering which the visitor is puzzled as to which way to go, and where to discover what he wants. After crossing the vestibule, we find ourselves in a central hall, with the principal staircase immediately before us, while on each hand open two wide corridors leading to the library on the right and the theatre on the left; smaller rooms for other purposes opening from these. These corridors are sufficiently lighted from skylights at each end, and from the light which is obtained from the large lantern over the central staircase which adjoins. The large library is also, as we understand it, to be the public examination-room, and adjoining it are two smaller examination-rooms, which, as well as the Professor's rooms, are reached by a transverse corridor crossing the end of the longitudinal one. A similar transverse corridor at the west end of the main one gives access to the two entrances for spectators into the auditorium and gallery of the theatre, and at the end to another examination-room, from which a flight of stairs descends, giving access to the dais or platform of the theatre; so that this room can be used as an ante-room for those who are to occupy the platform at the prize deliveries or on other important occasions. Whether it is quite desirable to have no separate access to the platform except through this room must depend very much on the working of the institution and the special uses to which the theatre and the room adjoining it are put. The centre staircase is wide and spacious, with a heavy coloured marble balustrade and balusters of white marble of somewhat thin and meagre design. The planning of the balustrade on the first floor landing, where it is turned away from the head of each flight of steps in a quarter-circle, is a good idea, giving a look of spaciousness to the upper landing, and might be well adopted, on practical grounds, in some places where there is more likely to be a crowd on the stairs occasionally than seems probable in this case. The stairs are carried on a constructed arch forming a good feature. On the first landing of the principal stairs is a niche and pedestal, opposite the lower flight, for the present occupied by a plaster cast of the Westminster Abbey statue of Shakespeare, but eventually to be filled, it is understood, with a marble statue of the poet. On each side of the niche are doors leading to reading-rooms, in what would be in the front a mezzanine; but the back elevation, which can only be seen from the roof of the Royal Academy, is innocent of orders or mezzanines, and quite independent of the front design. These reading-rooms are over the Professor's rooms, which are reached, as we said, by the western transverse passage. On the first floor, and occupying the centre of the front portion of the building over the vestibule, is the senate-room, 45 ft. by 38 ft., and nearly 30 ft. in height; adjoining this are less lofty committee-rooms. The east and west wings are occupied in this floor mainly by the upper portions of the theatre and library. We must mention that the theatre is a very handsome apartment, and will accommodate on the floor and in the gallery 900 persons. If we may judge from a passing trial, it is successful in point of acoustics. Statues of four of the Muses ornament the lecturer's side of the theatre. The rooms for servants and officials living on the premises are reached by a distinct and separate staircase at the back, running from the basement to the attic story, as much as possible shut off from the other portions of the building. A similar staircase is appropriated solely for access to the anatomical dissecting-room and laboratory, which are over the western smaller examination-rooms, and lighted from the roof. The laboratory, or chemical room, is fitted up with great completeness, each student having presses, basin, and water to his hand. The pipes from the basin are of earthenware, to resist the action

of chemicals. A "stink closet," in various divisions, is provided for dealing with offensive fumes; and there is a large air-shaft over the top of the room, controllable with dampers, to meet different requirements. From the back staircases access is gained to washing places, urinals, and other conveniences; the accommodation in this respect appearing to us to be rather under than over the mark.

And now to speak of the building as a work of architecture, independently, to some extent, of practical considerations. We must admit that much of the detail is of what is now called and considered "old-fashioned;" that is to say, it is not the style which is in vogue just now, and does not show sufficient individuality and originality of treatment to compel admiration in spite of fashion, although far more thoughtful and artistic than much of the Gothic architecture of the present day. The style is Roman, with

"Perhaps some modern touches here and there;"

which, however, would not in themselves be sufficient to

"Redeem it from the charge of nothingness,"

were it not for the originality and breadth of treatment shown in the general design. The reader will understand our remarks better if he refer to our illustration of the elevation. The treatment of the wings, which each contain an apartment necessarily lighted mainly from the roof, is very good and original, and furnishes a suggestion for the treatment of wall space when we are so compelled to dispense with windows. The heavy rusticated basement here gives the idea of security and stability, while contrasting well with the more ornate centre of the building, and the portion above the first string-course or cornice is broken up by coupled columns and niches for statuary, which here supply the expression and life to the wall which otherwise is obtained from windows. These statues, and the sitting statues on the centre porch, have been before described and catalogued in our columns. The centre front is perhaps scarcely so happy in treatment as the sides. The lower portion is occupied by the projected portico just mentioned, with heavy square piers and circular arcade, having in the main a very satisfactory appearance. But the odd little "altars" (for such they look) which rise above the cornice of the portico at each outer angle, and form the finish to the massive angle piers, are not a successful feature; and it is just here that we would have liked to see sculpture: had these erections, made perhaps a trifle larger, culminated in a good group of sculpture, there would have been some reason for them, and the sculpture would have had more point and effect there than distributed in detached figures along the cornice of the portico. The only valid explanation that can be given for these features, is that they are intended as a kind of repetition or echo of the clock-tower of a somewhat similar square form which occupies each extremity of the centre above. One of these towers, which each have a dial of the same size, is intended for an anemometer, the other (the eastern one) for a clock; and it is this latter, with its round white expanse of clock face, which shows so curiously to the spectator walking down Old Burlington-street, with a high building on one side of it, and a low one (the east wing) on the other. The front above the portico shows the single three-quarter engaged columns with entablature breaking round the head of each, and a statue carrying up the line above, which we know so well in this style of design, and which has the disadvantage, especially when seen in perspective, of cutting up the front of a building into series of vertical strips.

Internally, the most important feature architecturally is the principal staircase light, which consists of coupled circular-headed windows below the cornice, with a shaft as a centre mullion, divided by a group of shafts on brackets,

from which spring the ribs of the coved vault which forms the base to the skylight. These shafts and windows have a slightly Romanesque touch about them, and are less purely Classic in feature than anything else in the building. The first-floor landing, or gallery, is laid with a simple, but effective, design in marble for the flooring, exceedingly well executed. Beyond this there is not much to notice artistically in the interior. The pilasters carrying soffits and arches in the ground-floor corridors are of a good type; but there is a somewhat commonplace plaster flower introduced on the pilaster and along the cornice above the astragal, which had better be knocked off at once: it could easily be done, and the plaster made good again. We noticed with pleasure a very good and simple design of wooden bracket in the library, for carrying the landing to the upper book-cases; and saw with reverse feelings, at the east end of the principal corridor, three sham wooden pedestals, of 4-in. stuff, in its naked state, waiting for the painter to throw a veil of decency over it. Why do architects allow this sort of thing? If they cannot afford a stone pedestal in a niche, let the wooden one look like a wooden one, and be treated accordingly, instead of putting up a wretched handbox, to be painted "stone colour." The designs for the iron entrance-doors, and the gates and iron balustrades of the portico, are open to the objection that they are too realistic and too elaborate in that kind of surface-work which can never be well represented in cast iron. "Carving" and "casting" are two very different things, and the one should never simulate the other, as is done with regard to the latter, at least, in ninety-nine cases out of a hundred.

In respect to these matters of truthfulness in construction, and in the use of material, a good deal is owing to the recent study of Gothic work, and it is in such things that architects like Mr. Pennefather, whose education no doubt taught him to tolerate many things in this way which the present rising generation of architectural students are taught religiously to eschew, might take hints. But how many of the new school would have given us a building so simple and sensible in plan, and with so much of dignified repose in general design and outline, as this? We have stated pretty freely our opinion as to the defects of this building, partly because it has been somewhat ignorantly praised in certain quarters; and we may further say, *en passant*, that the introduction of the red Mansfield stone for columns and in other places, which has been much lauded as an attempt at polychromatic effect, is wanting in effect even now, and a few years of smoke and weather must obliterate all trace of it, save what difference of texture may afford on a close inspection. But with all minor defects, we believe we may congratulate Mr. Pennefather on having erected a building which no dispassionate architectural observer will pass without noticing it as evidently the work of a thoughtful and refined architect, and showing no small originality without a shade of grotesque or out-of-effect. As it now stands, the building will never really have fair play; and the interior wants very much the colouring which we understand is sooner or later to be applied to it; ceilings consisting of white plaster panelling are not attractive to the eye; nor can we help regretting that in a building of this magnitude and importance, some steps were not taken towards a more purely architectural treatment, at least of corridors and, perhaps, of one or two principal rooms, by the use of brick and tile lining, instead of that eternal plaster. But with regard to the exterior it may confidently be said that, with a better position, leaving a clear space of 50 yards or so in front of it, the whole composition would come out as one of great dignity, with, perhaps, a little too much of squareness of form, but expressing in an exceptionally successful manner the nature of the purpose for which it has been erected.

We should mention that Messrs. Jackson & Shaw are the general contractors for the work, which has been carried out under the superintendence of Mr. Warburton, as clerk of the works. The walls throughout the interior are rendered with Martin's cement.

Our remarks as to external design have had no reference to the back portion of the building, which, as we said, is not seen by ordinary passers-by, but might as well have been in something the same style as the rest, instead of in a variety of Italian Gothic with pointed windows. This curious, hermaphrodite character, it should be explained, arises from the fact

that the building was originally designed in a different style, and a portion of it thus erected was retained to form the rear of the present structure.

ARCHITECTS AND THE GOVERNMENT.

Few meetings of members of the Institute of Architects have been seen so numerous, unanimous, and determined as was that which was held on Monday evening last, to consider:—

"Whether any and what steps should be taken by the Institute in reference to the subject of a recent correspondence (printed by order of the House of Commons, April 4th, 1870), between Mr. E. M. Barry, R.A., and the First Commissioner of Works, respecting Mr. Barry's duties as architect of the New Palace of Westminster, and in reference to certain communications on the same subject received by the Council from Architectural Societies in Scotland, Ireland, and the provinces."

The new president, Mr. T. H. Wyatt, took the chair for the first time, and letters were read from Mr. Sidney Smirke, R.A., and other leading members of the profession unable to attend, expressing strong opinions on the subject, and offering subscriptions to defend the right of the profession to retain their drawings. The resolution of the council, passed on the 14th of March last, in which "the council express their most decided opinion that the rule and custom of the profession is, that all the drawings and papers of an architect prepared for the purpose of erecting a building are, and remain, the sole property of the architect," was confirmed by the meeting.

Letters were read from various Architectural Societies, in further confirmation of the opinion conveyed in the above resolution, and in support of Mr. E. M. Barry's right of ownership to the drawings and documents prepared for the erection of the Houses of Parliament, viz.: From the Royal Institute of Architects of Ireland, the Glasgow Architectural Society, the Liverpool Architectural Society, the Manchester Society of Architects, and the Birmingham Society of Architects, which have already appeared in our columns, or are printed in the present number. The two subjects, namely, the treatment received by Mr. Barry, and the right of architects to retain their drawings, were then discussed with great fullness, and the following resolutions were passed unanimously:—

1st. That it is fitting and indeed necessary for the worthy maintenance of national monuments and buildings, that they should be always under the superintendence of professional men of independent position and high standing, who have been specially educated as architects.

2nd. That the custom of the profession has uniformly been, that the ownership of drawings and other documents, prepared for the execution of buildings, has rested with the architects employed.

3rd. That a copy of the above resolution be forwarded to all the members of both Houses of Parliament, and that the widest possible publicity be given to the same.

4th. That a committee be appointed, to consist of the president, vice-president, the council, and such other members of the Royal Institute of British Architects as the council may deem fit, and that this committee be authorised and requested on the part of the said Institute to support and to urge upon Her Majesty's Government either at interviews, by correspondence, or otherwise, the views expressed in the previous resolutions; with the power to convene future special general meetings for further consideration of the subject whenever they may see fit.

5th. That a vote of cordial sympathy with Mr. E. M. Barry be communicated to that gentleman.

6th. That he be encouraged by the expression of such sympathy to resist to the utmost the unprecedented demand made upon him; and that, in the event of expenses being incurred with reference thereto, in trying at law any questions which may arise between himself and the First Commissioner, this meeting pledges itself to promote the raising a guarantee fund for the same."

It was afterwards resolved that the Prime Minister should be requested to receive a deputation from the Institute on the subject of Mr. E. M. Barry's case.

In the course of the discussion a large amount of evidence was given, proving the custom of the profession as to the retention of drawings. The following gentlemen took part in the proceedings,—the President; Sir William Tite, M.P.; Sir Digby Wyatt; Messrs. Aitchison, A. Allison, H. Austin, Chas. Barry, Boulton, Professor Donaldson, Edis, B. Ferrey, Fogarty, Geo. Godwin, O. Hansard, C. F. Hayward, Jennings, Horace Jones, Professor Kerr, F. Marrable, Newton, Penrose, E. Roberts, Seddon, and others.

We have read with regret, amounting, indeed, to sorrow, the leading article on this subject in the *Times* of Thursday, an article founded on want of precise knowledge, and inspired, it would almost seem, by a desire to disparage and degrade an important and laborious profession entitled to look for other treatment at the hands of the *Times*. When the writer, comparing the Institute with a body just now suspected of

having attempted to commit murder, says "the United Brickmakers demand that brickmaking shall never be made any cheaper; the Associated Architects maintain that an architect always had, and always ought to have, the privilege of getting paid for goods without delivering them," he says what is not correct. An architect is not paid for his drawings; he is paid for the production of a building; and whether he do this by means of drawings or without them does not concern the client in the least. Feeling probably the weakness of the position, the writer rests his argument on the necessity of possessing drawings showing the lines and drains,—drawings which Mr. Barry has never refused to give. We are unable to pursue the matter further at the moment of going to press, and can only add that Mr. Gladstone has consented to receive a deputation this Friday morning, who will, at any rate, be able to show to him the unanimous feeling of the profession against the course which has been pursued with respect to the architect of the Houses of Parliament.

THE COMMISSIONER OF WORKS AND MR. E. M. BARRY.

INSTITUTE OF THE ARCHITECTS OF IRELAND.

A SPECIAL Council Meeting of the Royal Institute of the Architects of Ireland has been held, to take into consideration the demand made by the Chief Commissioner of Works for delivery of plans. A statement was addressed to the council of the Royal Institute of British Architects, expressing strong sympathy and interest in Mr. Barry's case by the members of the profession in Ireland, and the anxiety of the Irish Institute to co-operate with their English brethren in resistance to this or any other encroachment on the uniformity of practice heretofore by well-established custom existing in the profession on both sides of the Channel. It was further stated that the rule of the Irish Institute was identical in expression with that of the rule of the Royal Institute of British Architects issued in 1862, having been adopted in 1863 as *property and correctly stating the practice and usage of the profession as heretofore existing in Ireland*.

It was further said that claims by clients for the delivery of plans had rarely been made on members of the Institute, and that in a few cases where such claims had been set up, backed by the institution of legal proceedings, such claims had, under the advice of eminent counsel, been resisted, and no further attempt made to prosecute them.

It is satisfactory to learn that a thorough uniformity of practice prevails among architects both in England, Scotland, and Ireland; and it would be desirable that before any re-issue of the scale of charges and statement of practice, a conference should be organised.

THE GLASGOW SOCIETY.

The Hon. Secretary of the Glasgow Architectural Society sends us the following extract from the minutes of a meeting of that society recently held:—

"It was resolved to write to the Royal Institute of British Architects, stating that it had been the invariable practice in this district to regard drawings as the property of the architect, and that this principle is always adhered to in Glasgow."

"WHO SHOULD KEEP THE DRAWINGS?"

It is manifestly a fortunate though fortuitous circumstance that the unfortunate controversy, whether architect or employer should retain the drawings of executed edifices, has arisen on a public instead of on a private matter. Abstract right is one thing, but the law of this realm is another thing. About such law touching the drawings there appears to be but little doubt. The custom of architects retaining drawings has been practically recognised by clients for centuries. Established custom is law. If it were not, English courts would soon be in hopeless confusion. They are governed by statute, or written, and by common, or unwritten, that is, customary law; and the latter is as binding as the former. Mr. Ayrton's claim thus roots up common or customary law, and shatters the foundation of property. If endorsed, what is to become of "customary freeholds," the customs of manors, &c. &c. But it is needless to expand.

With regard to statute law, some of the Acts of Limitations or Prescription may possibly apply to the period when Sir Charles Barry pre-

pared many of his designs; but we have chiefly to deal with common or customary law. It is yet to be seen whether we have in the present First Commissioner of Public Buildings not merely a sound lawyer by profession, but a liberal and enlightened statesman, capable of appreciating, as it was appreciated even two thousand years ago, the importance of the fine arts in conducing to the civilisation of the people. For such is the point involved,—the just, respectful, and generous treatment of distinguished artists, in order to foster useful, true, and great artistic efforts. The public should understand that this requirement of the drawings is not merely a question of economy, for ninety-nine out of a hundred are useless in that direction, and Mr. Barry offers copies of all that may be essential; but it is one of justice,—whether, after an architect has erected an edifice, he must, contrary to all usage, forfeit his means and appliances. A lawyer prepares a deed, a surgeon performs an operation, a sculptor produces a statue,—and retain their draughts, instruments, or models; plainly because they are not *the* thing done, but only ways and means, appliances, expedients, steps and measures *subservient* to the required result. On analogous principles, an architect keeps his drawings of executed works; and he will probably ere long have even more than their possession, namely, copyright in them.

EDWARD L. TARBUCK.

TREATMENT OF ARCHITECTS.

Str,—I have no doubt you will be sorry to learn that Mr. Ayrton, First Commissioner of the Board of Works, is about to commit another great mistake. He is about to appoint a clerk of works, as architect and surveyor, to the county courts, at a salary of from £600 to £700 per annum. What can the magistrates of the profession be thinking of that they do not institute a Parliamentary inquiry into the abuses at the Board of Works. Surely every architect is concerned in desiring that our public buildings should be entrusted to competent persons who possess more than a smattering of architecture, so that we may no longer be "a by-word among nations." Is there no one amongst the many professional assistants in the Board of Works better qualified than a clerk of works to design architectural works? or is it a fact (which so many aver), that the possession of talent is a bar to promotion in the Civil Service? I am inclined to think that such is the case, as the grossest injustice has been meted out of late to the learned in architecture at the Board of Works, as, for instance, the removal of Mr. Layard and Mr. Ferguson, while Mr. Pennington, a veteran in the profession, and Mr. Edward Barry have been superseded by Mr. Taylor (sometime since a carpenter in the employment of Mr. George Smith the contractor), whose claim to rank as an architect he has yet to prove. We may now expect to realise the dream of many a tyro,—a new style of architecture.

A LOVER OF ARCHITECTURE.

P.S. I have just ascertained that the clerks of works belonging to the Board of Works were examined on the 3rd and 4th inst. by the Civil Service Commissioners, on their knowledge of building materials, construction, and taking out quantities: their knowledge of design and architecture, being considered to be of no consequence, was taken for granted.

THE DECORATIVE ART OF JAPAN.

The glances which we have been enabled to take, from time to time, at the state of art-education in this country, as well as on the Continent of Europe, have led to the conviction that, however we may regret the want of due encouragement of the highest forms of art amongst ourselves, we are actually providing a school of decorative and industrial art which has produced much, and which promises more. Leaving aside, therefore, for the moment, the consideration of the great master-principle of the unity of art, and looking at the practical question how best to stimulate the exertions, and to improve the results, of our actual schools, within the limits to which they are at present restricted, it becomes a matter highly important to the national welfare to inquire in what localities, and to what masters, we are to look for instructive and improving examples of decorative art. We do not doubt that those whose opportunities of study have been such as to acquaint them with the subject, will at once anticipate that we are about to speak of Japan.

It is, indeed, to Greece, in the age of Phidias, that we invariably turn for the noblest examples of the highest forms of art. That this excellence was not confined to plastic art alone, we have the unique, but unquestionable, witness of the "Museum of Cortona," a Greek painting, discovered, comparatively lately, in Italy. In the decoration of the vases of Greece and of Magna Grecia, the historic development of which we may, to a very great extent, trace in the noble collection exhibited in the British Museum, we see rather the exuberance of the art-instinct, as displayed in the work of the potter, than the re-

sults of the demand of luxurious taste for sensuous ornamentation. Among the few ancient bronzes in the Italian museums are to be found the *chefs d'œuvre* of all human art. Coins of rare beauty attest the unrivalled excellence of the Greek die-sinkers; and *entaglio*, and even *cameo* gems, such, for example, as those signed by Pyrgoteles, are the masterpieces of an art all but extinct mystery of the meaning of relief.

The art of Greece is of that nature of which it is said, with truth, *nascebatur, non fit*. While the artist who attempts that which is most noble will ever seek inspiration and instruction from the oracle of genius, any endeavour to reproduce classic forms in their purity, in the present century, is likely to result, as it generally has resulted, in failure. We may spell a certain number of words with a K instead of with a C, without imbibing, by that or by any similar methods, any portion of classic inspiration. The style of the school of David, essentially artificial as it was, is fading from the French academies; in spite of the political reasons which dispose so large a portion of an impulsive nation, toward an imitation of all that was republican in antiquity. The effect of an exclusive study of classic forms,—of the second-hand study of nature,—in starving the mind, and in impoverishing the hand, is illustrated in a remarkable manner by the works of Flaxman. No artist in modern times had a purer taste, as far as taste could be formed by the love and study of the antique. His power of bold, striking, truthful drawing is evinced by his Italian note-book, full of masterly and admirable sketches of Italian art. Unfortunately, it was the dry bones of the past alone, that this artist found in Italy. He wandered through districts in which, even at this moment, female beauty may be almost called divine, without sketching, so far as his book is evidence, a single exalting model of nymph, or goddess, or virgin. Every scrap of Roman sculpture,—poor, ill-drawn, and harsh as these relics often are,—had a greater charm for his eye than the lithe forms of the women of Sessa, or the almond eyes of the girls of Lecce or of Brindisi. The natural, necessary result of this indifference to the mundane source of the Greek ideal, is to be seen in most of Flaxman's designs. Of the large number of sketches recently displayed in the Loan Collection at the South Kensington Museum, there was hardly one which an artist acquainted with living Italy (if she can be said to live), would care to copy, or even to possess, except as an autograph.

Admitting, as we must do, that the tone and temper of the day are not such as to allow us to expect the very proximate introduction, into this country, of the class of art-education which is attempted by more than one Continental government, it is evident that, in order to make the best of the education actually given, we must not hold too closely to Grecian models. As a mode of instructing both eye and hand in precision of form, and, to a certain extent, as a mode of forming and purifying the taste, the wiser method of copying, alternately, from the antique and from life, which has been introduced into our schools of art, is admirable. In this particular (and probably in this alone) Continental schools may take a lesson from our own; but so long as our national education is directed to the formation, rather of the art-workman than of the artist proper, we ought to look eastward of Greece for the source of his inspiration.

The tendency of the human mind, especially during the time when knowledge is but in the course of acquisition, to mistake a principle for the principle, is normal and constant; this evidence of partial and imperfect education is constantly out-cropping in art. It is the origin of most so-called "schools." It erects into distinct academies those minor divisions which ought to be only "forms" in one great, harmonious university of art. It speaks of the conventional, the realistic, and the ideal, as if any true art could exist which did not combine the three. But it is not falling into this vulgar error to insist that the conventional element must preside over the department of decorative art. That point admitted, it follows that examples, invaluable for the use of our industrial schools, may be furnished by the artists of Persia, of China, and of Japan.

It is in the art-works of these countries that we find at once the most perfect treatment of colour, as to harmonious blending, and the production of the effect of richness without gaudy vulgarity; and the most adroit management of geometric or arbitrary form in contrast to the flow and freedom of natural outline.

Japan may be regarded as the locality in which the most valuable discoveries in living art are now to be sought. Its civilisation, as peculiar as that of China itself, differs from that of the flowery land, not only in its artistic, but in its historic, characteristics. The most valuable productions of the special craft which takes its name from China, date from the age of the Crusades. The most rare and precious of the various species of Chinese porcelain, fragments of which are now treasured and worn as gems, the *snare crackle*, was fabricated under a dynasty which ascended the throne more than a century before the Norman Conquest. The most delicate egg-shell china, thin as bamboo paper, was produced early in the sixteenth century. The rage for cheap production, extending from our shores to the antipodes, has had the same fatal effect on the porcelain of China, that it has had on the iron of England. Modern productions, apparently of "hard paste," are made to sell, and not to endure; and a collection of valuable porcelain is now as rarely to be met with in China as a chest of good tea—of which herb all but the cheaper qualities have fallen into absolute neglect, in those districts which supply the English market.

But in Japan, so far as our limited acquaintance with that unique country extends, no signs are to be traced of decadence in art. Europe is only beginning to awaken to the vigorous life and the remarkable originality of the Japanese artists. It is true that we have long been acquainted with specimens of their rare cunning. The name of Japan, most inappropriately bestowed on the grim black paint, or the shining, splotchy, brown varnish, with which we decorate those iron boxes which are the pride of the legal profession, has been long cited as descriptive of that peculiar lacquer, of which we know little, save of two inferior kinds, the black and the red. Of the ten distinct orders of this peculiar manufacture, ranging as they do, from the gold lacquer, bright in all colours from that of fire to that of the rose itself, through the hues of aventurine and of tortoise-shell, to that vermilion paste (formed of fibres of urticaceous plants, bamboo paper, calcined snail-shells, and oil of camellias), which can be carved and chased like wood, little more than the names are known. Few of us are aware that not only wood, but china and metal, are encoated with the precious lacquer of the Japanese. Here and there an amateur has picked up one of those rare little cups, Chinese, it may be, or Japanese, in its porcelain lining, the outside of which has been covered by the patient toil of the latter race with a web of wicker, delicate as lace, and firm as if it were a portion of the earthen fabric itself.

The descriptions of produce which are known to be wrought, with unrivalled excellence, in Japan, include so large a range in industrial art as to suggest how wide a field, and that by no means unoccupied, must lie between. In variety, and in excellence of adaptation for widely different purposes, there are no *papiers* like those of Japan. No European silversmith, bronzist, or other worker in metal can emulate, or can altogether comprehend, the wonderful chasing, inlaying, tinting, and inexplicable transforming of metallic substances, effected by the Japanese metal-workers. Japanese porcelain has a style of its own. Wicker-work and bamboo-work of all kinds are employed, from the walls and roofs of the houses to the outside of the tea-cups. Of lacquer we have spoken. No country of Europe possesses so many specimens of Japanese work as does Great Britain. Her Majesty the Queen has given and has lent, to the South Kensington Museum, valuable specimens of China and of other industrial productions, including most curious grotesque groups in ivory. Up to the close of 1867 the Museum had acquired 183 specimens of Japanese art, of which forty were carvings in hard wood, ivory, or bone, twenty were specimens of arms and armour, fifty-four were objects of a textile fabric, and an equal number represented the porcelain of the country.

Japan was not represented at the Paris Exhibition in a manner worthy of her artistic eminence. A few articles of interest, representing the products of the forests of the country, filled a single case. They consisted of fibrous substances, such as palm-leaf sheaths, out of which fine sweeping-brooms are made; wooden tooth-brushes, charcoal of the tree fern, palm fans, neat wooden boxes, sandals, shields, baskets, and ornamental articles, made from rattan cane, large bamboo stems, and the bark of the *Broussonetia papyrifera* and other trees.

A good collection of samples of paper was also exhibited at Paris. The purposes to which this material is applied by the Japanese are almost inexhaustible. Severely descriptions are known. They paper their houses, they paper their rooms, they paper themselves; they have paper tiles, paper great-coats, and umbrellas of oiled paper; despatch-boxes, reticules, and tobacco-pouches of a paper imitating leather; paper-cloth, as strong as leather itself; card-board, ornamented with gold figures, costing 4 francs per sheet; gold-spangled and embossed complimentary paper, delicate writing-paper, gelatine paper, wrinkled paper, paper pocket-handkerchiefs, sold at the price of from 4 to 14 centimes per score. It is only necessary for the attention of the Japanese artists to be turned to the subject, for us to be put in possession of lace-paper, suited for ladies' dresses, which should unite the richness and delicacy of the finest *point d'Alençon* with an unsullied purity special to itself—the fire being the washerwoman—at an absolutely ridiculous price.

Japanese writing-pencils and cakes of various coloured inks are also known in Europe. A case of toys was sent by the Japanese Government to the Paris Exhibition, containing rattles, dolls with moveable eyes, dolls of white earthenware with grotesque faces, cups and balls, little boxes of kitchen articles, and similar objects. It was remarked, however, by the English reporter that, owing to the contents of the case being sold, the guardian obstinately refused to give any information about them.

The peculiar silks with which Japan has lately supplied the European market, are pretty widely known. It is not, however, generally understood that the peculiar hardness and sharpness of these fabrics is due, in some unexplained manner, to the influence of the soil or climate of the island. For when what is called Japanese "seed"—that is to say, the eggs of the silkworm—is imported into Italy, the descendants of the Oriental insects appear to become civilised by the inexplicable charm of the country (or the new food), and spin, after one or two descents, a finer and softer silk.

Of the works of the painters in Japan, we have but few specimens; but the originality of the canons of art which they follow is no less striking than is the case in other departments. The absence of defined outlines is a marked peculiarity. Queer blotches, violent contrasts of colour, purposeful defiance of what we call symmetry (that is to say, making one side a reflexion of the other), distinguish the toil of the Japanese painter, on wood, paper, or porcelain. Yet no one of these apparently accidental defects can be obliterated without damage to the "barbaric" composition; and the student is forced to admit that there are laws of harmony and of proportion, whether of colour or of form, too subtle for his grasp, but of which the Oriental craftsman evinces a perfect and an instinctive mastery.

The wonderful tiger now to be seen at the South Kensington Museum, may be cited as a characteristic specimen of the art of the Japanese painter. It has been previously described in our pages, but is now referred to as an instance of the mode in which nature can be simulated with an art almost equal to her own. Viewed at a distance, innumerable faults may be detected in the drawing, not only of the background, but of the animal. But when viewed closely, even through a magnifying glass, it is difficult to persuade the senses that one is not looking at actual fur.

In treatment of colour, an instinct of harmony seems to pervade the Oriental schools, distinct as they are in minor characteristics, which exceeds the utmost skill of the educated European workman. The Indian artists inherit as their birthright, says an English artist and art-writer, a wondrous sense of harmony in tint and dye. In their work we see how gold and colour can be brought together; how, through the most marvellous subtlety of colour and tint, the greatest sobriety can consist with the greatest richness—richness without a flavour of gaudiness; and, beyond all, how the decoration of each fabric is suited to its use, and thoroughly subordinate thereto. The flat treatment of ornament for textile design, the conventionalised rendering of the graceful forms suggested by, but not blindly copied from, foliage and flowers, and all the varied intricacy of vegetable growth,—the production, in short, of so subdued and harmonious an effect, both in form and in colour, that the unobtrusive masterpiece of art gives to the eye a rest like that which it experiences in dwelling on the graver aspects of nature,—such

are the results of the exquisite sensibility to the power, and to the varied refractions of his rays, that the sun has bestowed on his dusky neighbours in the East.

For in this, we conceive, lies the secret of the truth and delicacy of the Oriental taste. East and west are mere comparative terms, accidents of geographical relation; north and south, tropical, sub-tropical, or temperate, are terms of positive import. Southern Japan, China, India, Persia, Arabia, regard the sun as he shines with a strength unknown in the shifting climate of Northern Europe. The optic nerve, as, indeed, the reasoning powers in general, are stimulated in those lands into a susceptibility unknown to the races who think more keenly than they feel. Repose from glare is the first luxury under vertical sunlight. Thus, by the very glory and brilliancy of his climate, the Oriental artist has been taught how to dip his brush in soft and harmonious hues. The quaint conventional forms into which he has tamed the luxuriance of decorative tracery may, in all probability, be due to the same law. Contrast and consent of colour demand duly proportioned areas of display, and appropriate blending of the form and outline of those areas. It is thus that the Oriental patterns have grown out of the Oriental tints.

We have this proof that such is the case. In the production of these Oriental people who are so essentially monochromic in their creed, as to allow no likeness of any living thing to be pictured in their art, we find the patterns which we recognise as Oriental, alone to prevail. Every curve, every line, is conventional. But among those people, also Oriental, whom no religious motive withholds from portraiture or pictorial effort of any kind, side by side with subdued conventional forms, we find the wildest freaks of the grotesque. Michelangelo never dreamed of such contortions (even in that vision of judgment, in which the chief Western painters have allowed themselves the utmost licence of anatomical phantasmagoria), as are common to the grotesque statuettes of Japan, or the foliated dragons of China. In all that tells of form and of motion alone, the Oriental taste, when unrestricted by the Koran, turns into the very wildest extravagance. The stiffness and reserve of that delineation of form which is made use of, for the express purpose of the harmonious distribution of colour, in textile or ceramic fabrics, would therefore seem to have been produced by the instinct of the colourist, rather than by that of the draughtsman.

It is thus to Oriental art that we must turn, for the best examples to be collected for any school which seeks the improvement of decoration, as an end rather than as an accident. The glories of Sarcenic art were, it is possible, at their brightest, when the faith of Islam was yet in the conquering vigour of its youth. India has handed down her art traditions only from a date some two or three centuries antecedent to that of Arabian conquest. Persia had her artists when Babylon was ruled by Persian kings; nor has she lost the instinct of her craft. China, with her written history of forty-four centuries, has been, at least in some respects, degenerating and receding for a nearly a fourth of that period. Japan, so far as we can tell, has never been more vigorously alive than in her contemporary art. It is to Japan, therefore, that the philosophic student will look for valuable hints, and energetic stimulus, for the decorative artist of to-day. In metal and in clay, in silk and in other textile fabrics, in lacquer and in wicker, in all that comes under the name of paper, Japan strikes out, in rich profusion, productions which, so far from our being able to equal or to imitate them, often pass our comprehension, when we would inquire how they were produced. Her acrobats and her jugglers; her gymnasts, who hang from the roofs of the loftiest buildings, like monkeys or like birds; her wizard pot-spinners, who make that ancient toy simulate the action of obedient intelligence, who give the apparent sportive life of the butterfly to a scrap of paper, and who address an English audience in a whistling dialect, that resembles the springlike gabble of our hedge birds, are not her greatest magicians. For her soil is the seat of living, decorative art; and they may best attain to excellence in the pursuit of ornamentation who graduate in that unique university.

The illustrated books which treat on Japan are few. There is an Italian account of the arrival at Rome of some Japanese princes, in the year 1585, printed at Venice in that year. "A Description of the Mighty Kingdoms of Japan and Siam," translated by Capt. Roger Manley,

was printed in London in 1683. Memoirs of the Embassies of the Dutch East-India Company to the Emperor of Japan, were published at Amsterdam in 1680. There is a French work, by M. Taising, illustrating the funeral rites and marriage ceremonies of this strange people, in the latter of which two attendants, called the male and female butterflies, play conspicuous parts. "The Manners and Customs of the Japanese of the Nineteenth Century," and "Japan Opened," are two compilations published in London. "The Capital of the Tycoon," by Sir Rutherford Alcock, is a recent original English work.

But any one who wishes, without visiting the great maritime empire of the Mikado, to form a clear idea of a portion of the human family, amounting to some 35 millions in number, whose elaborate civilisation is as foreign to European notions as might be that of the inhabitants of another planet, should read the French work of M. Aimé Humbert, "Le Japon Illustré," which has been published during the present spring. The author, as Envoy Extraordinary and Minister Plenipotentiary of the Swiss Confederation, possessed unique opportunities of making himself acquainted with the interior life of the Japanese. The volumes are illustrated by nearly five hundred "views, scenes, types, monuments, and landscapes;" some admirably reproduced from photographs, and some facsimiles of the wonderful drawings of the natives. The writer has regarded his subject rather from the social, than from the artistic, point of view; but many illustrations of the art of this extraordinary race may be found in perusing the work. Without adopting the form of a journal, M. Humbert appears to have written as he travelled; or, at all events, to have taken the outline of his route as that of his work. The result is, in spite of a certain want of system, a more life-like presentation to the imagination of this long-sealed empire than can be readily conceived of without reading the book. The shadowy and mystic dignity of the Mikado, the supreme and sacred sovereign; the rise of the power of the Tycoon, or Taloon (High Chief), recalling the history of the Merovingian *Rois Fainéants*, and the Mayors of the Palace; the struggle between the Tycoon and the fierce and powerful feudal princes; the manners of the two-sided nobility; the sumptuous orgies of Sin Yosiwara, "the City of Vices;" grasp the imagination like a fairy tale. A civilisation of the utmost polish, free from the influences of either Egypt, Palestine, Greece, or Rome, is a phenomenon of extreme interest.

The remarks we have made on the subject of Japanese art, and of the more recent literature treating of Japan, were written before the appearance in the English money-market of the Mikado, or supreme head, temporal and ecclesiastical, of that empire, gave to the subject the fresh interest of a topic of the day. In the recent revolution in Japan, of which M. Humbert supplies some of the details, this exalted personage appears to have returned from a condition more closely resembling that of the faintest kings of France, of the Merovingian line, than any more modern parallel. Uniting, to some extent, the functions of Dalai Lama, Pope, and Emperor, this prince has recently suppressed the Siogounate, or vice-royalty, hereditary in the family to the noble known to us as the Tycoon; and, as we have seen, taken the first step towards putting himself on the level of his European brother monarchs,—*videlicet*, borrowing money. The amount of a million, ridiculously inadequate as it is towards the execution of any system of railways in the fertile and populous districts of the island empire, would, no doubt, have been immediately forthcoming on the ample security of the customs of the seaport towns. But some people never know when to cry "enough." If our information, which comes from a very central source, be correct, the margin between the price at which the French contractors took the loan themselves and that at which they offered it to the English public was so large (amounting to above 33 per cent.) that, an inkling of the fact having been given, people became unwilling to come in at the tail of such a very long queue. Thus we have seen the quotations fall more than 3 per cent. in a single day.

The question will naturally arise, if the Mikado wants English money, why not send it out under the direction of English engineers? The subject is too considerable to discuss in a hurry. One thing, however, is pretty plain from the

experience of the few residents who know anything of the inner life of Japan. Foreigners who go to teach these gentlemen (who are, as matter of literature, fully up to our most recent improvements) must be prepared to carry their lives in their hands.

THE PUBLIC HEALTH IN THE FIRST QUARTER OF 1870.

THE Registrar-General has published his Quarterly Return of Births and Deaths in the first three months of this year, in which, anticipating any recommendations which may be contained in the long-expected Report of the Sanitary Commission, is now given for the first time a mass of information in great detail, which cannot fail to be of incalculable value to the sanitary authorities throughout England and Wales. The country for registration purposes is divided into 2,196 sub-districts, each with a registrar. The average area of those sub-districts in 1861 was rather more than twenty square miles; they contained on an average about 1,700 houses, and rather less than 10,000 inhabitants. The quarterly return now gives for each of those sub-districts not only the births and deaths registered in the three months ending 31st March last, with the marriages for the previous three months, but the deaths of infants under one year, those of persons aged sixty years and upwards, those referred to each of the seven principal diseases of the zymotic class, those resulting from violent causes, those registered upon the information of the coroner being inquest cases, and those recorded in the large public institutions, for the most part work-houses and hospitals. To those thoughtfully interested in sanitary matters it is needless to point out in how great a variety of ways this information may be turned to practical account by local authorities, at the same time affording, to any one who cares to study the returns a good general view of the proportionate fatal prevalence of zymotic disease in the various parts of England and Wales down to so recent a date as the 31st of March last. The Registrar-General states that he is unable to vouch for the absolute correctness of the figures in the Quarterly Report, as it is compiled from the individual returns of the 2,196 registrars, to very many of whom the analysis of the causes of death has been a new and a somewhat difficult task. The facts are doubtless in the main correct, but the actual figures must be regarded as provisional, and subject to revision in the Annual Report for 1870, which, however, cannot be looked for before the end of 1871 at the earliest. In the meantime, this information, even with its percentage of inaccuracies, cannot well be over-valued.

The winter of 1869-70 was a long and trying one, resulting in a mortality considerably in excess of the average. The mean temperature of the first three months of this year was 38° Fahr.,—1° below the average of twenty-nine years, and lower than in any corresponding period since 1865, when it was only 36°. The mortality in the first quarter of the year rises in singular uniformity with the fall of the mercury in our thermometer, and it is not surprising therefore to find that the national death-rate last quarter was higher than in any corresponding three months since 1865. The remarkable alterations of temperature during last quarter, especially in March, had probably more direct influence upon the death-rate than the fact of the mean temperature being below the average for the quarter. From the 4th to the 15th of March the daily temperatures averaged a deficiency of 3°; on the 16th, 17th, and 18th there was an average excess of 6½°; and from the 19th to the end of the month a deficiency again of 5½°. Those three warm days doubtless rendered the succeeding spell of cold weather still more fatal to those suffering from affections of the respiratory organs than it would otherwise have been.

In the first three months of this year both births and deaths in England and Wales very considerably exceeded the average numbers in the ten previous corresponding quarters, after due allowance for increase of population. The natural increase to the numerical strength of the people during the quarter, as represented by the excess of births over deaths, was 62,451 against 70,618 in the same period of 1869: the births showed an increase of 2,386, but the deaths were more numerous by 10,553. The annual birth-rate last quarter was 38·1 per 1,000, and higher than the rate in the first quarter of any of the

last ten years, the average for which was 37·0. The annual death-rate in the whole of England and Wales last quarter was 26·5 per 1,000, against 22·3 and 24·8 in the same period of 1868 and 1869, and 25·3 the average of the ten first quarters of the years 1860-9; in these years the death-rate which prevailed last quarter was only exceeded in 1864 and 1865. The excess of mortality in our urban population over that prevailing in our rural districts was considerably below the average last quarter; the average excess in the first quarters of the ten years 1860-9 was 5·3 per 1,000, while in the quarter under notice the death-rate in all the chief towns averaged 27·8, and was 24·9 in the rural and village population, showing an excess not above 2·9. It is thus evident that the principal excess of deaths last quarter occurred in the country districts, but without a careful analysis of the causes of death (which is not yet possible), it would be hazardous to pronounce how much of this result was due to the more direct influence of the low temperature and sudden alternations on the rural population, and how much to an improved sanitary condition of our towns, which may to some extent have therein counterbalanced the unfavourable climatic conditions.

There was still, however, a large excess in the annual death-rate last quarter of our entire town population (roughly speaking, about half the population of England and Wales), amounting to nearly three per 1,000. This excess, which is beyond doubt amenable to sanitary control, is important enough to command the earnest attention of all humanitarians. This excess of three per 1,000 during the year results in 30,000 deaths in our town districts over the number who would die if the death-rate did not exceed that of the country districts. As a matter of fact, the average annual excess of the town over the country death-rate in the ten years 1860-9 averaged 4·6 per 1,000. Let us endeavour to trace this excess of town mortality within smaller limits. The death-rate in the entire urban population last quarter was as above stated 27·8 per 1,000. In the seventeen largest English towns, furnishing weekly returns, including London, and comprising an estimated population of about 6½ millions, the death-rate last quarter was 27·1 per 1,000, and scarcely higher than in 1869. In the fifty towns ranking next in size, with about 2½ millions of population, and including nearly all the towns the inhabitants of which number between 25,000 and 100,000, the death-rate did not exceed 26·7. If, then, in 8½ millions of our town population the death-rate last quarter was sensibly below the rate for the whole urban districts, it appears fair to assume that an undue excess occurred in the death-rate prevailing in the 2½ millions inhabiting the smallest towns. This appears probable when we consider that ere this the force of public opinion has produced liberal sanitary reform in nearly all the large towns for which the Registrar-General has published periodical returns of mortality; whereas, in many of the smaller ones, for which the vital statistics are not so readily attainable, much ignorance and apathy still lingers as to their true sanitary condition. The new form of quarterly returns will probably do much to remove the former and to stimulate the latter of these two dangerous shortcomings.

Among the seventeen largest English towns, including London, for which the Registrar-General now publishes weekly returns, the annual rates of mortality, during last quarter, per 1,000 of their estimated population, ranged in order from the lowest, run as follows:—

Sunderland	21·9	Leeds	27·5
Hull	22·4	Nottingham	27·6
Leicester	23·8	Norwich	27·7
Birmingham	24·0	Sheffield	28·3
Bradford	24·1	Liverpool	28·5
Wolverhampton	24·3	Salford	29·5
Portsmouth	26·0	Bristol	31·7
London	26·7	Manchester	32·7
Newcastle-upon-Tyne	26·9		

Most of these rates showed an increase upon those prevailing in the corresponding quarter of 1869, the largest increase appearing in Manchester and Salford, and in Bristol. In contrast to the generally increased rates, those in Newcastle-upon-Tyne, Hull, Sheffield, and Liverpool, showed a satisfactory decline. The annual death-rate in the quarter from the seven principal diseases of the zymotic class, ranged from 1·7, 1·9, and 2·2 per 1,000 respectively, in Norwich, Leicester, and Sunderland; to 4·8 in Bristol, 5·0 in Portsmouth, 6·2 in Manchester and Salford, and 6·9 per 1,000 in Sheffield. This throws considerable light upon the excess of the death-

rate in many of the above towns. Scarlatina was the most fatal of these diseases, especially in Sheffield, Liverpool, Leeds, and London. Whooping cough was also particularly prevalent in Manchester and Birmingham. The range between the death-rates in Manchester and Birmingham last quarter was large, but scarcely larger than usual. Manchester people may well ask why this state of things should continue.

In the list of the fifty large English towns ranking most in size with the seventeen above enumerated, the death-rates last quarter were lowest—17·3 in Birkenhead, 20·0 in Southampton, 20·1 in Coventry, and 20·5 in York; they were highest—33·2 in Bath, 33·4 in Shrewsbury, 33·6 in Stockport and Cambridge, 36·0 in Blackburn, and 37·6 in Exeter. In the latter city the deaths exceeded the births, and were 78 above the average of the three previous corresponding quarters.

The information now given for the first time bearing upon the ages and causes of death will become infinitely more valuable when comparison becomes possible with a series of corresponding quarters; the following deductions are, however, interesting. Of all deaths registered in England and Wales last quarter 22·6 per cent. were of infants under one year of age; and 26·2 per cent. of persons aged sixty years and upwards. The proportion of deaths of children under one year, to births registered, affords on the whole the most satisfactory means of testing infant mortality in different populations; this proportion was 15·8 per cent. in the whole of England and Wales, while it varied from 13·8 per cent. in the south-eastern, and 14·0 in the south-western counties, to 16·9 in the north-midland, and 17·8 in Lancashire and Cheshire. The proportion of deaths of persons over sixty years of age varied still more remarkably from only 18·9 per cent. in the manufacturing population of Lancashire and Cheshire, to 34·7 and 38·5 per cent. in the agricultural counties of Norfolk, Suffolk, and Essex, and of Devon, Somerset, and Cornwall. Two causes are in operation which may help to produce this result. In the first place, the continued migration of the younger portion of the adult population from the agricultural counties to our manufacturing town centres, leaves behind an undue proportion of elderly people; and secondly, the severities and shifting temperatures of our winter climate are more fatally felt in our rural districts, where the dwellings of the poor are less substantially built, and in less sheltered situations, where firing is for the most part dearer, and where low wages render the labourers less able to clothe and feed themselves in a manner to resist the cold winds and frosts than their town brethren. Thus may very probably be explained the large percentage of deaths of elderly persons in our rural districts during the winter, from bronchitis and other affections of the respiratory organs.

As to the causes of death, more than 20,000 fatal cases of the seven principal diseases of the zymotic class were registered last quarter in England and Wales, including 6,693 of scarlatina, 4,448 of whooping cough, 4,178 of fever, 1,922 of measles, 1,743 of diarrhoea, 710 of diphtheria, and 405 of small-pox. Scarlatina was proportionally most fatal in London and Yorkshire of the large registration divisions; whooping cough in London and Lancashire; fever in Lancashire and Yorkshire; and small-pox in London, the home counties, Lancashire and Yorkshire. Nearly 7,000 deaths in the quarter were registered upon the information of the coroner, being inquest cases; nearly 3,000 were referred to different forms of violence; and over 12,000 were recorded in the large public institutions of the country, including principally workhouses, hospitals, and lunatic asylums. In the seventeen large towns the proportion of deaths from violence to total death last quarter varied from 1·4 per cent. in Sheffield and Portsmouth, to 5·3 in Liverpool, and 6·6 per cent. in Birmingham. In the latter town no less than 13 per cent. of the deaths were inquest cases; and of these nearly half resulted from violence, the remainder being for the most part sudden deaths from natural causes. Why the proportion of these deaths in Birmingham should be so much higher than in the other large manufacturing towns it is difficult to say. The proportion of deaths in the large public institutions in the seventeen large towns ranged from 6·7 and 7·3 per cent., in Leeds and Sheffield, to 15·2 and 16·5 per cent. in Manchester and London.

Space will not allow us to do more than thus slightly to sketch a few of the most salient points

in the Registrar-General's new Quarterly. We hope, however, that enough has been said to prove to those interested in sanitary matters that there returns will in future afford every reasonable facility for obtaining prompt and reliable information as to the condition of the public health in all parts of the country. We anticipate that a very general stimulus will be given to the public interest in sanitary and hygienic matters by the publication of these returns in such useful detail.

THE ARCHITECTURAL EXHIBITION.

THE collection of drawings in the Conduit-street Galleries shows this year no falling off certainly as to the number of designs contributed, and, on the whole, these may be said to be of greater average merit, and to possess more variety of interest, than the drawings of last year's exhibition. The disparity between the number of Classic and Gothic designs, though the latter greatly predominate, is not so remarkable as in the architectural room at the Academy; it may be that in the eyes of academicians, who look mostly to drawing, a Gothic design makes a better and more effective drawing, as a rule, than a Classic one. Whether we can congratulate the adherents of Classic design upon having done much to advance the cause they have at heart is, however, "a question to be asked," and to be answered, we fear, in the negative: certainly we have noticed nothing so good or original as Mr. Wild's last drawing in the Academy (referred to in our last number); and it must be conceded that on the whole both the best drawing and the best and most original designing to be found in the room belong to the adherents of Mediaevalism, ancient or modern; for there is a modern Mediaevalism quite distinct from the original article. The modern antiquity disports itself most conspicuously in town-halls, which, once upon a time, were supposed to be of necessity Renaissance, and are at present equally of necessity Gothic. The size and showy character of the drawings which illustrate these lead one at first sight to suppose that town-halls predominate in the Conduit-street Exhibition. As a matter of fact, however, out of the 204 drawings hung in the principal room (excluding the screens), only twenty are illustrative of town-halls, while thirty-five are devoted to domestic architecture, and fifty-two to ecclesiastical design; the rest being various, including banks, schools, organ fronts, and decoration of various kinds. We will be guided by numerical superiority, and see first what there is to attract us among the churches.

These, to say truth, are not very satisfactory, or rather, perhaps, they are no more than satisfactory; comparatively few exhibiting either general treatment or special features to mark them out individually from among the crowds of designs for churches which are being, and have been of late, turned out by our leading popular church producers. Mr. White shows us elevation, plan, and details of "Holy Trinity Church, Barnstable" (9), "built, 1845; remodelled and rebuilt with the old materials, and the tower lowered, 1869." As we have no drawing of the tower in combination with the rest of the church, we cannot judge how far the whole composition may have been affected by the unusual course of lowering a tower already built, nor are we told whether it was done on artistic or practical grounds. The present drawings show a good, but not remarkable, Decorated Gothic design, with plenty of unbroken wall-space between the windows; but as a "remodelling" it is difficult to judge of it. Mr. F. Chancelor's very pleasing pencil sketch of "New Church, North-end Waltham, Essex" (12), shows a very clever and picturesque design, especially as to the tower, but with too much roof in proportion to the walls, and the long, narrow slip of roof left between the tower and the east-side wall has an unhappy effect in the drawing, though it may not really be so bad as it appears in this view. Mr. Emerson, in his exterior view of the "Choir of Allababad Cathedral, in course of Erection" (15), the interior of which (No. 793 in the Royal Academy) we alluded to last week, goes against all associations as to tropical architecture, in this heavy, colourless Romanesque design, which, on other grounds, has a certain merit and dignity, notably in the heavy drop arches which shadow the clerestory windows, the supporting shafts of which spring, however, rather awkwardly from the aisle roof. We may notice in passing the same architect's "Interior Perspective Compe-

tition Design for National Bank, Bombay" (16), which exhibits much the same merits and defects as the cathedral. Mr. Blomfield's interior of the Churches of St. Barnabas, Oxford, and of St. Mary's, Strood, Kent (25, 26, 27), show the usual clear drawing and colouring, and the usual accurate and satisfactory Gothic design which we are accustomed to receive at his hands, but not very much more.

There are a good many other churches in the room, to which we must refer more briefly; among the best, perhaps, are "St. Michael and All Angels, Stepney," by Messrs. Jarvis & Son, and "Congregational Church, Stamford-hill" (98), by Mr. Chatfield Clarke; the latter a small but very well-drawn and carefully considered west elevation. "A View of the Interior of St. George's Church, Tufnell Park, Holloway" (now pretty well known) (90), by Mr. Truefit, is, like many of his designs, a suggestion out of the common way. The view given, a large and effectively coloured drawing, shows an octagonal area with surrounding aisle, the clerestory supported by iron columns, which leave the whole floor all but completely unencumbered for worshippers. We regret, the appearance of the iron tie-rods from the springing of one arch to another; familiar as we are with the feature in Moorish architecture, we cannot get reconciled to it; independently of the break in the arch caused thereby, it irresistibly suggests the idea of the building being unfinished, and that the tie-rods are only waiting for the "written order from the architect" to be cut out. We must say a word in praise of the treatment of the capitals of the iron columns, in which no attempt at cast-iron imitation of carving is made, but a series of thin flat scrolls, turned over at the top in a curl, and such as could only be executed in the material actually employed, give a truthfulness of expression not often seen in ironwork employed in that position. The exterior and interior views of "Christ Church, Clapton" (96, 97), by Mr. James Brooks, are worth notice; they show a solid though rather heavy design in red brick, with stone dressings, in the modern chamferesque Gothic school. We must point out the very bad effect of the circular wooden barrel vault (a disagreeable fashion of church roof, which too much prevails at present), crossed by a series of parallel ribs, with the inevitable bands at intervals, and which in the perspective view, look rather like the ribs of a toast-rack seen in perspective. "A Specimen of Etching prepared for the Photo-lithographic Process" (154), drawn by Mr. W. H. Lockwood, is an admirable specimen of clear and effective architectural etching not overdone with lines (which is the temptation of etchers), and showing a very pleasing design, by Mr. G. C. Haddon, for a "Congregational Church," at Hereford. "Sketch in Waltham Abbey, showing new east end, erected from the designs, and under the superintendence of" Mr. W. Burgess (155), is one of the most effective water-colour drawings in the room, small in size, but finished with great depth of tone and chiaroscuro. The west end shows Mr. Burgess's usual merits and defects, defects which are perhaps inseparable from the peculiar style in which he has elected to work. A circular-headed recessed arch in the wall, with square soffit springing from short heavy columns in the jambs, encloses a large circular plate-tracery window, with circular centre light and seven three-quarter circles in rose-fashion round it. This incessant repetition of circles, and parts of circles, is rather wearying to the eye. Below this is a triforium stage, consisting of a pointed arcade on the same short shafts, which Mr. Burgess is so fond of, and with a band of deep quatrefoils over it, not in panels, but deep sinkings (apparently), in the wall face. There is certainly an expression of endurance and of sombre strength in this kind of treatment of Gothic, but it becomes wearisome after a while, and we cannot but wish for something more of refinement of outline and finish of detail along with this boldness and solidity of treatment. As a great contrast to such a design, let us look at the carefully finished elevation, drawn by Mr. H. Hall, of the west front of M. Ballu's "Church of St. Trinité, Paris" (181). This is a Renaissance façade, with some modern details, admirable as a whole in point of composition and outline, with its well-contrasted centre cupola, and smaller cupolas at the angles, the former itself an elegant composition, dignified yet light, sufficiently pyramidal in form to carry the eye up naturally to the apex of the composition, yet without interfering with the general horizontal lines of the front. The transition from square to

octagon is happily managed on the whole; but the small thin wiry flying buttresses at this point are a very weak feature, though fortunately not obtrusively noticeable. The ground-story, with sufficiently massive piers and round arches of a kind of refined Romanesque type, backed by a deep shadow from the entrance porch or narthex in the rear, forms an effective base to the whole composition. This front has certain defects common in Renaissance design; a certain want of unity and homogeneous expression, a system of design in successive stages, not sufficiently interdependent, and with windows here and there arbitrarily placed in the centre of a compartment of wall, with their cill and pediment, totally irrespective of composition; but on the whole it is a highly artistic and successful design, though made out of not quite satisfactory materials, and is at all events, more expressive of the tone and feeling of modern life in regard to matters religious than many of the Gothic—very Gothic—designs that are springing up around us; and we commend it to the notice of students who may be desirous of bringing forth ecclesiastical designs not totally out of harmony with the modern life around them. It may be observed, by the way, that the circular wheel window over the entrance, though in general form just what may be found in early French Gothic (as at Chartres, for instance), with a slight modification of detail harmonises completely with the other Renaissance details. Sculpture is freely, but not too freely, used in the decoration of the façade. Mr. C. F. Hayward shows us a pleasing design, in the "Church of the Holy Innocents, East Shefford" (158), which, by the way, might have been a little better illustrated than in the pencil drawings he has sent.

Nothing could better bear out some recent remarks as to architects' sculpture, quoted and endorsed by us in a late number, than the design showing "Proposed Sculpture and incised Decoration of the Narthex of St. Peter's Church, Vauxhall" (132), by Mr. Pearson. The church itself, which we illustrated some time since, is a good specimen of effective and picturesque architectural design. Why should the architect propose to adorn (?) it with sculpture which, as representation of the human figure and action, would certainly be ignominiously driven from the doors of the Royal Academy? Why are the lines of the hood moulds over the windows to cut into and interfere with the bas-reliefs above, thus conveying the idea that the whole sculpture is an afterthought, for which no provision has been made, and that it has to be squeezed in anyhow? Why are the "Resurrection" and the "Entry into Jerusalem" always represented by those architects who introduce sculpture, with figures below the natural height and proportion of a man, and without elbows, or calves to their legs, and often more like monkeys than men? If Mr. Pearson or his friends can give us a definite and reasonable motive for this treatment of sculpture, when it concerns what are to the majority the greatest and holiest of subjects, in a manner which would never be tolerated, which would simply be laughed at, in an ordinary exhibition-room,—if they can tell us why the same proficiency in anatomical knowledge and figure composition is not so necessary for the production of a figure of "Christ entering Jerusalem" as for one of "Venus Victrix" or "Cupid captive,"—we will retract our observations, and humble ourselves in dust and ashes. In the meantime, our verdict is *ne sutor ultra crepidam*: let architects study architecture, and leave the designing of sculpture to sculptors; except as exercising a general influence over the style and position of the sculpture, which we hold that they should do, as the architect ought always to be supposed to have considered the *tout ensemble* of his building more than the sculptor can have been able to do. Under the head of ecclesiastical design we may class a drawing for an organ-case for Melbourne (120), by Mr. D. Ruddle. We are glad always to see this important piece of furniture taken out of the hand of the organ-builder's foreman and artistically treated. This is a Renaissance design, with a very good and effective plan of front line, and finished with little dormers and gables and festoons in a not very original manner, though pleasing on the whole; but the large piers want a heavier base or plinth under them; and why was the decorative woodwork not made the crown of the whole, instead of projecting the tops of the pipes above it again? One of the main objects of the screen should be to hide the uneven line of pipe-tops, which

must always be unsightly, except in the case of very large pipes (in a "32 ft." stop for instance), which can receive each a separate decorative treatment. The panning in the dado is very weak compared with the upper portions. There is another so-called "Design for an Organ-case" (17), with the pipes merely ranged nakedly in a pyramidal row on two faces (the worst possible arrangement, by the way, as the organ-builder always wants the large pipes at the sides, not in the centre). It is difficult to imagine why Mr. Tarver should have made this drawing, still more why it should have been hung.

Among designs for public buildings of various kinds, we need merely mention that Mr. Street exhibits several of his views of different portions of the proposed Law Courts, which have been sufficiently discussed and criticised already. Mr. Nevill sends photographs of his "Bradford Town-hall Competition Design" (13), of which we sufficiently expressed our judgment, as to the exterior, in reviewing the Academy drawings last week; the interior view of the lower hall, "Borough Court" (51), is, we ought in fairness to add, much more successful, as an interior, than the exterior general design. Mr. C. O. Ellison sends a large perspective view of competition drawing for "Legislative Hall, Douglas, Isle of Man," which we are not surprised to find an unsuccessful one. The drawing is, to be sure, very badly coloured, which tells against it as to general appearance; but no drawing would redeem the effect of the heavy stepped gables of the dormers, and the inartistic treatment of the upper portion of the tower, which is, besides, far too heavy for its base. The end elevations, and other portions shown in drawings 170, 171, 172, where the tower is omitted, have a better appearance. Another competition design, the "Wesleyan Theological Institution" (179), by the same hand, is a better design, and of a less out-of-type. The author adopts the expedient of placing in the corner of the drawing a very small perspective view representing (on his own statement) the design actually executed,—a shrewd idea, no doubt; as to the fairness or good taste of which there may be two opinions.

We must postpone other observations till next week, but would, meanwhile, mention that several remarkable drawings of furniture and decoration by Mr. Owen Jones, declined by the Academy, as were several other important drawings now in this gallery, have been received by the committee. Although sent in after the stipulated time, we trust that space will be found for them.

METROPOLITAN BUILDINGS AND MANAGEMENT BILL.

In answer to Mr. Dillwyn, in the House of Commons on Monday last,

Sir W. Tite said it was certainly his intention to proceed with this Bill, if he could find an opportunity, but if the objection to the measure was one of clauses, and not of principle, he should offer no opposition, after it had been read a second time, to its reference to a Select Committee.

At a meeting of the City Sewers Commission on Tuesday, Mr. Alderman Lawrence, M.P., called attention to the Bill, which, he said, was a measure that interfered with property, not merely within the City, but outside of it. It was divided into eighteen divisions; it had seventeen schedules, and there were 132 clauses. The Metropolitan Board of Works, by whom it had been brought forward, had just issued copies, accompanied by sixteen pages of observations, and an additional page of notes. It was a Bill which was of importance both to owners and occupiers of property, especially within the City. He might state shortly that in streets 40 ft. wide, the height of buildings was to be limited to 60 ft. from the pavement to the eaves of the roof; and in streets of more than 40 ft. in width, to 65 ft. Warehouses or other premises were limited to 216,000 cubic feet, and if of larger size they must be divided by party walls without any opening whatever; 216,000 cubic feet might seem to indicate a large amount of space, but it was only the cube of 60 ft., so that the premises would only be 60 ft. long, 60 ft. wide, and 60 ft. high. Buildings like the National Discount Company's offices in Cornhill, or the Union Bank, opposite the Mansion House, could not be erected in the City after the passing of this Bill, unless the Metropolitan Board of Works were specially to give permission. Again, in the event of half of premises, such as those occupied by Messrs. Leaf, Messrs. Paw-

son, Messrs. J. & R. Morley, and others, being destroyed by fire, the other half would have to be pulled down and reconstructed in accordance with the provisions of the Bill; the object being to reduce premises both in size and height, as a protection against large fires. The effect upon the value of property in the City would be very great. The Bill affected not only the wholesale warehouses in the City, but also the large retail houses at the other end of the town; for no premises like Swan & Edgar's, Peter Robinson's, or Marshall & Snelgrove's could be constructed under this Bill; and if, unfortunately, more than half of any of these premises should happen to be destroyed by fire, the remainder would have to be pulled down and subdivided into compartments of 216,000 ft., without any means of communication between one portion of the building and another, except outside fireproof galleries. The Metropolitan Board of Works, through their representative, Sir William Tite, were anxious that the Bill should go before a select committee; but he (Alderman Lawrence) was quite sure that at the present moment the whole of the interests that were jeopardised by the Bill were entirely ignorant of its contents, and therefore he thought the Court should examine it closely, because, however anxious they might be to protect premises from fire, they should not be led in a panic to drive the trade and commerce out of the city of London, which would be the consequence of this Bill being carried out in its entirety.

On Monday evening Mr. Alderman Lawrence presented a petition from timber merchants and others engaged in the wood trade in the metropolis, against the Bill; also one from the Fishmongers' Company, with similar prayer.

It ought to be known that before completing the Bill the Metropolitan Board of Works invited the Institute of Architects and the District Surveyors' Association to send each three members to confer and advise with their Parliamentary Committee. This was done; the joint committee met a number of times; and the Bill was modified in various particulars in consequence.

We have already pointed out some of the peculiarities of the Bill, and will return to the subject if it go to Committee. The Board have agreed, we understand, to modify the clause objected to by the timber merchants.

The Board intend to propose in Committee the insertion of the following additional rules:—

"Every wall of a dwelling-house shall have a damping course; that is to say, a course of slate laid in cement or other material impervious to water, at a height not exceeding 1 ft. above the outer ground surface or the top of the footings, whichever is higher.

Where any room in a dwelling-house is below the level of the ground, and has a fireplace and window, a dry area shall be formed from the level of the footings to the top of the ground.

The ground surface or site of every dwelling-house, where not flagged over, shall be covered with good concrete at least 6 in. in thickness.

There are localities where the first and third of these requirements would be unnecessary, so that exceptions would be requisite.

ARCHITECTURAL PRACTICE.

MANCHESTER SOCIETY OF ARCHITECTS.

THE president of the Society, Mr. A.W. Mills, in the course of his address to the last general meeting, said the next subject to which, for a few moments, I desire to call your attention is one that frequently occasions us a great deal of trouble, and leads us into a certain amount of responsibility. It is, the materials and workmanship which we are supposed to control in the conduct of our business. A rather long experience and observation satisfies me that in my knowledge of such things I am in my infancy. The longer I live the more I have to learn. The ability displayed to supply an inferior material, and to cover it with loose workmanship, seem to me to have kept equal pace the one with the other. I take this opportunity of impressing upon you the necessity there is for showing no hesitation in dealing with the attempts which are constantly being made to supply us with materials and workmanship for our buildings which are not in accordance with the conditions of our specifications. The trouble and difficulty and ultimate responsibility which these proceedings sometimes lead to are incalculable.

The next point to which I shall refer is one which I venture to touch upon with a little delicacy; but, nevertheless, I think I may draw on the privileges of my office to do so. I

allude to the planning and contrivance of buildings intended for public purposes, in which large numbers of people may be expected to assemble. In these buildings we very often find the most inadequate means provided for getting the multitudes speedily out. We have lately heard of one or more serious calamities, which might have been prevented, so far as the injury to life and limb is concerned, by proper attention on the part of the architect to this important requirement in preparing plans. I confess I have myself looked with considerable apprehension on more than one important building in case a panic should seize the occupants. The responsibility of an architect for the neglect to attend to the means of egress from any public building is very considerable. Although it may not be direct, the responsibility is nevertheless there; and it has occurred to me to ask if it would not be possible, in planning public buildings, to provide some extraordinary means whereby the public could on necessity escape, but which should not be used except on such an occasion, and which really need not form any part of, or interfere with, the external appearance or internal convenience, except on the especial occasion upon which it might be necessary to use it.

Before concluding, I shall draw your attention to one other subject, which we find constantly interfering with us in our practice, and embroiling us frequently to a large amount of difficulty and annoyance, and our employers to a large amount of expense. I allude to the asserted right of light over certain properties which we are occasionally called upon to rebuild or improve. There is scarcely any one of us who has not experienced some inconvenience in either protecting or destroying some right or supposed right having reference to light. In most cases the right to light over an adjoining property in a city like Manchester, which may be said to have been rebuilt in the last fifty years, has been acquired,—time has given the privilege,—no pecuniary consideration has purchased it; and it does appear to me very trying (giving my individual opinion) that the owner of a one-story building on a very valuable piece of land should be prevented building any higher because the owner of the neighbouring plot happens to have put windows out that overlook the lower building, which windows happen to have been formed over twenty years. After devoting some little time to the subject, I am inclined to think that a fairer law would be that the party said to be about to injure a neighbour's lights should not be restrained, unless it can be shown that the injury, if any, is incapable of being assessed at a money consideration.

THE NEW WATERWORKS, CANTERBURY.

THESE works are now nearly completed.

They are situated in Wincheap, alongside the high road leading from Canterbury to Ashford, on an oblong piece of ground, two acres in area, enclosed on three sides by brick walls 9 ft. high, and on the fourth, or south side, by the public road, bounded by a substantial dwarf wall and piers with iron railing, having appropriate entrance gates and doors.

The works in the enclosed ground comprise accommodation roads, an engine, boiler, well, and lime house, tall chimney-shaft, coal-store, covered softening and lime-water reservoirs, workshop, and offices; two wells or bore holes, powerful steam-pumping engine and pumps, and two steam boilers, together with a large open artificial pond, constructed for the purpose of cooling the heated water discharged by the air-pump from the condenser of the steam-engine. The heated water is so discharged from the engine as to fall into the pond in numerous small jets, that form a sort of fountain.

From the entrance-gates, as well as from the road before the works, the front elevation of the engine, and the boiler, and the well-house, the coal-store, and the softening reservoirs can be seen. This elevation shows a line of buildings about 170 ft. in length. From behind the boiler-house the main chimney-shaft rises to a height of 90 ft. The whole of the buildings, chimney-shaft, and mouldings are built of Gault bricks, having copings and string-courses of solid Portland stone, the whole being set in Portland cement mortar.

The pumping-engine works two sets of pumps. One of the pumps raises spring-water at the rate of 750 gallons per minute from one of two bore-holes sunk by the company into the chalk, and discharges the water into the adjacent

covered reservoirs, where the water is softened by Dr. Clark's well-known liming process. The other pump pumps the water from the softening reservoirs, after it is softened, at the rate of 500 gallons per minute, through the line of 12-inch pipes, two miles and a half in length, laid by the company, from the works at Wincheap, along Castle-street, St. Margaret's, St. Peter's-street, and St. Dunstan's, into the covered service-reservoir on the top of St. Thomas's Hill, situated at an elevation of 200 ft. above Westgate, or of 160 ft. above the paving of the engine-house floor at Wincheap. The engine is capable of working up to 100 indicated horse power, is of the most improved construction, and freely works both sets of pumps at once.

The bore-hole or well from which the water is pumped is 26 in. internal diameter, and is lined with cast-iron cylinders for 36 ft. in depth; beyond this depth the bore-hole is 24 in. internal diameter, sunk to a total depth of about 500 ft. The bore-hole stands quite full of water to a normal level of not less than 8 ft. 6 in. above the river Stour at Wincheap, and yields a much larger quantity of water than is required to supply the 750 gallons of spring-water per minute pumped up direct from the bore-hole.

The softening reservoirs are capable of softening about 350,000 gallons per day of twelve hours, or a much larger quantity, say 550,000 gallons in the twenty-four hours.

The walls surrounding the softening and lime water reservoirs are all covered with a roof built of wrought iron joists, and Portland cement concrete. The top surface of the concrete is rendered with Beysell asphalt, 5-8ths of an inch thick, and the asphalt is covered over with a layer, about 8 in. in depth, of clean gravel stones. Altogether the roof is quite 2 ft. 3 in. in thickness, so that it is impervious alike to the heat of the summer sun, or to the cold of the winter frosts. This tends to preserve the normal temperature of the spring-water which, as it is pumped up, is 51° Fahrenheit at all seasons of the year. The weight of the roof is made to contribute to the strength of the two division wells between the reservoirs. These walls are only three bricks and a half, or 2 ft. 9 in. thick, including the thickness of the rendering, and have to sustain a depth of 15 ft. 9 in. of water, equal to a pressure of more than 3½ tons per foot run, or of 250 tons on their whole length. The walls alone would have been quite inadequate to sustain this enormous pressure, had not the weight of the thick roof been thrown upon them in such a manner as to contribute to their stability and strength.

The engineer is Mr. Homersham, and Messrs. Gaskin & Godden are the builders.

THE DERBY EXHIBITION.

THE Art and Industrial Exhibition at Derby has been inaugurated by the Duke of Devonshire, who is Lord Lieutenant of the county. The weather was fine, and the attendance of holiday observers was large. The magistrates, clergy, mayors of adjoining towns, and others, went in procession from the town-hall to the drill-hall, where the Exhibition is held. A "grand processional march," composed by a citizen of Derby, was played on the occasion, and an inaugural ode written for it by a clergyman, was sung. The local *Advertiser* thus describes the chief part of the Exhibition:—"We enter by the wide entrance in Becket-street immediately into the large court, which has been entirely covered with glass. On the right are arranged the bazaar stalls, most tastefully draped and decorated, having quite a fairy-like appearance. Opposite the stalls on the left of the court are arranged the ferneries, grottoes, waterfall, fountain, &c. The effect produced here is really surprising. Passing on we enter by a prettily-draped archway into the great hall, the first sight of which impresses us at once with some idea of the immensely rich collection of works of art and beauty contained there. We cannot attempt to describe any of the varied contents of the Exhibition, but must content ourselves for the present with giving a mere outline of its arrangement. The great hall is divided by three high wooden screens into three broad avenues. Upon these screens are arranged the thousands of magnificent paintings which have been so liberally lent for exhibition. On the right and left of the centre avenue, near the door, are arranged long glass cases, containing, no doubt, the finest collection of china ever got together in the world. In the centre of

the building is a tall glass case containing some splendid silver-plate, of exquisite workmanship and of immense value. Beyond this, the centre avenue is subdivided by two long screens, principally occupied by the water-colour drawings, in which the Exhibition is particularly rich."

THE LATE MR. HENRY GARLING, ARCHITECT.

ON the 9th of last month died, in his seventy-second year, Mr. Henry Garling, late of Bedford-row, and long a member of the Royal Institute of British Architects. Mr. Garling was articled to Mr. Page, of King's-road, Bedford-row, who, as usual in that day, combined the business of architect, surveyor, and builder; and, for three years after his articles, Mr. Garling acted for him in superintending (in fact, designing and doing everything, Mr. Page never answering any letters), in the remodelling of Grimsthorpe Castle, in Lincolnshire, for Lord Gwydir (Willingby d'Eresby). He became a student of the Royal Academy, and gained the silver medal in 1818;—started for himself about the same time, or perhaps as early as 1816, and appears to have obtained a large practice as a measuring surveyor, and especially a large connexion with several of the best legal firms of the day as a surveyor in valuing for leases, mortgages, dilapidations, and all the matters connected with estates; and he became surveyor to Rugby School estates about 1821.

Architecturally, he was engaged extensively for Lord St. John of Bletsoe, Baron Vaughan, Earl Spencer, and the Carron Company, of Thames-street. The market-house at Guildford, and the Holborn Union workhouse, were also designed and superintended by him. He retired from business in 1847, having accumulated considerable property. He had a fine library, and had become governor of Christ's Hospital, St. Thomas's, Bethlehem, and other institutions.

We have heard him say, that when in Mr. Page's office he was associated as clerk with the father of Edmund Keon, the actor; and how Keon, asking him home to a very frugal supper, in some not very aristocratic neighbourhood, and probably "high up" there, would borrow half-a-crown to procure the necessary beer.

Mr. Garling was a man of remarkable powers of application in business, and especially notable for his intimate acquaintance with practical detail of every kind, an advantage he derived very much from the school in which he was trained. We received and printed notes from him up to within a few days of his death.

His son, Mr. H. B. Garling, has distinguished himself on more than one occasion.

MEMORIAL WINDOW, BLACKLEY.

A LARGE and handsome stained glass east window, to the memory of the late Rev. W. R. Keeling, B.A., 31 years rector, has just been erected in Blackley parish church, near Manchester, and for a long time will no doubt prove a source of attraction to the congregation and parishioners.

The window is in the Early Decorated style, and consists of five lights, each representing some important event in the life of Our Saviour; the first being the Nativity, the second the Baptism, the centre one the Crucifixion, the fourth is the Resurrection, and the last the Ascension. Below these groups are the traditional emblems in the following order,—the Alpha, the Lily, the Orest of the late Rector, the Rose of Sharon, and the Omega; while over each group is a brilliant canopy surmounted by another suitable emblem;—first, the Lamb, as symbol of innocence of infancy; then the Dove, as typical of the Holy Spirit; over the Crucifixion is the figure of the Pelican (emblematic of Love's Sacrifice); the Palm-leaves of Victory are set above the Resurrection; while the final scene, the Ascension, is surmounted by the Conqueror's Crown and Stars. A proportionate quantity of suitable ornamentation rests over these, while above all there is an elaborately decorated wheel-light, 5½ ft. diameter. The total height of the window is 21 ft., and its width 11 ft.

Our correspondent says this memorial reflects very great credit upon the firm that has designed and produced it,—Messrs. J. A. Forrest & Co., of Lime-street, Liverpool. The design was chosen in competition with several others. The cost will be over 400*l*.

PREVENTIBLE FATAL ACCIDENTS.

THOSE persons whose business in this life consists in warding off by all practicable means the approach of death, are never so much annoyed and put out of their reckoning as they are by a consideration of that persistent and growing increment of our mortality-tables, which is classified under the repressive head of Fatal Accidents. Whether they are engaged as physicians in the cure or alleviation of particular cases of human suffering, or as sanitary economists in battling with external circumstances, including general error and neglect (the true state-physicians), or finally as architects or engineers in the design and construction of improved buildings and machinery, the observation and study of these fatal accidents produce on the mind only the same feelings of deplorable regret.

Why should there be so many fatal accidents in the present day? we wish to inquire. Why should there be such a plentiful harvest of death in this precise field of our common mortality? There can be no doubt as to the facts, as our own columns will faithfully testify, and there is very little difference in their general description.

We must admit at once that it is quite possible to answer this very grave question in a certain fashion, at least, by the old and worn-out scholastic syllogism—they exist; ergo they were intended to exist: accidents have always happened, therefore they will continue to happen. Hence it may occur that many good people who are otherwise sensible enough are sadly led astray in their conclusions. Because of the regular and frequent occurrence of such accidental deaths, they have come to regard them as inevitable,—as regular factors of the great quadratic equation of our mortality-tables; or, in short, as the indispensable sacrifice which is annually demanded of us by the genius (or the fiend, as the case may be) who presides over our progress in science and the arts. But surely such a purely fatalistic notion cannot be correct. It will not bear the most slender scrutiny as a theory; nor, in our opinion, can it account practically even for the most obvious and perceptible causes of the fatal accidents which are accumulating every day around us.

There is, unhappily, also, a strong tendency among a certain able group of our modern statistical writers,—particularly of that materialistic school which is represented by Messieurs Quetelet and Augustus Comte,—to regard such phenomena with the perverted light of a grim and fatalistic philosophy, almost, indeed, as if their invariable and constant recurrence were a dispensation of Providence! Here is an example of their reasoning, such as it is. There are so many deaths in a given population per centum per annum. Of these deaths a constant quantity consists of fatal accidents. There are likewise so many suicides at the Pont St. Martin; so many dead bodies deposited at the morgue; so many people accidentally shot; so many letters without addresses dropped into the post-office. Such things happen regularly every year. Hence they proceed to demonstrate to their own entire satisfaction that a monster which they have created after the manner of Frankenstein, yclept the "average man," is subject, by the very laws of his constitution, and the conditions of his existence, to an average number of fatal accidents!

It is almost unnecessary to assert that this philosophy is likewise essentially false. The sanitary reformers, at all events, have been accustomed to make sad inroads upon the average statistics of disease and death, particularly when they began to combat a given death-rate. Sanitary works and death-rates, in fact, have a strong mutual repulsion to each other, or, at least, they possess a very strong natural antagonism; and certainly they play an important part in neutralising each other in the great problem of the duration of human life. If, then, that increment, which we may term the undrained element of the death-rate, does not represent a constant quantity,—but, on the contrary, can be shown to be reducible by wise precautions and plain scientific appliances, to a yet unascertainable degree,—how much more should this be the case with the increment which we just as rationally are in the habit of terming fatal accidents?

What is an accident? An accident, if we must need go to the root of the logical expression, is a mere property of an object which may be modified, or may be altogether abstracted or

eliminated without the object ceasing to be essentially what it is. It was a pure accident, for example, in the design of the Monument that its gallery afforded such fatal facility to certain unfortunate persons who seemed determined to commit suicide. It was not an essential feature in its construction. And although many of the distinctions made by the older philosophers between accidentals and essentials are entirely fallacious, yet it is worth noticing that even the schoolmen were in advance of these modern fatalists in this important particular, that accidents as they held are always opposed to essentials or to substance. We need not refer to the analogous distinction in moral actions between principal and accessory, upon which is based the whole theory of our criminal jurisprudence, and upon which the celebrated Theodore Beza founded his well-known comparison between the state of affairs in this frail and transitory life, and that spiritual government in which the dicta of Providence reign supreme.

It was not, however, with the view of entering upon an abstract metaphysical disquisition that we began this paper. Our object was rather to show succinctly by the aid of a few actual occurrences how a great proportion of our fatal accidents may be foreseen, and by the use of simple but proper precautions be altogether prevented. In place of simply deploring them, we ought to struggle energetically to prevent them. But in order to prevent an accident we must first of all get to the root of its occurrence; we must ascertain its cause; and the true causes, at least the proximate causes, of fatal accidents will be found, if properly and patiently investigated, to proceed in nine cases out of ten from two very simple elements: the first of which is *ignorance*; and the second, *negligence*. Very seldom, indeed, in this country, unless it may be in Sheffield or in some recent instances which occurred in the sister island, can we allege malice as the occasion of fatal accident. Sometimes it may happen that the fault lies on the part of the individuals who suffer, as in the case of a perverse youth who ventures beyond his depth in water, who cannot swim. But far more generally, we suspect, the fault is due to society itself, which tolerates, or at least acquiesces, in the dangerous conditions by which human life is endangered or sacrificed.

Of course, it can never be seriously maintained that fatal accidents are only an accompaniment of our modern civilisation; for the pages of ancient history are profusely chequered with such unforeseen events. In one of the most beautiful of those exhortatory Psalms, regarding the vicissitudes of human life, which the Church of England has enshrined in her Book of Common Prayer, there are four similitudes introduced as illustrative of the miseries of the captive Israelites which we have often thought might be applied, with some modification, to our perilous condition in certain aspects of the present state of society. The first similitude is that of a traveller in a desert; the second that of a prisoner in a dungeon; the third that of a man in a dangerous sickness; and the fourth that of a mariner in a storm. We need not adduce the perils by land and the perils by water which the Apostle so touchingly describes in the account of his earthly pilgrimage.

We need not enter on the general subject of what are commonly called shipping disasters; although it is unquestionably true that they occupy a front rank in our sorrowful statistics. We can only say to chronicle the fact that the number of shipwrecks on our own coasts reported to the Board of Trade during the past year reaches in all to the gigantic sum of 2,135. These figures contain no specification of the causes nor any estimate of the loss of life. But they are nevertheless sufficiently startling to demand the most searching and critical investigation. Those of our readers who choose to refer to the passages we have printed from the Board of Trade report on the wreck register will remember the terrible story which afforded some clue to the promiscuous as well as the precise causes of shipwrecks. One of the most common causes without doubt is collision; for it would appear that the high seas, wide and spacious as they are, are getting somewhat crowded. Over well-known and often-traversed ocean routes the danger is great; but in channels and the mouths of harbours it is very much greater; and during a dark and tempestuous night it is simply terrible. Collisions in the Thames have now become so notorious and so fatal that the day must soon arrive for a total revision of our river-police and our Admi-

nally regulations with regard to the number and dimensions of craft, the approach to quays, and the time for sailing. A general and thoroughgoing reform of the whole system of our coast-lights seems also to be urgently needed; and, what is still more imperative, a far more stringent and accurate definition of the laws relating to steering and slackening speed when vessels approach each other. Nothing, to our apprehension, is more horrible than to read an account of the foundering of a vessel at sea owing to a serious collision with a steamer or larger craft, produced in the latter case by imperfect steering or a careless look-out.

We have already compared the poor miners to the prisoner in the dungeon. But, alas! no dungeon is so deadly as a coal-pit. It would appear, also, that the more difficulty we have in bringing our minerals to the surface, the more the risk of death to the poor miners. As to explosions of fire-damp, it seems almost hopeless to suggest new remedies, in addition to what we already possess; and the same may be said of further sanitary legislation in this solitary particular. But this we can do, certainly: we can enforce the present law more stringently and effectually. And to this end we were glad to notice the other day that the magistrates of Aberdeen had convicted a collier for smoking in the Navigation Coal-pit, and had sentenced him to a month's imprisonment. We are also glad to observe the juries getting more alive to their duties and responsibility. At the inquest held on the bodies of three of the six men killed by the recent explosion of fire-damp at the Hendro-forgan Colliery, near Swansea, Mr. Wales, the Government inspector, strongly condemned the management of the pit, and expressed an opinion that the ventilation was not only insufficient, but that the arrangements for the distribution of air were "of the worst possible description." The jury returned a verdict to the effect that the death of the three deceased was caused by suffocation from after-damp, caused by an explosion of fire-damp; appending to their verdict a recommendation that the colliery should be at once placed under the control of a competent mining engineer.

How much meaning, alas! lies in that last recommendation,—a competent engineer. Put such a duly-qualified person in charge of every coal-pit, and we venture to say, if he possess the requisite powers, that the long and sad catalogue of fatal mining accidents will be very much reduced in number. And why should such a regulation not be made imperative, we venture to ask? We suppose there is no use in insisting further for the compulsory introduction of the double shaft in every mine.

And as to our railways, what more can we say? The director is, we are gradually discovering, just a modern species of the old and well-known *genus* impostor. Who shall estimate the loss of wealth which the British empire has suffered during the last twenty-five years from its foolish belief in the magical and symbolical substantive which is everywhere emblazoned over the portals of our institutions in the term *Board*? The most ingenious political casuist that ever lived—the Abbé Seyes himself—could have discovered no other method of government so perfectly well adapted to the end of evading all responsibility, and hence of perpetrating wrong.

We need not seek to support this position, as we have more than once, and quite recently, done so. Our present object is to assert more specifically—even on the time-honoured principle of "*Falsus in uno falsus in omnibus*,"—that our whole railway system is a mockery, a delusion, and a snare. It is a well-known axiom in medicine, where the head of an individual is suffering from vital and organic disease, there is too much reason to fear that the body, even to its very extremities, must also languish and consume. We have said enough, however, for the present about the dangers of railway travellers, whose remedy against railway mismanagement lies in sweeping actions of damages. But we may devote a few words in the interests of railway employees, to reiterate that some change is urgently needed in the constitution of their offices and the organising of their labours. It is impossible to take up a morning paper, particularly a country paper, without noticing the startling frequency of fatal accidents to railway guards, porters, or pointmen.

Such cases of accidental death always press upon our attention the necessity, in the first instance, of all railway servants working under a certain definite and well-ordered code of regu-

lations, which would render such accidents an impossibility; and, secondly, of employing only skilled workmen in such dangerous duties. Here we may recite the recent case of a young man, brought up in a country town, a farm servant in all probability, uninitiated with respect to the laws of matter—inertia, for instance,—and totally unacquainted, it may be, even with the elements of mechanics. He is appointed to the situation of a goods-train guard. What is the consequence? He is crushed to death and run over by an approaching truck, while shunting part of his train into a siding. The reporter, indeed, tells us, that the guard fell, and in all probability he did so; but it is at least equally probable that he was knocked down by the truck, in front of which he was, or ought to have been, clearly out of place. Nevertheless, another man, from Kinross, or some country district more remote, will doubtless be got to take his place, possessed of an equal share of mechanical knowledge, railway experience, and presence of mind. He, too, will run the same risks, and be exposed to the same dangers. But very few people would think it anything extraordinary should he, in course of time, under similar circumstances, meet with the same cruel fate. The only miserable consolation we can find in this individual case, is the fact that the poor sufferer has left no widow or children to mourn over his premature death.

Something, we think, is due at the hands of the Government.

Our English constitutional Government is, doubtless, a great and a wise institution, but its warmest admirers are compelled to admit that it is sadly deficient in the paternal element, and that under some of its very highest phases of development it falls immeasurably short of our everyday requirements. We cannot help thinking that there is a screw loose somewhere. May it not be that we are somehow suffering under a false theory of political economy, or under erroneous ideas of what constitutes liberty?

Why, for example, should a poor man, who does not know the nature of carbonic acid, be permitted, as we have frequently asked, to commit unintentional suicide down an old well? Why should a poor over-worked London milliner be poisoned with the noxious and confined atmosphere of her work-room? Ought that mineral green colouring matter, of which the principal constituent is arsenic, be tolerated in the manufacture of paperhangings and artificial flowers? What must we do, to come nearer home, to put a stop to those fatal building accidents, which are for the most part a scandal and a reproach to our profession? Is there not the most urgent need for some reformation in the matter of bricklayers' scaffolds? Are all our projecting cornices safe? Are all our sewers and drains quite innocuous? What about our water-tanks and our gasometers? We need not go on with such common-place illustrations. Only this we may point out further, that our whole system of sanitary administration has been found grossly defective in regard to the poorer classes of society, and that here, as well as in other cases, we require a better and more effective system of supervision.

For, after all, we suspect the proper cure of this excessive mortality which is induced by fatal accidents will resolve itself into a system of police (that is to say, of inspection and of supervision), or public economy, as it was styled in Athens by Plato and his school. We have more than once pointed out the means; and let us add, that, whatever way the problem may be solved, we can only trust, in the interests of humanity, that it may be solved as effectually as it would have been done by those illustrious disciples of the Portico, who regarded the loss of an individual by accident as an irreparable loss to the state. There can be no doubt but our modern life is vastly more complicated in its relations; but our scientific knowledge is also greater; and accordingly it would be easier for us to guard against our fatal accidents, if we would only condescend to make use of the proper means. Ignorance such as we see may be enlightened, and negligence may be punished; but for apathy there is no resource; and we are all, perhaps, too apathetic on this subject. But it is high time we should bestir ourselves. The eyes of all Europe point to England as their leader in the practical applications of science. If we will first of all, therefore, learn to distinguish between an accident and an essential in this vital question, one step will be gained towards striking a vigorous blow at the root of it; to a

study of the preventable causes; to an application of the proper means; to an imposition of the necessary authority, and an enactment of the required regulations. We should then hear much less about fatal accidents, falsely so called; and nothing at all of that perverted philosophy which seeks, in the teeth of our better instincts, to classify them as an attribute of our modern civilisation.

MODERN HOUSE, PADERBORN, WESTPHALIA.

MR. GULDENPFENNIG, the diocesan architect to the Bishop of Paderborn, has recently erected several very remarkable modern houses in that town. The general idea of these buildings is derived from a careful study of the ancient domestic architecture of Northern Germany. The detail is of a somewhat earlier description than we are in the habit of seeing used in domestic work, and seems to partake of the style of the thirteenth century.

The house which we now illustrate is perhaps the most elaborate of this series of domestic buildings erected by Mr. Guldenpfennig. It is situated on the glacis of the town, and has attracted considerable attention from its quaint and remarkable appearance. At first sight, it is difficult to believe that one is really looking at a modern house, and expects to be told that it is a careful restoration of some ancient building; however, upon nearer inspection it will be seen that modern appliances are by no means disregarded, and that the architect, while building a highly picturesque and ornamental house, has also amply provided for the comfort and convenience of its inmates. We have not given a plan of this building, because the habits of a German family are so much more simple and primitive than our own, that many things which would be considered absolutely necessary in an English house are altogether omitted in a German house, and other things which we should consider of no importance are indispensable to the *menage* of a German household. In addition to which, the fact that three or four families live in one house makes an arrangement necessary which would be perfectly inapplicable to the same kind of building in England.

It will be inferred from our illustration that the house is built in the general form of the letter L, and stands at the corner of two streets. There are two entrances, one in the centre of the longest side, and the other most ingeniously contrived in the base of the tower: a detail of this is given in fig. 1. Over the principal entrance a bold and very picturesque bay-window projects, supported upon stone corbels, a detail of which is given in fig. 7. A second bay-window projects from the angle of the house; it is boldly bracketed forwards on wooden corbels (see fig. 2). The windows are all divided horizontally into two parts, the upper one being fixed and glazed in ornamental patterns, which in the principal apartments are formed of glass of various colours, arranged in intersecting circles and squares, but in the bedrooms they are formed of simple circles of greenish glass. Details of one of the more important windows are given in figs. 4, 5, 6. The lower portions of all the windows are wooden casements made to open.

The house is constructed of brick, laid in what we call "English bond," which, strange to say, seems to be the only "bond" used on the Continent. What we are in the habit of calling "Flemish bond" seems to be peculiar to this country, and is certainly not to be found in Belgium, or to the best of our knowledge, in Holland; so why it is called "Flemish bond" we leave to be decided by the writers of future architectural dictionaries.

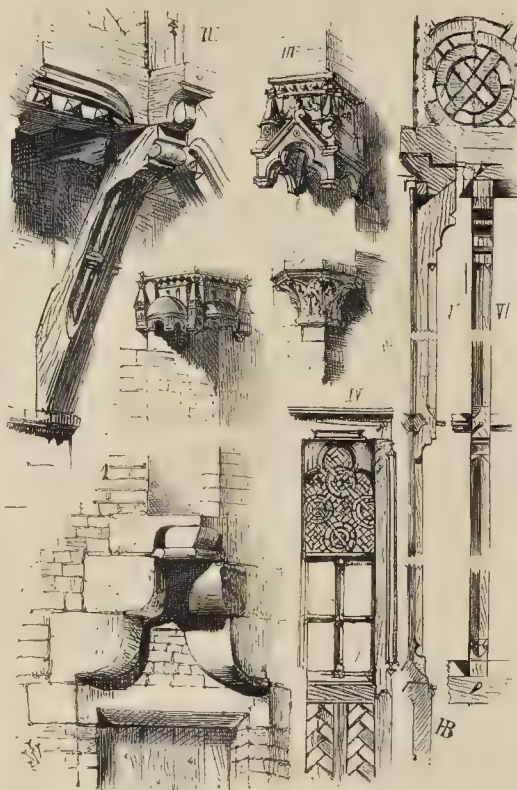
The brick is used with very thick joints, and the mortar kept back about $\frac{1}{2}$ in. from the face of the bricks. All the "putlog holes" are left open, a practice which is universal in ancient German brickwork. This kind of construction gives a very picturesque appearance to the building, and looks far better than our "tuck jointing" and "putty pointing;" in addition to which it is far more durable, and less expensive. The roof is slated, the slates being laid obliquely, as is the usual custom in Germany.

The interior of this house is as carefully studied and well executed as the exterior; most of the ceilings are divided into square panels by moulded ribs, and decorated in colour. The walls are also painted in diaper patterns.

The Cathedral of Paderborn, a noble Gothic church, about 360 ft. long, is undergoing a thorough restoration, from the designs of the same architect, who is also engaged upon many other works in the diocese. Our illustration is from a drawing made for us on the spot.

REFERENCES.

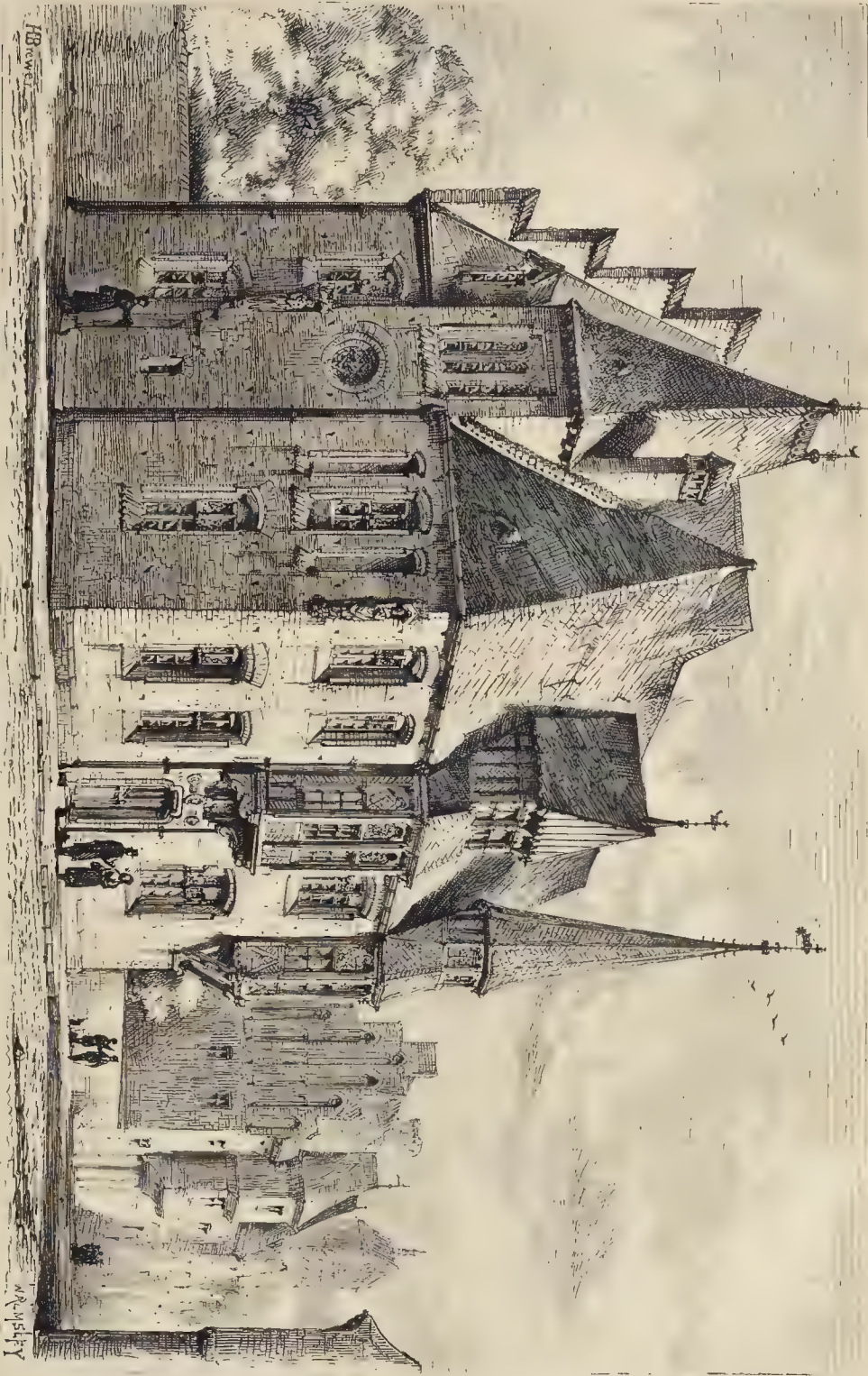
1. Head of doorway in the tower.
2. Corbel of angle bay-window.
3. Niche at angle of house.
- 4, 5, 6. Details of windows.
7. Head of principal doorway, fanlight, and corbel of bow-window.
8. Portion of window on ground floor.



MODERN HOUSE IN PADERBORN.

Details.

MODERN HOUSE IN PADERBORN, WESTPHALIA.—MR. GÜDENPENNIG, ARCHITECT.



SANITARY MATTERS.

A Fever-stricken Town.—Dr. Buchanan, a Government inspector, sent down by the Medical Department of the Privy Council, has been engaged in making a sanitary inspection of the town of Whitehaven. Attention had been directed to the high rate of mortality in the town, and inquiry showed that during the last four months there had been, out of a population of 19,000 people, between 360 and 370 cases of typhus fever, and one patient out of every six had died. The medical officer of the local Board of Trustees attributed the frequent occurrence of fever at Whitehaven to over-crowding and defective drainage. Out of 4,538 inhabited houses, 2,500 had no drainage, except the surface. He stated that he had urged upon the Board the absolute necessity of enforcing a proper and efficient system of household drainage. Dr. Buchanan inspected the town, which occupied him three or four days. The effect produced upon his mind by this inspection was that, after he had been in the town a few hours, he telegraphed to the Privy Council, that Whitehaven, infected and over-crowded, was not a fit place for the Cumberland Militia to assemble in for their annual periodical training. The adjutant has, by order of the Secretary for War, issued a notice countermanding a summons to meet there, and announcing that the Cumberland Militia are not to assemble this year.

Fever in Wales.—The neglect of sanitary precautions in some parts of Monmouthshire has led to alarming mortality. Defective drainage and the proximity of pigsties to dwelling-houses have borne the fruit that might have been expected. Pontnewydd and Cwmbran, villages between Newport and Pontypool, are suffering frightfully from typhoid fever. Blaenavon, a town numbering some 8,000 inhabitants, is in a deplorable state; and measles are carrying off the children at the rate of six or seven a day. It is computed that the death-rate had risen to the frightful figure of 163 per 1,000, instead of the usual proportion of about 20 per 1,000. The *Gambrian* states that fever is raging in and around Melincroth, Neath.

Proposed Fever Hospital for Sheffield.—A meeting of governors of the Sheffield General Infirmary has been held, for the purpose of explaining the proposition of the medical staff and Weekly Board to erect a new building, isolated, for the treatment of offensive surgical cases and contagious diseases, in the house; also to explain plans and to take into consideration the best means of raising the necessary funds. Mr. Curry, architect of the new St. Thomas's Hospital, has prepared plans, and he estimates the cost of the building at 7,000*l.*: with the extras, however, it is expected that 10,000*l.* will be required. A resolution was adopted, authorising and requesting the Weekly Board to carry out the plans in such manner as may seem most expedient. It was also resolved, that in aid of the necessary funds for the erection of the new building, a subscription be forthwith opened. The Duke of Norfolk has promised 1,000*l.*, and Messrs. Mark Firth & Sons, 500*l.* Several other manufacturers have promised 250*l.* each, and nearly 3,000*l.* were subscribed in the rooms.

The Sanitary State of Edinburgh.—The medical officer of health has been making a survey of a district in the Old Town, of which we lately spoke. At a recent meeting of the town-council he gave in a report, in which he says:—

"The medical officer begs to submit to the town-council the results of a survey he has made of a limited portion of the Old Town, comprised between the High-street and the Cowgate, to the north and south, and between the South Bridge and George IV's Bridge, to the east and west. This he has done, not in consequence of any outbreak of disease in the district in question, but because he was anxious to make himself more thoroughly acquainted with the condition of the houses of the inhabitants. Some of the houses were in such a dilapidated state, or so confined in their dimensions, that the medical officer has brought them specially under the notice of the council. The general want of water and of gas was noted as a sanitary grievance. The number of families living in this district has been estimated as 700. All of them pay largely for their house accommodation, and it seems but reasonable to insist that landlords should execute all necessary repairs. This, it appears to the medical officer, could best be effected by calling upon landlords throughout such an area as the one under examination to repair their property simultaneously, and not by singling out here and there individual landlords. In the one case, the repairs, when executed to the satisfaction of the authorities, would be paid for by increased rent, and the inhabitants, already high-rented, would find it impossible to resist the claim; but in the other case, if all the landlords of a district were compelled to put their property into a state of decent repair, it would be impossible to raise the rental of the district, and the inhabitants would reap the advantage of improved house accommodation. If the experiment

proved successful, it could easily be extended to the other parts of the Old Town. With regard to the common stairs, the medical officer begs to refer to the report on their condition, recently presented to the Council, and also to the statement regarding them contained in his general report on the sanitary condition of Edinburgh, in which he has insisted on the cleansing and lighting of the common stairs as a most important step in improving the sanitary condition of the Old Town."

Lord Warwick and Sewage Irrigation.—The negotiations between the Earl of Warwick and the Leamington Local Board of Health, for the disposal of the sewage of the town on his lordship's estate, has been brought to a satisfactory termination, and the agreements between the Board and his lordship have been executed and exchanged. His lordship agrees to pay 450*l.* per annum for the sewage, which the Board are to be at the expense of pumping to a given point on his estate, when his lordship will undertake the entire responsibility of disposing of the sewage on land prepared for its reception. The agreement is to extend over a period of thirty years, and the necessary works are to be completed by the Board, and the delivery of the sewage commenced, on the 25th of March next.

Adoption by New Shoreham of the Leamington Sewage System.—The Local Board have had under consideration the report of a committee consisting of the chairman, and Mr. T. F. Gates and Mr. W. H. Harper, who were selected by the Board to visit the Leamington Sewage Works, along with Mr. Colbran, of Brighton, and report on the same with reference to the applicability of the system to Shoreham. After undergoing the deodorising process, the sewage, having been fairly dried by means of a patent revolving pan, said the report, is spread out in the open air for two or three days, and sprinkled over with sulphuric acid to fix the ammonia, after which it is riddled and thrown up into large heaps, where it remains a fortnight, and is completely dried by natural heat, and becomes manure, which is eagerly sought after by the farmer and market gardener. It is sold at 3*l.* 10*s.* a ton. Mr. Colbran stated that the scheme, with a few minor alterations in the way of economy, would be applicable to Shoreham. The cost of manufacturing the manure at Leamington was but 30*s.* a ton. There was very little steam required,—only a two or three-horse engine,—for lifting the mud from the bottom of the tank; and this at Shoreham, which was a much smaller town, might be done by hand. Some plans were laid before the Board by Mr. Colbran, who made no report, and they were approved of. The meeting decided upon a site for the sewage works, and left the treating for purchase in the hand of their clerk.

Land for the Sanitary Works at Kidderminster.—Mr. Arnold Taylor, the commissioner appointed for the purpose, has attended at the Guildhall, Kidderminster, to inquire as to an application by the town council, to put in force the power of the Land Clauses Consolidation Act for the purchase of land for the sanitary works. The town clerk said the requirements of the Act had been complied with, as to the advertisements and notices. The commissioner then examined the plans. The proposed sewage farm is over 150 acres, and the population is estimated at 22,000 at the present time. The commissioner said that would be sufficient for a beginning, and Mr. Fairbank said that by extending the outfall sewage a greater distance, they could afterwards take other lower-lying land, if they required it. The commissioner said he had no doubt that fresh legislation would give them increased power of getting land for their purposes. The evidence taken in support of the application having been completed, and there being no opposition, the commissioner said it was gratifying to find that no one had appeared to oppose the scheme. With a rateable value of 42,000*l.*, they could obtain borrowing powers for nearly 84,000*l.*, and although they might not want this sum yet it would save a second application to the Government. The loan could spread over fifty years instead of thirty, which would make the payment of principal and interest much lighter for the ratepayers.

The Reigate Sewage.—At a recent meeting, the mayor said he had a further communication to present from the British Association, in reference to the treatment of the utilisation of sewage and the causes of its failure. It was proposed to select 250 towns or districts, representing types of towns whose works should be examined and reported upon. The committee desired to know whether, if Reigate were selected, every facility would be given to the examining engineers and chemists? The mayor further said he believed the Association asked for subscriptions.

The matter was referred to the sanitary committee. A letter was read from the solicitors of Mr. Henry Clutton, with reference to the proposed sewerage works. The letter stated that the writers had been informed that under the present scheme one or more outfalls were to be constructed near the residential property of Mr. Clutton, called Dovers Lodge, to a stream that flows through his land, and he entered his formal protest against the scheme, as in case of heavy rainfalls, certain foul and noxious matter was sure to be sent there to the injury of his property. Under the 24th & 25th Vict., chap. 61, he felt that he would be compelled to take such steps as might be advisable to protect his interests. The solicitors requested to be informed how far the proposed scheme had been sanctioned or carried out. This letter was also referred to the sanitary committee.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the closing annual meeting of this society, Mr. F. Horner, president, in the chair, it was stated that the subscriptions received during the year amounted to 86*l.* 2*s.*, and there was a balance of 2*l.* 17*s.* 6*d.* in hand.

Mr. H. H. Vale was elected president; Mr. G. A. Andley and Mr. John P. Bradley, vice-presidents; Mr. Parslow, librarian; Mr. G. F. Deacon, treasurer; and Mr. H. H. Statham, jun., secretary.

On the motion of Mr. S. Higgins, seconded by Mr. Bradley, a special vote of thanks was awarded to Mr. Statham for his valuable and indispensable services as honorary secretary during the past and preceding years; and on the motion of Mr. Boulton, seconded by Mr. Vale, a similar compliment was paid to Mr. Bradley, the retiring treasurer.

The president, in his closing address, said, "I am sorry that we cannot congratulate ourselves upon any improvement in the position of fine art in Liverpool; for it seems this great community is still unable to restore and support its once noble annual exhibitions. We expect this year to be visited by the British Association. On former occasions while they were here these autumn exhibitions were open, and proved a source of great interest to many of their members. Are we this year, then, to betray the nakedness of the land, and practically admit that we have been obliged permanently to close the doors of our academy? I have often felt that it would well become the learned societies of the town to combine in endeavouring to raise art from the very low estate into which it has fallen among us, and I am sure that any such movement would meet with a hearty response and support from many of our wealthy connoisseurs who may have both the will and the power to help in so good a cause. Birmingham and Manchester continue to support their exhibitions creditably, and it seems a reproach to modern Liverpool that she cannot do the same."

TERRORISM AT MANCHESTER.

A DETERMINED attempt is being made to get at the perpetrators of the outrage connected with the brickmaking business at Manchester. In addition to 500*l.* offered by the authorities of Manchester, and 100*l.* to be given by Government, the master builders of Manchester and Salford have agreed to give 200*l.*, those of Birmingham 50*l.*, and Mr. Johnson himself 150*l.*, to induce those who are in the secret to betray the actual perpetrators of the simultaneous outrage at Mr. Johnson's house in Levenshulme and his timber-yard at Ancoats.

Should all this not suffice, as many thousands as hundreds of pounds ought to be offered for the purpose, as it is all-important that such proceedings should be put a stop to at the outset. Otherwise, should the villains escape in this instance, others may be instigated to pursue the same system of terrorism in order to accomplish their nefarious ends. Greek brigandage,—Irish Ribbonism,—is nothing to this; for in these cases respectable persons are safe so long as they do not expose themselves to peril in byways and country districts; but here is a case where terrorism is brought to their very doors. Mr. Johnson, we learn, dares not let it be known where he is to sleep from night to night. He is obliged to disuse his own conveyance, and skulk to and from his business and his home in unexpected modes, and at unanticipated times. His premises are watched by prowling scoundrels; and, worse than all, the Manchester police have

IMPERIAL INAUGURATION OF THE
VIENNA WATERWORKS.

The execution of this great work, after having been for several years under discussion, has been ultimately decided on.

The supply of water to Vienna and its suburbs, comprising a population of about 800,000 inhabitants, is a matter of the greatest importance. Hitherto the whole supply was obtained from the Danube. By the present project it will be drawn from the "simmering" at the foot of the picturesque Alps, from two springs, viz., "Kaiserbrunn" and "Stixenstein," whence the purest spring water will be conducted to the principal reservoir, the "Rosenhügel," a spot beautifully situated on a hill near Vienna. Here, on the 21st of April, the Emperor of Austria solemnly inaugurated these works, attended by the Imperial family, the Austrian Court, the English and other Ambassadors, the nobility, and municipal council of the city, and all the notabilities of the empire.

The total length of the line of these works, from Kaiserbrunn, and from Stixenstein to the Rosenhügel, is 312,375 ft., passing by Ternitz, Baden, Weikersdorf, Matzendorf, and Mödling. The two springs at Kaiserbrunn and Stixenstein are to join at Ternitz. There will be 24,900 ft. of tunnels, the longest of which, in the "Höllenthal," measures 8,463 ft. Through the whole length of the line the water will be conducted in walled and covered canals, worked with hydraulic lime and Portland cement, where the water level will be 6 ft. beneath the surface of the ground, to protect the water alike from frost and heat. The most important viaducts will be constructed at Baden, Mödling, Liesing, Maur, and Speising. From the reservoir at Rosenhügel the water will be conducted to the two other reservoirs at Schmelz and Wienerberg (called "Spinnerin am Kreug") in cast-iron pipes of 33 in. and 36 in. diameter. From these three reservoirs the water will be led to the interior of the town through pipes of the smallest diameter.

The Donan canal and river Wien are to be traversed by pipes, sunk beneath the bed of the river, in order to continue the system from the opposite banks, and the top edges of all the pipes will be also laid 7 ft. beneath the surface of the ground. The length of this line of pipes is about twenty-three English miles, and that of the whole system about eighty English miles.

The total length of the five viaducts is 8,382 ft., the longest of which, at Baden, is 2,769 ft. The contractor for these works is Mr. A. Gabrielli, of Westminster Chambers, London.

KIRBY-HILL CHURCH, BOROUGHBRIDGE,
YORKSHIRE.

KIRBY-HILL Church has been re-opened for divine service. A short time ago, in consequence of the dilapidated condition of the church, the opinion of Mr. Gilbert Scott was obtained. His plans were adopted, and the contract for carrying out the restoration was entered into with Messrs. Shafte & Barry, of York. They have completed the work under the direction of Mr. Alfred Eoome, clerk of the works. Owing to limited funds, the original contract did not embrace all the restoration necessary to complete the church in its integrity, but this has since been done. The church is of great antiquity, and many remains of carved crosses and other stones, evidently of Saxon origin, have been found during the progress of the works. The south porch doorway is Norman, but the remains of two former doorways still exist beside the present one, some arch-stones remaining of one, and the jamb and carved impost of another. The Norman arcade dividing the nave from the north aisle has been restored. Some mural painting discovered upon the arches has been preserved. This arcade, also, from the appearance of the stones, is an insertion in a Saxon wall. The north aisle has been entirely rebuilt, in pulling down the walls of the former aisle, a fragment of tracery was found belonging to an ancient Decorated window. The design was traced, and has been carried out in the new windows. The whole of the seats in the church are now of oak, made from the original design, with carved poppy-head finials, and the ancient seats found in the church have been re-used. The main features of this church now present a similar appearance to what they did centuries ago, and there is sitting accommodation for upwards of 250.

SCHOOLS OF ART.

The Derby Central School.—On the eve of the inauguration of the Derby Art Treasures Exhibition, there was commenced at the Mechanics' Institution, Wardwick, a Central School of Art. The school is in connexion with the Science and Art Department, South Kensington, under Government inspection, and will receive a share of the Government grant according to the proficiency of the pupils. The school opens under distinguished patronage, and is to be worked under an earnest committee, by a very competent teacher. Some years ago an attempt was made under far less favourable auspices to establish such a school.

The Southampton School.—The foundation-stone of the new School of Art now in course of erection at the rear of the Hartley Institution has been laid. The stone bears the following inscription:—"Southampton School of Art.—This stone was laid by Mr. Conncillor Chipperfield, chairman of the Hartley Council, on April 6th, 1870.—Frederick Perkins, esq., mayor; James Lemon, esq., M.R.I.B.A., architect; F. T. Bond, esq., M.D., F.C.S., principal; Messrs. Joseph Bull & Sons, builders." The building, according to the local Independent, is rapidly approaching completion, and is expected to be fit for occupation at the conclusion of the summer vacation.

CHURCH-BUILDING NEWS.

Shiplake.—The ancient church of Shiplake has been re-opened after restoration. The work has been carried out by Messrs. Wheeler, of Reading, from plans by Mr. G. E. Street, of London. The chancel is entirely new. The stained glass windows and polished marble pulpit are the principal features seen on entering the church. The whole of the north wall is new, as also the chancel; eleven windows have been filled with stained glass, by Messrs. Horwood, of Frome; the small baptismal window being presented by Sir R. Phillimore. The chandeliers were made by Messrs. Hardman, of Birmingham; the pulpit and reredos are of alabaster, carved by Mr. Earp, of London; the tiles were made by Godwin, of Lugwardine, those in the chancel being expressly manufactured for the Shiplake Church. The bells have been re-hung by Messrs. Warner, and a new one given by the vicar added to the peal. Messrs. Wheeler, of Reading, were the builders employed.

Breinton.—The Church of St. Michael, Breinton, on the Wye, has been re-opened. The present restoration consists of the re-building of the chancel on its old foundations, the old windows having been worked in, again, and the partial re-building of the nave, the west gable, and western end of the south wall of which remain as they were; the remainder is new. The nave is divided from the chancel by a large and well-proportioned arch. On the north side of the nave a new aisle has been added, which is divided from the nave by an arcade of four pointed arches, carried on columns of blue Harnham stone, with moulded caps and bases. The nave is lighted on the south side by two windows, one having three lights and the other two. There is also an old lancet window over the circular-headed doorway at the west end. In the north wall of the aisle there are three windows, having two lights each, and of similar character to those on the south side of the nave. There is a long lancet window in the west end of the north aisle, and a circular window at the east end, over the archway leading to the organ-chamber and vestry. The floors throughout, the nave, north aisle, porch, vestry, and chancel have been laid entirely with tiles from Mr. Godwin's manufactory at Withington. The seats in the nave are of deal, varnished. All the roofs are new, and covered with slates; the nave, aisle, and vestry being open-timbered. The walls of the chancel internally are painted. There is a bell-turret, about 8 ft. square, at the west end of the nave, surmounted by a spirelet, treated entirely in slate and lead work. It is about 68 ft. high from the ground-line to the top of the vane. The cost of the work has been about 1,600l. The contractors were Messrs. Collins & Cullis, of Tewkesbury, by whom the work has been carried out from the designs and under the superintendence of Mr. Frederick H. Kempson, Hereford. The stained glass three-light window in the south side of the nave is the gift of Mrs. Eckersall.

Bilton.—The ancient parish church of Bilton having gone much to decay, has undergone a restoration under Mr. G. G. Scott, and the structure

has been re-opened for divine worship. The expense incurred by the restoration is in round numbers the sum of 1,200l. The restoration has been carried out by Mr. Brumby, of York, the contractor. Mr. Brumby sublet the carpenter's and joiner's work to Mr. Dennison, of York.

Burton-in-Lonsdale.—The new church of All Saints, which has been built at the sole expense of Mr. Thomas Thornton, of Brixton-hill, London, "for the benefit of his native place," has been consecrated. The building is in the Early Gothic style. The site chosen is in close proximity to the old church, and upon ground formerly occupied by cottages, in one of which the benevolent donor was born. The dimensions are:—Nave, 66 ft. by 22 ft., with aisle, 66 ft. by 17 ft.; chancel, 33 ft. by 21 ft. The tower contains six bells. A residence for the vicar has been erected near the church. The parish church of Thornton-in-Lonsdale, which is about four miles from Burton, has also been consecrated after having been rebuilt. It is dedicated to St. Oswald, and the architecture is of a similar style to Burton Church.

Birstal.—The parish church of Birstal, which has been entirely rebuilt and enlarged, has been consecrated by the Bishop of Ripon. The total cost of the re-erection has been nearly 18,000l. The church is in the Early Perpendicular style of architecture. The extreme length within the walls is 118 ft. 6 in., and the breadth 80 ft., and height to ridge, 41 ft. The outer walls are all faced with dressed ashlar, which, together with the moulded and carved work, is executed in Huddersfield stone. The porches, north and south, are lofty, and have groined ceilings, with groined ribs. A battlemented parapet runs round the eaves and gables throughout, and is broken up by carved and crocketed pinnacles over the buttresses and at the corners. The apex is further enriched with crosses. The clearstory is lighted on either side with eight two-light windows, with traceried heads. The east window has seven lights, and the head is filled in with moulded decorated tracery. The end windows to the outer aisles are each three-light, traceried. The whole of the other windows are square, with cusped heads, and retain as near as possible their original position. The roofs throughout are of deal, with moulded trusses and traceried spandrels, and the chancel-roof has hammer-beams, on which angels are carved. The seats are of oak, with moulded and carved ends, and in the chancel are placed stalls, which were executed by a Cambridge firm. Messrs. Hardman & Co., of Birmingham, executed the stained-glass east windows. The ironwork in the nave is by Mr. J. F. Firth, of Birstal. Mr. Rudcock, of London, did the stone-carving in the chancel, and that in the remainder of the building was executed by Mr. W. Stevens, of Dowsbury. The whole of the building has been carried out by Mr. Thos. Whiteley, of Leeds, from the designs of Mr. W. H. Crossland, of Leeds and London. The church will seat 1,050 persons.

Pitminster.—The church here has been re-opened by the Bishop of Bath and Wells, after undergoing a restoration. The church was in a very dilapidated state. Mr. Allen, of Crewkerne, architect, prepared the plans for the restoration. The rough casts that were placed outside the tower a few years ago have been removed, and the stonework pointed, and made to look as it did originally. On the north side the walls have been renewed with flint and sandstone, with Hamhill dressings, and the porch has been raised and surmounted with a parapet, with carved cornices and angels' heads, with a cross in the centre. The old windows on that side have been taken out, and a couple of new ones substituted. A new roof has been put to the nave, and new clearstory windows. The organ gallery has been removed, the western side thrown open, and the southern aisle widened. The pews have been removed, and open benches substituted. The roofs of the nave and aisles are of deal, stained and varnished. A south porch has been built, and the roof of the chancel is of oak. A new chancel arch has been erected, and a new arch has been built between the north chancel and the north aisle. In the chancel there are reredos, with diapered panels, and ornamented carving.

Ulcumb.—The parish church has been re-opened after having been restored. The works commenced in 1864, and have been from time to time since carried out by the architects, Messrs. Slater & Carpenter, as far as the funds would allow. The works consist of new roof on chancel, with panelled and moulded ceiling, as also all

the roofs throughout the church, the whitewash removed from the stonework, and replastered, the whole of the walls restored, the windows reglazed, and some new windows added, the old wainscot pews removed and replaced with open back wainscot seats, new reading-desk, altar table and rail, chancel paved with Milton's tiles, and the old pulpit renovated and replaced. The contractor was Mr. William Bottle, of Harrietsham. Two carved seats in the chancel have been given by Mr. Pepper, of Brighton. The old oak roof in Wandsworth Chapel has been cleaned and repaired, and the chapel has also been newly paved and plastered.

Great Yarmouth.—St. James's Church has been partly opened. The portion completed will form the chancel. The church has been designed by Mr. Seddon, upon a scale almost rivaling that of St. Nicholas. The extreme width between the aisle walls will be nearly the same, and the height of the chancel is not less lofty, 70 ft. The portion already erected presents a somewhat curious appearance, and gives no idea of the whole plan. It is constructed of brick and flint work, and is only a fragment of the design. When completed, the new church will accommodate from 1,000 to 1,200 persons; and its area will contain only four columns, so that sight and sound will not be interfered with. The plan is a Greek cross, with aisles parallel to the nave and chancel, bringing the general form nearly to a square. The style is Early Geometrical Gothic. There is to be no internal plastering, as the walls are finished in brickwork, dispersed in colour. A lofty tower and spire are contemplated at the north-east angle. The cost of the chancel, as built, is about 1,000l., and the whole church, when fully completed, will cost from 8,000l. to 10,000l. At present, however, the Iron Mission-room has been joined to its neighbour, and forms a north aisle. The new space will seat about 230 persons, so that with the iron aisle, 500 may join in the services of the church. All the sittings are free.

FROM SCOTLAND.

Edinburgh.—The executive committee of the Scottish national memorial of his Royal Highness the Prince Consort, finding that the sculpture intrusted to Mr. John Steel, R.S.A., and other distinguished Scottish artists, has made very satisfactory progress, and is already far advanced, have been considering the description of pedestal that ought to be erected, and have come to the conclusion, according to the *Scottsman*, that it ought to be of polished red granite, and not of freestone, as originally proposed. The granite pedestal, executed as proposed, would, it is said, be the finest granite work in the country, and it can be erected for about 2,000l. more than the committee have at their disposal for that purpose. They have, therefore, resolved to appeal to the public for the additional funds. The eighth annual general meeting of the Edinburgh Workmen's Homes Improvement Company (limited) has been held, Admiral Sir Wm. Ramsay in the chair. The report stated that the progress was on the whole satisfactory. The net revenue arising from the rental of the houses enabled them to maintain the dividend of 5 per cent., and to add a further sum of 68l. 12s. 9d. to the reserve fund. Although the houses built by the company at Dumbiedykes are at present all occupied, the report stated that the great extent to which building has recently been carried on in the neighbourhood of the company's buildings and elsewhere has had an appreciable effect on the letting of houses. Several of them stood vacant during the first and second quarters after Whit Sunday, and one was vacant for three quarters. There continued a great demand for the lower ranked houses, and it was only the houses of the highest rents (12l. a year) that there was any difficulty in letting. The report was unanimously adopted. The late Miss Walker, of Coates, Edinburgh, has bequeathed her estates to the Scottish Episcopal Church. The value of the bequest is 200,000l., of which, 40,000l. are to be devoted to the erection of a cathedral church in Edinburgh.

Limithgow.—Since 500l. were given by Mr. David Hutchison, of Glasgow, to improve and alter the parish church, considerable progress has been made towards that object. The estimated cost, it is understood, is fully 2,000l. Of this sum about 1,000l. have been promised, and Mr. J. Hardy, chairman of the town-council's committee, has been in communication with

Mr. Ayrton, Chief Commissioner of Public Works, and Mr. Howard, of the Woods and Forests department, regarding Government assistance. Mr. Howard is prepared to recommend a grant of 100l., on the condition that the other subscriptions amount to 1,500l.

Giron.—The foundation stone of a United Presbyterian Church has been laid here. The edifice will be of the Gothic order of architecture. It is intended to contain 400 sittings, and will cost 1,600l. of which 1,000l. are already subscribed.

Melrose.—Some time ago, the Lunacy Board of Berwick, Roxburgh, and Selkirk shires resolved to erect an asylum for the accommodation of the insane within these counties. A site was fixed upon in the vicinity of Melrose, immediately to the north of the Eildon Hills, where a field twenty-five acres in extent was purchased from the Duke of Buccleuch at a cost of 1,500l. The general plan of the asylum buildings forms three sides of an elongated quadrilateral figure, with a centre block between the wings. The general height is two stories. The south-west front is 377 ft. in length, and the south-east and north-west fronts 143 ft. 8 in., and the centre block between the wings surrounding a small open court is 100 ft. by 120 ft. The long line of the south-west frontage is relieved by the centre building, which consists of the recreation-hall on the ground, and the chapel on the second floor, being thrown forward considerably; and by the infirmaries, which are placed at the right and left angles, projecting 43 ft. forward from the general front line. It is further relieved by the style of architecture adopted in the centre division; large windows in keeping with the nature of the apartments (the recreation-hall and chapel) fill up the projection, and this again is surmounted by two towers, 35 ft. apart, rising to a height of 70 ft., or 34 ft. above the general line of the front elevation. On each side of the recreation-hall in the centre, the plan repeats itself, the south side being intended for female patients and the north for males. Considerable progress has been made with the mason-work, upwards of 200 rods of wall being finished, but the building is not expected to be ready for occupation before the spring of 1872. It is intended to accommodate about 150 patients. The total cost will be about 30,000l. The architects are Messrs. Brown & Wardrope, Edinburgh.

The Tay Bridge.—The passing of the Tay Bridge Bill being now certain, the directors of the North British Company intend, it is said, immediately to proceed with the necessary preliminaries, so that operations may be commenced without delay. Certain important alterations are contemplated on the bridge, with the view of reducing the expense and improving the gradients. The works are expected to be begun by August.

Books Received.

A Text-book of Art Studies for Use in Schools and Families. By HENRY WARREN, K.L. London: William Mackenzie. 1870.

MR. HENRY WARREN has long been appreciatively known as the president of the Water-Colour Institute, and an excellent teacher of his art. Like a' who think on the subject, he grieves over the ignorance in art matters that prevails, and the little care shown for it in general education, and he has issued this little book for schools to supply a want. It takes the shape mainly of a dictionary of painters, sculptors, gem engravers, and illuminators, chronologically placed, with observations interspersed on the art of the different periods. It is a little confused in parts, and wants careful revision by a literary hand. For example, speaking of water-colour drawings, by Ostade, in the British Museum, he says,—"A great number of such drawings by Dutch and French painters exist in Holland and elsewhere; and they bring us down with little change of manner of execution to our own Paul Sandby, our Cozens, our Rooker, our Beane, and so to our Girtin, and even our own Turner. Having executed many drawings in Scotland, he went, in 1752, to reside at Windsor, where he made above sixty views of the scenery in that neighbourhood. They are careful, elaborate, and characteristic, introducing as subordinate figures, many well-known personages and characters. His architecture, chiefly portions of the castle, are well and carefully drawn. They are executed in both body and transparent colour. They were all purchased by Sir Joseph Banks at a liberal price."

To whom this refers is not clear. It is certainly not to Turner. Nevertheless, the little volume is well calculated to be of service; wherever

dipped into something or other useful may be picked out; and we shall hope to find it circulating.

The Science of Building: an Elementary Treatise on the Principles of Construction, especially adapted to the Requirements of Architectural Students. By E. WYNDHAM TARN, M.A., Architect. London: Lockwood & Co. 1870.

OLD readers of the *Builder* will not require an introduction to the author of this manual, Mr. E. W. Tarn, or to be told that he has given much more attention to geometry and mathematics than the majority of architects. In the present work he has sought, and successfully, to lay before the student of architecture and building a general outline of the scientific subjects connected with his profession, an acquaintance with which could previously be obtained only by going to a number of works by various authorities. The headings of the seven chapters into which the volume is divided, will show the scope of the work:—1. Mechanical Forces; 2. Retaining Walls; 3. Arches, Cupolas; 4. Building Stones; 5. Timber; 6. Iron; 7. Water contained in Vessels and Pipes; and a Table of Weight per Cubic Foot of Building Materials is given as an appendix. The title, "The Science of Building," is a little too large perhaps, but so far as it goes we have here a very valuable book, which we strongly recommend to all students. The author has sought, by avoiding the use of the higher mathematics, to bring the various subjects within the capacity of those whose mathematical attainments do not extend beyond elementary geometry and algebra. Mathematical knowledge, however, to this extent is necessary for those who would avail themselves of the work.

VARIORUM.

"The Military Chest," and "The Beaver Trappers" (W. Tegg), are two capital little story-books, translated from the German of Horan, by John Henderson. Each little volume contains several stories, the chief in each case giving the title. They are tales of adventure, spiritedly told, and will please both boys and girls.—"The Anchioneers' Land and Estate Agents' Directory," by H. Allnut (200, Fleet-street), contains a list of the principal auctioneers and agents throughout the kingdom. Some particulars as to Charges, and a list of useful books for auctioneers, land agents, &c., are worth the attention of those to whom they are addressed. Auctioneers and agents are much better paid than architects. The current number of *Britannia*, edited by Mr. Arthur A. Beckett, and illustrated by Mr. Matt. Morgan, contains a number of amusing stories. Mr. Palgrave's *Simpson* commences in a story "Worse than Death: a Tale of the French Revolution of 1848," which promises well. If we remember rightly, Mr. Simpson was in Paris during that event, and communicated some very valuable particulars to a London paper. Mr. Tom Hood, second and fanciful, has contributed to *London Society* a capital paper on "Vers de Société," in which he introduces some good specimens of such compositions, and a humorous paraphrase, by himself, of Horace's "Integer Vitæ." Amongst the illustrations of the number, "Boating Life at Putney," sketched by Mr. Chasemore, is a genuine piece of fun.

Miscellaneous.

An Architect's Quarrel.—In the County Court at Hereford, a case sent down from the Queen's Bench, has just been decided. It seems to have simply been one of accounts between the parties, and the judge grumbled at being obliged to act as an arbitrator in it. Mr. Payton, the plaintiff, and Mr. Haddon, the defendant, had been in the habit of acting together professionally, and the matter related to a balance due on their respective proportions of commission. The judge gave a verdict for 12l. 12s. beyond the amount paid into court, each party to bear his own costs of the day. Subsequently, the plaintiff complained of being called upon to pay his own costs, or rather that the amount was hard upon him, inasmuch as all the witnesses had been summoned upon his side. His counsel said his fees must be paid, also 2l. 2s. to one witness, 1l. 11s. 6d. to another, and so on. He really got worse than no thing, therefore, by his honour's decision. The judge said the question of costs was already settled.

Society for the Encouragement of the Fine Arts.—On Thursday, 5th, Mr. H. C. Solous read a paper on "Greek Art." Mr. R. Westmacott, R.A., occupied the chair. After a survey of the progress of Phœnician and Egyptian art, and their alternative magnificence and meanness, he proceeded to show how by his wonderful imitations of the human form, truth to nature and exquisite finish, the Greek sculptor, though ignorant of anatomy, had arrived at the highest point of perfection, which the Greek painter, from want of a knowledge of perspective, had failed to attain. Grecian art was of spontaneous growth, not an inspiration from Egypt, and this youth of art might be inferred from the Grecian carelessness, keen sensibility, and thirst for pleasure. The Assyrian artist was blind to the natural dignity of the human form, which was the element of every beauty and the perfection of every mechanical contrivance. He next adverted to the treatment of the male and female figure and its adornments by the artists of Greece, and compared the discernment shown in the criticisms upon the statues of Phidias with the indiscriminate praises awarded to half the pictures of the artists of the present day, who trusted to titles and long quotations for their success. He concluded with some remarks on the great personal beauty of the Greek nation, their intellectual love of the beautiful, and adoration of the human form, which he contrasted with the present senseless shapes, so destructive of perfect form and motion—high heels and waspish waists, that nature abhorred quite as much as a vacuum.

The Proposed Bridges at Grimsby.—According to the plans prepared by Mr. Sacré, and examined by the council, the footbridge over the railway company's yard, at East Marsh, Grimsby, will be a wrought-iron lattice girder bridge of the latest construction. The principal span will be 72 ft. clear over the railway and sidings; side spans, 50 ft. and 33 ft., to provide for future extension of sidings. The pillars supporting the bridge will be, therefore, a considerable distance from the railway metals, and consequently the less likely to form an obstruction to a train requiring a wide berth. The bridge over the Old Dock will also be a girder bridge of wrought iron, having a 45 ft. span swivel bridge across the channel. The bridge across the Old Dock is designed so that the work of construction can be carried on without interfering with the business of the dock, and for this reason the piers for the swivel bridge are to be on cast-iron cylinders, sunk to the brown clay, and these cylinders 4 ft. in diameter, will be sunk to the required depth by excavating the soil within them, and they will be afterwards filled up and made solid with brick in cement or concrete. The remainder of the piers are to be cast-iron screw piles sunk to the required depth by means of capstans, on Mitchell's principle. The plan of cylinder piers was originally designed by Lord Cochrane (afterwards Earl Dundonald), thirty-five years ago, but has only within the last few years been carried out in general practice. The cost of the railway bridge, it is expected, will not exceed 2,000*l.*, and that of the dock bridge between 7,000*l.* and 8,000*l.*

Further Opening of National Gallery and British Museum.—In the House of Commons, on a motion for going into committee of supply, Mr. W. Allen submitted a motion in favour of opening the National Gallery and certain portions of the British Museum for the inspection of the public between the hours of seven and ten p.m., at least three evenings a week. The hon. gentleman had estimated the cost of lighting the National Gallery at 4,000*l.* per annum, and the British Museum at 6,000*l.*, making a total sum of 10,000*l.* per annum. After some discussion, during which it was stated, in the part of the trustees, that the buildings were not constructed with the view of being lighted with gas, the Chancellor of the Exchequer reminded the House that a new National Gallery could in fulness of time be constructed in Trafalgar-square, and that perhaps a portion of the national treasures would be removed from the old building at South Kensington, and that both edifices might be so planned as to remove the obstacles to the introduction of the light which existed in the old ones. Mr. Alderman Lawrence having suggested that the British Museum should be opened every evening of the week during the summer months, Mr. Allen pressed himself satisfied with the ventilation which the subject had received, and withdrew his motion.

A New Synagogue for Newport.—The foundation-stone of a Hebrew synagogue has been laid on a site between Lewis-street and Francis-street, Pilgrimage. The buildings will comprise a centre and two wings. In the centre is the entrance to the synagogue, through a lobby, of T shape, which will be paved with mosaic paving. From this lobby stairs ascend to the ladies' gallery, which will be placed over the west end of the synagogue. In the inner part of the lobby are lavatories, and over them are lavatories for ladies. The synagogue proper forms the right wing. It measures 37 ft. in length by 22 ft. in width, and has accommodation for about 100 persons on the ground floor, and about forty in the ladies' gallery. The interior will be lighted by four round-arched windows in each of the sides, and a group of four smaller ones of similar character in the end. The whole of these will be filled with embossed and tinted glass. The sanctuary will be to the east, and form a raised platform, with ornamental canopy over, and have at the back the recess for the rolls of the law. The roofs will be of open timber-work, divided into panels by the bracings, and the whole stained and varnished. The left wing is the minister's house, which will be of a similar description. The style of the building will be round-arched Italian of simple character, built of black rock, with Bodmer brick-moulded dressing, and the whole will cost about 800*l.* The architect is Mr. B. Lawrence, and the builder Mr. J. W. Chack.

The Street Tramway Movement.—The two-miles-and-half length of street tramway has been opened between Whitechapel and Bow Churches. The line is constructed by the North Metropolitan Tramway Company, and the works have been carried out by Messrs. Fisher & Parrish, American contractors, who have successfully supplied Liverpool and Dublin with similar conveniences. Owing to certain sewerage operations in South London, the Brixton line, the opening of which we have recorded, is nothing like so perfect an illustration of the system as this in the eastern district. The registered number of passengers is 46. The cars are about double the length of ordinary omnibuses, and are built to seat 22 within, and 24 without. According to the provisions of the Act of Parliament, workmen are to be conveyed at the fare of one penny on particular journeys, morning and evening. The horses wear a minimum of harness, nothing, in fact, behind the collars, and the drivers are clad in the smartest of liveries. The calculation is that one horse on the tramway can do the work of three on the common road. The car is stopped by the break, rapidly applied by the driver. The vehicle is balanced upon Indian rubber springs. The Whitechapel undertaking has cost something like 4,000*l.* per mile.

Artists' General Benevolent Institution. The annual dinner of this institution has been held in Willis's Rooms, and numerously attended. The Duke of Argyll presided. Since its foundation 2,592 donations have been granted by it in sums amounting in the aggregate to 34,418*l.* The funds collected last year amounted to little short of 3,000*l.* This year an application having been made to Sir W. Tite, for a subscription towards carrying out a project for assisting the orphans of artists in connexion with the institution, he responded to the application by sending a check for 1,000*l.* In replying to the toast of the Royal Academy, Sir F. Grant said the Academy entertained the most friendly feelings towards all the other art institutions which held separate exhibitions. The Academy had learnt with much interest that an orphanage was being established under the auspices of the Council of the Artists' General Benevolent Institution, and he had been requested by the General Assembly of the Academy to place in the hands of the secretary a check for 500*l.* towards that object. The toast of the "Two Water-colour Societies and the Society of British Artists" was proposed by Mr. Kinnaid, and responded to by M. Carl Haag. The amount of subscriptions received at the dinner was announced to be 1,583*l.*

New Public Baths in Brighton.—The tenders of Mr. John Blackmore, of Brighton, to perform the builder's work for 920*l.* in the erection of the new public baths, and Messrs. C. & J. Reed, North-street, of 575*l.*, to do the engineering's contract on that part of the baths which is to be built upon the site of the Infantry Barracks, at the bottom of Church-street, Brighton, have been accepted.

The Bradford Corporation Reservoirs at Horton Bank Top.—The work of constructing the two corporation reservoirs at Horton Bank Top is making progress. The reservoirs adjoin each other, one being on the north, and the other on the south side of the Bradford and Halifax road. They are both to be used as service reservoirs for the high-level district. Operations have been going on at the larger reservoir since November last. The smaller reservoir was begun about a month ago. At the larger reservoir more than two-thirds of the entire excavation has already been dug. The masonry intended to be put into the main outlet culvert is all in readiness. The east retaining wall and the lower puddle trench, which is 30 ft. deep and 21 ft. wide, have both been completed, and are waiting for inspection. The other puddle-trenches are also in a forward state, and a great portion of the masonry for the remaining retaining walls is worked and ready for use. The plant employed in the construction of the works is extensive. There are about 600 men on the ground, mostly excavators, and on an average they dig up and remove at least 1,800 cubic yards of solid earth per day. The work in the different departments is under the personal supervision of Mr. Fogg, one of the contractors, and of the engineer.

North Eastern Children's Hospital.—The Princess Louise will open a bazaar for the benefit of the building fund of the North-Eastern Hospital for Children, on Monday, the 16th of May, and two following days, in the large room of the City Terminus Hotel, Cannon-street. The Princess of Prussia and Princess Christian have sent contributions to the stalls, as have many other ladies. This hospital has been hitherto one of the best managed in London as regards the arrangements for out-patients, which up to the present time has been partly self-supporting. We have a strong opinion as to the good effect of making the poor contribute something. It saves them from the degradation of pauperism. The dispensaries and gratis hospitals do an immense deal of good, but, as we have before asserted, they injure the moral fibre of the poor, and they induce the habit of receiving charity, which unfortunately is extremely difficult to cure. We shall be glad to find substantial aid given to the Shoreditch Children's Hospital.

The Decoration of the Central Hall, House of Commons.—Mr. A. Seymour, in reference to a question on this subject, said he addressed it to the Prime Minister, because of want of courtesy on the part of the member for the Tower Hamlets. Mr. Seymour then asked the First Lord of the Treasury what instructions had been issued to Mr. Poynter with regard to the decoration of the central hall, and whether the cartoons exhibited by that gentleman at the Royal Academy's exhibition were to be returned. Mr. Gladstone said, that he understood that Mr. Poynter had been promised that he should be employed in decorating the central hall, but he had been requested by the First Commissioner of Works to await the decision, which had not yet been arrived at, as to the method of carrying into effect the designs contemplated. The cartoons alluded to were the property of the Government, and could not be permanently returned to Mr. Poynter. They would be employed for some public purpose.

Proposed New Drill-shed for Rotherham.—On Tuesday night, a meeting of the Drill-shed Committee was held in the Corn Exchange, Rotherham, to consider the advisability of offering a premium for the best plans for the drill-shed which it is proposed to erect on a plot of ground at the end of Norfolk-street. After considerable discussion, it was decided to advertise in the local papers, offering a premium for the best set of plans for the intended building. The drill-room is to be 90 ft. by 50 ft., with a light gallery running round three sides, and a band-gallery at the fourth side.

Lambeth School of Art.—The annual meeting of the students and friends of the Lambeth School of Art was held at the School-house, Miller's-lane, Vauxhall; the Rev. Canon Gregory in the chair. The Bishop of Winchester delivered an address in relation to art; and there was a numerous attendance. The Rev. Canon Gregory distributed the prizes to about thirty students. Mr. Cressy, Mr. H. Doultou, the Rev. Mr. Carnes, Mr. Sparkes, and others addressed the meeting.

Monumental.—Six years ago a number of gentlemen associated themselves together with the object of obtaining a statue of Mr. Gladstone for St. George's Hall. The execution of the design was subsequently undertaken by Mr. Adams Aton, sculptor, who was to receive 1,000*l.* for the work. The result has now been placed in a niche at the east side of St. George's hall, immediately on the left of the statue of the late Earl of Derby. There has been a private unveiling of the statue, preliminary to the inauguration. Mr. Gladstone is represented in a standing posture, arrayed in the flowing robe of the Chancellor of the Exchequer. His right hand is crossed upon his breast, while the left lightly grasps a scroll.—The Emperor of Brazil has refused a statue which his people are about to erect to him, and recommends that the money should be spent on primary schools. The statue, however, is to go on.

Communication through St. James's Park.—Her Majesty has given permission to open a road, as soon as possible, from St. James's-street, through the end of the park, to Storey's-gate, for carriages, hired cabs, and riders on horseback. When Parliament-street is widened, this new and temporary route may be closed. Mr. Ayrton, in announcing this in the Commons, said also that when the metropolitan authorities decided on such an outlay, the Mall might be continued to Charing-cross in a straight line. No doubt, he added, an opening giving a complete vista of the Mall from the Strand would be a great improvement, and would be sanctioned by public opinion; but long since the Government had ceased to make improvements for the benefit of the metropolis out of the national exchequer.

"The Auto-biography of an Octogenarian Architect."—Under this title, Mr. G. L. Taylor (joint author with Cresy in the "Architectural Antiquities of Rome") is about to publish a record of his studies at home and abroad, during sixty-five years, comprising among the subjects treated of the cathedrals of England, France, and Italy; the temples of Rome, Greece, and Sicily, with explanations of their various styles—and plans, from measurement; also, incidents of travel, and sketches of other buildings and objects on his route, from notes and measurements during tours through England, France, Italy, Greece, and Sicily, in 1816-17-18-19 (principally on foot), with re-visits in 1857 to 1868. It will be published through Messrs. Longmans & Co., by subscription, the number of copies limited, and can scarcely fail to be a work of considerable interest.

The Water Supply, Rawmarsh.—The report of the Water Committee was read and adopted. It contained the certificate from Mr. J. P. Bateman, London, approving Mr. T. W. Roome's detailed plans for the sewerage and water supply of the Rawmarsh Local Board district. The chairman said that the plans which had been prepared by the surveyor, in connexion with the Rawmarsh water supply, did the greatest credit to him. He had pleasure in proposing that a donation of ten guineas be presented to the surveyor for his services in preparing the plans. This was unanimously passed.

Sea Water for London.—A "Learner" writes: A sea-water lake of ample circumference would be a great boon to the inhabitants of London. Salt water might be forced up, on an elevated part of the coast, and conducted perennially, into a thermal reservoir. Many lives would be saved, many morbid states cured and prevented by it, and the physical condition of the population much improved. The surplus water might help to flush the sewers.

Royal Gallery of Illustration.—Mr. German Reed has secured the services of Mr. Corney Grain, a new vocal and pianoforte humorist, whose delineations of society in its various phases have been received for some time past with great relish in private circles. On Monday, May 16th, Mr. Grain will appear in a musical sketch written by himself, and entitled, "The School Feast." "Ages Ago" is to be withdrawn, to make way for a new Entertainment by Mr. W. S. Gilbert.

Bells for Melbourne.—A set of five bells have recently been cast by Mr. John C. Wilson, Gorbals Bell Foundry, Glasgow, for the tower of the General Post-office, Melbourne, and to the order of the Government of Victoria. The tenor, or hour bell, weighs 32½ cwt., and the four smaller bells are for chiming the quarters.

The New Music Hall, Sheffield.—In consequence of the contractors, Messrs. Nelson Brothers, having requested to be relieved from their engagements for the masons', bricklayers', and excavators' work required for this new building, the directors have re-let the contracts to Messrs. G. Longden & Son; and the workmen have commenced to clear and level the ground ready for the excavation of the cellars and foundations of the building.

The Institution of Civil Engineers.—We are given to understand that the late Mrs. Appold has left to the Institution a legacy of 1,000*l.*, payable at the same time as the legacy for a similar amount from her husband, the late Mr. J. G. Appold, F.R.S., Assoc. Inst. C.E. It is believed that both bequests have been made "for the general use and benefit of the society," without being fettered with any conditions.

Opening of the Paris Fine Arts Exhibition.—The annual exhibition of pictures, sculpture, and other works of art, was opened on the 1st of May, according to custom. The total number of works shown amount to 5,434. The pictures in oil number 2,991, and occupy twenty-three rooms (eight more than usual); they are all hung in alphabetical order.

Acoustic Science.—A Parisian savant, M. Lissajous, has been profitably lecturing upon acoustic science, says the *Musical Standard*, and particularly upon the phenomena of sound and flame, the emission of musical sounds by flames passed through tubes of proportionate length (as set forth at the Royal Institution of London), a process which he entertains a hope of bringing to some practical utility.

Sir Francis Crossley's Gift to Halifax.—The governors of the Halifax Infirmary have resolved that in consequence of the munificent gift of 10,000*l.* by Sir Francis Crossley, bart., M.P., towards a new building, all schemes for altering the present infirmary be abandoned. The estimated cost, exclusive of the ground, is 20,000*l.*

Palestine Exploration Fund.—The annual meeting of the Society for Promoting the Investigation of the Holy Land will be held at the Royal Institution on Monday, the 16th, at three o'clock. Capt. Warren will give an account of his most recent excavations.

Fall at Waverley Bridge Station, Edinburgh.—A portion of the south-east corner of the passenger-shed of the Waverley Bridge Station of the North British Railway Company, Edinburgh, has fallen to the extent of 40 ft. by 60 ft. Fortunately no one was injured.

Foreign Joinery.—It is generally understood that the greater part of the foreign joiners' work imported into this country is manufactured by machinery made in England, principally in London, and exported for that express purpose.

Roman Remains in Bath.—The excavations that are being made in Bath for the construction of the new Pump Room Hotel have brought to light some very interesting Roman remains.

A Proposed Canal.—A memorial is being submitted to the Birmingham iron trade in favour of a canal from Gloucester to the Severn, navigable for vessels of 2,000 tons.

The Albert Institute at Windsor.—Her Majesty, on application, has stated that she will contribute 100 guineas to this Institute whenever the building is in course of erection.

The Pharmaceutical Society.—This society will hold a *conversations* in the South Kensington Museum on Wednesday evening, the 18th.

The Royal Society.—Of the fifteen candidates selected by the council for election to the honour of F.R.S., five are Doctors of Medicine.

Architectural Education.—The Voluntary Examination is now going on at the Institute of Architects. There are ten candidates.

For house, stables, &c., at Tapwood, Caterham, for Mr. J. T. Edgell, architect. Quantities supplied by Mr. Frederick Sparrow:—

	House.	and	Stables.
	Greenhouse	Conservatory.	
Roberts	£3,350 0	£230 0	£490 0
Blackmore	3,248 0	341 10	527 0
Pollard	3,145 0	243 0	685 0
Turner & Son	3,141 0	244 0	613 0
Williams & Son	3,178 0	277 0	457 0
Dove, Brothers	2,975 0	323 0	605 0
Hearle	2,987 0	335 0	465 0
Ward	3,000 0	250 0	434 0
Chappell	2,888 0	241 0	461 0
Jarrett	2,860 0	216 0	450 0

For stables, &c., in Tichborne-row, Edgeware-road, for Messrs. Eastman & Son, Mr. H. T. Northcott, architect:—

Scott	£2,197 0 0
Wiship	2,189 0 0
Manley & Rogers	2,077 0 0
Higgs	2,063 0 0
Nutt	1,855 0 0

For erection of the Birmingham Edge Tool Works at Aston, Mr. William Hale, architect. Quantities supplied:—

Wykes	£1,130 0 0
M. Butt	1,078 0 0
Messrs. Webb	1,086 0 0
Messrs. Barnley	1,138 10 0
Sorman	881 0 0
Bliss	90 0 0
Barnescroft (accepted)	1,889 0 0

For alterations and repairs to dwelling-house and stables, No. 39, Bedford-place, Mr. Lewis Solomon, architect:—

Bridgman & Nuthall	£268 0 0
Wood	583 12 6
Fittman	435 8 0
Dunster	334 0 0

For building infectious and fever wards, Wycombe Union House, Mr. F. W. Burnham, architect. Quantities supplied:—

Ward	£525 0 0
Spicer	525 0 0
Smith & Fletcher	489 0 0
Hux	489 0 0
Looseley (accepted)	489 0 0

Accepted for landing-place and ship pier for the city of Rochester. Mr. Henry Andrews, architect. Contract No. 1.—*Landing pier, Strood.*

Clements	£245 0 0
Contract No. 2.— <i>Ship Pier.</i>	
Gates	120 0 0

For public rooms, offices, &c., at Tunbridge Wells, Messrs. Wilson & Willcox, architects. Quantities by Mr. Thos. Lids:—

Edwards, Brothers	£10,763 0 0
Haward, Brothers	9,620 0 0
Markwell & Taugood	9,646 0 0
Strange & Son	9,587 0 0
Mathews	9,555 0 0
Wood	9,471 0 0
Ancombe	9,337 0 0
Blackmore	8,855 0 0
Mitford	8,820 0 0
Bayes & Ramage	8,770 0 0
Macey	8,740 0 0
Ascock & East	8,529 0 0
Nightingale	8,410 0 0
Heinshaw	8,377 0 0
Tunbridge & Dennis	8,338 0 0
H	8,224 0 0
Whitcombe & Oakley	7,897 0 0

For the erection of two semi-detached houses, Amersham Hill, High Wycombe, Mr. Arthur Vercoe, architect. Quantities supplied:—

Silver & Son	£1,825 0 0
Houwar	1,763 0 0
Lawsley	1,754 0 0
Woodbridge	1,750 0 0
Reavell	1,760 0 0
Hauhu	1,740 7 4
Wood & Co.	1,694 0 0
Ward	1,695 0 0
Hunt	1,681 0 0
Spicer	1,670 0 0
Cooper	1,601 5 0
Morrison	1,641 6 0
Nightingale	1,553 0 0

For three houses at Egham, for Mr. James Wyke, Messrs. Quaple, architects:—

Nightingale	£1,272 0 0
Crabb & Vaughan	1,236 0 0
Poole	1,200 0 0
Sawyer	1,153 0 0
Quader	1,026 0 0
Ball	897 0 0

For sundry works at Cookham Union Workhouse, for the Quaple, Mr. C. Cooper, architect:—

West	£497 18 6
Silver & Son	459 0 0
Heard	454 0 0
Lamb	448 0 0
Reavell	448 0 0
Prior	345 0 0
Parlo	423 0 0
Woodbridge	410 0 0

For two shops, Widmore-road, Bromley, Kent, for Mr. Wood, Mr. E. H. Badger, architect:—

Amer	£1,765 0 0
Gorrum	1,774 0 0
Penny	1,680 0 0
Je. vard	1,683 0 0
Bates & Lucas	1,685 0 0
Pain & Salings	1,596 0 0
Beaton	1,539 0 0

TENDERS.

For alterations to the Old Eagle, College-street, N.W. Mr. F. F. Selworthy, architect:—

Wheeler	£238 0 0
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The Builder.

VOL. XXVIII.—No. 1424.

American Professional
Papers.*

WELVE years have now elapsed since the architectural profession in America gathered itself together, and founded an Institute of Architects.

This raising of the standard has placed the profession upon a legitimate basis; not only bonding together and making it a tangible reliable fact before the public, but creating for it head-quarters, an agreeable fellowship among its members, the possibility of action in unison, and pervading it with

that subtle quality of cohesion, combination, and competition, known as *esprit de corps*. The last three years of the period in which the Institute has existed

have been the most fruitful, whence we may assume that those to come will be still more so. The progress made is most recognisable in the fact of the inauguration of annual conventions of one or two days' duration, in which the president gives an address, the reports of the local chapters are read, and papers on various professional subjects are read and discussed. As would be observed in the *Builder* of the 23rd ult., the Institute has issued a schedule of charges, endorsing as a starting-point the time-honoured fee of 5 per cent. usual on this side of the Atlantic, and some of the details in common with the schedule of the British Institute. It has also published the proceedings of the three conventions that have now been held, and the papers read on these occasions. But it is not by the work it has accomplished itself so much as by that it has called forth in other directions that we must measure the amount of usefulness it has performed. Since these annual conventions have been arranged, a number of professional journals, altogether independent of the Institute and of each other, have appeared upon the face of American literature. Directly architecture came to the front, in a word, sympathisers and supporters appeared on her right hand and on her left; and we must look upon the position so assumed and thus ensured as one of great promise.

We have received the proceedings of the third annual convention of the American Institute of Architects, and the current numbers of most of

the journals to which we have alluded. They show us the great, busy, work-a-day America, with its tall warehouse-looking dwellings and tramway-laid streets of bold-faced, self-asserting stores, in every respect indicative of the fact that trade and traffic are the main considerations taken into account in their eager, daunting, pushing continuity; and they show us, too, that other America, beautiful as boundless, that had rest and release in it for troubled spirits in the days of the Stuarts, the Old Colony days, the land of Miles Standish and John Alden, that our forefathers spoke of as "our plantations in America." This last phase is most apparent in the paper read by the president of the Institute, Mr. Richard Upjohn, on "The Colonial Architecture of New York and the New England States." He tells us that only a few of the colonial buildings remain, but they are striking evidences of the taste and skill of the period to which they belong, and identical in style with contemporary buildings in Holland and England. If the Institute should be able by its influence to preserve these interesting fabrics from demolition, it will be doing a good work. As pictures in the history of America, they are absolutely priceless; nevertheless, their number is gradually getting smaller and smaller. In the face of the strong feeling there is in our own country in favour of the conservation of our ancient buildings, it is scarcely to be credited that this comparatively new country ruthlessly razes to the ground the architectural links that connect it with the Old World. Even some of the old churches of the early colonists have been destroyed: relics we should have deemed as precious as Saxon remains are in this country. Their ancient features, with their refinement of quaint simplicity, associated with so much that is worthy in the history of the sons of Japhet, have been considered as nought; as no more, in fine, than the rosemary odour, "commingled with pansies," "the beautiful Puritan pansies," that Edgar Allan Poe would have found lingering in them. The North Dutch Church, erected by the Dutch colonists in Fulton-street, was destroyed last year; and the South Dutch Church, now used as a post-office, is doomed. Mr. Upjohn remarks that St. Paul's, one of the most prominent landmarks in the city of New York, still stands in almost pristine vigour. We trust that it may long remain to do so, for a companion edifice, Old Trinity Church, has been already thrice rebuilt. All the domestic buildings of the primitive days of this city are either utterly lost or so defaced as to be of little interest; but Brooklyn is more fortunate in still retaining some of the picturesque homes built by the earnest, stout-hearted, faithful colonists. Mr. Upjohn records, and we are glad to pass on the word, that there is an old house in South Brooklyn, on Fifth-avenue, near Greenwood Cemetery, with the date 1699, in wrought-iron figures forming the anchor heads, on the outside. He says,—"It is a brick building, built, as was usual at that time, of bricks brought from Holland, and laid up with mortar probably made of shell lime. It is remarkable that the gable walls of this house are without coping, but are finished with bricks standing angle-wise, and forming the zigzag lines still seen on the gables of houses in Holland and Belgium; yet the mortar joints, exposed to the weather 200 years, are still intact." The period of this erection will be better realised if we remind our readers that it was only thirty years after Charles II., by the grace of God, King of England, Scotland, France, greeting, granted to his "dear and entirely beloved cousin, Prince Rupert," and others, the sole trade and commerce of Hudson's Bay. Architecture and the art of building have not arrived at so much perfection in America that the loss of such an example can be afforded; and we must add, again, the Institute will advance its interests by

protecting from demolition the Old-World homes that were transplanted with so much effort and care. Boston, Cambridge, Newport, New London, and Connecticut also retain attractive examples of genuine domestic architecture, of which, Mr. Upjohn suggests, the members of the academy of design should make careful studies, as they will be buried in oblivion in the course of another century; which prophecy all well-wishers of architecture in America will desire may not be fulfilled. Later buildings are apparently valueless. We quote the president of the Institute as a verification. "The ecclesiastical architecture of the Ante-Revolutionary days, was, in almost every instance, far superior to that of the period subsequent to the Revolution. Then every trace of refinement, of truthful expression and fitness of purpose, was lost sight of. Not a vestige of sacred thought can be discovered in the houses of worship of this period." Besides this interesting catalogue of the Jacobian architectural antiquities of America, there were four other papers read at the convention, besides many documents relating to the management. Mr. A. Closs read a technical paper "On the Theory, Functions, and Incidental Uses of Chimneys," in which he worked out the intimate relation of science to architecture; and Mr. William Ware read a paper "On the Relations of Science and Art in Architectural Study," in which he disavowed the too literal cultivation of this intimacy, and urged that an artistic spirit rather than a scientific education should be looked upon as the chief instrument in the hands of a student; the conflicting opinions being, to some extent, reconciled in the discussion that followed, by Mr. Peterson, who drew from them the conclusion that the proper method of education lay half-way between the two opposites. The third paper was by Mr. Hatfield, "On the Elementary Training of the Architect," in which he fancifully and skilfully treated his subject, claiming for architects that they are workmen upon the palace of architecture; and the fourth, or closing address, was a paper upon "Professional Guilds," by Mr. Godkin. This last-mentioned gentleman remarked that probably there has never been a time or place in which man did not feel the loneliness of standing alone, and did not endeavour to associate himself with others of common tastes. The early Christian brotherhoods and the guilds of the Middle Ages offered this association, when society otherwise presented little more than a joyless existence. Professional guilds were the result of the same yearning for fellowship, though founded upon a different basis; the trade guilds making most of the comfort and condition of the workman; the professional guilds considering of foremost consequence the skill, fidelity, and uprightness of its members. And when the French revolution brought to the surface of things a re-action against associations, and a feeling in favour of individualism, it broke through much salutary discipline. The formation of professional associations similar to that of the Institute, he continued, would be of great service in the concentration of opinion in aid of morality, and in the growth of the strongest of the social forces, "that loyalty of man to man, that proud concern for the worth and repute of all, and of all for the worth and repute of each," the French only have found a name for, in *esprit de corps*. With such hopeful strains closed the convention; the proceedings generally showing complete culture, a high appreciation and feeling for the wonderful past, as well as great and good aims for the future.

The journals, collectively, show us America busy, bustling, and boasting of "whipping creation." But amid the clank of cog-wheels and clang of steam-hammers, the rush, and wear and tear of countless industries carried on to their, apparently, uttermost limits; the building of new towns, and increase of old cities, we come upon facts that touch our most cordial sympa-

* Proceedings of the Third Annual Convention of the American Institute of Architects, held in New York, November, 1869. Western & Co., New York.
The Architectural Review and American Builder's Journal, By Samuel Sloan, Claxton, Remsen, & Baffelinger, Philadelphia. Vol. II., Nos. 9 and 10. March and April, 1870.
The American Builder: a Journal of Art. Charles D. Lakey, Chicago. Vol. II., No. 3. March, 1870.
The Manufacturer and Builder. Western & Co., New York. Vol. II., No. 4. April, 1870.
The Technologist: especially devoted to Engineering, Manufacturing, and Building. The Industrial Publication Company, Broadway, New York. Vol. I., No. 2. March, 1870.

thies, and evoke our warmest admiration. Looking first into the *Architectural Review*, which is a large octavo, in a pale dove-coloured paper cover, with several illustrations of buildings, we read, "There is no reason for despondency among architects generally. There is unlimited capital in the country ready for investment, and there is likewise a growing comprehension of the greatness which vast, chaste, and elegant construction confers upon a rising nation like this of ours." And the writer proceeds to state that philanthropy, religion, education, and trade will all avail themselves of the services of architects as among the best means to further their own interests. Again we read, "Where there was one architect some ten years ago there are now fifty, and in the Southern States alone, where, a few years back, the designs required for a building were supplied by the eastern and northern cities, local architects are to be found in every town of ten thousand inhabitants. . . . The community at large are more interested in the progress of architecture than is supposed." A similar cheerful tone pervades both the numbers of the review before us; which, for the rest, are filled with word of American work, mixed with papers upon European subjects, illustrations of both novelties and antiquities, with here and there an extract from European publications, including the *Builder*. Now, we are told of the building of a new town, consisting exclusively of gentlemen's residences, with from one to two acres of land attached to each, at Bryn Mawr, an extension of the small Welsh settlement that originally gave name to the romantic and hilly location; which new town is said to be sure to become the resort of the wealth and fashion of Philadelphia, and furnish employment to architects, builders, and horticulturists for the next few years; and on another page we hear of the burning of a great tract of business premises in the centre of the town of Cheyenne, with the erection of twelve new houses on the site of the conflagration before the smoke of it had cleared away! Among local subjects is a pleasant paper on Philadelphia fifty years since, which describes several of the old brick houses built on marble basements, which were standing at that date, but which have since been removed; and the writer complains that the brown stone houses built upon their sites are not so hospitable-looking as those old mansions were, being tawdry, and exhibiting but little difference from the store fronts of the business streets. He says, deplorably, that the same style of front and ornamentation obtains for both stores and dwellings from the Atlantic to the Rocky Mountains, and from the Kennebec to Mason and Dixon's line. Altogether, throughout the review we perceive this feeling that better things can be done, and must be done, than Transatlantic taste has accomplished in these latter days. Another writer, we must mention, speaks in high praise of additions to West Philadelphia, consisting of 138 large dwellings, thirty-three of which are of white marble, and all of which have been erected by one builder in the space of eighteen months. We must congratulate Mr. Samuel Sloan, the editor, upon the wide field and favourable season before him.

The *American Builder* is a quarto, in a faint salmon-coloured cover, rather less quietly and nonostentatiously professional than the *Review*; and with many more advertisements relating to technical objects in it, thereby carrying out the quoted opinion of a Boston contemporary, that it is "an indispensable exchange." The number before us has four illustrations; the first being the new Drake Block of Four-storied Houses in Chicago, with *Scores* on the pavement line below them; a Wood Villa, built for Colonel Nichols, at Maywood, which has all the appearance of being made of cast iron, in the utter absence of the characteristic features that iron in timber should present, so charmingly illustrated, for instance, in the Castle of Coburg, shown in our columns on the 23rd ult.; a design for a small Church, in timber, with a Norwegian treatment, by the Messrs. Upjohn; and a French-looking design for a Villa, with a verandah and so-called "truncated roof." The letter-press commences with contributed papers, the first being from Pars, and concerning Parisian workmen; and the others philippics against shams and in favour of consistency. Then follow a chapter on science, chiefly astronomical; communications to the editor; miscellaneous matter,—so miscellaneous, indeed, that one of the items, stating the trigonometrical survey of England and Wales is completed, we perceive is given twice over; a column

called the What-not; another as eccentrically called the Editor's After-dinner Hour; and then notices of new publications, including the proceedings of the Convention. It is among the news items in the Editor's After-dinner Hour that we come most in contact with the speculative, rapid, and incessant industry of our cousins, and their eager acceptance of novelties. One line tells that 26,555 new houses have been built in Iowa since 1867; another, that the Charleston Theatre was built in forty days; a third, that a disputed house has been sawed in two, and the most obstinate claimant continues to reside in his half; another, that the largest bed of slate in the world has been found on the St. Louis river; 15,000 tons of steel rails will be laid this year on the Grand Trunk Railroad; 500 miles of snow-sheds erected along the Union Pacific Railroad; a submarine cable is to be laid along the Pacific coast of South America; the proposed Art Museum in New York is to be a success; houses can be covered with the new paper building material for a few dollars each; and so on. These good big facts and wholesale quantities make the foreign news items appear of the smallest and weakest description. Even the trigonometrical survey so complimentarily mentioned, appears a dwarfish undertaking compared to the speed, the space, the scale, and the figures of those on the other side of the Atlantic. After noticing a Boston proposition to cut a tunnel 1,900 ft. long through the most frequented portions of that city in one column, the progress of the Suez tunnel, mentioned in another as now bored to a length of 715 ft., appears puny. After reading, at the top of a page, that the bridge just completed over the Ohio, at Louisville, is a mile long, exclusive of approaches, the bridge to be built at Maldon, Essex, mentioned lower down, must be looked upon as a toy. After reading, too, of a new locomotive, constructed in Taunton, Mass., to run backwards and forwards alike, being double in all its parts, with the engineer's standing-place in the centre, a wire tramway, five miles long, described as newly laid upon the green downs of Brighton, appears a trifle of the order of retrogression. And so on, from column to column. Everywhere we are impressed with the conviction that there are still giants upon the earth, as great as any that have gone before.

When we take up the maize-covered journal, entitled, *The Manufacturer and Builder*, we expect to step nearer to the workshop, and are accordingly not surprised to be confronted on the first page with diagrams showing the latest improvements in ice-machines, for the manufacture of ice, with the assistance of a steam-engine for driving the apparatus. This information, suggestive of inconvenience from heat, is shortly followed by an article on laying bricks and stone in freeing weather, suggesting similar discomfort from extremely cold weather. The writer of this last declares that a vast amount of work is done that is frozen up tight in less than twelve hours after the mortar is used, and that there are scores of brick houses erected in Brooklyn and New York, with scarcely strength to stand from this cause. "And," he continues, "we have in mind several instances in which portions of the walls were crushed to such an extent, that the entire structures had to be taken down to the very foundation, simply because the walls were built with mortar that was allowed to freeze soon after laying the bricks." None too soon, therefore, does the *Manufacturer and Builder* speak on this head. European applications and discoveries are carefully noted, and in one instance, we perceive, a translation is given of a German paper "On the Application of Cement for Submarine Constructions." Photography, dialling, weaving, the supposed loss of power by the crank motion, are touched upon among other subjects equally disconnected; and there are various articles relating to buildings, in most of which can be traced a manufacturing idea of introducing iron in every capacity into structures of all sorts. One correspondent, described as a distinguished architect, suggests that galvanised iron should be used for mouldings along house-fronts, chimney-tops, mantelpieces, chimney-fues, &c., "so that the whole fireplace, from the fire-grate upwards, including everything to the chimney-top, could be bought of any required size to be set in the house to be built, making a set of complete outfits from floor to roof." Further on, there is an illustration of an ironclad house, coated with plates of iron like an ironclad ship, built in One Hundred and Seventeenth-street, New York, which is the first

instance where the plan has been adopted for a first-class dwelling. The benefit supposed to accrue from the adoption of this principle is durability combined with decrease of cost; because the structure bolting the sheets of iron can be finished in a much rougher manner, and made of commoner materials, than it would need to be if exposed. This chief merit is thus summed up. "An elegant front may now be ordered in New York, boxed up and sent to any part of the world. Any builder can then connect it with the outside of the coarsest walls, while they are in process of erection, and in this manner a residence of metropolitan aspect may be constructed almost anywhere!"—of too metropolitan an aspect, we should suspect; corresponding with the rectangularity of the buildings also spoken of that are erected in twelve working hours complete. These last-mentioned ready-made houses formed the chief part of the material carried westward on the Pacific railroad, the *Manufacturer and Builder* tells us, and were transported in bundles of twelve doors, twelve sashes, &c. A contractor, according to "an exchange" quoted, is now sending out seven meeting-houses, of this type, for the Presbyterians along this line of rail. Thrown in, gracefully, amidst suggestions of such angularities, is a chapter, with illustrations, taken from the American Woman's Home, showing how unpretending homes may be made beautiful with chromo-lithographs in home-made frames, and flowers in home-made stands and cases. And the moss and ferns and swamp grasses scent the page, and cause us to lay down the journal approvingly.

A fourth journal, the *Technologist*, is in still earlier youth than the rest. We have the March number before us, which is but the second of the first volume. Engineering holds the first place in it, manufacturing the second, and building the third. Like that just described, it engrafs upon the technicalities of these pursuits subjects of a somewhat lighter nature, that are likely to enlarge its sphere of usefulness. Thus, though the aesthetics of construction, comparative tests, technological education, Boulay's new battery, and kerosene explosions are fully discussed, we find the girl of the period, the books we read, and periodicals for the young, described for the reader's recreation. In a notice of the Winter Exhibition of the Society of Painters in Water-colours, we are struck with the choice of subjects made by the artists. Their own mountains, and falls, and prairies, and "pictured rocks" are passed over; not a scene from Washington Irving, "Evangeline," "Hiawatha," or Walt Whitman is given; but Haddon Hall, the Scottish Highlands, Stratford-upon-Avon, a Surrey Bye-way, and Westminster Abbey, have found fresh pencils and patrons. The election of a new president of our Institution of Engineers, with his inaugural address, occupies a much more prominent place than an account of a meeting of the American Society of Civil Engineers. When statistics relating to the healthiness of various occupations are given, it is our own registrar-general who furnishes them; when roads are discussed, Mr. Bridges Adams is cited as an authority; and when drainage is urged upon New York, the system adopted in Paris is proclaimed. In a word, the most friendly appreciation of all things English and French, and kindly competition with them into the bargain, are apparent upon every page. Nevertheless, there are novelties of American invention, for which full credit must be given. And we feel, as we close the last of these professional papers, that have an aspect that is neither English nor French, yet like unto both, that they will be the means of very satisfactory ends.

Institution of Surveyors.—At the ordinary general meeting held on May 9th, a discussion took place on the paper by Mr. E. Ryde, entitled "Parochial Assessments," and was taken part in by many members. The following candidates were balloted for, and declared duly elected:—A member—Stephen William Williams, Rhayader, Radnorshire. As associate—Robert Charles Catling, Needham Hall, Elm, Cambridgeshire. The next meeting will be held on Monday evening, May 23rd, when a paper will be read by Mr. R. Hall (Vice-President), entitled "Notes on the Inclosure Acts, and their Results." The chair to be taken at eight o'clock. The annual general meeting of the Institution, to receive the report of the council, and to elect the officers for the ensuing year, will be held on Monday, May 30th, at three o'clock.

BRIGANDAGE AND ART.

Is this a fit title for an article in a journal devoted to science and art? Is brigandage a fit subject for discussion or dissertation in those pages? Can we, as practical men and artists, find a legitimate theme for consideration in the nefarious doings of outlaws in distant countries? Can there be any connexion, even the most remote, between brigandage and art? Can the deeds of such miscreants in any way concern us or have relation to our professional studies?

In answer to the many who will ask these questions, we reply to them all affirmatively. In the first place, we wish to record, in common with our fellow journalists, our detestation of the late massacres in Greece. Secondly, as practical men we would endeavour, from our own experience, to suggest a remedy for the future. Thirdly, as long as the ruins of the finest temples are frequented by robbers, so long will the study of Greek art from ancient remains be pursued under disquieting conditions.

We desire to put on record our abhorrence of the late evil deeds in Greece, as men, especially as Englishmen, and also as artists. As men, we are affected at the cold-blooded murder of defenceless travellers; as Englishmen, we are indignant that that "distorted thing called the kingdom of Greece," which we have spent so much blood and money to establish, should harbour semi-political bravos, who shed the blood of some of the gentlest and best amongst us with deliberate malice; as artists, we are touched, because these late events bring prominently before us the unfortunate fact, that all those countries which possess the finest works of antiquity, and have, therefore, the greatest attraction for the archaeologist and architect, and which present the most picturesque and the most richly-coloured scenery, and are therefore yearned after by the painter, are haunted by brigands of the worst class. Magna Græcia, Sicily, Greece, and Ionia are infested by gangs of robbers, who will shoot you down from their ambuscades, or drag you after them for months among the mountains, to suffer every privation, until your friends can communicate with them and furnish them with some thousands of pounds as your ransom. In these countries no sketching excursion can be undertaken, no scientific expedition carried on, without the trouble and expense of guards, who are not always to be relied upon for protection. It surely, then, concerns us, as artists and archaeologists, to look upon this matter of brigandage with regard to the interests of art; for all amateurs of architecture and picturesque scenery would like to have the privilege of visiting the ruined fauces of old without the chance of being popped at by a brigand from behind a column, or of being carried off into the mountains, and having their noses or ears lopped off and sent in letters to their friends, by way of expediting the business of ransoming.

This state of things has lasted for a long period. The traveller in search of the remains of Greek art is everywhere checkmated by brigands. When at Naples, the adventures of Mr. Moens are depicted to him by kind friends, to prevent him from risking his life for a peep at Positum. In Sicily he hesitates about making an overland journey to Agrigento and Segeste, on account of his landlord's report of the state of the country; and even when he makes up his mind to drive to Monreale, the portly host of the Trinacria, standing on his threshold, bids him a most solemn adieu as though for the last time, and washes his hands of the departing guest, after giving him all necessary warning.

It is true that the Italian Government has lately stated that there is only one band of banditti in Sicily, and that this consists of only forty-five members; and we remember, upon making inquiries from the commandant at Reggio, some few years ago, as to the state of brigandage in his district, that he told us that it did not contain a single bandit; but did not the Greek Ministers, or their deputies, assure the unfortunate travellers that there was not a brigand in the neighbourhood, though there were then thirty of them in ambush within ten miles of them at the time they spoke?

When the traveller goes further eastward lands at the Piræus, he finds that the road to Athens, of only six miles in length, is patrolled by guards; that he cannot stroll a mile out of the town without danger; and that a journey to Rhamnus or Corinth would be madness.

As long as we can remember Greece, brigandage has been its chronic complaint. At the

time of our first visit to Athens, during the Crimean War, and though there were two regiments,—one English and the other French,—encamped at the Piræus for the purpose of maintaining order, about a hundred peasants and farmers were seized by Klephts, stripped of all they had, and locked up in a church one Sunday during our stay. And it was also reported,—we do not know with what degree of truth,—that some officers of these regiments were kidnapped when out for a stroll. On the occasion of our second visit, we heard that a party who had landed near the Isthmus of Corinth from an English nobleman's yacht (Lord Selkirk's, we believe), had narrowly escaped being carried off. Our fourth visit was just after the release of Lord Harvey and party (who were captured in 1867 by a chief whose death is recorded in a telegram just come to hand). About this time Kitzo's band carried off the Minister of Finance, and murdered a priest who was about to betray them; subsequently various landed proprietors were carried off and ransomed. Now the culminating point of anarchy has been reached; and we sincerely hope, for the sake of humanity and of art, that England, either alone or in conjunction with other European countries, will stamp out Greek brigandage for ever.

In all countries there are land sharks who prey upon the weak and defenceless; such as burglars, grottoes, footpads, and sharpers of all kinds, until lately known amongst us by the appropriate name of "Greeks," either after the crafty Ulysses and his compatriots, or after those supposed to be his descendants, but who are in truth a mongrel race with much Italian and Turkish blood in their veins. In half-civilised countries where the governing powers are weak, or the administration corrupt, these miscreants assume a bolder character, and live at open war with society, especially with those travellers who seek the hospitality of their country. But in most regions they do not proceed to the extent of wantonly taking away life. The Bedouin, who strips you to the skin and leaves you to find your way to a neighbouring town clothed only in a hat and shirt-collar, is an angel compared to the Klepht, who shoots you down without compunction because you are footsore and cannot clamber over jagged rocks as quickly as he wishes. Yet the Klepht has received some education; can read and write, goes to church, is on visiting terms with people who have held office, and probably banks at the same house that you do. He takes a keen interest in politics, and is delighted if his exploits lead to the dismissal of the minister, and give his friends of the opposition a chance of place. We in peaceable England cannot well realise such a state of things, except by supposing that when Disraeli was in power Bright's bands would take to the road, and be heard of somewhere near Blackheath; and that when Gladstone ousted him, Newdegate would establish himself in the ruins of some old monastery, and sally forth to seize foreigners in order to bring the Pope to his terms.

Greece has been protected long enough from the attacks of the Turks, let the three Great Powers now protect her from herself. Brigandage is a gangrene which affects the whole society, proceeding from a savagery innate in the people. The "merchant prince," who gave his thousands to propagate rebellion in Crete, though by a fortunate turn of the wheel, he has been enabled to cast his "fustanella," and come to live in Hyde Park, would probably have made up a purse upon the mountains, if his lines had not been cast in pleasant places. We are speaking now only of the Athenian Greek. The rayah is in many points his superior, especially in Asiatic Turkey and the Turkish islands.

We have supposed a traveller searching for remains of Greek art at Naples, Palermo, and Athens being checkmated at all these places. He then proceeds to Ionia, and lands at Smyrna. If he land in the winter time he may travel without fear of molestation, and visit Ephesus, Miletus, Magnesia, and Tralles, without meeting a hostile person; but if he go in spring, summer, or autumn, he will hear of robbers at every stage. Guards, often unreliable, will be forced upon him, and he will be fortunate if he return with a whole skin and a full pocket. There is a strip of mountainous country, extending about ninety miles south of the Gulf of Smyrna, as far as the mouth of the Meander, containing some of the most important ancient sites, and inhabited chiefly by Greeks, which is annually infested by Greek brigands from the islands. They land in bodies of twenty or thirty, headed by an experienced leader, who is well acquainted with the

mountain paths. They subsist on provisions supplied them by the villagers (who sympathise with them, as they consider their operations semi-political), with an occasional sheep stolen from the flocks of the Eurocks in the plains. From their mountain eyries they watch the unwary traveller through their glasses, and pounce down upon him when they think there is an opportunity for a favourable coup. Their season begins in April, and lasts till November. They keep the settled and peaceably disposed inhabitants in a constant fever of alarm. The Smyrna merchants who have country houses at Boujah and Bourabat buckle on their revolvers, clean up their rifles, and are no longer content to jog to town singly on their slow-paced donkeys, but travel in parties and mount on fleet steeds. Ladies no longer venture to take walks in the country, and the owners of *chiftiks* confine their promenades to their farmyards, or, if they venture beyond them, go attended by a whole posse of guards. It was from a chiftik that Mr. Van Lennep, the nephew of the Dutch Consul in Smyrna, was carried off in the spring of 1868, and only released on the payment of some 1,600*l.* This periodical invasion of barbarians has lasted as long as we have known Smyrna; that is to say, for fifteen or sixteen years. Dr. Macgrath, a resident, was taken off for about a fortnight, and he has related to us his experiences with the rascals, which were, to say the least of them, painful. The Turkish police are, on the whole, more active than the Greek soldiers. The band which took off young Van Lennep was happily surprised while at breakfast by a few *cavasses*, headed by the Mudir of Sokia; three of them were shot, but the others escaped.

Now all this annual panic might be prevented and security guaranteed by a very simple measure—viz., by stationing a *cordon* of a hundred men, armed with breech-loaders and revolvers, in small block-houses along the coast, ten in each, for the distance of ninety or a hundred miles. The posts should communicate with one another by means of telegraphic wires, so that the appearance of a suspicious-looking caïque in the offing, or the landing of men of doubtful character might be signalled along the whole line. The small expense of the maintenance of these would be balanced by the relief that would be given to merchants and to travellers. The Turkish Government would naturally object to the introduction of foreign troops for this purpose, but a strong pressure put upon the Porte at this juncture would make it open to this improved police. The force should be paid by the Turkish Government, composed, as far as possible, of Europeans, and officered by them, and should not be answerable to local authorities, but only to head-quarters, at Stamboul. If some measure like this be not adopted, the brigands hunted out of Greece will crowd into Ionia, and render it less secure than before.

For the future interest of art and archaeology, may brigandage be put down by an armed occupation of Greece, and by the establishment of a strong coastguard along the shore of Ionia, which is the only part of the Turkish Empire regularly frequented by Greek brigands.

THE ARCHITECTURAL EXHIBITION.

RETURNING to the Collection in Conduit-street,* Mr. W. Lee shows in a large and well-executed drawing the "Interior View of Large Hall" in one of the premiated designs for the Manchester Town-hall: a very large proportion of ornament is so equally distributed as to have a quieter and less tawdry effect than is sometimes exhibited in rooms where there is really a less amount of ornament not so impartially distributed. The exterior views (93 and 94) are even better executed than the interior, but, for external work, somewhat over-rich and wanting in repose; the eye can rest nowhere. The style is Decorated, but with nothing to remark upon in the treatment. Of a like kind of merit, though shown in a totally different style of drawing, are the designs for the "Plymouth Guildhall and Public Offices," by Messrs. Fogarty & Drew (161, 162, 163). This is a well-intended design as to plan and general conception. The Guildhall and Offices are placed at opposite sides of a central court, an open loggia connecting the two blocks, and with a centre gateway, runs along a third side: the whole is well placed and considered for general effect and balance of composition.

* See p. 392, ante.

but in detail and style it belongs to a class of designs the merit of which appears to us to consist mainly in a happily-acquired manner of using and combining Gothic features and details, without any great amount of originality. A contrast in this respect is Mr. C. F. Hayward's design for the Plymouth Guildhall (164-167), though perhaps wanting in dignity, and certainly not the design to win the hearts of a committee. This is a quiet and unpretentious Gothic building, shown in very good ink etchings, with a long two-storied front of a late type of Gothic, with square-headed mullioned windows on the lower story, and pointed windows under square labels above. (The small and sketchy perspective view shows a fairly harmonious grouping, totally without trickery or pretension; though a more elevated centre feature would have improved the principal elevation, and, in matters of detail, the finials are somewhat clumsy and heavy, and in the arched porch the arrangement by which a pier comes in the centre, instead of an opening, is unhappy. But we commend these drawings to the attention of students, rather than the more striking and seductive towered productions in the shape of town-halls, which first attract the eye. Messrs. Poperty & Drew's design for "Municipal Buildings, Belfast," shows a clever planning of a triangular site, especially in the manner in which the large semi-circular entrance steps and colonnade are got in: the plan is worth study, and the design, though of a common-place Roman type, with engaged columns and a balustrade supporting some "sweet things in pots," is not without merit in general design and in the contrast of the large and small cupolas, the latter of which is very elegant. Of course, gentlemen who are willing to work in such totally opposite styles as this and that of their Guildhall design, to suit customers, cannot expect to succeed well in both, and may very likely end by succeeding in neither, artistically at all events. Mr. R. Miller's "Design for Government Buildings" (105) is an instance of the fact that very large drawings do not make (necessarily) very grand designs. The general treatment is of a very ordinary Gothic type, and the buttresses round the dome, a somewhat novel feature, have been designed without proper consideration as to their effect upon the outline of the principal feature, which in effect they almost rob of its domical form, and reduce to the aspect of something like a pyramid.

Among designs in the class of domestic architecture, one of the first which we notice in going round the Architectural Exhibition room is a very small drawing, by Mr. Edis, of a "Half-timbered House in course of erection at Bexley, Kent" (19). The employment, in general, of this not very durable style of architecture, can scarcely be recommended: however, both on practical and artistic grounds, it is much more in place on such a country site as is here indicated than in the streets of a town; and no one can deny that its architect has made out of this little house, with its picturesque outline of roof and corbelled out upper story, a pleasing design of the class. The same architect exhibits the south-east view of a mansion in course of erection, the north-east view of which is exhibited in the Academy (753), and was favourably noticed in our review of that collection; the present drawing (62) more than confirming our previous good opinion of the design. A more ambitious and, from its size, important work, is "Glenbeg Towers, in course of erection near Killarney" (56), by Messrs. E. W. Godwin & Crisp, a regular piece of feudalism, whose frowning bastions and parapets sort ill with our associations with Killarney, though, perhaps, they may be deemed only too suitable to the present and recent anxieties of dwellers in the Green Island. The look of the place, with its square windows in a blank wall, is not inviting, for all the good colouring of the drawing. Mr. Toulon's "Additions to Branch Hill Lodge" (66) shows a quietly picturesque red-brick house, of originality of outline and grouping, and a good suggestion as to the treatment of a brick garden-wall, which, from about the centre of its height, is battered up to a thinner open brick balustrade at the top, with solid piers at intervals. The elevations and plans of "Cowhill House, Dumfriesshire" (100, 101, 102), by Messrs. Carter & Lyon, show of course a mansion with that profusion of circular corbelled angle-turrets and "corbie-step" gables which we should presume are imposed upon architects by their Scottish clients, who appear to think there would be "nae luck about the house" without these architectural features. A certain pictu-

resqueness of outline is inseparable from this style of treatment; and in this, as in other respects, the mansion in question does not differ in general design from a great many other Scottish mansions; save that in the mullioned windows there is more look of the refinement of southern domestic architecture than is usual in northern houses. We may comment, by the way, on the great predominance of the square mullioned window in the domestic as well as in other designs in the Exhibition, in situations where, some years ago, architects who used a decorative window at all would have employed tracery. It should seem that the architectural profession are coming to the conclusion of a well-known contemporary novelist, quoted in our columns some time since, that "square mullioned windows afford a greater aggregate of happiness than any other form of window." The plan of Messrs. Carter & Lyon's mansion presents nothing special for remark, except that the principal windows of drawing-room, business-room, and library, all have the same aspect, which, probably, cannot be an equally good one for all of them; but as the architects have not given the points of the compass on their plan, it is to be feared they do not reckon at its proper importance the planning of a house with regard to aspect. Without a north and south point given we cannot undertake to pronounce upon the merit of a dwelling-house plan. Another of these frowning Scottish strongholds is the "Proposed Mansion in Argyllshire" (160), by Mr. Honeyman, with the same distinctive features, corbie-step gables, and a mass of square tower in the rear; it is shown in a rather powerful and effective water-colour drawing, with a strong light thrown on the red-brick walls. Some "Designs for Gate Lodges" (30), by Mr. Young, etched with a free and effective touch, are worth notice as suggestions in picturesque architecture on a small scale. It is curious to notice what a large amount of what may be termed picturesque design finds place on the walls of the exhibition,—design of a class illustrating what would suit the painter in point of varied and irregular outline, rather than that repose, and symmetry, and balance of outline and expression which belong to the best and purest forms of architectural design, properly so called.

Mr. Blomfield's "Whitgift Hospital Middle-Class School," at Croydon (31), is, like his churches, a sound Gothic design well drawn, and with a rather commonplace type of tower, differing in no material respect, in design and expression, from what we should usually suppose to be a church tower; but such a diversity of expression ought surely to exist in buildings for such different objects. Next to this hangs the "Gaiety Restaurant, Strand" (32), by Mr. Phipps, who has probably been hampered by having to assimilate his building to the style of the well-known front of the theatre adjoining; considering this, he has been fairly successful, but the treatment is heavy and unrefined. Mr. J. P. Seddon's "Alms-houses, Fulham" (52), is a clever drawing with a disagreeable tone of colour, showing an original, though rather quaint, Gothic design, with figures illustrative of the object of the building in low bas-relief sunk in panels. The panel in the gable end is somewhat awkward in outline, and fits very ill into the irregular space left in the gable, one side of which is half cut off by the line of the adjoining wall. The "Grammar School at Kingston-on-Thames" (54), by Mr. Stallwood, is what we should call a "fagety" design in red brick (very red in the drawing) and stone dressings; and the "Proposed National Hospital for Incurables, Oxford" (61), by Mr. Buckridge, of which we have a view of part of the quadrangle, seems to be a combination of church and cottage architecture,—a cloister or aisle, with elaborate traceried windows, below, and very plain little dormers and square sash-windows above. Mr. Edis shows details (78) of the warehouse front design which is exhibited in the Academy (802), which do not alter our good opinion of the design; but why does he indulge in the absurdity of placing in his section and elevation figures dressed in Mediaeval costume? Gothic architects who do this sort of thing ought surely to see that they are militating against their own cause; for what possible excuse can there be for it except as an expression of feeling that the buildings represented in the drawing are unsuited in style to any but Mediaeval life and society? Clever architects like Mr. Edis should be above this sort of nonsense. Mr. Goodchild's perspective of "Design submitted in Competition for Queen Elizabeth's

Grammar School, Kingston-on-Thames" (85), is a remarkably nice etching, showing a building in a quiet style of domestic Gothic of the fourteenth century character: the bell-turret is not very happy in outline. The "Lincolnshire County Prison," hung next to it (86), by Mr. Peck, at all events looks like a prison, which is, perhaps, the chief architectural merit that such a building can give very well exhibit. Mr. Dawson's "Orphan Asylum, Watford" (91), is a bird's-eye view of a large group of buildings arranged around three quadrangles, of the merit of which it is difficult to judge from a drawing of this kind, especially with no plan to give us a key to the motive of the whole. Mr. Peck's "Suffolk County College" (95) is a pleasing design in brick, Tudor Gothic, with some touch of modernism in it. A quiet and picturesque design, too, is Mr. Howell's "Berkshire Lunatic Asylum," which we illustrated some little time since. The "Great Northern Station Hotel, Leeds" (173), recently completed by Messrs. Hadfield & Son, shows a rather powerful and picturesque treatment of this class of building, with its two large square masses above the first floor line, and the deep recess between them; this is certainly something out of the commonplace in general treatment, so that we more regret the unsatisfactory character of some of the details; the trick (for it is nothing else) of placing pointed labels over round window arches, and the paltry character of the balcony railings, which might have been made, as the Parisian architects constantly make them, a really ornamental feature. In "Premises to be erected for Messrs. Brandon" (177), by Messrs. Giles & Biven, we are introduced to a few acres of pilasters, redeemed by a praiseworthy effort to give a little stability to the ground story by heavy granite pilasters between the inevitable sheets of plate glass. Mr. Chatfield Clarke's "Design for a City Building" (174) is a very ordinary Roman design, with coupled engaged granite columns on the ground floor, and pilasters on the floor over; the window mullions on second and third floors, narrow on the face and with deep reveal, and a projecting bracket at the top, partake far too much of the character proper to a cast-iron standard, a mistake which we have frequently noticed in recent designs for stone buildings. "Design for Entrance-gates, Ballymahon, Ireland," by Mr. Aitchison, is, at all events, a solid treatment of gate-piers, a feature for which there is something to be done by architects to redeem it from the commonplace; the present design, classical, but with novel treatment of panelling and detail, is so very solid, that the piers would certainly look hopelessly stumpy in perspective, unless, indeed, they have been a little cooked for the elevation. The "New Premises for the East India Railway Company," by Mr. Knightley (182), is a very sensible, plain, street design; Italian, with a good deal of novelty of treatment in detail: the window architraves on the second floor are a little awkward in outline, but the treatment of the first-floor windows, with the line of the architrave cut out at top and base into an ornamental outline, and crowned by just sufficient decoration in the small cornice above, is very good, and in a style well suited to this climate and atmosphere. Mr. Robins's design for the "Wilts and Dorset Bank, Salisbury" (193), is a good and pleasing classical design in itself, but wants the strength and accentuation of the lower story, which are necessary to give the appropriate expression to a bank; the comparatively light columns and circular-headed windows of the ground story suggest rather a club mansion. Next to this, Mr. Marrable's "Church of St. Peter, Deptford" (196), is worth looking at, as an admirably drawn and coloured interior view of a brick church, with square-softened, notched arches springing from polished granite shafts, with a very happy contrast of tone and colour. "Overstone Hall" (200), by Mr. Toulon, is a dignified design for a large mansion, with what may be called a mixture of Renaissance and Elizabethan features pretty successfully fused into a consistent whole; a massive tower forms the leading object in the composition. "Frogmore, near Newfod" (201) is by the same hand, and in a different style, a late Tudor design in brick; and Mr. Toulon, however he may vary the style of his domestic buildings, always impresses on them a certain amount of originality of treatment, and is quite in a different position from those architects who merely reproduce correctly and exactly the original features of two or three styles totally unconnected with each other by age or country.

Having mentioned the best of the designs actually executed or to be executed, we may go back to the top of the room, and look at one or two of the ideal designs which have been premiated by the Academy and the Royal Institute. The "Design for a Railway Station," for which the Soane Medalion was awarded, is represented by a perspective view (No. 800) in the Academy, which did not strike us as calling for any remark. It had the aspect of a railway-station, certainly, but with an unpleasant general outline. The details shown here (111) of part of the waiting-room elevation are in the Gothic plate tracery manner much in vogue. Bas-reliefs on the first-floor level show smiths carrying on forging operations, &c., which is appropriate enough; the bas-reliefs above these windows show allegorical figures placed uneasily on the haunches of the arches, with ornamental trees growing out of the window-labels, &c., a clumsy method of placing bas-reliefs, though clever men adopt it. Mr. Florence's "Design for Theatre" (106: Royal Academy gold medal, 1869) is a fine Classical design of Roman type, suitable enough in expression. We should have thanked Mr. Florence more for it if he had suggested any means of doing away with or of treating architecturally the immense expanse of sloping roof which generally forms the crown to a theatre, and which, when seen from a little distance, deforms the whole as a design; and if also he had suggested anything more new in the way of decoration. Why festoons of flowers and naked boys are always to be considered *propria que theatris* we know not, unless the latter feature is a hint of the nudities that are now to be seen within. Mr. Londale's "Ball and Concert Rooms" (107, 114, not premiated), though not looking very lively, even with the addition of the four shrubs in flower-pots over the entrance, show a good deal of originality, especially in the manner in which it is contrived that the upper stages of the two towers should shut up, like a telescope, into the lower portion, as they evidently will do. Bas-reliefs on the towers represent Torpishcore and suite, and Orpheus playing to the lions and other savage beasts. Our experience is, that "lions" of any art are bad listeners at a concert, and prefer the sound of their own voices. This design is worth something, though, because it shows that the author thinks for himself. He should reconsider his towers, and remodel the upper stage, which is quite different in character from the rest, and more like timber construction than masonry.

In decorative design we have "Decoration of Vestibule, 14, Fitzroy-square," designed and executed by Mr. H. S. Marks. The arts of design (apparently) are represented by three figures in the centre, while "Music" and "Poetry" stand a little apart on either hand: the work is in the usual flat style which Mr. Marks employs so well for wall decoration, and in a very subdued scale of colour, perhaps a little too subdued, but much depends on the actual situation, light, &c. "Art Tiles," by Mr. G. B. Cooke (144) are, many of them, very pleasing, representing single figures, groups of birds and flowers, &c., lined in black, with warm buff tint on the figures against a white ground. They are not suitable for floor tiles, but would be an agreeable novelty in wall decoration, if discreetly introduced at suitable points. It is a mistake to attempt background, as he does in one or two of them; this kind of decoration should be perfectly flat. Mr. Chancellor's "Designs for Chimney-pieces, at Whitton Lodge, Northamptonshire" (149, 150), are most praiseworthy and successful efforts to concentrate a little more art than is generally found around the domestic fireside. The dining and drawing room chimney-pieces are shown in sepia line drawings; the former a square opening with square panels round it, filled with foliated carved ornament; the latter semicircular, and with semicircular panels round the opening, after the manner of "cupping" on a large scale. The character of the two designs, in relation to their respective positions, is very well discriminated. The boudoir and nursery chimney-pieces are shown in coloured drawings, with the same appropriate diversity of character: the nursery chimney-piece is decorated with blue and white tiles, representing little stories, calculated to attract the infant mind, and with the motto over it, "Who never tries cannot win the prize." We wish some of our large chimney-piece manufacturers would try to get a few such designs as these from those who can produce them, instead of the unmeaning and detestable things which are ranged by hundreds in their show-rooms to

tempt the purse of the British Philistine. Mr. Gribble's "Design for Bookcase, and Decoration for Library" (119), is a very good drawing, in the current Gothic manner of furniture design, but with more of refinement of detail than we find in many such works. Unfortunately the wall decoration shows in the frieze the worst style of absurd conventional Mediaeval figures, whereby so many architects and decorators endeavour to persuade us that we are living in a barbarous and uncivilised age when people could neither invent nor draw anything but monstrosities. It is a great pity, again, that any one who can use the pencil with so much facility and spirit as Mr. Moyr Smith should waste his ability over such worthless nonsense as the sketch of the "Signs of the Zodiac" (131) for "Wall Decoration," forsooth! What man in his right mind would go to the expense of having such a grotesque absurdity stereotyped on his wall? His "Unfinished Sketch" for wall decoration (148), with a gold background, is more serious in intention, and looks "melancholy" enough for the subject it is designed to illustrate. Mr. J. D. Crace contributes some capably-executed sketches in colour of wall and ceiling decorations at Cairo and Damascus; one of these, on the "exterior wall of the Jama Mallah, Damascus," is a very good specimen of Arabic geometric design inlaid in coloured marbles. Mr. F. Leighton's "Decoration of Hall in Mansion at Kensington" is very happy in tone and colour, as might be expected, but seems to have been designed in a hurry; the arabesque work in the upper portion is not very good in detail. Mr. Marks sends some "Book Cover" designs, which we submit are too Egyptian in type, though clever and suggestive. Mr. P. Anson's "Study for Decoration of the British and Foreign Bible Society's Premises" (169) is somewhat hard, with its chequered soffits on the ceiling, but shows a good design for stair-railing. It does not clearly appear from the catalogue whether Messrs. Green & King's "Decorations of Teatro Massimo, Palermo," is an executed work or not; but there is a good deal of merit in the design, which, however, follows the prevalent taste for what is over-florid and showy in theatrical decoration; the best bit of it is certainly the decoration of the front of the upper tier of seats, intentionally kept rather plainer and quieter than the lower tiers, and in much better taste and more architectural in character. We have noticed the same thing often in theatre decoration, which as at present practised is generally best exactly where the decorator has intended to keep his work rather subdued. Will no one ever venture to decorate a theatre, externally and internally, on really refined artistic principles, instead of on the principle of making the most gaudy possible show for the money? It must be admitted, certainly, that such decoration would accord but ill with the style of theatrical entertainment most popular at present.

The two screens in the principal room are occupied, No. 1 by the Architectural Association Sketch-book, and No. 2 by various designs by members of the class of design in connexion with the Architectural Association. We have not space to go into these in detail, but many of the drawings on both screens are well worth attention. The Sketch-book drawings show notably great clearness and firmness of line, one or two by Mr. Vials we may particularize as excellent in this respect. On the back of this same screen are some very fine and successful photographs of old and new buildings, including several of Bayonne and Moulins Cathedrals. Among the drawings [of the class of design on Screen 2, we may mention with praise a "Design for a London Shop-front," by Mr. Watts, and two designs of the same class by Mr. W. L. Spiers, the latter very sensible and thoroughly practical designs, which we hope the author may one day be able to carry out: there is a wide enough field for improvements in shop-fronts! A "Boat-house," by Mr. Aston Webb shows clever treatment of a rather out-of-the-way subject. In the smaller room is a large collection of sketches from buildings in various parts of the world, among which we may mention the fine series of water-colour sketches of Indian subjects by Mr. Emerson, especially "Ruins in Fort Agra" (286), and "Gateway and Capitals at Bejapore" (294). Mr. Spiers sends two or three sketches in his now well-known style, and Mr. P. Anson's series of "Sketches taken at Athens in 1836" (266-276), including an admirable sketch of the monument of Lysicrates, cannot fail to interest the visitor, and ought to have seen the light earlier than the present year.

We have gone at some length into the contents of the Architectural Exhibition, being anxious not only to encourage what we regard as sound art, and to discourage its opposite, but also to convey to readers who have not visited the Gallery in Conduit-street an idea of the variety of designs, many of them exceedingly suggestive, some of very high merit indeed, which are collected there, and to stimulate them to aid in supporting and making known this medium for the collection and exhibition of drawings representing current architectural progress in this country. There is, we have reason to know, a feeling on the part of some of the leading members of the profession in London that architectural drawings had better be concentrated in the room which the Royal Academy have consented for the present to devote to architecture, in order that they may be placed where the public cannot but see them, or at least go through the room in which they are placed. This latter, however, as we hinted in our review of the Academy drawings, is really all that the public mostly do; they walk through the room; they do not come to the Academy to look at architecture, but to look at pictures; and, moreover, the Academy have not room in the one gallery they appropriate to architecture for as many drawings as can be hung in the Conduit-street rooms. The drawback is that the public do not come to this latter room; to which we reply that better funds, arising from a larger subscription-list, would render the proper advertising of the Exhibition in non-professional quarters an easier matter than it is at present. We do not say that the present exhibition is altogether satisfactory to us. We see too much of mere archæology, too little evidence of thought and purpose in designing, too many drawings which merely represent what we have seen over and over again. But these very defects remind us how useful it is, or ought to be, to the members of the profession, independently of the general public, to have this means of seeing and comparing *en masse* a number of tolerably representative drawings, of noticing the direction in which we are going, of correcting faults of habit and fashion by comparison with the few designs which stand above these influences. It rests with the profession to say whether this opportunity is to cease after the present year, or whether they will combine, as they easily may do, to furnish the means for its further continuance.

ARCHITECTS AND THE GOVERNMENT.

On the 13th instant a deputation from the Institute of Architects attended the Prime Minister in Downing-street, touching the dismissal of Mr. Barry from the Houses of Parliament, the importance of properly qualified supervision of all important public buildings, and the ownership of architects' drawings. The deputation included Sir William Tite, M.P.; Mr. Beresford Hope, M.P.; Sir M. D. Wyatt, Professor Kerr, Professor Lewis, Mr. G. Atchison, Mr. A. W. Blomfield, M.A.; Mr. D. Brandon, F.S.A.; Mr. F. P. Cockerell, Mr. H. Currey, Mr. R. W. Edis, F.S.A.; Mr. G. Godwin, F.R.S.; Mr. O. Hansard, Mr. C. F. Hayward, F.S.A.; Mr. E. P. Anson, Mr. E. Roberts, F.S.A.; Mr. J. P. St. Anbyn, Mr. G. Truett, Mr. Sancton Wood, Mr. J. H. Hakewill, Mr. J. Peacock, Mr. R. L. Rounien, Mr. T. R. Smith, Mr. W. White, Mr. F. Warren, Mr. J. P. Seddon, Hon. Secretary; and Mr. C. L. Eastlake, Assistant-Secretary.

The deputation was received by Mr. Gladstone, with whom were also the Chancellor of the Exchequer and the First Commissioner of Works.

Sir W. Tite introduced the deputation and the subject. Sir Digby Wyatt, in place of his brother, the president, who was unable to attend, stated forcibly some of the views of the Institute, and Mr. Beresford Hope, Mr. Godwin, and Mr. Seddon followed. We have not notes of what was said, and can only recall the observation of one of the speakers.

He said he had been requested as an old Fellow of the Institute to add some words to what had been already urged;—first as to the ownership of drawings. As a matter of universal custom, the drawings belonged to the architect. As the conductor of a professional journal, he had corresponded during more than twenty years with persons in all parts of the kingdom on this subject, and he could say that in no one case of which he was aware had the claim, when made on the part of the employer, been maintained. He did not know that any case had been taken to a court of law: representation of the existence of the custom, and the common

sense on which it was founded, had sufficed to bring about a settlement. The custom prevailed everywhere. He believed copies of resolutions to that effect from societies in England, Ireland, and Scotland, not to speak of America, had been already handed to the Minister. Should the question go to law, he thought the courts would hesitate before coming to any decision in opposition to a custom so long and generally acted on, even should they happen to be of another opinion. It had been asserted in a public journal that the Institute of Architects had wrongly interfered in expressing their opinion that it was necessary for the worthy maintenance of national monuments and buildings that they should be under the superintendence of specially educated men of high standing. He could not agree in this objection. The Institute, a chartered body, were disinterested in so speaking, the matter affected so few, and he knew no other association from whom the public might more fairly look for an expression of opinion and guidance on the subject. Reference had been made to various public buildings, each placed under the superintendence of an architect, such as St. Paul's, the Bank, and others. He would add to the list by naming nearly all our cathedrals. These important structures had suffered for years by being left to the care of a mason or a clerk of works; but the opinion of deans and chapters had become educated on the point, and now he believed there was not one cathedral that was not under the supervision of an architect. The profession were strongly affected by the course that had been pursued towards Mr. Edward Barry, and the important questions that were raised by it, and he ventured to urge that it called for reconsideration on the part of the Government.

Mr. Ayrton replied at some length, and Mr. Gladstone also spoke; but their views, as expressed later in the day in the House of Commons when speaking on Mr. Cowper-Temple's motion, have since been so widely published that it is unnecessary now to report them. The striking point in Mr. Ayrton's reply was the assertion that much of what had been said by the deputation was founded on misconception, as Mr. Barry had not been dismissed! Mr. Gladstone, in the course of the debate, said the same thing. What Mr. Temple did was to call attention "to the correspondence relating to the dismissal of Mr. Edward Barry from his employment as architect of the Houses of Parliament; and to move that, in the opinion of this House, the abrupt discontinuance of the employment of the architect who has hitherto been engaged whenever professional skill and responsibility were required, at a moment when works entrusted to his direction were still in progress, is uncalled for and of doubtful expediency."

Mr. Gladstone, as referred to, said:—

"The words of the motion evidently implied that the completion of works in progress under his charge was to be taken out of his hands; but that was a statement which was entirely without foundation. Mr. Barry was to complete the works which were in progress exactly as he would have done if this correspondence had not taken place; and as to the future, the Chancellor of the Exchequer had given it as his opinion, that Mr. Barry ought to continue to be employed when works were required in that building. The employment of Mr. Barry as an architect actively, had been discontinued with regard to works in progress, nor had been declared to be about to be discontinued with regard to architectural works which might hereafter be declared necessary."

We will say nothing of the terms of the correspondence on which the opinion out of doors was founded. On these statements being made in the House it would have been as well if the motion had been withdrawn. However, it was pressed to a division, and being twisted into a sort of "want of confidence" motion, was, of course, lost, 109 voting for it, and 152 against, a small difference under the circumstances, especially as several members quite opposed to the proceedings of the First Commissioner—for example, Lord Elcho, Mr. Alderman Lawrence, Sir James Lawrence, and others,—refrained from voting, considering it not desirable to press the Minister too hard.

The claim to ownership of drawings still remains open, and to this we shall doubtless have to return.

A House for Societies.—A proposition is on foot to build some place of accommodation for various learned societies which meet in London. Last week a meeting was held of representatives of seventeen societies, which pay in the aggregate no less than 1,700*l.* a year for rent of premises, and the possibility was talked about of building a hall, at a cost of about 20,000*l.*

WATER SUPPLY AND OTHER QUESTIONS IN INDIA.

The condition of the water-supply in India has recently undergone a searching examination, and the results obtained are by no means satisfactory. The low-cast (or no-cast) natives of Bengal are not particular in the matter of water, and up to a very recent period Englishmen have thought far more of conquest than of sanitary regulations; so that the sources of water supply have been very little cared for. Tanks have accumulated vast masses of vegetation, and have abounded with fish and water-insect life. Wells, as a rule, have had no protection against surface pollution, and the results have been and are that both tanks and wells continue to be fearfully polluted, not only with vegetable and mineral matters in excess, but also with animal matter of the most revolting sort, namely, drowned bodies of natives. Any person conversant with Indian history knows that the poor Hindoo is a creature of impulse and despair; death has little of terror for a famine-stricken native, and suicide by drowning, even in tanks and wells known to be in use, is fearfully common, and human bodies are committed to the sacred waters of the Ganges in countless numbers; and yet this water is used by the residents on its banks and even in Calcutta. In the Bengal Presidency, during one year, upwards of 1,200 human bodies have been removed from tanks and wells, the water of which tanks and wells is in use as a supply for towns, villages, stations, barracks, hospitals, &c., and on further cleansing some of these wells, many human bones have been removed, the flesh having wasted (dissolved) away. At many of the stations in this presidency Europeans on their first arrival suffer in various ways; as by fever, diarrhoea, and cholera, by boils, and by entozoa and intestinal worms; regiment after regiment, as the men have arrived, going through this disgusting routine of drinking tainted water and paying the penalty in human sufferings. Recent chemical analyses show that a vast proportion of these diseases is preventable. The presidency of Bengal is a region of heat, moisture, rivers, swamps, jungle, and cholera; and it is in this vast district that this dreaded disease (cholera) obtains its birth; and, in its terrible maturity and strength, passes forth over the inhabited parts of the earth to teach men that they must pay the penalty of a sudden and loathsome death if the simple laws of nature are neglected, or are blindly and selfishly broken. It has long been known that polluted water is, during epidemic periods, a deadly poison; and, if water pollution and cholera are cause and effect, the tainted wells and tanks of Bengal only perform their natural work. The preparations and the results are in accord. Tanks and wells are neglected; and, consequently, are polluted to the uttermost: the population, native and European, blindly and ignorantly drink the waters and suffer accordingly. From the grand ranges of the vast snow-capped Himalayan mountains to the sea, over the regions watered by the sacred Ganges and its numerous tributaries, this neglect prevails. The monsoons bring deluging rains and relief, for as the waters rise cholera disappears, being drowned out of the submerged swamps and vast alluvial plains, but only to reappear on the subsidence of the great flood waters, as the tropical heat evaporates the sodden soil and rotting vegetation. The mortality in such a district, so neglected, has been very great. The questions now are, "Need such mortality continue?" "Must European life be expended at the rate common to periods which have passed?" On the nature of the answers to these questions depends the supremacy of British power in India for a shorter or a longer period. Sanitary science teaches this lesson. Abandon stations situate in swamps and jungles; cleanse and protect all sources of water supply, and establish a sanitary police both for the native and for the British populations; remove every known cause of disease which is removable; wash and be clean; but see that the water is free from pollution. The continued government of India by Europeans cannot be. Great Britain may plant her pure religion, her civil law, and her sanitary order; but she will not govern in perpetuity. She may devise canals, tanks, and wells furnishing pure water, and construct networks of highways and roads, common and iron; foster native manufactures, and encourage commerce; but in due time her work will have been accomplished and her labours must cease. In the future history of the

world the facts and incidents connected with British power in India must dwell upon will not be of armies, generals, governors, and conquests; of battles, suppressions of mutiny, or of human slaughter in any form. The memory of these may remain, breeding feelings of revenge, or of shame, or of sorrow, in proportion as the hearts of those who read are hardened or have been civilised by Christian teaching. The true and enduring fame of Great Britain will be connected with the permanent establishment of works and regulations of the most simple character; namely, those works which have tended to promote social comfort, and those regulations which have best insured human happiness, and are a means of securing health to the greatest numbers.

THE WORKMAN AND HIS FINE ART.

If there be one thing more certain than another in connexion with the future of the working man, it would seem to be that "improvement" must be begun by himself feeling the need of it; and that that improvement must in the first place be a physical and bodily one, and one that concerns the house he lives in, the furniture in it, and the clothes he wears. Mental improvement, whatever that may mean, comes after these. It is a fact which has not often been noticed, that so strong is the desire for improvement in the human mind, even in its lowest and almost hopeless state which it so often is, unfortunately, that you cannot anywhere, in the very lowest neighbourhoods, such as the poorer districts of Westminster, close to the Abbey, or of Whitechapel, or the more famous St. Giles's,—and those are the places wherein the working classes are found to congregate and cluster together most thickly,—you cannot anywhere see a small room, however shabbily furnished, without noticing that the walls of it are thickly hung with pictures of some sort or other; commonly they are very coarse coloured lithographs of it, would seem, no sort of interest whatever, but yet they are pictures of figures representative in some sort of human passions and interests. How any one can endure the constant sight of such worthless things may remain a mystery, but there they always are; and it seems to show that art of a certain character is found to be necessary to every human being, however depressing their circumstances and surroundings may be. It would be a curious question to inquire into, to determine, if it be possible, as to how far is any one to be considered improved, mentally improved, who thus collects and has perpetually before him pictures of any kind, and which to him, or to her, are pictures and works of fine art. Is it the very beginning or the end of human culture, and how far is such a one in advance of those, if there be any, who care for none of these things? It has been affirmed that no uncivilized people anywhere are found to care about art at all; you must, it has been said, educate them first. But here in Westminster we see that people not at all educated do care about art, and pay for it, and carefully hang it up, and cannot help at all times looking at it. The costly pictures round the rooms of the wealthiest, and those common coloured prints round the room of the poorest, are nearly on a level, as far as the impelling motive is concerned. In this sense they are both educated and both improved; and here we would venture to hint at a means of adding to the educational appliances of the working man, perhaps more effective than many yet suggested, viz., the production through the autotype process or otherwise of facsimiles of the productions of the great masters of art and painting, of original drawings, etchings, engravings, both old and of to-day. Thus and through these might the working man and his wife and children educate themselves without troubling their betters; for surely no one will doubt that there is no small amount of educational force and help in such things as these, the highest efforts of the greatest minds and hands. Through their great works we see them and their thoughts and labours. Thus may the educational apparatus and furniture of the working man's house and home be added to and improved.

Another subject akin to this, and always to be found in the room of the poorest and humblest, are what are termed "chimney ornaments." Strange objects enough. What sort of pleasure or mental delight they can give it would be curious to inquire; they are never of the smallest possible use. Figures in coarse china-ware, very

gorgeously coloured, animals of different sorts, grotesques somehow contrived so as not to be grotesque at all, but only utterly unmeaning and silly; imitation model clocks, a whole warehouse of stupidities, are common and to be seen everywhere, and are eagerly bought and carelessly displayed, and always on view, for there is no getting away from them. Let us be just to these people: it is real love of ornament and fine art that compels on a Saturday night the appropriation of a portion of the week's earnings to objects of this kind, worthless and trumpery as they are. It is certain that our present race of working and labouring men and women are, at least, above the lowest stage of human progress, for they have, as we see, art and ornament, and a love of the beautiful, as far as they can see it; for these things of beauty are found where there is hardly enough of furniture for necessary use, and are carefully arranged and kept free from dust. We have no right to despise these things, for chimney ornaments are common property, the very richest sometimes have no others; indeed, it would seem to be no little of a puzzle to discover what we should ever do without "chimney shelves," where would the "ornaments" go to, or would there be any at all anywhere? Perhaps a hint might be got from the interior of a Tartar tent or "ourt," where the "ornaments," useful things ornamented, are suspended from the walls of it.

What was said above about prints and pictures here applies to "chimney ornaments": they may not be improved so as to help to educate the working man, and his wife, and child? Can new and *bonâ fide* modern ornaments be designed and executed, or is it necessary to resort to "old examples" and precedent, and reproduce, by aid of plaster and the electrotype process, the few remaining fragments of Greek and Roman and Italian art and furniture; and thus to educate the modern artisan by giving him the thoughts and handiwork of the old Greek and Italian workmen of days gone by, and of thoughts whose full meaning is well-nigh forgotten. Perhaps some art-benevolent-society may be found to solve this riddle. It is worth a little trouble, for the poor man's wife on a Saturday night will surely and certainly buy a "work of art," even from the very hand of Plinius himself, if it be cheap and it happens to strike her fancy. And this must educate both her and her husband, and their sons and daughters, in art and in the perception of the true and beautiful. The great strength and certainty of success in all this lying in the assured fact that works of ornamental art, if cheap, will be bought and looked at by the humblest cottager, if they be but provided for sale. Anything will and must be an improvement on the present market stock, no matter where from or what it is.

It may not here be out of place to inform or remind the intelligent reader that there are "warehouses" in the east end of London which regularly import by wholesale cargoes of ornaments of the kind mentioned. They would seem to be manufactured in France and Germany, and are the production, for the most part, of children working, of course, under a regular system of manufacture, the object passing from hand to hand as it goes on to completion. The full nature of this wonderful display of indescribable trumpery can only be appreciated, or even conceived, by being seen, and the very best wish that any charitable person can possibly have, is, that the countries from which they come are either too enlightened or too ignorant to keep any portion of the stock themselves, and for their own use and eyesight. The workshops are the south of France and Germany, but the markets England and America. Thus it is that one of the best and highest faculties in man's nature is made to bring about and keep alive the most worthless of results, and it is melancholy to reflect on the time and mental and bodily strength and skill thus expended and lost.

One other note it may be useful and of some interest to make, as it may catch the notice of some who may care but little for the ignorant fancies of working people. The strangest part, perhaps, of these displays of "ornaments" is the manufactured oil pictures. These are copies of well-known and celebrated works of Dutch and Flemish pictures, of interiors and landscapes. Parts, at least, of these pictures would appear to be handwork, and by the same hand, but the precise mode in which they are produced it would be difficult to point out. Where the painters get their thin, washy colours from must be a manufacturers' mystery; and how it is

that accident does not sometimes do a little towards the production of painting seems equally mysterious; but one artistic feat is certainly accomplished—anything approaching to real painting is steered clear of in a truly dexterous way, and there is a thing to wonder at. But one class of objects there is which accident or fate now and then helps; these objects are the work wholly, it is said, of small children. They are figures of animals of different kinds, cut out of soft wood, and are carved sometimes with very considerable spirit and life, and apparent knowledge of the forms and movements of animals, and even of the hair or wool which covers them. It may be, and probably is, the result, among so many, of pure accident; but it shows to what a level modern European art is reduced, and how out of it fortune will sometimes smile on things. What, if any among these children should have the faculty of catching the forms and strange movements of animal life, as their forefathers did in Gothic gables and tall spires, and the power of perpetuating them in wood and stone; and what sort of thing can that "progress" be which condemns them to their present work, so different from that of their famous "Dark Age" ancestors? These things may be bought at any toy-shop for a penny and twopence each. It is a fact which must perpetually force itself on the attention of the thoughtful observer of modern art, that all things seem to conspire towards the rendering it more and more impossible to employ legitimately and naturally the artistic capacity and energy of the time in which we of the present age live. These are all wasted and thrown away, and seem to come to an end in mere "shop-keeping," and all you can possibly get out of the most diligent inquiry into the matter is that the art-power nowadays, in Europe, at least, is wasted away, and is subservient only to the wretched ends of mere manufacture, and the production by wholesale of such things as we have above referred to. The art-power, without doubt, exists, but we can never see the true and noble results of it!

This subject is just now rendered the more especially interesting from the fact of the proposed introduction of a universal system of education, whereby it is proposed to compel everybody, whether he will or no, to be educated. It will surely then be seen that the art of common things is a matter of importance and interest, and the chimney ornaments on the chimney-shelf of a working man's room, and the pictures hang round the walls of it, may come to be tests of his educational advancement; and perhaps the Government inspector himself may actually find out what sort of education the workman's family of sons and daughters are receiving by a simple inspection of the chimney ornaments and pictures in his possession, and even get in time an idea of art himself.

Yon, sir, I think, are among the very very few who have given an adequate attention to such matters as these. They are not particularly attractive or specially fashionable, but they are certainly as important as anything can be which concerns the workman and his future, whatever that may be. Surely it is not so contemptible as many may think it; for if among the very worst of these trumpery "ornaments" we take the vilest and the most worthless and the cheapest,—say a small earthenware figure of a man and dog, the man with a daub of red, and the dog with a daub of blue, and compare such with a very expensive modern line engraving of a like subject,—I say it would puzzle the most expert of art analysts or art critics to determine with accuracy which of the twain is the emptiest and the most artistically worthless. A real and practical change in art and in the practice of it will certainly come about when the time shall come for even the commencement of a new order of things on the "chimney-shelf" and walls of a common room! C. B. A.

ROOFING ZINC.

THE use of zinc has rapidly increased in this country within the memory of the present generation. In 1845 the annual consumption was about 5,000 tons, which had increased in 1860 to 25,000, or fivefold. Since then the progress has been still more rapid, and the returns of one company alone recently showed the figure of 45,000, as the gross of their annual transactions in zinc, used solely for roofing in England and the colonies; and future years will probably show a still greater increase if the arrangements now made to secure "good work" be carefully carried out.

We should premise that throughout the Con-

tinental its use has been, and still is, more extensive. In Paris it is the leading material for roofs of every description. We may mention as examples the newer portion of the Tuileries, all the new markets, nearly all the mansions of the new Boulevards, and the Champs Élysées, dating as far back as 1830. Other places throughout Europe may be quoted to any extent, but we think the above quite sufficient to prove that the material has established itself as adapted for works of good character.

The more extended use of zinc for roofs in this country to which we at first alluded, dates from the year 1859, when the Vieille Montagne Company, the largest manufactory of zinc in the world, instituted a special inquiry into the causes of the failure of zinc here, which was conducted by Mr. Jas. Edmeston; and the result was to show clearly that the faults did not arise from the nature of the material itself, but from the use of inferior quality in some instances, and improper workmanship in others. In all cases where the zinc was good, and the work properly done, it has stood the test of time, requiring neither painting nor repairs, and when of proper thickness, it forms one of the most lasting materials for roofing that can be employed.

We may here point out the causes of failure which are to be avoided.

The first is the quality of the metal, which, when manufactured from inferior ore, contains certain other metals in admixture with the zinc, which, when exposed to atmospheric influences, set up voltaic action, leading ultimately to the destruction of the metal: this kind of zinc is spotty and uneven in colour, and darker than the proper quality manufactured from the best ore, the calamine.

The second cause of failure is defective workmanship, using the zinc too thin, not allowing sufficient play for expansion and contraction, using iron nails, or allowing the zinc to come in contact with iron or lime; in either case, a destructive chemical action being the result.

As examples of work done in this country, we may notice the cloisters of Canterbury Cathedral covered twenty-four years ago, and which have not cost £1. for repairs; the Victoria Station, ten years ago, now in a perfectly satisfactory state; as well as many stations on different railways, and many other buildings in England.

In conclusion, we may notice the peculiar way in which the atmosphere acts upon zinc. Quoting from a report made to the Academy of Sciences by the Director of the Conservatoire des Arts et Métiers:—

"It appears from actual experiment that the oxidation proceeds for about four years, gradually diminishing after the first three months, and that it then hardens into a protecting coat, 'dross,' of a dark grey colour, preserving the metal beneath from any further deterioration."

It becomes evident that as a sheet of zinc exposed to the atmosphere for a series of years loses little or nothing of its weight or thickness, and as its surface remains hard and polished like enamel, it may fairly be deduced that the following years are not likely to occasion any alteration, and therefore zinc will be placed in the same condition as bronze, which is protected by its "patina" for ages.

There has been, to some extent, a prejudice against zinc as a lasting material, but with the evidence before us, we may safely say that where it is of a proper description and well laid, this is utterly unfounded. Its lightness and cheapness will doubtless render its use more extensive, if only necessary precautions be taken.

RULES OF PROFESSIONAL PRACTICE.

SIR,—A circumstance occurred at the recent special general meeting of the Royal Institute of British Architects, on which the profession generally may reasonably ask for a little further information; and, failing any other means of obtaining it, may I request the aid of your columns to assist in ventilating the subject?

At that meeting I took occasion to inform those present how that not long ago the whole question of the usages and rights of the profession had been fully brought before one of our superior courts, and that a decision fully recognising the principles now contended for on the part of the profession was only prevented by the conduct of a member of the Institute, who gave evidence flatly contradictory to the published statements of that body. I also complained, and I think with reason, that the late Council, on being appealed to, declined to take any decisive action in the matter, which still remains in an undecided state.

In defence of this inaction of the Council, the secretary stated, what until then was perfectly

new to me, that the member denied having given the evidence stated, and that therefore the Council could take no action.

Now, as the complainant in the case, to whom one would suppose this ought to have been at once communicated, allow me to say that during a long correspondence I had both with the secretaries and the late president, it was never once hinted that there was any denial of the facts stated in my complaint, the inaction of the Council having been then defended on totally different grounds: one being that in the opinion of the then Council the code of practice set forth in the Institute paper was only "recommended, and could not be enforced."

This idea, I need hardly say, is directly at variance with numerous previous resolutions and declarations in which the same code of practice is set forth as "authoritative," "binding alike on employers and employed," and "undoubtedly the law on the subject;" and if it is to prevail, what chance has Mr. Barry or any other member of maintaining the position now sought to be established, if brought to a legal issue?

I am further strongly inclined to think that the secretary either wholly mistook or forgot the facts, when he stated that the member whose conduct was complained of had denied the accusation. I have accordingly applied to him to verify his statement by reference to the correspondence; but, I suppose with due official reticence, he has not favoured me with any reply. I can only hope he will do so now, for surely nothing is to be gained by mystery and reserve on such subjects.*

I should be very sorry to make any complaint against a brother architect that did not admit of clearest proof, and was always ready and willing to appear before the council and substantiate every statement in any proper way that might be required. "The thing was not done in a corner," but was perfectly notorious in the Irish metropolis, where it occurred, and was noticed by the council of the Irish Institute in their annual report.

It is absurd to attempt to draw any distinction between my case and Mr. Barry's. There may be differences in detail, but there is none in principle. I brought my action to try whether there were any and what usages of the profession to be recognised as legally binding; and if Mr. Barry's case were to come to a legal issue, the main question would be the same. While one case remains undecided through conflict of evidence, another case is not likely to come to any better conclusion. Nor need it be supposed that this anomalous state of things is not well enough known to those who may have to deal with the question in the legislature. Three of the counsel engaged in my case are members of the House of Commons, and two of them are also members of the present Government. These gentlemen heard the contradictory evidence given, and two of them who were retained by me expressed their utter astonishment that members of such a profession as ours could be found ready to contradict their own published rules. A different state of things prevails, I need hardly say, in the profession they belong to. At all events, so long as it continues we can expect either the Government, the House of Commons, or the public, will pay the slightest regard to our rules or usages whenever they may be called in question?

WM. FOGERTY.

THE NEWSPAPERS AND ARCHITECTURAL CRITICISM.

SIR.—The ignorance and carelessness about subjects connected with architecture, continually displayed in the pages of English newspapers, have, I suppose, long ago been accepted by those who understand these matters as a necessary and inevitable characteristic of English journalism; but the carelessness of our press in this respect could not be more strikingly illustrated than in the fact that the *Pall Mall Gazette*, a paper which professes to take a lead in æsthetic matters, and to employ on special subjects only writers of competent special knowledge, should have printed such an article as that which was offered as a criticism of "The London University Buildings" in its impression of the 11th. The greater part of the article is cobbled from a

* In a second communication the writer of this letter says this has been satisfactorily explained to him:—"It would appear that the member against whom I preferred the complaint did represent that his evidence was not to the effect complained of. As, however, the matter was perfectly notorious at the time, I distinctly join issue there."

recent description of the building in the *Observer*.

After a long descriptive paragraph reproduced word for word (without acknowledgment), we have such bits of adopted criticism as these:—

Observer.

"The porch has five openings, with flights of steps in front, the divisions or supports being groups of columns attached to a pier, 'rusticated' or channelled, to harmonise with the wings. The four middle piers carry seated statues, and the two other piers terminals of peculiar form."

Pall Mall Gazette.

"The porch has five openings, with flights of steps in front, divided by groups of carved columns (see?). The four middle piers bear seated statues, and the two outside piers have terminals of a peculiar form."

The compiler, not knowing apparently what "rusticated pilasters" are, translates them into "carved columns." But the finest bit is the following: the *Observer* mentions that,—

"The lower division of the wings externally has a Doric frieze continuing that of the order of the porch."

Strained through the brain of the *Pall Mall Gazette* writer, the sentence comes out this way:—

"Externally along the wings runs a light Doric frieze, which continues the order of the noble porch in front."

The *Pall Mall Gazette*, however, gives one sentence, and just one, of original criticism on the building, which I commend to the attention of your readers:—

"Taken altogether, the façade has a striking yet graceful appearance."

This, if not very intelligible, is at all events safe, as it may mean anything or nothing. This is the only sentence the germ of which I cannot find in the previously published account.

Now, sir, this is only one out of many specimens of the manner in which literary papers habitually treat architecture. A publication which, when dealing with other branches of art, thinks it worth while to obtain the assistance of contributors who, at all events, give evidence of knowing something of the subject they are writing about (even if their criticism is not always on the soundest principles), is content, in dealing with an important architectural work, to cobbler up remarks from another source, without even understanding their meaning, and to offer its readers an article containing not the faintest apology for anything less intelligent criticism. Editors rely, no doubt, on the ignorance of general readers with regard to architecture; but you will agree with me that those who do understand something of the principles of architecture have a right to expect that works in this branch of art should receive the same degree of attention, and that the same care should be taken to put the criticisms of such works into competent hands, as is exercised with regard to painting and music; and as the advertisers of Warren's blacking "kept a poet," I would advise literary papers to "keep an architect," unless they prefer to continue running the risk of making themselves ridiculous in the eyes of some, at least, of their readers, and to offer "pickings and stealings" as original matter.

I enclose my card, and need scarcely add that I have no possible or remotest connexion with the paper which its contemporary has laid under contribution, but write merely and entirely in the interest of

ARCHITECTURE.

CHARITABLE DINERS.

The Literary Fund dinner, on the 11th, presided over by Lord Dufferin, who made a very good address, was lively and agreeable, not the less so, perhaps, because many of the visitors had received invitations to the concert at Buckingham Palace that evening, and so when speaking were led to be short and sharp. Sir Erskine May, the Bishop of Carlisle, Lord Houghton, the Nawab of Bengal, Mr. Bateman, F.R.S., and Sir Digby Wyatt, were amongst the speakers. An amusing spar between Professor Blackie and Mr. Tom Taylor closed the proceedings. The amount of subscriptions announced was 950l.

At the Newspaper Press Fund dinner, on the 14th, Mr. W. H. Smith, M.P., took the chair, and Sir W. Cudington, Mr. E. J. Reed, Lord Houghton, a member of the Spanish press, Mr. Godwin, Mr. A. Trollope, Mr. Newdegate, M.P., and others spoke, in between much very agreeable singing. About 500l. were contributed to the fund.

Something less than this amount was sub-

scribed at the dinner given in aid of the Royal General Theatrical Fund, on the 16th, when H.R.H. the Prince of Wales presided, with his accustomed geniality and earnestness. Mr. Buckstone made his annual address, which included more facts, and rather less fun, than usual. Mr. Bouicault, Mr. Alfred Wigan, and Dr. Doran also spoke.

At the Lord Mayor's Pension and Almshouse festival the Prindley presided. The subscriptions amounted to about 500l. Mr. S. C. Hall, who responded to the toast of the evening, commented on the absence of authors and publishers. In truth, however, the number of such dinners is so large that even well-wishers get tired out.

THE SEWAGE QUESTION.

Leeds.—The report presented to the Leeds town council, by the streets and sewage committee, on the utilisation of sewage, has been printed. The committee propose to adopt the A, B, C process now carried out at Leamington by the Native Guano Company, Limited. In order to carry out the system for the whole of the sewage, it is calculated that five acres of land will be amply sufficient, and that the works to be erected will not cost more than 20,000l. These works can be constructed in six sections. The company intend to begin by expending not more than 6,000l. in works, which will purify more than two million gallons daily; and if successful, then to extend the works so as to operate on the whole of the sewage. According to the agreement, the company consents to pay the corporation 5 per cent. on their outlay, and 15 per cent. of net profits, after deducting the 5 per cent. already mentioned, and working expenses. The remaining 85 per cent. is to be retained by the company.

Shoreham.—The local Board of Shoreham has resolved upon adopting the system of drainage employed at Leamington, that is, of deodorising the sewage by what is called the A, B, C system of mixture, which costs 30s. per ton, and gives a manure sold at 3l. 10s. per ton.

ON THE DESIRABILITY OF RESTORING CHURCHES OF THE ITALIAN STYLE OF ARCHITECTURE.

This subject was treated of by the Rev. E. L. Cutts, at a recent meeting of the Institute of Architects.

Mr. Cutts said the taste of the public during this generation, at least of the church-building and restoring public, has run so exclusively in the direction of the Gothic revival, that it has failed to do anything like common justice to Classical architecture in general, and to churches of that style in particular. And yet we have in London and in some of our towns churches in this style which are really noble buildings, many which are of very respectable architectural merit, and others which, while they are not perhaps such as to satisfy our architects' knowledge and taste, are still important buildings from their size and their use. Those ought to be carefully treated, so as to bring out their architectural merits; these so as to make them at least as worthy as possible of their important use.

It is quite true that many of those buildings internally look very cold and unchurchlike, but so did our old churchwardenised Gothic town churches before they were restored. Some of these Classical churches will, perhaps, need as thorough and costly a renovation as those Gothic churches did. We shall have to make a clean sweep, perhaps, of lobbies, galleries, and pews. Then we shall find in some cases that we have the shell of a very beautiful temple (as St. Mary Woolnoth and Hanover Chapel); in other cases we shall have a building of spacious area and imposing proportions, which are not unsatisfactory features for the restorer to deal with. We should have, probably, to put painted glass in the windows, and colour and gilding on the architectural features, and paintings on the walls, and statuary, perhaps, in suitable positions; and so we should give them as buildings the accessories which they have always needed. Then we shall have to replan the area so as to fit it for the purposes of a church, and to put into it furniture which will harmonise with the architecture in style, and yet be ecclesiastical in its general effect. Indeed, these are the two principles of restoration which I would venture to lay down: first, that it shall be in true harmony with the architecture of the building, not an

attempt to Gothiciſe or Byzantinise Italian buildings; ſecondly, that it ſhall be eccleſiaſtical in its feeling and effect.

The lecturer then took three or four well-known London churches as examples, and ſketched out the way in which he would ſuggeſt that they ſhould be treated. At the cloſe he ſaid:—

I ſhould like to ſee St. Mary Woolnoth taken in hand. The Goldſmiths' Company, I believe, and private people of influence in the City, have already interpoſed to ſave it from being included among the City churches condemned to deſtruction; let them complete their good work by effecting ſuch a remodelling of its beautiful interior as I have ſuggeſted,—the coſt need not be large, probably 2,000l. would effect it; and they would give the metropolis a more beautiful Clasiſical interior than any which it at preſent poſſeſſes. It would not be well adapted for a large congregation, but no large congregation now uſes it; the Sunday congregation is uſually fifty; but it would be admirably adapted for one of thoſe ſhort, daily, mid-day ſervices which have lately been eſtabliſhed for the uſe of City men; and its ſituation in the very focus of the City makes it the church of all others in which ſuch a ſervice ſhould be held.

Happily we have the artiſts who could execute theſe reſtorationſ thus ſuggeſted, even though they include, as in ſome caſes they ought to include, painting of a very high character of art. I have to thank Mr. J. D. Crao for kindly exhibiting on the walls to-night in general illuſtration of my ſubject, drawings of ancient Italian church decoration from Sienna and elsewhere, and of modern examples of a ſimilar kind from Munich. Sir Digby Wyatt has been ſo good as to ſend his diſigns for the reſtoration of St. Lawrence, Jewry; and Mr. Burges his deſigns for the reſtoration of the Chapel of Worceſter College, Oxford; and here is alſo a rough ſketch of the coloured decoration of St. Peter's, Notting-hill, juſt executed by Meſſrs. Harland & Fiſher. I may mention alſo Mr. Butterfield's reſtoration in progreſs at Chriſt Church, Albany-ſtreet, and St. John's, in the Waterloo-road.

I do not at all deſpair of ſeeing the public led to appreciate theſe buildings, which they have ſo long undervalued and neglected, induced to contribute munificently to their proper reſtoration, and I venture to promiſe that they would be aſtoniſhed and delighted with the reſults.

Of the obſervations that followed we can only record a few.

Mr. C. P. Hayward ſaid whether the time has now come for theſe notes or not, or whatever difference of opinion may exiſt with regard to the ſtyle of the propoſed improvements, there can be no doubt theſe Clasiſſic churches as they exiſt are a reproach to us. No one could be found to ſay, for inſtance, that the grand old churches in the City referred to by Mr. Cutts are exactly in the condition that they ſhould be, and that no alteration is required to adapt them to preſent times and altered circumſtances. Either they ought to be taken care of, or if not deemed worthy of anything but neglect, ſhould be ſwept away altogether, as actually cumbering the ground, and doing more harm than good by taking up the ſervices of thoſe who would be better employed elſewhere, and who are now in charge of the mere machinery of worſhip inſtead of looking after the ſpiritual welfare of a congregation. Already there are ſeveral of theſe churches reſtored in ſuch a way as opens the queſtion which Mr. Cutts has taken up, viz.: how this reſtoration ſhould be carried out, whether in a Clasiſſical or in a Gothic ſpirit? Notwithſtanding the eminent ſucceſs with which ſome churches have been reſtored in a quaſi-Gothic manner, I cannot help thinking Mr. Cutts is right when he advocates conſiſtency of ſtyle, and that when there is a good Clasiſſic building to deal with, the only proper way in which an architect could work upon it would be to treat it as he would a Gothic building under ſimilar circumſtances, and taking it for what it is in fact, carry out any changes in the ſpirit of the original ſtyle.

Mr. E. L'Anſon.—I congratulate the meeting on the advent of a gentleman who ſtands up and gives us a paper in favour of the Italian churches of London. They repreſent an epoch in the hiſtory of architecture of which, in theſe days, it is well to be reminded. There is, no doubt, a vaſt deal to be done in improving the interior of the churches in the City; but we ſhould bear in mind, I think, that the queſtion of church decoration was not revived until after a conſiderable reſolution in the ſtate of religious ſentiment. So

long as Paritan and Low Church views prevailed, churches were not decorated; and up to a recent time, till the High Church party called attention to the ſubject, the decoration even of Gothic churches was never dreamt of. During the time in which this ſtate of religious feeling prevailed, the reſidence of the inhabitants within the City was more cuſtomary than it is at the preſent day; but now the congregations in theſe City churches are exceedingly ſmall, the intereſt of the pariſhioners in religious matters being in moſt inſtances diverted from that locality to others, and hence many of the City churches are ſcarcely viſited at all. I was myſelf born and brought up, and have lived amidſt theſe churches. I know how bare their walls are, and how deſerted they now are as places of worſhip. I think, myſelf, that all Wren's churches are very noble ſtructures, but they are ſingularly wanting in what we now look for as characteristic of religious places; ſcarcely any of them have a chancel: indeed, they are little more than ſquare rooms. We now look upon the chancel as a diſtinctive feature of a church for our ſyſtem of worſhip. In that reſpect they differ diſtinctly from Gothic churches: in other reſpects I venture to ſay they are quite as convenient as places of worſhip; and the Gothic churches are generally ſo encumbered with columns that a large portion of the congregation in the pews cannot hear what is going on. That is not the caſe in Wren's churches. If we look at the examples of St. Vincent de Paul and Notre Dame de Lorette, in Paris, we ſee how effectively internal decoration can be carried out; in the firſt-named church, eſpecially, the decoration depends very much upon the magnificent hiſtorical paintings which ſurround the whole church, the work of H. Flandrin and others, and the coſt of that ſtyle of decoration I think would hardly be ſubſcribed for by the ſcanty congregations of the City churches.

Mr. Seddon.—I have been much intereſted by this paper, and appreciate Mr. Cutts's motives, and the practical way in which he has brought forward this ſubject. There are two or three other churches of the kind in London, which have been, to a certain extent, treated as he would propoſe, viz., one in the Waterloo-road, by Mr. Bionfield, and another in Albany-ſtreet, by Mr. Butterfield. The reſult in each caſe has been ſo far ſucceſſful as to afford great encouragement to carry out Mr. Cutts's views in other caſes.

Mr. J. D. Crao, Viſitor.—Mr. Cutts advocates that where a church exiſts, and it is conſidered right that it ſhould continue to exiſt, whether in London or elſewhere,—be it of a Gothic or a Clasiſſic character,—it ſhould be made worthy of the worſhip which is carried on there. It appears to me that there are a large number of theſe ſtructures of more or leſs merit, which may be rendered more worthy of the purpoſe for which they were built and leſs repellant in appearance than they now are. In conſidering the re-arrangement and coloured decoration of ſuch churches, we are, perhaps, under even leſs difficulty than in treating churches of a Gothic character. The churches exiſting on the Continent, which have been more or leſs elaborately ornamented, and whose walls have been treated as fields for pictorial art, are very numerous; and ſo near as in the city of Paris we have ſeveral examples of churches of a Clasiſſic character treated ornamentally with great ſkill and taſte. I may particularly mention that of "St. Eustache," occupying a poſition of transition from Gothic to Clasiſſic, which is treated with a coloured decoration of a very clever character. The treatment of moſt of the churches which Mr. Cutts has mentioned is certainly more difficult than of ſuch a church as "St. Eustache," becauſe they are more or leſs picturesquely in composition. The interior of St. Martin's Church looks like a large concert-room or theatre; ſtill I think, with ſkilful treatment, ſuch buildings might be rendered more eccleſiaſtical than they are. No doubt in the caſe of a church like St. Stephen's, Walbrook, a very fine effect might be produced by a coloured decoration. The interior of St. Mary, Woolnoth, is diſmal in the extreme. It is like a dirty white-waſhed cellar. You can hardly diſtinguiſh the details owing to its grimy condition; but a certain amount of diſtinct coloured decoration would render its really fine architecture intelligible. It appears to me that the ſubject has been left too long in obſeyance. The ſympathies of the public and of many of us lie more in the direction of Gothic art. At the ſame time we are not under difficulties in falling back upon

examples for the treatment of ſuch buildings as thoſe to which Mr. Cutts has referred.

Profeſſor Donaldſon.—I cannot allow a diſcuſſion of this nature to go on without expreſſing my aſtoniſhment to think of the period at which we are arrived. Fifty years ago, if a gentleman had ſtood up and talked of improving the architecture of Wren by ſquaring corners here, or cutting off angles there, it would have cauſed a conſternation in the profeſſion. But we have reached an irreligious epoch as to architecture, which Mr. Cutts has, I think, remarkably and fully developed this evening. It conſiſts of colour. The mind of the worſhipper is to be gratified, and his devotion excited by blue, green, or red colours on the wall, and gold on the ceiling. My own feeling is that religion is not of that gaudy-painted character, but a ſober, ſolemn impreſſion worthy of the religious place where we worſhip the Almighty in ſpirit and in truth. It ſeems to me, there ought to be reſerve and ſoberneſs in the human mind, when we approach the awful preſence of the Almighty. But if we are to have the eye diſtracted and the taſte flattered—if, when a man is at his devotions, he is to be met with gold in one place and red in another, is it not calculated to diſtract the attention? Ornament is not a thing to be put upon architecture, but ſhould ariſe from the architecture itſelf. That is a truth which ſhould pervade all deſign: therefore in the caſe of our buildings for worſhip, they require reſerve and ſoberneſs of treatment, or the religious feeling cannot be ſolemn. It is ſuggeſted that our Italian churches ſhould be treated with decoration in the way propoſed to-night. I have been abroad a good deal lately, and what have I ſeen? I have ſeen worſhip carried on at Genoa, in places like theatres: ſolemn they are not: decorated they are. You may go all over Italy, you may go to Venice, and ſee pictures with gaudy frames, and they attract the worſhipper and excite his feelings. Is that conſiſtent with one's ideas of the worſhip of the Almighty? I think not.

Mr. Edwin Naſh.—My opinion is, that a Clasiſſical or other building, if reſtored or altered, ſhould be treated in the ſame ſtyle, with the ſame feeling as the original deſign, and I can imagine nothing more painful than a building like ancient St. Paul's with the clasiſſical portico of Inigo Jones attached to it, however beautiful the portico may have been in itſelf. Such a treatment as that would not occur if a due appreciation were given to art for the art itſelf, and I conſider that architectural appreciation has always been imperfectly cultivated.

Profeſſor Kerr.—We have arrived at ſeveral very uſeful propoſitions. The firſt is, that there is a certain amount of Wren's architecture which is of ſufficient merit to admit of its being "reſtored." Secondly, we have arrived at the propoſition that the reſtoration is to ſome reaſonable extent to be permitted to be in accord with the original deſign of the buildings. This will be ſatisfactory to many of us, I dare not ſay to all, but to ſome. For my own part, I think if one or two of the City churches which are condemned to be pulled down were to be previously "reſtored" without this condition, indeed in the moſt approved modern Gothic manner, it might be well worth while. It would, at any rate, enable us to ſee what ſome of our friends would do for the credit of their creed with *carte blanche* as regards ſtyle. Gentlemen appear to forget that there is here ſomething which is not in itſelf religion, but which at the ſame time is worth mentioning in connexion with religious architecture. I will not ſay that England is a Proteſtant country, the remark would be too ſevere; but I may ſay that in the time of Wren it was a Proteſtant country. Wren had to build Proteſtant churches, and Proteſtant churches he built, and built them well. Hence the curtailment of chancels and the regretted abſence of baldachins to ſtand in the miſt of the ſweeping ceremonial ſtages which the lecturer advocates. We do not want ſuch things for the ordinary forms of Proteſtant worſhip; they have no legitimate purpoſe for the architect to recognise. It is true that faſhion changes, and that we muſt allow for its change; and when one ſide of the houſe is in the faſhion, the other of course muſt be out. Some of us have been out of faſhion in church building for a long while; but the time is coming when by a turn of the wheel of fortune we ſhall come in again. I am ſure that ſome of our younger friends at leaſt may expect to live to ſee the faſhion entirely changed. I have only to add that when this time comes it may be difficult for them to know what to do in the way of "reſtoring" the Gothic churches that are now ſo fashionable.

MR. EWAN CHRISTIAN, *Architect of East Lacington Manor House.*

THE SANITARY STATE OF BERLIN.

THERE have been many deaths among the inhabitants here, some from fever, some from congestion of the lungs, and other disorders, induced by the want of a sufficient supply of nutritious food, and by ill-ventilated rooms. To the best of our experience and information, the people here pay very little attention to ventilation and cleanliness. They do not keep their rooms and their houses as clean, sweet, and airy as they might, opening the windows at every opportunity, and giving a thorough washing and cleansing after any illness. They walk out of crowded, stuffy rooms into the dank evening air. Berlin is a disagreeable place. It is a city of several palaces separated by broad and dirty streets. These cannot be kept as clean as in some other towns, on account of the filthy open drains on each side of the streets, where every filth is allowed to accumulate. There is always a smell, and where there is a smell there is mischief. The deaths registered in Berlin show an annual death-rate of 34 per 1,000. Diarrhoea caused forty-five out of 469 deaths in the first week in April. However, the poor working-classes put up with great hardships and inconveniences; through the enormous rise in house-rent they are obliged to live in the cellars and back rooms of the houses, where pestilential smells, disease and poverty, dirt and dampness exist, and apparently there is no attempt made to do away with the cesspools in every house, where everything is allowed to remain for months. We cannot find words disparaging enough against the sanitary state of Berlin; and what surprises us more is the quiet resignation of the people over such a state of bad management. There is some talk about sewerage improvements and a new water company. Somehow the managers of the English Water Company have not gained the affections of the inhabitants in a business way.

Some steps have lately been taken towards building an English chapel at last. What surprises every one is, that there has not been some-

thing of the kind attempted years ago, instead of the present plan of worship allowed by the King of Prussia, who, like the late king, shows every kindness towards the British subjects residing in his capital city. Although there are only about 200 British subjects residing in Berlin, it is to be hoped that with some outward assistance the required funds will be got together.

LONDON STREET ARCHITECTURE.

BUSINESS PREMISES IN THE POULTRY.

To build a new house higher and lower than the old one on the comparatively small site of a London shop, forming fresh vaults front and back, without pulling down the old house in the first place, or stopping the business for a single day, which would have entailed a serious loss, is not an easy matter; but all this we understand was effected in the case of the building which we illustrate in our present number.

Pimm's old-established house in the Poultry and Bucklersbury has been carried on for some time past by Mr. F. Sawyer, of "The London," Fleet-street, who had acquired it by purchasing the business and freehold, and who had also obtained by purchase the leases of the adjoining houses, Nos. 4 and 5, Poultry, and 39, Bucklersbury. These leases he afterwards surrendered on obtaining a lease for eighty years from the Merchant Tailors' Company, for the purpose of extending the business of the restaurant and luncheon-rooms. How to do what was needed without interfering with the business, which was conducted on the ground-floor and basement, with the kitchen on the first-floor, was then the question.

The first difficulty that offered was, how to keep the old floors and party walls up, and build the new. 12-in. rolled iron girders were laid at short intervals to carry the timbers of the roof, which is flat, and covered with 7 lb. lead: the upper part of the party walls was built for their support. The floor below is formed entirely

of wrought-iron arched girders and concrete (Moreland's patent), the whole being overlaid with 9-in. square tiles for the kitchen, with all its various fittings, cooking apparatus, and so on, which are of enormous weight, together with a brick-built oven of not less than 15 tons in weight, together with iron tanks to hold about 2,500 gallons of water, supported on strong wrought-iron girders above the roof, all of which had to be supported before the under portions of the party walls were removed and rebuilt, and so on, floor after floor, with the iron girders; and each story of party walls was successively rebuilt downwards to the completion, without interfering with the business for an hour. This, we need scarcely say, could only be successfully accomplished by the every-day superintendence of the architect, and careful attention on the part of the builders.

When all the interior is completely fitted up, the mezzanine floor above the ground-floor will be provided with luncheon-bar. The first floor is prepared as a chop and luncheon room, and the floor above is being fitted up as a ladies' dining and coffee room, the whole being supplied by a lift from the kitchen above. The proprietor intends, so soon as the whole is completed, and in good working order, to rebuild the older establishment, "Pimm's" proper, to harmonise with the new portion.

The material of front and back is white Suffolk brick; the principal cornices, string-course, window-heads, carved caps, and carved work generally, are in Corinthian stone, similar to that used by the same architect at the Hop and Malt Exchange, Southwark-street, and which he thinks stands the London atmosphere well. Mansfield stone is used for the columns to the upper windows; and Peterhead granite for the fronts, with Portland stone piers and pedestals, and light grey polished granite for bases in the Poultry front.

Messrs. Merritt & Ashby, of London-wall, were the builders. The architect was Mr. R. H. Moore, of Walbrook.



LONDON STREET ARCHITECTURE: BUSINESS PREMISES IN THE POULTRY.

MR. R. H. MOORE, ARCHITECT.

THE THRUST OF ARCHES.

Str.—In your notice of the drawings in the Architectural Exhibition, you call attention to an octagonal church with iron columns, and refer especially to the appearance of the iron tie-rods at the springing of the arches. Being curious to learn how the thrust of such large arches could be counteracted, when arranged on an octagonal plan, I paid a visit to the church shortly after it was opened, and found that the tie-rods were the only provision made for balancing the external thrust of these arches, unless the lean-to roof of the surrounding "aisle" may be supposed to do something towards resisting the outward pressure.

As it is, of course, important that adequate provision should be made for resisting the horizontal thrust of large arches in buildings, perhaps you will allow me to discuss briefly the principles to be considered in the erection of arches which are not in a straight line on plan. When two equal arches meet at the angle of an octagon, the directions of their horizontal thrusts make an angle of 135° , and their resultant bisects this angle. Let P be the horizontal thrust of either arch, B the value of the resultant of the thrusts of the two arches, whose direction bisects the angle of the octagon. Then by the principles of mechanics,

$$\begin{aligned} R : P &:: \sin 135^\circ : \sin 112\frac{1}{2}^\circ \\ &:: \sin 45^\circ : \sin 67\frac{1}{2}^\circ \\ &:: 101 : 132 \end{aligned}$$

Therefore the outward thrust is—

$$R = P \times \frac{101}{132}$$

Or the outward thrust, tending to push over the column from which the arches spring, is rather more than three-fourths of the horizontal thrust of either of the arches.

The horizontal ties introduced at the springing serve to counteract only a portion of the horizontal thrust; for an arch cannot be considered as a perfectly rigid mass, but its thrust acts at every part, and is greatest at the haunches; the maximum thrust in a semi-circular arch acting at one-third of the distance from the springing to the crown, measured along the circumference. In the example above referred to, it seems to me that the thrust might easily have been counteracted by means of arches thrown across the outer "aisle," from each angle of the octagon to the external wall of the church. This would have done away with any necessity for ties.

E. WYNDHAM TARN.

BELLS AT ST. PAUL'S CATHEDRAL.

As I have probably devoted more time and attention to metropolitan bells in general, and to the great bell at St. Paul's in particular, than has any other person, those who have read my notes on the subject in the *Builder* from time to time will doubtless think that I ought to say a word in reply to the significant communication of Mr. Ellacombe which appeared in the number of the 30th of April last.

Your valued correspondent says:—"It [the great bell] is 6 ft. 10½ in. in diameter, as lately measured by Mr. Tyssen, and also by Messrs. Warner."

Now, allow me to say that upwards of ten years have passed since Mr. Tyssen measured the bell, and that gentleman tells me that as he used tape for taking the dimensions, the party holding the tape by the ring at the end might have misplaced it, and that my statement,—6 ft. 9½ in.,—may be correct. Moreover, Mr. Tyssen never said that the diameter exceeded 6 ft. 10 in. I should mention, too, that our most experienced bell-founder publicly asserted in 1855, that the diameter is 6 ft. 9½ in., and when I examined the bell in 1868 I found he was right.

Speaking of the smaller bell in the north-west tower, made by Philip Wightman in 1700, and now used for the daily service, Mr. Ellacombe ventures to remark:—"This may have been cast from the metal of the bell in the clock tower opposite Westminster Hall-gate . . . called Great Tom."

Your esteemed correspondent must admit, however, that this is a very unfortunate conjecture. Philip Wightman recast "Great Tom" of Westminster, to which a quantity of new metal was added, for the clock in the south-western tower of the cathedral; and not as a service bell for the other tower. But Wightman's recast Clock Bell proving faulty, Richard Phelps made one of new metal in 1709, and having first

delivered the same at the cathedral, he took possession of Wightman's bell. I need scarcely repeat what I said in the *Builder* of April 4th, 1868,—Richard Phelps recast his bell of 1709 in 1716.

As to the weight of the present Great Bell, had Mr. Ellacombe said, "about five tons,"—as I have elsewhere,—instead of 5 tons 4 cwt., he would have been nearer the mark. It is true that in 1867, I gave the latter weight on the same authority as Mr. Ellacombe now gives it, but having since been permitted to consult the "Fabric Accounts" in the private library at the cathedral, I am now in a position to state that the weight of the bell is rather under five tons.

Our excellent campanist says:—"The key-note of the bell is A flat, but the sound when heard at the greatest distance is E flat, or a fifth above the key-note."

Now, I do not hesitate to say that this statement, which appeared in a certain periodical many years ago, and has since been copied over and over again into various other works, is erroneous, and very unsatisfactory to competent judges of bells and musical sounds.

With reference to a letter from our respected bell-founders in last week's number, permit me to say that in the *Builder* of March 10th, 1855, Messrs. Chas. & Geo. Mears, speaking of the Great Bell at St. Paul's, wrote thus:—"Diameter, 6 ft. 9½ in.; height to the top of crown, 6 ft. 4½ in.; thickness at sound-bow, 5½ in.; weight, 5 tons 4 cwt." But in your impression of May 14th, 1870, Messrs. Mears & Stainbank write:—"It is 6 ft. 10 in. in diameter at mouth, 4 ft. 7 in. (sic) from lip to shoulder, 5½ in. thick at sound-bow, and of the estimated weight of 5 tons."

Here, then, are specimens of some of the erroneous and conflicting statements with which we constantly meet in searching numerous works for materials with a view to compile an accurate account of remarkable bells.

It may not be out of place to add that the "part of the original contract for making and fixing the bell" [at the cathedral] which is now in the possession of Messrs. Mears & Stainbank, and which I examined some time ago, has nothing whatever to do with the present great bell. It relates to a former bell cast in 1709.

THOMAS WALESBY.

PALESTINE EXPLORATION FUND.

An influential meeting, largely attended, was held on Monday last at the Royal Institution, Albemarle-street, to hear Captain Warren report the result of recent explorations in Jerusalem. The Archbishop of York, in the chair, showed the value of the association, and appealed for further aid. Captain Warren seemed to think it rather a joke than otherwise that nothing he had yet done settled anything. We confess to viewing the matter differently, sincerely desiring that the results were more positive than they are. Sir H. Rawlinson, Mr. S. Morley, the Dean of Westminster, Mr. G. Grove, and Professor Donaldson gave their aid at the meeting. We wish the latter gentleman, who has been on the spot, would candidly tell us whether or not he thinks the explorers are on the right tack or not. Unless we have very wrong impressions, the results, so far as the society may take credit, are sadly incommensurate with the amount of money spent. This may be simply unfortunate; but it may be otherwise.

THE DISASTER AT RICHMOND, VIRGINIA.

ADVICES from the United States contain long accounts of the terrible disaster which took place at Richmond, Virginia, by the falling of the floor of the Court of Appeals on the 27th ult. The daily papers having announced that the Court of Appeals would make their decision at eleven o'clock in the Ellison-Chahoon Mayoralty case, an immense crowd packed the court-room, in the second story of the Capitol, before the hour named. The court-room is just over the Hall of the House of Delegates. Suddenly the packed gallery gave way, and was thrown forward with a heavy concussion into the centre of the court-room. This occurrence, with the rushing and surging of the crowd, caused the whole floor to break through from the walls and sink in a cloud of dust, and laden with its load of human beings, down into the hall of the House of Delegates below. It is fortunate that the catastrophe happened at the early hour of eleven; for if it

had occurred after the House of Delegates had met, scarcely any of the members could have escaped. A large meeting of Delegates which had been held in the hall had just adjourned. The scene which was presented after the fall of the suspended court-room was frightful beyond description. Those who were struck by timbers and caught by the gallery above, and those who were in the lower hall and caught by the falling mass, were the sufferers from the occurrence. It was a cause of thankfulness that so small a proportion of the great number of persons who were in the court-room has been injured. The number of persons killed proved to be sixty, and 125 others were more or less seriously injured.

An experienced architect who has reviewed the plan of the Capitol says the girder which gave way was composed of two pieces of timber bolted together, making when combined an area of 13 in. by 20 in. It was formerly supported by columns, which were removed to improve the appearance of the hall of the House of Delegates. In the centre of the girder was a mortise, which reduced the available strength to 9½ in. by 20 in. The fatal error was in making the interior changes without examining the girder with reference to its capacity to endure the new stress placed upon it.

GALLERY OF ILLUSTRATION.

MR. AND MRS. GERMAN REED added, on Monday last, to their always attractive evening's amusement, a spirited and clever half-hour's performance by Mr. Corney Grain. The production, written by himself, is entitled "The School Feast," and the contributions of several of the invited towards the amusement of the assembled sharers of the feast, afforded matter for the display of Mr. Corney Grain's varied talent. One was irresistibly reminded of John Parry in his palmy days. Mr. Corney Grain's perfect command of the piano as an accompanist, his excellent voice, animated and gentlemanly manner, his great powers of imitation, rendered his first appearance in public a success. Whether in the nigger song with chorus, or as the young lady with her French song, or the one singing her *roulades* unappreciated to village ears, or the young short-sighted gentleman whose mistakes in the text of his song introduced most ludicrous witticisms, or in the crowning song,—the Scotch ballad, with bagpipe accompaniment by an amateur,—Mr. Grain succeeded in bringing down rapturous plaudits from a crowded audience.

THE ROOF OF THE ROYAL ALBERT HALL.

MANY readers will be glad to know that the supports or wedges under the centres on which this roof has been constructed, were knocked out on Wednesday, the 11th inst., by Col. Scott, the chief director of works, and Mr. J. W. Grover, the constructive engineer, and that the results were very favourable, the deflection being only about 5-16ths in the centre. On examination since, it is found that this has but very slightly increased. In fact, the behaviour of the roof has been excellent, notwithstanding the moderate use of iron, and it is believed that it has now attained its final bearing.

The total height to the apex is about 165 ft., which is somewhere about 40 ft. below the top of the monument. The span (major), is 219 ft.; (minor axis), 187 ft.; the great Birmingham roof major span being, we believe, 212 ft., and the St. Pancras, 245 ft., which, however, springs from the ground, and not from the top of a wall, over 100 ft. high. The elliptical form necessarily made the calculations of this roof very troublesome.

THE FAIRFORD WINDOWS.

THOSE of our readers who took interest in the discussion as to the date and authorship of the Fairford windows, will be glad to hear that the managers of the South Kensington Museum have made arrangements for the exhibition of *fac similes*, so far as these can be made in any material except glass, of these interesting works. They are to be of coloured tracings, or coloured drawings produced by the aid of tracing, and will give not only the pictorial outline, but the exact tints, the leads, and the entire details of the whole series of windows. Two of the lights have already been received. They are at present hung in the corridor which gives access to the offices.

What with the actual specimens of ancient glass which are in the Museum, the aid of the Art Library, in such works as those of Winston and of Franks, and the coloured drawings of which we hope that we now welcome only the first, the material elements of instruction in this fascinating art are being richly gathered for the service of the student in the Art Museum.

THE SWANSEA NEW WATER-WORKS.

A QUESTION of serious moment has been brought under the notice of the Swansea Board of Health. A report from the surveyor was read, which stated that there was a leakage in the main pipes of the conduit between the reservoir and Morriston, amounting to upwards of 260,000 gallons of water per diem. The new works were opened with considerable delay in 1863, the contractor having been voted 500l. by the then Corporation as a bonus for completing the works some twelve months before the time specified in his contract. At the opening the works were said to have been finished in the most satisfactory manner, and important effects, both sanitary and pecuniary, were anticipated. Although not yet seven years old, however, the works still cost, so our authority, the *Cambrian*, says, something like 1,000l. per annum in repairs alone. The surveyor is afraid to give even an approximate estimate of the outlay now required. The main pipes from the reservoir to Morriston are something like six miles in extent. The leakage cannot, it appears, be localised within narrower limits. The two previously existing water-works have been amalgamated with the newer and more extensive works, and the total cost of the Swansea water supply amounts, in round numbers, to about 160,500l. The total revenue derivable from this vast outlay is said to be but little more (after deducting the cost of repairs and working expenses) than 3,500l. a year. The *Cambrian* asks: Is it possible that the giving 500l. as a bonus for the early completion of the works led to too great haste in the laying of the service-pipes? The works were planned by Mr. Rawlinson, C.E.; were carried out by Mr. William Williams, contractor, under the personal superintendence of Mr. Consens, the town surveyor; and a clerk of the works was employed.

ACCIDENTS.

ONE of the men engaged at the New Gas Works, near Barking, went down a well to measure the depth of water. It appears that the well was used for the purpose of draining the land, and before he had been down long he was suddenly seen by those above to stagger and fall. One of his companions, in spite of all past experience and warning, instantly went to his rescue; but the poor fellow shared the same fate. Undeterred by this, a third, fourth, fifth, and sixth went down (!), but only with the same sad results,—all falling victims to the foul air contained in the well. After a short time another man, provided with a diving-dress, was lowered, and succeeded in bringing them up. A medical man, after four hours' laborious work, succeeded in recovering two of the seven.

Two Men buried alive at Cambridge.—A number of men were engaged in excavating for a sewer for a house about to be erected in the immediate vicinity of Parker's place. They had reached a depth of about 11 ft., when the earth at one side suddenly caved in, literally burying three men. The most strenuous exertions were made by their fellow-workmen for their release, and one, who was in an upright position, was got out alive, and is now in a fair way of recovery. The other poor fellows, who were in a stooping position, were quite dead when extricated. At the inquest the jury, after a long deliberation, returned a verdict of "Accidental death," and expressed the opinion that due caution had not been exercised by one of the men, named Moore, who had objected to the shoring up.

Fall down a Well 25 ft. deep.—A curious accident, fortunately unattended by serious consequences, has happened at Writtle. It appears that Mr. Henry Tanner, jun., plumber, of Chelmsford, was engaged in repairing the auction-pipe belonging to a pump-well in the kitchen of a house, when a bearer or plank stretching across the well, upon which he was seated, broke in two, and he was precipitated to the bottom, a depth of no less than 25 ft. Fortunately, the well contained about 7 ft. of water, and this so

effectually checked the fall that Mr. Tanner escaped as nearly as possible unscathed. A first attempt to climb the auction-pipe proved unavailing, for, when half-way up, Mr. Tanner sustained another fall to the bottom, but again without receiving any injury. A second essay to climb the pipe was more successful.

Fall of a Church.—A serious accident has occurred in Bernard-street, Bridgton, Glasgow, whereby five men have been rather severely injured, one, it was feared, fatally. A temporary wooden church was being erected at the east end of the street, in connexion with the Independent body. The building, which measured about 50 ft. in length by 20 ft. broad, and 18 ft. to the top of the side walls, had made considerable progress towards completion, the woodwork of the roof having been finished, and the slaters having begun operations, when the sides of the building suddenly gave way, and the roof fell in. The cause of the accident is not known.

OPENING OF THE NEW STANLEY PARK, LIVERPOOL.

ON Saturday afternoon a new public park at the north-east end of Liverpool, and called the Stanley-park, was inaugurated by the mayor and corporation of the town. The park is finely situated, and comprises about 100 acres of land. It has been laid out at a cost of 42,000l., by Mr. Kemp, of Birkenhead. The contract for the whole of the groundwork was let to Mr. Pearson Lee, of West Derby. Mr. E. R. Robson, the Corporation architect, was deputed to design and carry out the various architectural features of the park, and the contract for these was undertaken by Mr. Samuel Campbell. Mr. Peake obtained the contract for the different iron fences in and around the park; and Messrs. Morton & Co. got the execution of the fence by the side of the equestrian drive in Priory-road. About 6½ acres of the park land, on the upper side, adjoining Anfield-road, have been reserved as building sites, and several plots have been already sold, one pair of villas already being seen rising out of the ground. About seven acres have been devoted to an ornamental lake, and the remainder is occupied by a terrace ride, lawns, plantations, walks, &c. Of the total estimate an amount of about 19,000l. has been expended on ground work, drains, planting, &c.; and the rest has been required for cottages and other agricultural works, fences, &c. A complete set of working sheds and a reserve garden are provided in the neighbourhood of the superintendent's house; and retiring-rooms and other conveniences both for men and women are attached to the foreman's cottage at the top of Mill-lane. Stanley Park is the smallest of the three principal Liverpool parks, the contents of which, in statute acres, are:—

STANLEY PARK.	SWANSEA PARK.	SUTTON PARK.
Total Building area.	Total Building area.	Total Building area.
100 0½	100 0½	352 113
	37½, and about 81 sold.	

THE TRADES MOVEMENT.

Arbitration in Germany.—The committee of the German Chamber of Manufacturers at Leipzig have resolved to form societies of manufacturers in the chief centres of German industry, for the purpose of furthering the interests of the workmen, keeping the peace between them and their employers, and settling any differences which may arise between them by means of friendly compromise.

Strike of Bricklayers' Labourers at Wolverhampton.—A new town-hall, with police barracks, cells, quarter sessions and police courts, and council-chamber, are being built on one site in Wolverhampton at a great cost; but nearly all the work has been stopped by the action of the bricklayers' labourers. These men are now being paid 4d. an hour, or 18s. 10s. a week, for they leave at noon on Saturdays. They have turned out, however, because their employer, Mr. Horsemann, of Wolverhampton, builder, will not give them another ½d. per hour, for which they have given a week's notice. Mr. Horsemann claims that any notice of alteration now, in wages, should have been given last March, and he is taking steps to resume operations by means which will render him to a large extent independent of the labourers. There is coming to Wolverhampton from Manchester a steam engine and other apparatus, by which the bricks will be

hoisted by machinery, and the mortar made without labourers' aid. Some labourers whom he has already got from Manchester have left, because they have been threatened with death if they remain in the town!

MONUMENTAL.

THERE is already talk of a national monument to the late Sir James Young Simpson, the discoverer of the anæsthetic or sleep-producing power of chloroform, which he used most extensively in his own practice, as professor of midwifery; so relieving "the woman" from the prediction (not curse) in Genesis, that in sorrow or pain she would bring forth her children. The professor "shut up" certain Calvinistic objectors to his practice, on the score that it was flying in the face of a Divine curse, by quoting Scripture in the case of the creation, or bringing forth, of "the woman" herself out of "the man," whom God, to that end, plunged into a deep sleep. What God himself had done, he said, could not be wrong.—A commencement has at length been made with the county memorial of the late Earl of Carlisle at Brampton. The Moat, a high hill in close proximity to the town, and forming part of the Naworth Castle estate, has been selected for the site. The pedestal, from designs by Mr. Foley, the sculptor, has already been completed by Messrs. Nelson & Cockburn, of Carlisle. It is octagonal in shape, about 8 ft. 3 in. in height, and built of white stone. Originally it was intended to take the shape from one of the quarries in the neighbourhood belonging to the estate, and Tercroft, near Gililand, was fixed upon; but on an examination it was found that although admirable in colour and very durable, it was too coarse in the grain to admit of that fine polish and carving which the nature of the work required. Recourse had therefore to be had to the well-known quarry of Prudah, in Northumberland. The statue is now in the hands of the bronze founder. It will be 8 ft. 3 in. in height. His lordship, habited in the robes and insignia of the Order of the Garter, is represented in a standing position, the hand resting on a book. The entire cost of the memorial will amount to about 800l.

THE BUILDING ACT.

SIR,—Your correspondent, Mr. Gundry, seems to have lost sight of the special reason which induced the Legislature to frame the existing regulations with respect to window shutters and their frames, and I for one should greatly regret to see so useful a regulation superseded.

I believe I am right in saying that many of the provisions of the present Act were framed in accordance with the opinions expressed by the late Mr. Bradwood, and were specially directed to the prevention of accidents by fire. What, I would ask, can be more dangerous to property or the lives and limbs of persons engaged in subduing fire than burning window-frames falling out of windows instead of inward? The object of setting these frames 4½ in. back from the external face of a wall, is manifestly in the case of fire to prevent their falling out, and thus becoming a source of danger.

With respect to the question of taste, that I am quite content to leave in other hands, and would merely remark that safety ought to be the first consideration; the other advantage mentioned by your correspondent of placing the glass as near as possible to the exterior surface, can almost always be obtained practically by splaying or chamfering the window jambs. Edward Pown.

"AN ARCHITECT'S BILL."

PECK T. LINCOLNSHIRE AND NOTTINGHAMSHIRE UNION SCHOOLS.

SIR,—An extract from the *Lincoln Journal* appears under the above heading in your impression of May 7th, and it is, as you will presently see, so manifestly untrue to our client, Mr. Peck, that we have no option but to beg insertion in your next number of the facts as they really stand. We will not inquire from whence the *Lincoln Journal* derived its inspiration; it is sufficient to bear in mind that London architects of success are not always too popular with their country brethren. The facts, as briefly as we can put them together, are these. Mr. Peck's plans for the new school were submitted to the Lincolnshire and Nottinghamshire Union Schools Committee, and were adopted by the managers, who, however, eventually abandoned their scheme *in toto*. This was done in March, 1869. Before the abandonment, Mr. Peck was instructed to prepare various estimates in accordance with instructions given, so as to reduce the accommodation, and he did so. After the abandonment, Mr. Peck's account stood, as follows:—

Commission on 13,730l., being estimate of expenditure	£696 10 0
Surveyor's charges for preparing quantities and lithography	21 19 0
Commission on 9,147l. for fresh plans and estimates, and various attendance on meetings and at Poor Law B. aid.	239 0 0
Total	£1,190 0 0

Under the circumstances of abandonment, Mr. Peck expressed a wish to have the last item at the special request of the clerk to the Board. He did this, however, in contemplation of a prompt settlement of the balance; this not taking place, he assented to a reference

to arbitration, and the terms of reference were placed in our hands to settle with the solicitor to the Board, Mr. Tweed, of Lincoln. We naturally insisted on the full amount of claim going before the arbitrators, and this being refused, after a month and ten days' most patient waiting and correspondence, which, in justice to Mr. Peck, should be taken in excuse, we sent Mr. Tweed a writ for acceptance of service. After several days' further delay, Mr. Tweed returned the writ, complaining of its having been issued, and declining to accept service, which we had to effect. Mr. Peck, the Clerk to the Board, all adding to expense. We had on several occasions inquired of Mr. Tweed the corporate appellation of his Board, without success; but after the action was commenced he suggested that it should have been brought against the managers personally; and, strongly desiring to avoid personal annoyance to those gentlemen, we begged him again and again to accept service for them. After nearly a month's further delay, we heard from Mr. Tweed that he had no instructions; and on the 4th of February we wrote to the Chairman of the Board, Sir Glynes Gregory, a long letter, recapitulating the facts; and, in our desire to avoid making expenses and giving needless annoyance, we suggested that he and the Vice-Chairman should instruct a solicitor to appear for them in the name of the Board. This was acted on, and Messrs. Beaumont, of Grantham, gave the required undertaking. Sir Glynes Gregory and the archdeacon, Trollope, were consequently not served with copies of writs, as is most incorrectly and unfairly stated; but by their own choice, those gentlemen represented the whole Board for the reasons and in the manner we have stated. A good deal of correspondence afterwards ensued between Messrs. Beaumont and ourselves with a view to settlement, and the sum of £911 was offered in full discharge of Mr. Peck's claim. We declined this on the strong advice of leading architects we consulted; and at our instance the trial was postponed from the first to the second sittings in Easter Term, in order, if possible, to settle without either side being put to the expense of delivering briefs. Eventually, sick and tired of the delays, and like all professional men, most unwilling to go into court, Mr. Peck, entirely against our advice, insisted on receiving the sum just named in settlement, and this after a delay of over a year after the abandonment of the scheme. MONCKTON & CO.

Gregy & Jau.

ARCHITECTS' ACTIONS.

THE long-pending Chancery suit between Mr. O. J. Richardson and Mr. Whistman, M.P., relative to buildings at Queen's-gate, was, on the 20th of April last, in the Rolls Court, before Mr. Justice Stirling, decided in favour of the decree, after a very short discussion. The whole of the buildings are ordered by the Court to be sold. The action first came into Court on the 26th. 800 letters were produced in court. Sir Richard Baggallay, defendant's counsel, asked if a compromise could be effected, as the case was a very complicated one. Mr. Richardson assented, naming £20,000. Time was allowed for him to consult and advise Mr. Whistman. On his refusing any compromise, the case came on directly afterwards.

NEWTON'S OBSERVATORY.

Sir,—Does the notice at p. 374 refer to the erection of a style to the top of the house in Orange-street? And if so, John Timbs (I believe no mean authority) corrects his description of the same in his "Curiosities of London?"

I quote from memory, not having the book handy, but I think he says that "this Observatory, popularly believed to be Newton's Observatory, is not so in fact, having been built by a Frenchman, a subsequent tenant of 'Newton's House.' The paragraph in the *Builder's* states that the Observatory is to be sold for the low sum of 500*l.* for repairs, and a proposal is made to purchase the same, and present it to the nation; also that some Americans are likely to speculate on the purchase. Are these Americans the parties who have purchased the erection in question very recently for something less than 1000*l.*? If so I must admire the cuteness of them." OUR AMERICAN COUNSEL.

CHURCH-BUILDING NEWS.

Tunworth.—The church here has been re-opened after restoration. The operations which have now been brought to a termination consist of an entire rebuilding of the church, with the exception of the tower. The plan of enlargement may be approximately described as the erection of a nave, chancel, and porch, covering the whole site of the old structure; a north aisle and a chancel aisle being built on new ground taken in from the churchyard; a vestry is creased off at the east end. The tower is the only portion of the original edifice left standing. An examination of the few fragments of work in the old church walls—and chiefly of a window on the north side—which were at all characteristic of a style, determined the architect in his choice of Early English features as the type that it would be desirable to follow in the new design. The new church affords sitting accommodation for about 150 persons, including the school children, for whom seats have been fitted up under the tower. The roofs of the nave and aisles are open-timbered, and supported by framed trusses, which in their turn spring from carved stone corbels in the walls. The chancel roof assumes a polygonal shape, the angles being emphasised by moulded ribs dividing the whole surface into panels. The use of cathedral glass in the windows softens the light of the interior. Mr. G. R. Crickmay, of Veymouth, was the architect under whose superintendence the building was begun and

completed, the original plans having been prepared by the late Mr. John Hicks, of Dorchester. The builder was Mr. Augustine Green, of Blandford. The carving was by Messrs. Boulton & Son, of Cheltenham.

Boyton (East Suffolk).—A greater proof of the extent to which the work of church restoration is now being carried out could not be given than the fact that it has reached the out-of-the-way little parish of Boyton, the church of which has been re-opened, after being almost re-built. The church is dedicated to St. Andrew, and must have been founded at a very early period; but the structure now open contains very few relics of the original building. The chancel has been rebuilt at a comparatively recent date, but in a style that was thoroughly debased. The whole church was mean and unsightly in the extreme. Now it has been almost entirely rebuilt. The tower, which alone has not been rebuilt, belongs to the Decorated style, and the new work is Decorated in character. Externally the walls of the tower have been cleaned, and a new plain stone parapet put up. The new part of the church consists of the nave, with south porch, and north transept, and chancel. The walls are flint, with white stone dressings. The roof is tiled. The present building is some 15 ft. longer and 4 ft. wider than was the old church. Internally the roofs of nave, chancel, and transept are open and of varnished deal. In the north wall of the nave are two two-light windows, and there are the same number in the south wall. In the transept gable wall is a two-light window, whilst the chancel is lighted by a three-light east window and two single-light windows in both the north and south walls. The nave and transept are benched with open deal benches, and those of the chancel are of oak. Mr. Wm. Smith, of London, was the architect, and the contract was taken by Mr. W. G. Cannold, of Ipswich, for 996*l.*, exclusive of the restoration of the tower, which came to 118*l.*, and some extra work, which brought up the total to 1,232*l.*, besides the old materials, worth about 80*l.*, so that the total cost of rebuilding the church has been a little over 1,300*l.*

Cransley.—The parish church here has been re-opened for divine service, after a restoration. The old high wainscot around the chancel, by which it was rendered dark and gloomy, has been removed. The choir-seats and the prayer-desks are of oak, carved, and the floor is laid with Minton's tiles. The roof, as also that of the whole of the church, has been taken off, but so much of the material (oak) as was sufficiently sound has been replaced, the new work required being of oak of English growth. The outer covering (of copper and lead) of the whole roof has been made good, and underneath it has been placed a layer of dry hair roofing-felt. The whole work has been carried out from the designs and under the superintendence of Messrs. Slater & Carpenter, of London; and under the eye of Mr. Lucas, as clerk of the works. The builders engaged on it were Messrs. J. & G. Henson, of Kettering; the carving having been done by Mr. Gregson, of Northampton; the carpenter's and joiner's work by Mr. W. Henson, of Finedon; and the ironwork by Messrs. Mobbs & Co., of Northampton. The cost of the work is 2,000*l.*

Isham, near Kettering.—The church here has been re-opened after a restoration under the superintendence of Mr. W. M. Fawcett, of Cambridge, architect. The builder was Mr. Day, of Bedford; the plumber, Mr. Downing, of Finedon.

The high pews have been replaced by oak seats. The west arch, which was blocked up, has been thrown open. There are new roofs to the chancel and nave, and in part also to the side aisles. The walls have been freshly plastered, and, where necessary, restored. A new heating apparatus, by Mr. Gidney, of East Durham, has been put in. The cost of the restoration has been about 2,000*l.*

Long Newton.—The parish church here has been reconsecrated. The edifice has been enlarged, chiefly at the cost of the Right Hon. T. H. S. Sothern Esq. and the rector. Our space will not admit of a full account of all the alterations, additions, and decorations, but we may mention one or two things done. The chancel, where the principal enlargement has taken place, is embellished with two stained glass windows. The east one was erected by "The Family," in fulfilment of a wish expressed by the late rector, the Rev. Edmund Escount; the style, like the building, is Early English. The north one, in memory of the same reverend

gentleman, was given by his own children; it is by Messrs. Hardman. The seats in the chancel occupied by the choir are carved out of cedar grown on the estate. The pulpit is of carved oak and rosewood. The west window is a subscription one, in memory of the late Mr. Edward Escount. The work has been carried out under the direction of Mr. Wyatt, the architect, by Mr. Brown, of Tetbury.

Speldhurst.—The chief stone of the alterations of the parish church here has been laid. The alterations will be in the body of the edifice, the old tower (which will have a new top put on, if funds are forthcoming) being left standing. The body of the church will be of the Early English style of architecture, from designs made by Mr. J. O. Scott, with a nave and one broad aisle, and it is supposed it will accommodate 420 persons. The cost is estimated at 3,500*l.* Mr. Constable, of Penshurst, is the builder, and Mr. John Wheeler is the clerk of the works.

Cerne Abbas (Dorset).—The church here has undergone considerable alteration and repair, and has been re-opened for divine service. The architect employed was Mr. Wyatt, the diocesan architect; and Mr. Northover and Mr. Byles were the builders. The stone for dressings and the carvings required in the restoration were provided by Mr. Chapman, of Hamhill. The pews have been remodelled. The panelling of woodwork has been removed from before the west window, and the lofty panelled arch thrown open. The nave and aisles are approached by panelled doors of oak, which, when closed, form an apartment for the ringers of the five bells with which the tower is furnished. Another feature of the restoration is the removal of the dead wall which formerly extended from the roof-screen to the ceiling, hiding the east window, in which are many pieces of old stained glass. The rubble masonry which filled the space above the roof-screen has been removed, and a moulded chancel arch, 16 ft. in the span, has been inserted. A serious obstacle existed in the way of constructing this arch, as the roof-screen, over which it has been built, divides the chancel from the nave between, and not, as is usually the case, at the pillars supporting the arches of the roof. Two of the panels had, therefore, to be cut away on either side, and abutments built on which to raise the chancel arch. Over the roof-screen is a battlemented cornice.

White Colne.—The church at White Colne, which has during the past ten months undergone extensive alterations and repairs, has been re-opened for divine service. The architect employed was Mr. Charles Moxon, of London; and the builder and contractor, Mr. Z. Rogers, of Earls Colne. In course of the restorations ancient remains have been discovered, including some early paintings which were hidden under a thick coating of plaster. The old roof was found perfectly good, but the walls have been replaced. A painted window, the subject being Christ blessing little children, has been put in at the west end of the church at the expense of the vicar. A great change has been made in the interior of the building. The old coating of plaster and the top of the old tower being in a very bad condition, it was found necessary to rebuild the belfry window and string-course, and a shingle spire of 30 ft. in height has been added. The old porch has been replaced with an entirely new one composed of stone and flint. For want of funds the chancel has not been completed. In the nave of the church, we may state that in lieu of the pews open benches have been substituted, and that 220 persons may now be accommodated. The cost of the restoration as at present completed is nigh 700*l.*, and a further sum of 200*l.* is yet required.

Waltham St. Lawrence.—The new concrete church of All Saints here has been consecrated. The site, which occupies 1 roof 2 perches, was given by Lord Braybrooke. Mr. J. Sharp, jun., of Waltham St. Lawrence, was the architect, and Mr. B. Lawrence, of the same village, was the builder. The entire cost of the church, which is intended to be a chapel of ease to the parish church, is 930*l.* The church is built in the First Pointed style, and consists of nave, chancel, apse, north and south transepts, and open wooden porch at south entrance, with a bell-turret at the west end. The walls on the exterior are of red brick, slightly relieved by black bands, and in the interior of concrete block in imitation of stone. The mullions, splay, hood-moulds, string-courses, and corbels are all of red brick, and were moulded by the builder at his own kiln from the drawings of the architect. In the apse, with its coloured win-

dows, there are three single lights, the centre one being filled with a stained-glass figure of the Saviour. The side lights are filled with stained-glass figures of St. Peter and St. Paul. The walls are composed of concrete blocks, and the timber roofs are stained and plastered between the rafters. The chancel and transept arches are of stone, with carved capitals and corbels. The church will seat 180 persons.

DISSENTING CHURCH BUILDING NEWS.

Bath.—Hayhill new chapel has been opened. The style is Gothic, of the thirteenth century. Owing to the difficulties of the site the ground plan of the building is of an irregular character, the ends not being parallel, and the sides consequently of different length. The end facing Bladud's-buildings forms the front of the chapel, and this is divided into three compartments by two counterforts, which each terminate in a pinnacle. The interior of the chapel consists of nave and two aisles, with a chancel, or sanctuary, which is divided from the rest of the building by a large semicircular arch supported on Pennant columns. Over the chancel arch is a circular coloured window, consisting of a central light surrounded by ten smaller ones. The bays on either side are six in number, the arches springing from round iron columns, which have capitals, but no bases. The clearstory windows, which on one side number five, and on the other four, each consist of three lancet lights. At the back of the chancel, behind the pulpit, is a simple three-light window of tinted glass, with coloured borderings. Galleries are erected in the aisles and at the end over the entrance. Seating has been provided for 650; the seats are open, and of varnished pitch pine. The architects were Messrs. Wilson & Willcox; Mr. Bladwell contracted for the masonry; and the woodwork has been supplied by Mr. Rideout. The glazing, plastering, and tiling were contracted for by Mr. Backhouse.

Oldham.—The chief stone of a Primitive Methodist Chapel and Schools has been laid in Henshaw-street. The chapel, when completed, will accommodate 1,000 persons, exclusive of the orchestra, the measurement being 29 yards in length, and 17½ yards in width. The school-room will hold 1,000 children. The measurement is to be 21 yards long by 13 yards wide. In connexion with the chapel there will be a minister's vestry and a choir vestry, and in connexion with the school an infant school-room, library, and seven other class-rooms. Mr. John Wild, of Oldham, is architect, and the different contracts have been let as follows:—Excavating work to Mr. J. Spencer; mason work to Messrs. Heywood & Son; brick-work to Mr. J. Partington; joiners' work to Mr. J. Dodd; flagging and slating to Mr. D. Jackson; plumbing and glazing to Messrs. Hulme, Brothers; plastering, Mr. R. Harris. The total amount of the tenders is 3,734l. 18s., which, with the architect's fees, would amount to upwards of 4,000l. The chapel will be built of bricks with stone dressings. The internal fittings are to be of pitch pine varnished. The whole of the seats both in the body of the chapel and in the gallery will be open benches with solid pitch pine bench-ends. The school has its principal front towards Henshaw-street. It is intended to heat both chapel and schools with hot air. The architect is Mr. John Wild, of Oldham. The entire cost of the buildings will be upwards of 4,000l.

PROVINCIAL NEWS.

Winchester.—A new Town Hall and city offices are about to be erected in Winchester, on the site where the Globe Inn now stands. It appears that only 13 out of the 24 members of the Council are in favour of the proposal, and the choice of the site is described as "a miserable sacrifice of the interests and future of the city to petty and personal interests and ward jealousies," as it is a situation in a decaying part of the borough from which trade and civic life have departed.

Sheffield.—The scheme for erecting a new building, in connexion with the Sheffield General Infirmary, for the treatment of severe surgical cases and contagious diseases arising therefrom, has been brought before a full meeting of the governors. Plans were submitted for a building which would contain 40 beds, to be placed on the western side of the present house, the cost being estimated by the architect at 7,000l. This, however, it was explained, must be looked upon

as inadequate, and the effort must be to raise 10,000l. Subscriptions were promised in the room amounting to 3,000l.

Birmingham.—A new building for the National Provincial Bank has been erected at the corner of Bennett's-hill and Waterloo-street, at a cost of 15,000l. The premises stand partly upon the site of the old bank. Externally, the building is of Wrexham stone. The windows, nine in number, have been fitted with wrought-iron grilles. The bank is entered by an open vestibule at the corner of Bennett's-hill, the roof of which is carved with four sculptured groups, representing the principal industries of the town, viz., the small-arms trade, iron and glass working and iron moulding. Upon the floor of the vestibule is a star, designed in slate, marble, granite, and stone, with a garter of white marble in the centre, bearing the title of the bank. The banking-room is 70 ft. by 32 ft., and the floor, together with the lobby, is paved with Minton's encaustic designs. Busts of Devonshire marble, with decorative capitals, separate the windows; and from the ceiling, which is divided into ornamental panels, hang three gas pendants. The wood fittings, —counters, desks, &c., —are of polished mahogany. The rooms, or safes, for holding securities, bullion, and books, are fire and burglar proof. For heating the building, Phipson's hot-water principle has been adopted. The bank was designed by Mr. J. Gibson, of London, and was built by Messrs. W. & J. Webb, of Birmingham. Bank extension just now seems to be the rage in Birmingham. The National Provincial makes the third new bank opened in the town within a year; and another, Lloyd's, is in course of erection in Ann-street.

Books Received.

"SECOND Annual Report of the Edinburgh Association for Improving the Condition of the Poor, 1869-70. Office, 69, Hanover-street."—The objects of this association are excellent. They relate to the poor, but not to the paupers. They seek to achieve these objects by a thorough, systematic, and sustained house-to-house visitation by effective volunteers; a thorough investigation of every application for aid; giving what is most needed when it is most needed, and for as long as it is needed; and endeavouring to establish among the legal and voluntary charities some system by which, either by a common register or otherwise, they should be prevented from overlapping each other. Amongst the special objects in view are the removal of physical as well as moral nuisances from the abodes and neighbourhoods of the poor; the endeavour to procure employment for those out of work; and generally to improve the temporal condition and physical well-being of the poor; foster habits of temperance, economy, and cleanliness; discourage mendicancy and idleness; and encourage the education of the young. The association has made a successful beginning, and it is now in its second year of action. It is very influentially patronised and managed.

"The Government of London: Speech of Mr. William Newton at the Metropolitan Board of Works on the Municipal Government of the Metropolis." Mr. Newton here discusses the present and prospective state of the metropolitan municipal government both in the City and out of it. He is of opinion that the Metropolitan Board are justified in going to Parliament and asking that the Board may be transformed into a greater municipal authority, be invested with greater power, and bear a name in better keeping with municipal authority, — a name which would put it out of any one's power to say that it was formed for the construction of works only.

"The municipal council of London [he remarks] would be a great power when invested with municipal powers and authority, with control over the whole of the metropolis in all things which concern the metropolis as a whole, and to the district boards those matters which more properly belong to them, and to the City of London the possession of its own charters, so long as they relate to the City, and do not trench on any other portion of London. Let it have its pageants still, and let it enjoy its festivities as before; but do not let it exercise authority over any portion of the metropolis outside its own boundary: the whole of its authorities in that respect must be vested in the municipal council. If that were so, you may leave the vestries and district boards to themselves; you may make some modifications, that is, where districts are too small, and let the merely local government take the form it now occupies. . . . It would be no unworthy ambition to aspire to be a member of a council governing a population as large as that which inhabited all England at the time when Elizabeth sat upon the throne."

— "Report of the Council of the Camden

Society." This report was read at the general meeting of the Camden Society on May 2nd. It gives an account of the books printed by the Society last year, and of those they propose to print during the current year. The council announce that the General Index to the first hundred volumes of the Society's publications, by Mr. Gough, is about half done, and is steadily progressing. The Society will probably print some of those many historical documents which the new Government Commission are discovering, though others may be printed by the Government.

Miscellaneous.

A New Church for Rochdale.—The corner-stone of St. Edmund's Church, Falinge, erected solely at the expense of Mr. Albert H. Roys, at a cost of 10,000l., has been laid. The ceremony was performed with Masonic honours. Mr. Roys is a P.G.M. of Worcester and a D.P.G.M. of East Lancashire, and the Masons in the district, appreciating his munificence, took advantage of the occasion to muster in very large force. The church will be well situated, on a plot of land between the Spotland and Falinge roads. The edifice will be cruciform in plan, having a massive central tower, with lantern and angle-turret; a nave and chancel (on the south side of which is the Founder's Chapel, and on the north side the vestry) and a western porch. Accommodation will be provided for about 750 persons. There will be a circular staircase, with a conical roof, leading to the small western gallery. The style will be decorated Gothic. The east window, of five lights, is to be filled, as are also many of the other windows, with richly stained glass. The western facade will contain a large rose-window. The side windows will be tracery. The two principal entrances will be in the south transept and at the west end of the church. The arches supporting the tower inside will be carried upon massive granite columns. The church will be built throughout of Yorkshire stone. The organ will be placed at the end of the south transept, the organist and choir being seated in the body of the church. The seats will be open benches. The church will be decorated, both externally and internally, with various Masonic symbols. The contract has been taken by Messrs. Ellis & Hinchliffe, and Messrs. Medland & Henry Taylor, of Manchester, are the architects.

Shocking!—Sir: An interesting lecture on "Electricity: its Progress and Future," was delivered in Chiswick school-room. The audience were requested to join hands: at this moment an *employé* of the Duke of Devonshire entered, accompanied with a large Newfoundland dog. He had him by the ear: we were positively electrified; the dog also. It doubled him up; howling and contortions denoted acute pain. The lecturer advised himself of this incident, and informed us if the man had held a small bird, a fly, or an insect, the shock would have killed it. Mr. Editor, cannot this be applied to useful purposes?—to destroy ticks, which burrow in the body of sheep; to kill the vermin which cling to hop-bine; to rouse out destructive little quadrupeds in corn-ricks? If applied to modern third-class houses, erected at — per dozen (one in for cash), and warranted not to stand anybody's use or abuse long, a test-shock might liken many in fate to *Jericho's walls*. The police could press a coil against violent prisoners to render them powerless. I hope to recur to this shocking subject shortly. We were delighted with the entertainment; only one dissentient—the dog.—R. T.

Glasgow: a Suggestion.—The removal of the University to its new site, on Gilmore-hill is now in active progress. The halls of the new museum are not nearly ready, but temporary accommodation has been provided in some of the adjacent apartments. In connexion with this subject a correspondent points out that an excellent opportunity now exists for opening up a new street in a direct line from the Union Railway Terminus (the old College Green) on the one hand, and the Glasgow Green and river Clyde on the other, intersecting the Gallowgate by the present St. Mango-street. Very little property would need to be demolished, we are informed; and such new thoroughfares are always desirable in a crowded city like Glasgow. The suggestion, at all events, may be worthy of consideration by the City Improvement Trust.

America's Greatest Engineering Work. The proposed suspension-bridge over the Hudson River, near New York, will extend across the river from Fort Clinton, on the west side, to Anthony's Nose on the east, with one clear span of 1,600 ft., and an elevation of 155 ft. above high-water mark. The total length of the bridge, including approaches, will be about 2,500 ft. The entire structure will be composed of steel combination truss and cable work, of great strength and graceful appearance. There will be four systems of twenty cables deeply rooted in the rock and abutments of the towers on either side of the river. Each cable will be about 14 in. in diameter, interlaced and secured by innumerable smaller cables, and will contain altogether 371,165,750 ft., or 70,302 miles of steel wire. The estimated weight of the iron and steel in the bridge will be about 17,000 tons, and the total suspended weight 9,651 tons. For the towers and approaches, 59,084 square yards of solid masonry will be required. It is believed that the bridge, when completed, will be able to sustain the aggregate weight of sixty locomotives, or more than six times the weight that can ever be crowded upon it at one time. The estimated cost of the work has not yet been announced.

Opening of the New Street at Whitechapel.—This new street was formally opened to the public on Saturday in last week by the chairman and representatives of the Metropolitan Board of Works, under whose guidance and responsibility the work has been carried out. The street, which is only 400 yards in length, but has been constructed at a total estimated cost of 243,000*l.*, including the cost of compensations and purchases of property, connects Whitechapel High-street with Commercial-road, in line with the latter, affording on the one hand clear access to the City, and on the other hand a direct and continuous line of thoroughfare to the East India Docks. It supersedes the narrow and tortuous channel of Church-lane. At Whitechapel, as at Holborn, the engineer of the Metropolitan Board of Works (Mr. Bazalgette) has had to clear the way for the new thoroughfare by cutting through blocks of old houses. The carriage-way is paved with granite, laid upon concrete; and beneath it, along the centre of the street, there is an arched subway of brickwork for the accommodation of the gas and water pipes. The contractor was Mr. J. G. B. Marshall, of Whitechapel.

The Proposed Abattoir at Bolton Bridge, Bradford.—At a meeting of the Bradford Abattoir Company, the plans of Messrs. Taylor & Garthwaite, architects, sent in for competition under the motto "Economy," were selected by a large majority, and instructions were given to the architects to prepare the contract drawings as soon as possible. The plan of the building proposed is of a plain and simple character. The basement floor of the building is to be elevated by sleeper walls, 4 ft. above the ground, to keep out the flood water of the Bradford Beck. The drainage is to be entirely outside of the building, and is to pass through a filter bed previously to being ejected into the beck, in such a manner as to secure the solid sewage for sale as manure, and at the same time to avoid fouling the beck. The whole of the abattoir buildings are to be executed with stone exteriors, coursed and pointed, the interior to be executed in hard, calcined, pressed bricks, walled in as close together as possible. The approximate estimate of the cost of erecting the whole buildings is as follows:—Abattoir, 3,100*l.*; hanging sheds, 900*l.*; hotel, 1,150*l.*; stabling and shed, 150*l.*—total, 5,300*l.*

Hamilton-place and Park-lane.—In reply to Mr. Denison, in the House of Commons, Sir W. Titte believed the Metropolitan Board had not lost a moment in giving effect to the Act referred to. It was intended to cut a road 60 ft. wide, which would lead out into Park-place, the present road being 35 ft. only. It was intended to take down Sir Edward Kerrison's house and the stables at the back, as well as two other houses, so that the road would be 60 ft. wide throughout, and in some portions 65 ft. They were under great obligations to the Marquis of Conyngham, for though a portion of the road was cut through his garden, no objection had been offered, the noble owner regarding the matter as a public improvement. They were not to interfere with the garden at the end of Hamilton-place until after August, when the trees and shrubs could be removed without injury.

Liberality and Public Spirit.—These are happily now-a-days no rarity. We have to report several recent instances. The Duke of Norfolk, who lately made several liberal donations to Sheffield institutions, has intimated his intention to subscribe 1,000*l.* towards the cost of a new orphanage and industrial school between Worrall and Oughtibridge, which is being erected by the Roman Catholics of this town and district. It will be remembered that last year Mr. Robert Barnes, of Manchester, presented 10,000*l.* to the Manchester Infirmary to form the purchase-money of Cheadle Hall and grounds for the purpose of a Convalescent Home. The same gentleman has just sent to the medical superintendent of the home a cheque for 16,000*l.*, which will enable the trustees to erect a new and more suitable building. Mr. and Mrs. Platt, of Dunham Hall, have presented public baths to the people of Stalybridge. The cost of this considerate gift is 6,000*l.* Mr. A. H. Roys, as elsewhere noticed, has undertaken to defray the whole cost of a new church at Falinge, near Rochester, estimated at no less than 10,000*l.*

Proposed Breakwater at Hunstanton, Lynn.—There is in course of construction on the shore at this place, adjacent to the newly-opened pier, a specimen length (50 yards) of a very simple, but it is said very effective, breakwater, designed by Mr. Jackson, of St. Leonard's-on-the-Sea, and constructed by Messrs. Aickman & Spurr, ironfounders, Lynn. It consists of a kind of cellular wall or thick lattice of cast iron, fixed to piles driven into the sand, and rising two or three feet only. Notwithstanding this apparent insignificance of height, it is stated to be capable of completely breaking the force of the waves, while allowing the free passage of the water, but causing the sand and shingle to accumulate on the land side, so as to form a protection to the shore and to the base of the cliff, which is much needed. Mr. Jackson has also invented an extension of the device, by which it may be formed into a pier and promenade, and furnished with contrivances for bathing in the open sea in perfect safety, and quite out of sight of the shore.

Mechanics' Institute, Margate.—On the movement of the Margate Branch of the Amalgamated Society of Carpenters and Joiners, a Mechanics' Institute will be probably obtained for Margate. At the close of the Friendly Society's conference, a meeting of the members of the proposed "Mechanics' Institute" was held. Mr. M. H. Judge was elected Honorary Secretary, and it was resolved:—"That the Hon. Sec. do call another meeting of the members for the further election of officers, and to decide as to the opening of the Institution; such meeting not to be called within three weeks of this date." The members present generally expressed themselves to the effect that by the commencement of next winter, a very good institution might be opened, if all would assist to their utmost in advocating its claims to support among their friends and neighbours.

The Oxford Architectural Society.—The members of this society had their first excursion for the season on Saturday last, the president of Trinity, who is also president of this society, accompanying the party. Islip was the first place visited. The old church was examined, and its architectural and historical features pointed out by Mr. Branton. Thence the party proceeded to Oddington Church, where they were met by the incumbent, the Rev. G. Petch, and here again Mr. Branton pointed out the most interesting features of the edifice. From Oddington, Charlton-on-Otmoor is only about a mile distant, and on visiting this church Mr. H. Maxwell-Lyte pointed out its chief features.

New Town-hall for Spennymoor, near Darlington.—Resolutions have been adopted for the erection of a Town-hall, adjoining the New Market, at Spennymoor. Mr. E. Dancombe Shafto, of Whitworth Park, has offered 100*l.*, and the difference has been made up in shares of 5*l.* each. The hall will be 70 ft. in length, and 34 ft. in breadth, and will be fitted up for lectures, concerts, balls, &c. There will also be two entrances, ante-rooms, and requisite conveniences. A provisional committee has been appointed to carry the matter into effect.

Mangold Cake.—The letter on this subject, from Mr. Hugh Smith, has led to many inquiries, especially as to the mode of preparing the cake. The writer being applied to, reminds us that it is a patented process.

Something New (?) for the Polytechnic. At a conversation in Plymouth, Mr. J. N. Hearder, F.C.S., exhibited an electric apparatus of enormous power which he had made for a scientific amateur, and called an electric fulgurator. By means of this machine he could produce sparks 3 ft. 6 in. long, and under certain circumstances even 9 ft. or 10 ft.; even 15 ft. to 20 ft. might be attained. The sparks are zig zag, like lightning, and manifest themselves with a loud report. The principle is not new, although the scale is; Mr. Hearder having himself made one forty years ago. Could not localities be colonised by means of the wholesome lightning thus got up in close seasons?

The Naples International Exhibition.—All who are interested in the forthcoming Naples Maritime Exhibition will be glad to hear that the indefatigable author and antiquary, Colonel Giuseppe Novi, has prepared for the use and instruction of visitors an illustrated descriptive work, which will materially assist them, and doubtless bring Col. Novi the credit he deserves. The journal may be obtained at the office of publication in Naples, 109, Strada Mergellina. We may add concerning this exhibition that the Italian Government will despatch to England a transport in June next, for the purpose of conveying to Naples, free of all charge, the objects selected for exhibition.

Quashing a Gift of 25,000*l.*—Vice-Chancellor Malins has decided against the legality of the gift by Miss de Lancy, of 5,000*l.*, for the erection of a fever hospital for Cheltenham. Miss de Lancy was very advanced in years, and shortly before she died she handed to her physician a cheque for 5,000*l.* for the purpose stated, which sum he held in trust. The Vice-Chancellor said the gift stood in the same position as if it had been a bequest by will, and the object of the Statute of Mortmain was expressed by the preamble to be, to prevent gifts for charitable purposes by dying or languishing persons. Three out of the four interested under the will raised no objection, it is said, to the gift.

The Archaeological Societies.—The Congress of the British Archaeological Association will be held this year in Hereford, the first week of September. Mr. Wren Hoskyns will preside. The Archaeological Institute will hold its meeting at Leicester at the end of July next, under the presidency of the Lord Talbot de Malahide. The chief objects of interest in the town of Leicester will be its Medieval churches, the Norman Hall of its ancient castle, the "Newarks" of the castle, numerous Roman pavements, one being *in situ*, and the noted mass of Roman masonry called the "Jewry Wall."

The Globe Theatre.—Mr. Herman Vezin is one of our best actors, and the "Man o' Airie" affords him his best part. It is one of those personations that, once seen, remain fixed upon the memory, a thing complete, and of itself. The part requires considerable versatility,—humour, and pathos, youthfulness and old age are involved,—but Mr. Vezin is equal to all its requirements, and gives every phase with equal effect. The other characters are supported very satisfactorily; and in the burlesque on "Robert Macaire," that follows, Miss Fanny Josepha, the manager, is bright and sparkling, and Mr. J. Clarke frightfully funny.

Supposed Subsidence of Soil at Lynn.—It appears from recent observation that, owing to the Norfolk Estuary Works and other improvements in the main drainage of this district, the bed of the river is being continually lowered, and the fleets and streams running into it are following suit, so that the whole of the property adjacent to them indicates symptoms of settlement. The heavy "false front" of the Corn Exchange has for some years past been supposed to be settling outward, away from the building; but it is now suggested that the building is rather sliding away from its front towards the river.

The Free Church of England Movement.—The foundation stone of a Gothic structure in connexion with this movement, will be laid in the course of the ensuing month, at Barn's-green, near Horsham, where a gentleman has succeeded to an estate belonging to Sir Percy Shelley, and given a freehold site. The individual referred to at present resides at Plaistow, where it is intended to erect another similar church. Mr. Pepper's contract (of Bedford), has been accepted.

Discovery of Roman Altars.—Recently Mr. Humphrey Senhouse dug up in a field at Netherhall, Maryport, thirteen Roman altars. These altars are said to have been raised by the prefects or tribunes who commanded the Roman legions which were at one time encamped at Maryport. These troops are generally described as Spaniards. From one of the stones it is inferred that a regiment of volunteers had been attached to the Roman camp at Maryport, and the inscription upon it is believed by Dr. Bruce, of Newcastle, who has examined the remains, to be unique in England.

Iron and Steel Institute.—This institution, which was established last year at Middlesbrough, and now numbers 350 members, opened its annual meeting last week, at the Westminster Palace Hotel, under the presidency of Mr. J. Bell. Various papers were read. In the evening a conversation took place in the same building, at which interesting models of machinery for the working of iron and steel were exhibited. On another day the members proceeded by special steamer to visit Chatham Dockyard, and the Gun Factory and Arsenal at Woolwich.

Royal Architectural Museum.—On Saturday last a party from the Working Men's Club and Institute Union visited the Museum under the guidance of Mr. E. Hall, Mr. G. G. Scott, R.A., Mr. Wallis, the Curator, and others, were present to furnish information. Sir Bartle Frere will lecture on Wednesday, the 25th, as already mentioned, on "Modern Architecture in Western India." We are glad to hear it is intended to open the Museum on certain evenings in the week, which will shortly be advertised. The numbers attending the Architectural Art Classes are encouraging.

Progress in the East.—The deep impression produced upon the Sultan's mind by his visit to the West appears in a sensible speech of his while on a visit to the Sublime Porte, when he spoke of the necessity for progress, commercial, manufacturing, and agricultural; and announced his intention to have plans and specifications prepared by engineers for a general system of railways and roads throughout his extensive empire. The improvement of navigable rivers and harbours was also specially referred to.

The late Mr. J. S. Mulvany, Architect. Mr. Mulvany, whose recent death at the age of fifty-seven, we have just now heard of, was a pupil of the late Mr. W. Deane Butler, and son of the painter, the late T. J. Mulvany. Mr. J. S. Mulvany erected a large number of buildings, especially club-houses and residences. The Broadstone, Galway, and Kingstown Terminus, and the Royal Irish Yacht Club-house, at Kingstown, are good evidences of his skill.

Omnibuses and Tramways.—Vice-Chancellor Malins gave judgment on Monday last in the suit of the Liverpool Tramways Company against the Omnibus Company of the same town. The Act permitted vehicles with ordinary wheels to use the tramways, but as it was alleged that the Omnibus Company had altered the gauge of their conveyances in order to suit the rails, the Tramways Company applied for an injunction, and it was granted by the Vice-Chancellor.

Outrage at Oxford.—The library at Christ Church, Oxford, has been forcibly entered from the windows by some foolish and evil persons, who removed the statues of Dean Gaisford and other notabilities which adorn the interior of the building, and, having conveyed them into Peckwater Quadrangle, a bonfire built of faggots and door-mats was kindled, and the statues, being placed in the middle, were completely destroyed.

Opening of the New Hall, Inner Temple. We learn from the daily newspapers that Mr. Smirke's Gothic hall, for the Templars, of which we gave interior and exterior views and plan, on January 8th, 1870, was opened on Saturday last, by her Royal Highness the Princess Louise, accompanied by Prince Christian, and in the presence of the Masters of the Bench and other members of the Inn.

St. Luke's Parochial Schools.—The chief stone of the new schools for St. Luke's parish, London, has been laid. The site of the new schools is in Old-street, almost opposite the St. Luke's Hospital. The building is to be in the Gothic style. The architect appointed is Mr. Tover, and the contractor is Mr. Henshaw. The estimated cost is 4,000l.

Crystal Palace Baths Company.—A new limited company is being formed, with a capital of 12,000l., in 2,400 shares of 5l. each. The company purposes providing visitors to the Crystal Palace, and inhabitants of the neighbourhood, with swimming and hot baths, to be erected on an acquired site abutting on the Thicket-road.

The Roman Circus in Paris.—An interview is understood to have taken place between M. Chevreau and the Minister of Fine Arts, at which the resolution is said to have been come to that these interesting relics should be purchased, the nation and the city each supplying the sum of 800,000 francs.

Drinking Fountain, Guilford-street.—A new public fountain is in course of erection exactly opposite the Foundling Hospital, Guilford-street. It includes a female figure pouring water from a pitcher. It will be opened in the course of a few days.

International Exhibition of 1871.—A prize of 40l. (1,000 francs) will be given by her Majesty the Queen for the best fan exhibited next year, painted or sculptured by a female artist of any nation, and under twenty-five years of age.

King Robert the Bruce.—It is proposed to erect a monument to Bruce on the field of Bannockburn. An identical committee has been formed in London and in Scotland, who are obtaining a design from the artistic veteran, Mr. George Cruikshank.

St. Paul's Cathedral.—We are glad to hear that a conference has been held with reference to the completion of the cathedral, and a sub-committee has been appointed to prepare and circulate a public statement.

Portraits.—The head we give in our present number was drawn from a photograph produced by Mr. John Watkins. The successful likeness we recently published of Mr. Beresford Hope was from a photograph produced by the same good hand. The drawings were made by Mr. T. Scott, and were engraved by Mr. John Knight; both these gentlemen have made a character in their speciality.

TENDERS.

For taking down part and rebuilding Railway Inn at Feltham, for Messrs. Farnells and Watson. Messrs. Walker & Elam, architects, who supplied quantities:—
Hawcock 47 10 0
Gibson Brothers 642 0 0
Lodge 683 0 0

For alterations to four houses on Royal-hill, Greenwich, for Mr. E. Shalless. Mr. Henry Roberts, architect:—
Penn 21,659 16 0
Ware 976 16 0
Hammond 885 10 0
Todd (accepted) 845 0 0

For alterations to bar, &c., at the Castle Inn, Eltham, for Mr. Edward Coppinger. Mr. Henry Roberts, architect:—
Todd 2215 0 0
Theobald (accepted) 180 0 0

For works at Orton Longueville, Peterborough, for the Marquis of Rutland. Mr. George Truett, architect:—
Vine (accepted) 21,076 0 0

For new offices, Market Place, Reading, for Messrs. Sutton & Sons. Messrs. W. & J. T. Brown, architects:—
Woodruff 41,389 0 0
Sheppard 1,867 0 0
Mathews (accepted) 1,855 0 0

For alterations and additions to mansion at Duffryn (first contract), for the Right Hon. H. A. Bruce, M.P. Messrs. W. G. Habeshon & Pite, architects:—
Price 44,860 0 0
Baker 4,307 0 0
Lewis & Sons 3,697 0 0
Bolt & Co. 3,695 0 0
Beaven & Son 3,454 0 0
Stride 3,400 0 0

For farm buildings at Buckland, Herts. Mr. W. Watson, architect:—
Gibson 12,238 0 0
Gibson 1,189 0 0
Ansell 1,037 0 0

For farm buildings at Thetford, Herts. Mr. W. Watson, architect:—
Gibson 2,358 0 0
Gibson 356 0 0
Ansell 321 0 0
Preston 224 0 0

For building a pair of houses in Bridge-street, Leatherhead, for Mr. A. Lipecomb. Mr. F. J. Dibble, architect:—
Hamblin 21,510 0 0
Bauchop 1,419 0 0
Putney 1,198 0 0
Taylor & Clear 1,090 0 0

For house at Croydon, for Mr. H. McKean. Mr. Richard Martin, architect. Quantities supplied by Mr. J. A. Barker:—
J. & A. Wright 22,345 15 0
Hyslop & Sons 2,359 0 0
Turner 2,359 0 0
Jarrett 2,338 0 0
Pollard 2,332 0 0
Chappell 2,300 0 0
Hearie 2,145 0 0
Ward 1,995 0 0

For two detached houses at Caterham, for Mr. John Gleny. Mr. R. Martin, architect. Quantities supplied:—
Ward (accepted) 21,730 0 0

For detached house at Kenley, for Mr. Young. Mr. Richard Martin, architect:—
Ward (accepted) 4300 0 0

For school-room in the Brighton-road, Redhill, Surrey. Mr. John R. Collett, architect:—
School-room Fittings.
Worsfold 4243 16 0
Hall 407 15 0
Coburn 23 10 0
Hooper 375 0 0

For alterations at No. 23, Finsbury Circus, K.C. Messrs. J. Tarring & Son, architects:—
Burbop 2448 0 0
Heep 350 0 0
Shurmer 370 0 0
Snowdon 343 0 0

For main drainage and other works, at Hurstpierpoint, Sussex. Mr. B. H. Nunn, Surveyor. Quantities supplied:—
Cable 23,251 5 7
Harry 3,159 0 0
Crockett 3,165 0 0
Symonds 3,098 0 0
Lock 2,820 0 0
Cheesman & Co. 2,023 0 0
Backmore 2,999 0 0
Blountfield 2,985 0 0
Hayward 2,920 0 0
Goodair 2,757 0 0
Young 2,750 0 0
Vickers & Crane 2,747 0 0
Widdow 2,411 0 0

For warehouses, &c., at Rugeley, for Mr. Swainston Adamson. Messrs. R. Scrivener & Son, architects, Hanley. Quantities supplied:—
Whitome 21,757 0 0
Whitome 1,839 0 0
Issip 1,819 0 0
Trow & Sons 1,600 0 0
J. & H. Brown 1,460 0 0
Bowden 1,400 0 0
Barlow 1,390 0 0

For china works at Hanley, for Mr. Charles Ford. Messrs. R. Scrivener & Son, architects. Quantities supplied:—
Harvey 23,891 0 0
Iskell 3,890 0 0
Woodridge 3,795 0 0
Bowden 3,733 0 0
Baily 3,695 0 0
Collis & Hudson 3,639 0 0
Bennett & Cooke 3,475 0 0
Barlow 3,365 0 0

For twenty cottages to be erected at Roshampton, Surrey, for Earl Spencer. Messrs. Beaton, Son, & Breerton, architects:—
Easton Brothers 23,928 0 0
Beckley & Holman 3,891 0 0
Wigmore 3,699 0 0
Avis & Co. (accepted) 3,640 0 0

For carpenter and joiner, and ironmonger's work at the New Town Hall and Markets, Abergevenny:—
Wolt & Co. 22,183 0 0
Foster Brothers 2,125 0 0
Rassie & Co. 2,000 0 0
Mordland (accepted) 1,960 0 0
The former contract for having contracted for the whole and failed, the Commissioners are carrying on the masonry themselves. The contract for the whole was, in the first instance, 7,240l.

For the Centenary of Huntingdon's Chapel, North street, Brighton. Mr. John W. Mable, architect. Quantities by Mr. W. E. Storer and Mr. Lansdown:—
Barton 48,079 0 0
Ancombe 6,930 0 0
Cheesman & Co. 6,864 0 0
Newman & Mann 6,476 0 0
Dove Brothers 6,195 0 0
Nightingale 5,167 0 0
Wilcombe & Oakley 5,050 0 0
Sharpington & Cole 4,554 0 0
Killy 4,208 0 0
Sawyer 4,720 0 0
Chappell 4,657 0 0
Myers & Sons (accepted) 4,425 0 0

For the Walling Improvement Commission roads and sewers. Mr. Boys, Borough Surveyor:—
Chamberlain 4848 4 0
Osborne 447 0 0
Hughes 443 0 0
Penke & Hurley (accepted) 419 15 0

For two houses and shops, near Woking Station, Surrey. Mr. Henry Peak, architect:—
Nason 2,601 10 0
Patrick 690 0 0
Pollard & Son 694 3 7
Dickinson 623 1 9
Winburn 669 0 0
West 625 0 0
Harris (accepted) 615 0 0

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WANTED, by a steady and experienced DISTEMPING, &c. Wages moderate.—Address, R. D. Mr. Wood, 6, Church-street, Blackfriars, N.W.

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TO ARCHITECTS AND BUILDERS.
AS FOREMAN, by a thoroughly experienced and qualified Man. Good references.—Address, H. B. 45, Park-wall, Chelsea.

The Builder.

VOL. XXVIII.—No. 1425.

The Value of the Study of Nature.

HATEVER may be the exact character of that mysterious bond which connects man with those mute forms of animal life over which he exercises so unchecked a dominion,—whatever that community of intelligent nature in virtue of which he has trained the horse, and domesticated the dog,—no doubt can exist as to the important part which familiarity with the habits of animals bears in human education. Not, indeed, that this educational power is confined to the species of the animal

kingdom alone. The childhood of mankind, whencesoever that golden age may have dated, was passed face to face with nature. The physical forces that give constant variety to the features of the wildest landscape, impressed their message on the imagination of the new-born race. The sunshine was, to those children who were fathers of men, the smile of Heaven. The storm uttered a voice of warning, of terror, or of protection. To this very hour the poet can only be reared in the cradle of nature.

The double world of life, the animal and vegetable kingdoms, teems with lessons fitted for a more advanced period of education. Industry was first taught by the culture of vegetable produce. To eat bread was the first inducement to human labour; so soon as a northward migration, from regions where the banana and the date-palm offer their untitled harvest to the dusky tribes had taken place, to those where, under more changeful seasons, the olive, the vine, and the cereals are indigenous, and where they wooed the hand of the cultivator. So long, and so harsh, has been the tyranny of what is called civilization, that the power of appreciating the beauty, as well as the wealth, of nature seems to have been crushed out of the greater number of the humbler tillers of the soil; and we might have been led to think that one of the chief characteristics of a delicate and poetic organisation, the passionate love of flowers, was peculiar to an educated, rather than to a natural state of society; were it not for the taste with which, at this very hour, the wild Indian women will deck their hair or their children with the scented, starlike, blossoms that gleam in the Southern forests.

Of the million of little children who are alive at this moment in London, how many thousands have never seen a wood or a lawn? How many not even a flower,—at least, as the glory of a living growing plant? How are the great utterances of nature stifled and smothered by dense walls of brick and mortar, before they can

reach the ears of these birthrightless children of penury? "God Almighty," said one of the wisest of our race, "first planted a garden. And indeed it is the purest of humane pleasures. It is the greatest refreshment to the spirit of man; without which buildings and palaces are but grosse handy-works." What sense of beauty, what inspiration of hope, what presence of the softer and nobler emotions of humanity can be expected to spring up within the bosoms of men and women who have been reared, from an unlovely childhood, as exiles and aliens from the face of nature? What gracious influence can smile on a squalid infancy, of which the only dismal playground is bounded by the wall and the gutter, in which the earth they tread is divided into court, and alley, and row, varied only by the sullen gloom of palisaded square or the selfish jostle of busy street? How can children reared in the unchanged gao of a great city, to whose experience land is divided into paths and streets, pavement and mud; sky consists of a few square yards of smoky canopy; and sea or far-stretching area of water are altogether unknown and undreamed of;—how can such children, as they grow up from a neglected youth into a dangerous maturity, fail to exact from society some penalty for the loss of all that makes the glory of childhood?

Nay,—we may be told by those who are quite contented with the world as it is, viewed through their own well-glazed windows,—this is an exaggeration! We are a free country. No one is compelled to live in a city. Men and women may walk from Land's End to John o' Groat's without a passport, and are not now, under almost any circumstances, forbidden to leave their parish. Demand and supply are correlative. This correlation is the grand law of economical policy. Interference with its action is a mistake, an offence against the true source of national wealth, which means national riches. If dens, and courts, and *culs de sac* exist, and teem with a pale-checked population, it is because there is a demand for such abodes, and a something or other that calls such a population into existence. It is not the part of wisdom to meddle with such matters. Let them right themselves!

A less enlightened man, one in whom the memory of certain names that rang in the ears of a former generation,—Howard, and Wilberforce, and Jenner, or even the more modern sound of Nightingale,—is not altogether extinct, may here rebuke the more advanced, scientific statesman.

There is a limit, our second reprover will tell us, even to the effect of the laws of the political economist, unquestionably true as they are in the main. We must protect society in the mass, because the mass has no organisation by which to protect itself. We must draw our sanitary cordons; prevent the unsavoury outcome of the lower neighbourhoods from damaging the proprietary value of the bettermost localities. We must even drain, and sweep, and whitewash in the very rookeries, lest they become the nests in which pestilence may be hatched; which, disgusting to say, is no respecter of persons. Let us avoid sentimentality in talking about the poor. Their condition may not be all that we could wish, but who among us has all that he or she wishes? All that society can do is to prevent evil, hatched by poverty, from extending to the detriment of those who, by their own exertions or those of their progenitors, are happily placed above poverty. And this, indeed, it will be added, with a triumphant smile, we do in a most praiseworthy manner!

Now, even as to the very subject of re-oxygenating the air requisite for the consumption of the metropolitan residents, exaggerated appeals to sentiment should be avoided. In more than one of the City churchyards grass grows quite properly upon graves, and even a tree or two may be seen by those who are curious to know what one looks like, and who are

too lazy to walk three or four miles for that purpose. In one of the very narrowest lanes of the City may be found a certain Italian villa, sacred to the worship of Pius, famous as the site of the very fountain of Pætolus, and adorned by its carefully walled garden. Then we have very lately swept away poor mean houses, by scores and by hundreds. They were, it is true, the railway people who did this; but look at the large area opened on the site of the former shores of the River Fleet! It is positively exhilarating to see so much open space in the midst of a town! The old inhabitants must now inhabit somewhere else, to the great improvement of the air of the City!

Then have we not presented ourselves with a noble river promenade, wrested from the mud-lark? and will not the recovered land supply very eligible gardens for the nobler sort of riverside mansions? Have we not the parks for those who care to walk—broad, free expanses, traversed by irreproachable macadamised roads, and containing real trees. Nay, more—borders of shrubs have been planted, and labels attached to each specimen, written, not in Hebrew, in Greek, and in Latin, but, more appropriately, in English and in Latin. And then, over and above all, for those who can reach it, in the pure air of Sydenham, we have a glittering palace, reared among lordly grounds, vocal with the finest music (for the half-crown people), and available as an unfailing source and fountain of beer.

It may be ignorance, it may be obstinacy. But yet we are unconvinced. We plead for something more for the poor man's child—for something that may be placed within his reach, and that, when reached, shall make him the healthier, and the better, and the happier, for the pure enjoyment which it ministers. "These particulars are for the climate of London; but my meaning is perceived, that you may have *ver perpetuum*, as the place affords."

"And because the Breath of Flowers is farre sweeter in the Aire (where it comes and goes like the warbling of Musick) than in the hand, therfor nothing is more fit for that delight than to know what be the flowers and plants that doe best perfume the Aire." For gardens (speaking of those which are indeed princely-like), a fifth part was assigned by the cultured fancy of Bacon to a heath or desert, besides the well-shorn green at the entrance, bordered by a stately hedge. "For the heath, which was the third part of our plot, I wish it to be framed, as much as may be, to a natural wildnesse."

"Thickets of sweetbrier, and honny-suckle, with some wild vine amongst. And the ground set with violets, strawberries, and primroses. For these are sweet and prosper in the shade; and these to be in the heath, here and there, not in any order."

For the delight of the cultivated taste, no less than for the full enjoyment of the beauty of English scenery, a great garden for the people must contain much; indeed should for the main part consist of something yet closer to nature than the studied neglect of an artificial desert, such as is to be seen skirting the lovely rose-gardens of Cashiobury. The great glory of England, in a picturesque point of view, lies in her parks—Windsor, Chatsworth, Cashiobury, Knole, Tottenham. It is hard to find any European scenery that is at once so wild and so domestic as are these stately oases. A daily walk under the time-honoured oaks, the terraced cedars, the arched avenue of humming lime-trees, in one of these noble retreats, is in itself an element in a liberal education. Let us honour the art of the florist, no less than that of his kinsman the gardener of herbs and of fruit. Let us never omit to draw around any scene of attraction for thousands of visitors broad bands of dazzling flower-beds, bright with everyseasonable glory of hue. Broad and stately walks of well-rolled gravel, shaven lawns, affording an

emerald setting for the flowers, winter gardens, rich with the graceful forms of the tropical flora, palms, and tree-ferns, luxuriant creepers, and tufted moss-worts, the lily of the Nile, and the bean of Pythagoras,—let us have all these. Let us add a live dictionary of plants, in a plot of ground arranged in two divisions, serving as index and as catalogue, after the artificial and the natural systems, as far as the genera of Linnaeus can be exemplified. Neither let us exclude lawns and alleys fitted for the exercise of manly or gentle games,—fields of fair flight for the archer, of wide spread for the outlaws at cricket, of close-cropped, cushion-banked grass for the picturesque groups of the croquet party. But with, and among, and beyond, all this must there be a shadow and a setting of forest, or tangle of copse pierced by leafy alleys,—a depth of shade, green, in early spring, with the light shed through the young foliage of the beech, or blue, of a tint like that of the creeks of the Ionian Sea, with an untrodden wealth of blue-bells.

Nothing is more marked, nothing ought to be more instructive, to those who care for the comfort, the elevation, and the future, of the great masses of the English people, than the avidity with which they turn towards the teaching of Nature, wherever that voice may be heard. In the very vices of the national character this tendency is present. No taxation or registration is necessary to discourage the Belgian, the French, or the Italian peasant, from burdening his slender resources with the appetite of a bull terrier or other hungry mongrel of any impossible ugliness. The one great relief which the harder worked portion of the educated classes seek from the toil of the bar, the bench, or the senate, lies in a return to the shadow of the original habits of the Britons who gave Caesar such a rude reception; even if they are driven to the pursuit of grouse on the Scottish moors, now that red deer no longer browse beneath the oaks of Epping. To drive, to ride, to farm, to break horses, to run them, to hunt, to shoot,—all the chosen relaxations of the English gentleman breathe an inherent love of nature. True, in the *bathos* he may sink,—from bad example, let us hope,—into a butcher. In squab-time he can hardly claim to look down with any real vantage upon the rat-catcher. But even these aberrations of the instinct of the hunter are more manly and more healthful than the occupation of a chair on the boulevard, with the daily accompaniment of the eleven o'clock omelet, black coffee, *file en quatre*, and duel with dominoes; or than the flat cake of ice, glass of water, half-chewed cigar, and interminable prate of the Italian deputy or senator.

Not only is a love of nature, however stunted and distorted in its development, an integral part of the English national character, but its presence has been detected (rather than grasped) by the recent movement of the Science and Art Department in the direction of national education. Among the various museums, galleries, and scenes of display which are grouped together at South Kensington, it is observed in the last report, that the specimens, diagrams, and drawings illustrative of the physical condition and natural history of the earth, attract, with the most irresistible force, those whom we should most anxiously strive to attract, since they are those who have the most to learn. Something of the same tendency may be observed by those who visit the British Museum, as students of something more than the collections. The long corridors and crammed cases, devoted to the store,—we can hardly call it the arrangement,—of the zoological specimens, attract thoughtful and wondering spectators. It must be a sheer love of the subject that brings them there, for the collection, though admirable for its magnitude, and containing rare specimens of the art of the taxidermist in some of its latest additions, is not so disposed as to convey much knowledge to the previously uninstructed mind. The cases are too crowded, the classification, though quite intelligible to any one accustomed to the pages of Linnaeus or of Cuvier, is too unnatural. The whole aspect of the museum is that of a place of reference for the student or the professor,—not of an exhibition intended for the public.

We write not without acquaintance with the difficulties that oppose the classifier; those difficulties which led Cuvier to conclude that the discovery of the true *Systema Naturæ*, the hope and dream of Linnaeus, was altogether unattainable. Nor are we unaware of a later theory, a reaction from the unimaginative positivism of the later years of the great French

naturalist, which ascribes a creative, or, at least, a transformative, power, to the effects of hereditary impulse or of reproduced caprice. But we have no hesitation in affirming that it is possible so to construct, and so to arrange, a Natural History Museum for the people, that a walk through its halls will be a lesson, at once memorable and delightful, as to the grand outlines of that world of life of which man, as a mortal inhabitant of the planet earth, constitutes one among many allied groups.

The broad and primary division of zones of abode marks a primary division of animal forms which is in perfect accordance with the classes of the naturalist. We do not refer to geographical zones, or to that distribution over the surface of the world which is mainly due to the degree of temperature; but to the vertical belts or levels of abode afforded by seas and rivers; by shores, sea-bottoms, bogs, morasses, and fens; by dry land in plain, valley, or mountain; and by arboreal or aerial elevation. In these four great zones of position, the primary classes of the vertebrate animals, fishes, reptiles, beasts, and birds, naturally find their home. Each zone is afforded by organic beings themselves, the abode of numerous parasitic species of both vegetable and animal race. Not only do all the main groups known to the naturalist, under the three primary types of animal structure, coincide with one or another of these five zones, but division and subdivision may be carried on step after step on the same principle of arrangement; and the answer to the double question of what a given animal is like, and of what relation it bears to others, either in homology or in analogy,—that is to say, either in essential structure or in functional modification,—may be impressed clearly on the mind by an intelligent and persistent reference to this great and simple law of disposition.

A comparatively limited but thoroughly well-selected number of specimens, never allowing, let us say, more than a single representative to a genus (and not admitting the extremes of modern generic subdivision), stuffed with as much care and skill as are evinced in the preparation of the Aye-aye, the Owl, and the Bird of Paradise, which so delight the visitors to the British Museum, arranged in well-constructed, well-lighted cases, without crowding, each specimen accompanied by a clearly descriptive printed label,—the divisions of the whole collection indicated by good divisional labels, in larger and larger type, according to their classificatory value, would prove a mute but instructive lecture-room, which would probably be the most attractive exhibition that could be offered to the attention of the children of our great metropolis,—the children of every age.

In the attempts which are being made, from time to time, to retain breathing-spaces amid the hourly-extending province of London habitations, to secure, to prepare, or open, parks or gardens, or places of educational resort for the people, we hope that these important requisites will be borne in mind. City life has its own brutalising influences, apart from, or even opposed to, the intellectual sloth of rusticity. We shall best counteract these evil tendencies by restoring the presence of nature. We cannot do this in the grandeur or the power of her wild dominion; but it is within our reach to present to the mind some of the noblest elements of natural beauty, and so to group them as to supply, by a mute but reciprocal illustration, a lesson that would be lost in the very expanse of unchecked rural wildness. Let us set our flower-gardens for the people in their natural framework of heath, of park, and, where possible, of forest. Let us group well-preserved forms of animal structure in a manner that shall illustrate the wisdom, if not the boundless variety, of Nature herself. Let us place these things, physically and peculiarly, within the reach of the children of the metropolitan poor. And, if this fails to attract, to charm, and to educate, let us take thought for thicker walls and more numerous wards for the goals and poor-houses that will be required in the days of our children and our children's children.

Blasting on a great Scale.—An extraordinary blasting operation has taken place near Morthyr. A hole, 38 ft. deep, was bored in rock, and it was charged with 600 lb. of powder. The explosion of the charge produced quite a local earthquake, and detached at least six thousand tons of stone.

A NOTE AT CAMBRIDGE: CAIUS' COLLEGE.

AN investigatory stroll about the time-honoured University town, in the interval between the arrival and departure of trains, leads us to notice the new buildings at Caius' College, nearly completed, from the designs of Mr. Waterhouse, as the principal architectural work now in progress there. Though the general appearance and expression of the building at once suggest to us the name of the architect, we find him here employing detail and ornament somewhat different from that with which his name has been mostly connected hitherto. The general object aimed at in this building is at once apparent to the architectural critic: the intention has been to fuse some of the characteristic effects of Gothic and Renaissance design; and in pursuing this aim we must say that Mr. Waterhouse has succeeded in producing an effective and, on the whole, consistent building.

The new buildings occupy one side and two halves of the other two sides of a quadrangle, the two re-entering angles in the interior being carried off in the one case by a circular stair-turret occupying the angle, and showing on its exterior design the raking line of the staircase, and at the other corner by a return of the principal wall face at an angle of 45°, cutting off a small portion of the plan of the quadrangle. Through this angle opens internally the principal entrance to the quadrangle, which externally, however, forms a principal feature in the outline of one of the returned wings of the building. Entering from the outside through a large semi-circular archway, we find ourselves first in a square grained porch and then in an inner porch, where we turn at an angle to the left through the internal entrance just mentioned. Externally this entrance is emphasised by a break in the plan giving a projection in the wall-line; a break which above the roof is developed into a kind of low tower, with a pyramidal slated roof and lofty chimney-stacks at each side, and round corbelled-out angle-turrets or finials on the two outer angles. This combination gives the same kind of confusion of skyline and crowded appearance of composition which we noticed in criticising the new hotel at Liverpool by the same architect some time since; the chimneys and the pointed roof are so closely fitted together, and so nearly equal in height, that (viewing it in perspective especially) we scarcely know which to select as the principal feature, and the whole grouping makes a very confused and unsatisfactory finish. The architect would do well to avoid this defect in future, and study unity and simplicity in the sky-line of his loftiest features. The whole of the windows are square-headed, with multitudes and tracery with slightly heavy but very effective moldings, the doorways mostly with round-arched heads, no pointed arch appearing in the building so far as we noticed. A machicolated cornice, perhaps scarcely powerful enough to dominate sufficiently into one whole the rather variegated features below it, runs round the building, and over this rises a series of dormers of picturesque semi-Elizabethan outline, with a singular kind of flying buttress or stone rail springing in a segment of a circle from the foot of the dormer gable, and joining it again near the apex, on each hand; the feature is not a very architectural one, but has a pretty effect nevertheless. The carving round the jamb and archivolt of the external entrance is a kind of mixture of Greek and Gothic detail, which rather happily gives the key to the motive of the whole design; and the carving in the panels under the first-floor windows, while sufficiently deep out to be effective, is essentially renaissance in line and style. At the angles are the square corbelled oriel windows, facing at an angle of 45° with the two sides, which Mr. Waterhouse is so fond of employing. The row of square projecting bay windows running through two stories, along the longest external elevation, are not so successful in effect; their corbels are rather heavy in outline, and the effect is perspective, when looking along the longest front, is not very happy. In the centre of this longest front is a smaller entrance to the quadrangle, through a semicircular doorway of similar character to that on the wing face; both entrances have ornamental iron gates of good design, more Gothic in manner than Classic. The one purely Gothic feature in the building is the row of grotesque spout-heads on the cornice; and these, to say truth, are a feature that might

have been spared without any disadvantage. It should be noticed, also, that the dormer windows rise directly from the upper surface of the cornice without any further sill, and this gives them rather an awkward appearance, especially when near the building, when the lower portion of the window is entirely cut off from the eye by the cornice. Over the windows towards the quadrangle are small cornices after the Renaissance manner, but treated with partially Gothicized detail, as the eye discovers on a closer inspection, in the carving under the soffit. The building is to be decorated externally by portrait statues, the positions for which are already marked by niches and corbels in various places; and one statue of a wigged and gowned former clerical benefactor was already *in situ* at the time of our visit. The walling is of Caester stone, in regular masonry of thin and thick courses alternately; and the dressings, mullions, &c., are of Ancaster stone, which, in point of tint, does not differ sufficiently from the other to preserve a distinctive appearance for any length of time, if such distinction is an object. Taking the building as a whole, we should be inclined to say that a little more study given to the style of the ornamental detail, both as to individual portions and as to general congruity, might not have been amiss; but in the main the whole work is a very clever and successful effort to attain novelty and variety of effect by a combination of materials belonging to different styles, and is, at all events, worth notice and study on this ground, on the part of any of our readers who, in passing through Cambridge, may find time to get far enough into the town to visit Caius' or (as the undergraduates euphoniously term it) "Kays" College. Mr. Waterhouse has added also an apsidal termination to the college chapel, where, as we learned, a new organ has recently been erected.

A stone's throw or two farther on brings us to the east end of the new chapel of John's College, where now the canopied niches on the buttresses are gradually becoming filled with the sculpture for which they were intended, such filling having, indeed, been accomplished along the south side of the choir, and apparently proceeding energetically. After looking a little at the chapel, and thinking that it is in a general way too Continental in style and pretentious in appearance to harmonise very well with the sober and homely style of old John's College buildings, and that the tint and tone of the roofing tiles is too near that of the stonework to look well, as they are palpably not the same class of material; and after wondering how Mr. Scott came to put such heavy pinnacles and such a very thin and weak-looking balustrade between them as a finish to the tower, the visitor will, if he is of our mind, stroll across the large court of Trinity adjoining, with its tinkling fountain in the centre, and so through into the "second quad." with its verdant turf surrounded by one of the most elegant and spacious of Italian loggias, through the further side of which he may see the green gleam of sunlit trees beyond, and whence he may emerge into the college grounds behind, and crossing by the so-called "cycloid" bridge, where

"Camus, reverend sire, goes footing slow,"

may wander up and down "that long walk of limes," the favourite haunt of how many a generation of learned and ambitious spirits, and lose himself in we know not what of day-dreams, till "time and the hour" warn him to re-seek the commodious and well-arranged railway station, and return to rapid locomotion and the nineteenth century.

FREE LIBRARIES AND MUSEUMS.

A PARLIAMENTARY paper, just published, will excite surprise and regret that the Free Libraries and Museums Acts of the late Mr. W. Ewart, member for Dumfries, should have borne so little fruit during the last twenty years, in which they have been in operation. The paper referred to is a return moved for by Mr. Edward Baines, M.P., last year, intended to show all the boroughs and places in the United Kingdom that have adopted the Act of 18 & 19 Vict., c. 70, and others, for establishing public libraries and museums and schools of science and art. The return is so palpably imperfect in several important particulars, as to induce a misgiving that it is not to be relied upon, even in the cases concerning which returns are professed to be given. As touching the incompleteness of the return, for instance, it seems passing strange that a free

library, established under the Acts, which is situated almost at the doors of the Houses of Parliament, has no reference whatever made to it; we refer to the Free Library of St. Margaret's and St. John's, Westminster. This humble institution is the only one of the kind that the great metropolis has to boast of, or rather to humble itself concerning; but such as it is it deserves mention; and, in connexion with its establishment, honourable mention of Lord Hatherley, the present Lord Chancellor, who was mainly instrumental in its establishment. In various parts of London, as well as in many other cities and boroughs throughout the kingdom, attempts to adopt the Acts have been made and defeated by the economists,—save the mark,—with whom the penny in the pound is a more important consideration than the moral and intellectual culture, or the improvement in taste, of the industrial population. The penny is tangible and intelligible; the possible results of the establishment of free libraries, museums, and schools of art are not dreamed of in their philosophy. It should be mentioned, before passing away from the metropolis, that London city has its very excellent corporation library and museum at the Guildhall, to which access is easily attainable by any respectable person. It includes a reference and lending library and museum, and is especially rich in books, antiquities, and other objects relating to London.

With respect to other places from which returns were asked for, it is to be regretted that from twenty-four towns in Great Britain—twenty-one in England and three in Scotland—no returns of any kind have been received. There is surely culpability in this, especially in relation to the towns in which free libraries under the Acts have been established for years. The list includes Birkenhead, Oxford, Kidderminster, Lichfield and Yarmouth, in all of which we believe free libraries exist; most certainly they do, or did, in Birkenhead and Oxford. A list is given of 240 cities and boroughs in England and Wales, concerning which the brief and unsatisfactory record is made, that "returns have been received stating that they have not adopted the Acts in question." The list includes such populous places as Newcastle-upon-Tyne, Hull, Rochdale, Rochester, Oldham, the Hartlepool, Halifax, Wakefield, Weymouth, York, Chester, Chesterfield, Colchester, Dartmouth, Falmouth, Ramsgate, Shrewsbury, South Shields, Staleybridge, Stockton-on-Tees, and very many others that might be named.

The return contains some gratifying illustrations of hearty unanimity and of large majorities by which the Act has been adopted; but illustrations of an opposite and less satisfactory character also. At Berwick-upon-Tweed the Act was adopted in 1867, but in consequence of subsequent opposition by the ratepayers no action has been taken upon it. At Gloucester an attempt to adopt the Act was made in 1867, but the promoters withdrew the proposal without coming to a vote, in consequence of the hostility of the ratepayers. At Maccosfield the ratepayers have determined by resolution not to adopt the Act. At Margate, in 1867, a library and museum, with the freehold of a scientific institution, were offered to the town on very advantageous terms. A very large number of the most respectable burgesses, the largest ratepayers, were out-voted by a majority of the lower class, who outnumbered them on the motion that the Free Libraries and Museums Act be adopted. The triumphant majority comprised those burgesses who would have paid least and benefited most by the adoption of the Act. At Portsmouth two attempts made for the adoption of the Act have been defeated. From Carnarvon the return is that "nothing has been, or is likely to be done, in the matter of public libraries or museums for the borough." At Swansea the Mayor has been defeated by the burgesses in an attempt to put the Libraries Act into operation. In enlightened Edinburgh, a renowned seat of learning and literature, an effort was made in May, 1868, to establish a library under "the Public Libraries Act (Scotland), 1867." On a poll being taken, the vote was 1,025 votes against, and sixty-eight in favour of the proposal! Edinburgh has splendid collections of books in its Advocates' Signet, University, and other libraries, which are not available to the artisan class. This discreditable vote almost implies that these libraries are little used or appreciated. Love of books is totally incompatible with a disposition to limit the range of their usefulness. Enlarged views were scarcely to be expected among the huck-

sters and lodging-house keepers of Margate; but far less should it have been expected that the enlightened citizens of "the modern Athens" should have so far outstripped the humble burgesses of Margate, Portsmouth, or Berwick-upon-Tweed, in the achievement of such an enviable distinction.

Happily, the returns furnish hints for a brighter picture, in the particulars communicated illustrative of the munificence of the people of Manchester, Liverpool, Salford, Birmingham, and other places, in the establishment of free libraries and museums, and concerning the splendid successes achieved by these noble institutions. The Manchester Free Library was opened in 1852, and, as now developed, consists of a reference library, containing 45,000 volumes; five lending libraries, which make up the total volumes to considerably above 80,000; and five public reading and news rooms. In the year 1868-69, there were 873,648 volumes issued in all the departments, or an average of 3,088 volumes per day. The sum of 12,823L was subscribed by voluntary contributions when the library was instituted: above 20,000 artisans and workpeople contributed to this amount. The associated libraries are maintained at a cost of about 5,000L per annum, exclusive of 350L per annum appropriated to the maintenance of a museum. The produce of the rate in Manchester, at a penny in the pound, is 5,700L per annum. The Liverpool Reference and Lending Libraries have 100,000 volumes, and, with the museum, are maintained at an annual average of 4,800L. The penny rate in Liverpool raises 5,600L. The splendid building in which the reference library and museum have their home, was the gift, during his lifetime, of the late Sir William Brown, M.P. The monthly issues of books at the reference library, are 35,400, and at the two lending libraries, 35,300. The visitors to the museum average 27,300 per month. The Liverpool Library and Museum are maintained under a local Act. The Salford Free Library commenced in 1849 with a voluntary subscription of 7,523L. There are 31,614 volumes in the reference and lending libraries. Above 5,000 volumes per month are issued in the reference, and as many in the lending library. The value of the contents of the museum is estimated at above 10,000L; and the average annual cost of maintenance is 1,565L.

The Birmingham free libraries are of much more recent date, and of more rapid growth than the institutions already referred to. The first department, a lending library, was opened in 1861. The libraries establishment now consists of an art-gallery, a reference library, and five lending libraries, with a free public news-room attached to each. The total number of volumes in all the departments is about 60,000, of which half are in the reference library. The issues of books are above 100,000 volumes per month, and the visitors to the Art Gallery, above 17,000 per month. The cost of maintenance of the libraries is 4,250L per annum, which absorbs the penny in the pound. Bolton (Lancashire) adopted the Act in 1852, when 3,245L were subscribed by the inhabitants as a starting fund. The reference library has 16,000 volumes, and the lending library 9,000; about 9,000 volumes are issued in the two departments monthly. The annual cost of maintenance is 400L, obtained from a rate of one halfpenny in the pound. The votes polled to adopt the Act were 662 for, and 55 against. Blackburn (Lancashire) adopted the Act in 1863 by a vote of 430 to 2. It has above 15,000 volumes, and issues about 3,000 per month. A rate of one halfpenny in the pound is levied for the maintenance of the libraries, which realises 380L per annum. Cambridge adopted the Act in 1853, when 575 polled for, and 73 against, the proposal. There are above 14,000 volumes in the two departments, reference and lending; and there are about 45,000 issues annually, or equal to the issue of each volume above three times. The cost of maintenance is 900L; the penny would produce about 450L. Coventry Public Free Library, opened in September, 1863, has above 12,000 volumes, and issues about 250 volumes daily. The penny rate yields 362L. The Act was adopted at Norwich in 1854 by a vote of 150 to 7. It has about 4,000 volumes, and issues above 2,000 volumes monthly. The annual cost is 141L, "beyond interest and instalment of loans." Nottingham adopted the Act in 1867, with only one dissentient. Buildings for the reference library and newsroom are in progress. The number of volumes issued is about 15,000 per

month, and the cost of forming and maintaining the library and natural history museum, 1,000*l.* per annum, which is taken from the borough rate. Sheffield adopted the Act in 1853, the two departments have above 30,000 volumes. Its issues to readers in the library are about 3,500, and to readers out of the library about 14,000 monthly. The cost of maintenance is about 1,300*l.* Among other towns that have free libraries and museums in operation under the Acts are:—Canterbury, a museum and library maintained at an annual cost of 190*l.*; Dover, a museum, at a cost of about 200*l.*; Hertford, a library, at a cost of 95*l.*; Ipswich, a museum, and a limited library, at a cost of between 400*l.* and 500*l.*; Leicester, a museum, with library in progress, at a cost of 683*l.*; Maidstone, library and museum, at a cost of 900*l.*; Stockport, a museum, cost defrayed from rate of 4*d.* in the pound per annum; Northampton, a museum, with library to be added; borough rate appropriated, 386*l.*; Walsall, a lending library and reading-room, at a cost of 270*l.*; Warrington, library and museum, at a cost of 250*l.*, the museum containing upwards of 25,000 specimens of natural history and works of art, nearly all obtained by donation; and Warwick, library, at a cost of 142*l.* per annum. In Wales, Cardiff has a public free library established by the unanimous vote of the ratepayers. It is maintained at a cost of 500*l.* a-year. In Scotland there are libraries in operation under the Acts at Airdrie, Dundee, and Paisley. At Paisley the necessary buildings for the free library and museum were erected at the expense of Sir Peter Coats, and transferred to the corporation, free of cost, in trust for the community. The Act has been adopted, and the provision of the necessary buildings, and the formation of the libraries and museums, are in progress, at Ayr, Dundee, Lynne, Exeter, Leamington, Leeds, Leicester, Stockport, Tynemouth, Westminster (Wills), and Wolverhampton. The subject of adopting the Acts is under the consideration of the corporations of Bath, Bradford (Yorks.), and Derby.

Some gratifying illustrations of the liberality of private donors are given in connexion with towns which have not free libraries under the Acts. At King's Lynn, for instance, there is the public library, founded by the present Earl of Derby, when he was member for the borough, and which is known as the "Stanley Library." Preston has its free library, founded by Dr. Shepherd, which is now maintained by the corporation. Bristol has a free library, the property of the corporation; and, as regards the borough of Barnstaple, Mr. F. W. Rock, a native of that town, and for many years a respected London publisher, generously subscribes 100*l.* a-year to the Literary and Scientific Institution of the town, which enables the managing committee to admit 100 free members annually, who have the use of the library and news-room, and of the classes formed for instruction in languages, elementary art, and science. Are there no large-hearted men in Edinburgh ready to follow such a noble example?

FANS AT SOUTH KENSINGTON.

With the view of assisting in the art-teaching of the Department for the Instruction of Women, and especially to direct their attention to the attempts which the Lords of the Committee of Council on Education have made for the improvement of fans, a loan exhibition of fans has been opened at the South Kensington Museum. Her Majesty the Queen has lent some fans, as have a number of ladies; and Mr. Samuel Redgrave has prepared a special catalogue, prefacing it with the relation of some interesting facts concerning fans and fan-makers. The present exhibition, as we have said, is part of the scheme of the Department of Science and Art for the art instruction of women. To promote this object, the Department offered prizes in competition for fans painted by the students in the female schools of art in 1868, and again in 1869. The fan-mount, to which, in the first of these years, the chief prize was awarded, is included in this exhibition, and it is intended to continue the competition; her Majesty also purposes to offer a fan prize for competition at the International Exhibition of 1871. Those, therefore, who desire to compete may now have the great advantage of seeing all the best fans which can be brought together, and of studying, not servilely copying, what is in every respect most appropriate, tasteful, and novel, as well as what

should be avoided. But the mount, which is the object of competition, is only a portion of the completed fan.

Some interesting facts relating to the Paris manufacture of fans appear in the Report of the Délégations Ouvrières, Paris Universal Exhibition, 1867. It is stated that the fan-stick is specially made in the Department of l'Oise, and that mother-of-pearl, ivory, bone, sandal-wood and other domestic and foreign woods, are used in the manufacture in mother-of-pearl being carried on at Andeville, and in other materials at St. Genévieve. The work is chiefly domestic, the artisan, his wife, and children taking a share in it, and frequently attaining great skill by their own untutored industry and talent. The finely-painted mount is exclusively Paris work, the most esteemed artists being frequently employed. The fans thus produced are made under the direction of the principal dealers in Paris, and usually represent some specialty which belongs to their producer. In England, the trade has not found such a development, and its future extension would seem to depend upon the uprising here of men of taste and capital, to which end the present exhibition may conduce.

The dress-fan of a high character is now exclusively made in Paris. In no other city does a modern fan command a price of 100*l.*, and the makers claim to have made all Europe tributary to them, admitting, however, that they cannot rival the cheap and remarkable quality of the Chinese fan.

Mr. Redgrave reminds us of the relation by Nollekens, the sculptor, that when his wife was a girl, her father's intimate friend, Goupy (a well-known water-colour draughtsman, who died in London, 1763), was considered the most eminent of the fan-painters, and that fan-painting was then so fashionable that the family of Athenian Stuart placed him as a pupil to Goupy, conceiving that by so doing they had made his fortune; and we learn from other sources that Stuart originally gained his livelihood by painting fans. We should like to meet with one of these.

At the present time, the only fans produced in London are, we believe, of the plainest and commonest character, made of paper or of white wood.

The fans exhibited are 413 in number, of which about half are French; 160 of the latter, including thirty-four from the Empress of the French, having been obtained through the good offices of M. de Sommerard. The Baroness Meyer de Rothschild and some other ladies worked sedulously to obtain contributions, and Lady Wylst may be specially mentioned as having contributed largely to the collection. Amongst those from the Empress is one with an elaborate picture (No. 146), "The Adventures of Cupid," including numbers of miniature figures.

A French fan (No. 248), sent by Monsieur Volain, Paris, deserves attention. The subject is the "Symbolical Marriage of Louis XV. and Maria Leszinska, on Mount Olympus." It consists of a great number of figures, with portraits of the King and Maria surrounded by geni; figures of Jupiter, Juno, and Apollo in cartouche, surrounded by musicians and others, in rose camaïeu, surmounted with the arms of France and Poland. Sir Philip de Malpas Grey Egerton lends one with an elaborate drawing in pen-and-ink, representing an Academy of the Sciences, with architectural background, by Sebastian Le Clerc. Madame Jubinal has forwarded, with many others, an elegant Italian fan, belonging to the middle of the seventeenth century, painted with the "Rape of the Sabinæ," an original design by F. Romanelli, who was employed by Louis XIV., and painted the frescoes in the Bibliothèque Mazarin. The Empress of the French sends more than one charming modern fan, painted by Madame Calamatta and by Guimel.

No. 211, with Harlequin and Pierrot, painted by Gavarni, will not escape comment. Another noticeable work is sent by M. Chardin, *Eventailiste*, Paris (No. 324). It is of the time of Louis XV. It is painted with "The Triumph of Mordred," signed "Gormo;" on the back an Italian Classic landscape.

Several matters we need scarcely say, are involved in the production of a fine fan besides painting, such as the general form, carving, gilding, and varnishing. Of the works known as *Vernis Martin* several good specimens will be found. Martin, who invented the process, and produced so large a number of fans in the reign of Louis XIV., is supposed to have been an Englishman. The fans made under his direction display remarkable finish and brilliancy of colour.

Some of the fans in the collection well illustrate the period at which they were produced; as, for example, No. 102, of the time of the French Revolution, engraved with bust of Mirabeau and scenes from his life. The Chinese and the Japanese fans are distinguished by the depth and brilliancy of the colours employed. Some of the fans have a story which gives them a separate interest: thus No. 178 is a fan described in one of Madame de Sévigné's letters; 218, a remarkable specimen of imitation lace, was formerly used by Madame de Pompadour; 278 belonged to Queen Charlotte; and 272, a small ivory dress fan, painted with subjects in cartouches, was the property of Queen Marie Antoinette, and was obtained by the Queen of the Belgians for Queen Victoria, who lends it. No. 382 was brought from Italy by Sir Joshua Reynolds for his niece; and 383 formerly belonged to another P.R.A., Sir Benjamin West.

The majority of the English fans exhibited are not very good specimens, although by no means out of place in a typical collection. They may, and should, still be added to. We recollect of one (does it belong to Mr. Lewis Pocock?) that was painted with a representation of the tiles at Tanbridge Wells, with Dr. Johnson and other known characters taking the air.

In addition to the prize of 40*l.* offered by the Queen, as already mentioned, for the best fan exhibited in 1871, being either a work of painting or carving, or a combination of both, and executed by a female artist, under twenty-five years of age, the Society of Arts has offered its Gold Medal (of the value of twenty-one guineas) for the second best fan exhibited. The Lady Cornelia Gneist and Baroness Meyer de Rothschild have each offered a prize of 10*l.* for the two next best fans; and a sum of 50*l.* will be awarded and spent in various amounts by the Science and Art Department for fans produced by female students of the schools of art in the United Kingdom. We may hope that some practical results will follow these endeavours to revive the production of fans in England as a branch of fine art applied to industry.*

"LOTHAIR" AND HIGH ART LIFE.

If we were to ask what the foremost idea is which may be said to embody and include the whole number of the aspirations and wishes of the present time, it would certainly be contained in the word *progress*. Everything, we are told from all quarters, is progressing—i.e., going on towards something or other, no one knowing precisely what it is, inasmuch as people are found to differ a good deal from one another as to the point to be aimed at. But one thing is quite certain, and that is, that all the whole of the actual and tangible and visible progress that is being made for the most part concerns but a very few people indeed, the final results of all improvements finding their way into comparatively few hands. Mr. Disraeli, in "Lothair," has presented us with a specimen of an example of what progress in its final outcome means and is. Lothair has got everything,—i.e., boundless wealth, leisure, and opportunities, which now-a-days means everything. *Five art* in all conceivable places is his, for he either buys it, or goes to it, and it is a question of no small interest to find out whether there does now exist, and where, or in what places, any sort of Art, old or new, worth the notice of any man to whom nothing stands in the way of his coming at it. Or we may put another, and the only alternative case: must he, perforce, fly to Nature herself, Art not sufficing. It confirms the readers of the *Builder* because the real subject of this book is the modern material and surroundings of those who can get them by simply paying for them.

Mr. Disraeli's is a very clever book, but a very disappointing one, considering who the author is, from the sheer fact of Lothair being a mere dummy, moved about like a shuttlecock from one "influence" to another, without anything in him to direct his own flight or movements: so that the book is, for the most part, mere apparatus, and art, and furniture influences, not directed, but directing. Every artist should read this brilliant book; for it is about modernism, modern art furniture, and the final results of "progress." Lothair has everything which the

* We may as well mention here that, to provide space in the Museum for the examination and exhibition of the National Competition Drawings of the Schools of Art in the United Kingdom, the Gallery of Raffaele's Cartoons will be used, and must be closed for a short time.

modern world of to-day can give, and he can have no more. No man living knows more of the world of "sustained splendour" than the late Prime Minister of England. What a pity it is that he did not in this book make the hero of it say out of it what it is that a very clever man, with boundless means, can get out of it, or make of it. This is not the place to talk about a novel, nor does the book really call for it, because it leaves all the apparatus of wealth dead. It is a book about the most enormously expensive furniture, and one cannot help feeling a kind of contempt for it, from the constant thought of the fact that all the sustained splendour in the furniture of it is simply the mere dead matter in and about which the life in the book moves, but that life does not move it. What a pity it seems, therefore, that the illustrious author of this book, with all his opportunities of knowing, and capacity to influence others, did not go to work, perhaps for the last time, and with all his added experience, and tell us what to do with boundless wealth and power, to possess every thing; and tell us, too, what there is in his estimation worth possessing, or seeing, and how far it is an improvement, or progress, on and beyond what they had who have gone before us, or in advance of those in other countries, as India or China, who have not arrived at our stage of improvement and progress. Might it not, from Mr. Disraeli's head and experience, have been the book of the day, a sort of revelation of all that is now possible? It is a book about splendid apparatus, and ends in fact nothing; but surely there is that in it, or not in it, which may be made to subserve an artistic purpose, and guide us to something and somewhere.

Mr. Disraeli's purpose is, then, as far as he has the faculty to exhibit it to us, "modern society" in its very best and highest state, the low elements in it being totally excluded; in other words, the end and result of our modern progress, and without the means by which it is attained, is here in a measure placed vividly and brilliantly before those who cannot see it all for themselves, and even before some who can; and here it is that the thought occurs,—is the apparatus, the art, splendid as it no doubt is, which the modern man and woman of wealth can accumulate around himself or herself, an advance, artistically or even usefully, on that which the men and women of old Greece or Rome possessed three thousand years back, or even antique Egypt five thousand years ago? What is all this splendid art which the author of this book writes about so knowingly and lovingly? Art in the abstract is simply the so working up the raw materials of the world as to approximate them to Nature's own work. The gilded chairs of a modern drawing-room such as those in which Lothair reclines, and the ivory chairs in which the conscript fathers of old Rome sat, and the marble seats in the Greek theatres, are, after all, but the efforts made to worthily provide such necessary and useful articles of furniture; and the toilet apparatus of a Pompeian lady, and the ivory-handled brush, with its engraved coronet of a modern lady, are but efforts artistically in a like direction; but surely they are as nothing compared with the living beings who use them. Surely it is better to see a self-sustained human being on a burnt-out tar-barrel than a mere dummy and "clothes-horse" in the most splendid of drawing-rooms. It is better by far to be able to kick away the barrel than to lie helplessly in an ivory and gilded chair, with no power to move until lifted out of it by some external force, or to wait till you are advised by some great personage that it is time to take a constitutional walk. Yet of such is this Lothair, the favoured recipient of all that the round world can in these modern and advanced days produce. There is not a scientific society, nor an art society, nor a prosperous trader in pearls or splendours, nor an architect producing plans worthy of "purple velvet ease," who is not ready with all he can do to administer to the wants or whims of Lothair. The living question is, can he get anything out of them?

But one of the great defects of "Lothair," and not the least of them, is the total absence of the common herd of humanity in it, and all that pertains to them. It is all about the higher orders of men and things, and does not condescend to men or things of low estate. This is a great artistic defect, for gold and diamonds themselves would be utterly worthless if there were nothing in the world but gold and gems: so that not only is Mr. Disraeli's book deficient in its main purpose of exhibiting the full advantages of high life and splendour, but as far as

the human being is interested and moves in it, it fails by not showing, by way of contrast, what its opposite low life is; and from them to show what is the amount of gain to be got, artistically or otherwise, by high or splendid life, and what it is that low life reduces a man to, or puts him entirely out of the pale of. Mr. Disraeli has shown high-art existence only, with its surroundings, and "sustained splendours." What is low-art existence with the absence of those so much coveted splendours? Are they to be made up for in any way? and if so, how, and what is that which now does it? for human nature, whatever it is, must be, in some way or other, satisfied. All must live, the common as well as the splendid, and all will have art surroundings and ways of getting rid of time some how or other. Lothair's mind is filled to the very brim by the mere sight of royalty, followed by the imperial presence of ambassadors, not in the gorgeous costume of the Dark Ages, but decked out in mere common-place and inartistic modern "tailoring," containing certainly nothing of anything like a high-art element in it. Is there anything in lower life, or the life of the lowest, which ever does on any occasion fill its mind and soul to the brim? Well, there is, as there must be, or humanity would die out altogether. Would that Mr. Disraeli had said something about it, if only to show what the world is made of. In the obscurer parts of London, not west but east, there are "splendours" of gas, glass, gold, jewels, coloured stuffs, and everything,—to wit, "gaffs," theatres, such as they were in Shakespeare's day,—places full of sustained splendour, and sound, and of people to fill them; but of which it is evident Mr. Disraeli knows nothing, and which, if he did, he would probably despise and loathe. But, alas! for the fallibility of man, even when leading the House of Commons; for it so happens, we speak from actual eyesight and personal and active experience, that all and the whole of the splendid apparatus of furniture, crystals, and wonders of which he speaks actually does exist in duplicate in the far-off and dismal regions of which we speak. It is a most wonderful fact, that if you go into a modern West-end drawing-room, and look attentively by daylight at each individual article of furniture in it, from the carpet on the floor to the crystal lustre hanging from the ceiling, and from the smart be-brassed stove to a wine-glass, and then go down East, and look into some den of poverty and helplessness there; or, better still, into some shop filled with the scourgings of such places, you will see precisely the same things,—only cheaper. Why, the magnificent lustre in the corner gin-palace was cast from the very same mould, and sold by the same firm! The wine-glass and the gin-glass are the same articles. If you wonder at the cheapness of the cotton handkerchief and at the splendour of its monster flowers, you will be told that it is just as good as one in silk, for which you may sigh, and was actually printed from the same block,—not in far-off India, but perhaps but a few steps off. Wonderful are the things to be found in the far East, not from where are to be met with the spoils of Asia, but in Shoreditch! What a pity it is that Lothair did not travel there for a day before going so far as he did. Why, the fact really is, though the late Premier does not know it, that of all the trumpery (looked at artistically) that is to be found in the known world, a full-furnished West-end Belgravian drawing-room contains the pick of it, enormously rich and expensive, but as art, as low and devoid of real artistic skill and thoughtfulness as are the articles to be found in the unknown East.

What a book, then, on "art" would this have been had its wonderful author gone but a few hundred yards east of Temple Bar, and looked about him, before travelling so many thousand miles only to miss it, and to labour under the impression that "unsustained splendour" is only to be found in Belgravian mansions; and to labour, too, under the still more fatal idea that these splendours are really "art," and artistically impressive and valuable. Of the mere costume, the dainty tailoring which he thinks so much about, and which at times almost overwhelms him, it is not, perhaps, possible to speak in this place; but the time may come, even in Belgravia, when fashion, even in dress, may mean something more than mere change from one thing to another, without the slightest reference to form, colour, fitness, beauty, or adaptability of any sort or kind to the human frame, whether of age or youth.

So much for "Lothair;" but there is one ob-

servation in it, which concerns the art of the future, not a little noteworthy. The late and present Prime Minister agree on few subjects of human thought, but with one in this book they do, for Mr. Gladstone has himself written a book about it. It is that the Aryan and Semite after all their labours, and works, and wanderings, represented as they are by the "Hellenes and Hebrews," have met and are destined yet to meet and to combine the treasures of their accumulated wisdom, and hence to secure the civilisation of man. So says this clever book, and so says Mr. Gladstone in his account of Homer and his Greeks. Now, if there is one thing more to be wondered at and admired in the original planning of this world than another, it is that of diversity in unity, or that provision that has been made for securing the individuality of the nations of the earth, and in the certain fact that each one of these nations has a course and a progress of its own, and an interest of its own; and that so far from anything possible to be got by "amalgamating peoples" or "fine arts," it would seem to be a "law of nature" that they be separate, and left to work out, each one for itself, a civilisation, an individualised humanity, and an art of its own. The Greek is one man, and the Jew is another.

But yet one thing more Mr. Disraeli might have done for the age in which he lives, and in this book he might have sketched it out,—viz., what sustained splendour, worthy of the name, or, in other words, fine art applied to humanity, ought to be, and really is, when true and as it has been, at divers times in the history of this world. What if, leaving Shoreditch, and its Jews, and Italians, and Irish, in all their despised roughness, to take care of itself and themselves, or to go to merited or unmerited destruction, Mr. Disraeli had pointed out to us what sort of place a modern West-end Belgravian drawing-room would be, if filled, not with mere upholstery and fashionable shop furniture, with nothing to single it out from the commonest but enormous expensiveness, but with real and *bonâ fide* objects of art,—things interesting, each one by itself, as the expression of the mental and bodily powers of the artist who produced it,—e.g., an Etruscan vase? Why, if any lover of this splendour, even Mr. Disraeli himself, not a Lothair, who knows not one thing from another, were to go into the most splendid of modern drawing-rooms, and see the frightful tradesman's bill which would represent its immense value,—say ten, or twenty, or thirty thousand pounds' worth,—and were to discover, up in some obscure corner of it, but a mere broken fragment of Greek, or even Roman art, it is absolutely certain that neither the art-lover nor the author of "Lothair" would think of pausing for a moment, or looking twice at anything else in the whole suite of apartments! Or, to venture on one more and not the least absorbing thought, suppose Mr. Disraeli had but only suggested that if it be desirable by human art and ingenuity and perverseness, to disguise and disguise human nature thoroughly and effectually, it is but necessary to be dressed up in the newest and most "improved" of modern tailoring and millinery: the more fashionable and costly it is, the more certainly and surely and completely is the fact performed!

THE STRENGTH OF IRON.

INSTITUTION OF CIVIL ENGINEERS.

At the meeting on May 3rd, Mr. C. B. Vignoles, President, in the chair, the paper read was "On the Strength of Iron and Steel, and on the Design of Parts of Structures which consist of those Materials," by Mr. George Berkley.

The author stated that the strength of wrought iron varied with the quantities of work involved in the production of the form of the material tested. This was proved by the fact that a bar of iron 1 in. square, which would break with a strain of 26 tons, would, if drawn down to the form of wire $\frac{1}{16}$ of an inch in diameter, bear a strain of 40 tons per square inch. The strength to be relied on in practice would probably be best represented by the minimum strain that 1 square inch would bear without rupture, and by the amount of stretch which would take place in a given length before it broke. Iron could be obtained, at the current market rates, which would bear the following strains:—For plates, an average breaking strain of 20 tons per square inch, and a minimum breaking strain of 19 tons per square inch, and an average stretch of 1 in. in 12 in. lineal. For L and T irons an average breaking strain of 22 tons per square inch, and

a minimum breaking strain of 21 tons per square inch, and an average stretch of 1½ in. in 12 in. lineal. For rivet iron an average breaking strain of 18 tons per circular inch. For bars intended for chains, couplings, &c., an average breaking strain of 22 tons per square inch, and an average stretch of 1½ in. in 12 in. lineal. For ordinary classes of work, let at competitive prices, stronger iron could only be obtained with difficulty.

In the consideration of the practical limit of strain to which 1 square inch of wrought iron could with safety be subjected, and the principle on which such a limitation rested, the erroneous impression, as to the degree of strain being 10 tons or 12 tons per square inch which first produced "permanent set," was pointed out; as well as the apparent discrepancy between the results of ordinary observation and of minutely manipulated experiments, such as those of Sir William Fairbairn and Mr. E. Clark, wherein permanent set had been observed after 3 tons per square inch had been imposed on the iron, and was explained by the difficulty of registering such small amounts of set as 1/1000 part of an inch in 5 ft., which resulted from a strain of 10 tons per square inch.

Attention was drawn to the fact that upon the application to 1 square inch of wrought iron of strains exceeding about 12 tons, the measure of stretch per unit of strain, which had previously increased in a certain proportion to the units of strain applied, increased with a greater and progressive rapidity. It was also noted that the amount of stretch actually produced by the imposition of a strain of about 12 tons per square inch, would be sufficient frequently to preclude the use of wrought-iron so strained.

In illustration of the effect of the repetition of strains on iron and steel, it was stated that with blows powerful enough to bend bars of cast-iron through one-half of their ultimate deflection (that was to say, the deflection which corresponded to their fracture by dead pressure) no bar was able to stand 4,000 of such blows in succession. And also that when the bar was thrown into a violent tremor, then "when the depressions were equal to one-half of the ultimate deflection, the bars were broken by less than 900 depressions." A piece of rail weighing 68 lb. per yard, made of Bessemer metal, which, when placed on firm bearings 3 ft. apart, bore one blow from a weight of 1 ton falling through 30 ft. without breaking, though bending about 7 in., broke with a weight of 33 cwt., falling 15,400 times through heights increasing from 1 ft. to 10 ft. by increments of 6 in. each time. With wrought iron, it appeared from an experiment of Wm. Fairbairn that when it was desired to repeat the application of strains from two to three million times it would not be prudent that such strains should exceed 7 tons per square inch of section.

It appeared from these considerations that the practical strength of wrought iron in structures of a permanent character could not be estimated at more than 12 tons per square inch, when such an amount of strain was repeated more than a small number of times; and that it should not be calculated as exceeding 7 tons per square inch when strains of this amount would be applied to it many times daily. In some of the principal suspension-road bridges it was said that a maximum of about 9 tons per square inch of section in tension was imposed on extraordinary occasions, while railway bridges were frequently subjected to the maximum calculated strain, a limit of 5 tons being in this country generally adopted. From this practice it was assumed that a margin, for errors of design and for other practical defects, of only 25 per cent. was allowed in permanent structures. The importance of sound principles of design was, therefore, manifest. The parts most difficult to design were the connexions of portions of the structure with riveted joints.

The author next directed attention to the unsatisfactory state of the knowledge of the profession respecting the power of struts of various proportions and forms to resist compression, and stated his belief that the formulae which had been proposed to facilitate calculations for determining the strain which such columns would bear, produced results which agreed neither one with another, nor with any series of such experiments as had been tried. It seemed probable that, for the present, error might be best avoided by referring to the results of experiments that had been made upon columns, &c., the conditions of which were analogous to the case under consideration.

ARCHITECTS' DRAWINGS: THE LIVERPOOL ARCHITECTURAL SOCIETY.

A SPECIAL meeting of the professional members of the Liverpool Architectural Society was convened at the office of the president (Mr. H. H. Vale), on Tuesday last, to consider "what further steps (if any), should be taken by the society, in order to strengthen the position of the profession with regard to the question of the right of property in architectural working drawings, and render assistance to Mr. E. M. Barry in resisting the demands which have been made upon him by the First Commissioner of Works." A good many written statements and opinions, from various members of the profession, as to the custom with regard to possession of drawings, were laid before the meeting; all the writers concurring in the view that after the completion of a building, the drawings reverted to the architect as his property, and stating that they had never given up any drawings under such circumstances, except as a matter of courtesy in special cases; though as to the ownership of drawings of buildings not carried out, opinions were not so unanimous, one or two members being of opinion that the question was in this case a doubtful one. We have space for only one or two quotations, which bear strongly on the general principle of the matter. Mr. Kipin, in enforcing the rule that the client pays for the building, not for the drawings, observed that,—

"When a picture is ordered, the purchaser, when he receives it, never thinks of claiming the preliminary sketches which are necessary for the production of any great work of art; so an architect's client should be satisfied with the possession of the finished building, without demanding the preliminary drawings necessary to produce it."

Mr. H. P. Horner was of opinion that,—

"The production of the building is the end and result desired, towards which the architect's drawings are his intellectual tools, just as the models and casts made by a sculptor, or the sketches of a painter, are theirs towards the production of works in their respective arts; and to the possession of such implements of these arts I have never heard of any pretence of a claim by patrons or clients."

Mr. T. D. Barry observed that,—

"It was extremely common for architects, during the progress of an extensive building, to make detail drawings on *boards* provided by the contractor; surely in such a case the client could not lay claim to the boards so supplied!"

The chairman also was of opinion that,—

"If the drawings and specifications are to be claimed as a right by the client, either before or after the architect's final certificate has been given, the position both of the architect and builder will be much prejudiced, for should every little matter in the building works not agree to the letter with the plans and specifications, an unscrupulous client might use these as levers for his own advantage against both the architect and the builder; for we will allow that in practice many in dictations not shown either on the plans or in the specifications have to be made during the progress of the works, and not infrequently at the suggestion of the client, and solely for his benefit."

Another leading member was of opinion that,—

"The idea of a client claiming the drawings and specifications is too absurd to discuss, and may with equal propriety claim the scissors from his barber after his hair has been cut."

In illustration of the possible consequence of the client having possession of the working drawings, it was mentioned by another member of the society that a gentleman who had bought a house recently completed from his designs, had endeavoured to obtain the drawings of it from the contractor, with the avowed object of building another house like it in another part of the country. Other statements, from Mr. G. Williams, Mr. Hornblower, Mr. Boulton, Mr. Mercer, Messrs. Atkinson (of York), and others, were to the same general effect; Mr. C. H. Beloe and Mr. Deacon also expressed similar views as to the practice in the profession of civil engineering: one member only among those present, Mr. Farlow, dissenting from the general opinion.

With regard to the possibility of offering further assistance to Mr. Barry, it was mentioned that the Manchester Society of Architects had offered to join in any general subscription to assist him in the legal expenses he might be put to in contending the matter, and in pursuance of the same idea the following resolution, proposed by Mr. H. P. Horner, and seconded by Mr. T. D. Barry, was adopted by the members present:—

"That, having already pledged ourselves, as members of this Society, to give our best moral support to Mr. Barry in resisting the claims of the First Commissioner of Works, we further pledge ourselves, in the event of material aid being required in carrying on the contest, to afford the best assistance in our power, and to influence the members of the profession within our knowledge towards the same end."

THE LATE MR. HANDYSIDE RITCHIE, SCULPTOR.

THIS able Scottish sculptor has recently died. He was born in Musselburgh, near Edinburgh, in the year 1804; and, from his earliest youth, perseverance and enthusiasm—the sure tokens of genius—were marked features in his character. He became a modeller in his childhood. His father was an ornamental plasterer. Mr. Leonard Horner aided him in his youth. He went to Rome, and through the influence of the Duke of Hamilton and Earl of Minto he was received into the studio of Thorwaldsen. He produced many well-known works in sculpture, among which was one of Kemp, the architect of the Scott Monument, who was an intimate friend of his. For many years he was an exhibitor with the Scottish Academy, of which body he was elected an Associate in 1846. In 1847 Mr. Ritchie was commissioned to execute for the Houses of Parliament statues of Eustace de Vesci and William de Mowbray; and he executed his commission to the utmost satisfaction of the Commissioners. He long devoted himself principally to architectural sculpture, which, from its size and nature, is not adapted for an exhibition-room. Every one who knows Edinburgh must have observed the admirable works of this kind at the British Linen Company's Bank, St. Andrew-square; in the pediment of the Commercial Bank; and on many other commercial buildings. One, however, is deserving more than a passing notice—the very fine monumental group of the Rev. Dr. David Dickson comforting the widow and orphans at the West Church. He sculptured the four colossal heads representing the Seasons at the Duke of Hamilton's Mausoleum at Hamilton Palace.

RESTORATION OF THE SOUTH AISLE OF ST. NICHOLAS' CHURCH, GREAT YARMOUTH.

WITHIN the past twenty-two years the parish church of St. Nicholas, Great Yarmouth, has undergone various restorations. There are few, if any, of its class which surpass it in point of size, it being 230 ft. long by 108 ft. broad, exclusive of the projecting portions of the transepts. The extreme width is 154 ft. It has been computed to have an internal superficial area of upwards of 23,000 ft., whereas the average of London churches is but 8,000 ft., and they contain only 1,000 persons on the floor instead of from 4,000 to 5,000, which is the amount of accommodation afforded within the walls of this structure. Those parish churches which have the greatest pretensions to compete with it in scale are St. Michael's, Coventry, 22,080 ft.; St. Botolph's, Boston, 22,270 ft.; St. Botolph's, Newcastle-on-Tyne, 20,110 ft.; Holy Trinity, Hull, 20,036 ft.; and Holy Trinity, Southwark, 18,200 ft.

The aisle recently rebuilt is that which was erected in the thirteenth century to supersede the narrow one of the Early Transitional Church of which the present nave was a part. It is of the colossal width of about 40 ft. internally, and is lighted by a triplet in the west end and seven windows on the south side, of the latter of which the internal jambs and arches were the only original portions which remained; these had on the outside been filled with Perpendicular mullions and tracery of a poor type. Mr. Seddon, the architect employed, has restored the early portions and swept the rest away, having superseded them by three light windows of an Early Geometrical character in harmony with the rest of the structure. The alternate windows vary in detail, and form a feature from the principal approach from the town. Between each pair of windows a buttress, finished with a gabled canopy, rises to the level of the parapet. The great western triplet, of which sufficient traces were left to enable the architect to effect a strict restoration of the original, except that the tracery of the window openings, if any, had been obliterated, have been treated in the same character as the side windows, with which they now harmonise. An entirely new roof has been placed on the aisle. The material is of Memel, but the ceiling below, of an arched form, is of oak. This is divided into panels by moulded ribs, with the old heraldic bosses of the former one replaced at the intersections. These ribs and bosses and the wooden cornice above that of stone have been decorated with colour.

The roof is covered with lead, and its ridge with an ornamental cresting, and the gables

coped with stone with carved crosses at each end of the aisle. Some fragments of polychromatic decoration were discovered on the interior of the walls, and as the new plaster would at present have destroyed any reproduction of them, they have been copied on paper and temporarily fixed to show the effect which it is hoped may ultimately be reproduced in a more permanent manner.

One of the windows has been filled with stained glass in memory of the late town-clerk of Yarmouth, Mr. Charles Cory. There are three subjects, one in each light, representing the greater prophets, Jeremiah, Ezekiel, and Daniel. Over each figure an angel bears a scroll. Another window has also been partially filled with stained glass at the expense of the Sunday-school teachers. The subject is a representation of Moses, with the Ten Commandments. The figures are by Mr. Rossiter, the artist; and the glass has been executed by Messrs. Saunders.

Externally the church has received great additional height and consequent dignity, having been dug out of a hole, the earth to the depth of many feet, which had in the lapse of ages accumulated around and about the base course, having been excavated and removed, a space falling from instead of to the walls as heretofore, having been paved with pebbles in ornamental patterns to a surface drain carried entirely round the restored portion of the church. The levels of the approaches to the church have been rearranged accordingly, and an improvement has been thereby effected, but which needs hereafter to be carried out further when the rest of the restoration is proceeded with. The porch now calls for improvement.

THE CONSTRUCTION OF NEW GAS AND WATER WORKS IN YORKSHIRE.

The present season seems to have been chosen for the construction and extension of new gas and water works to a greater extent than has been the case for some time, and hence builders and others interested in the construction of such works will not object to learn that in the West Riding of Yorkshire, at least, a good deal of work will be found in this branch of the trade. Most of the improvements and extensions which are about to be made are connected either with the opening out or the further development of works in places which are rapidly rising, and which will in a few years rank amongst the most important of Yorkshire towns.

The borough of Barnsley have scarcely completed a very fine plant at Ingbirchworth, near to the Yorkshire Moors, at a considerable cost; and the town council have just accepted tenders for the construction of two service reservoirs, a cottage, and other works at Champney Hill, about three miles from the borough. The works, which have been constructed under the superintendence of Mr. Hawksley, may be said to be equal to any in Yorkshire.

The town of Keighley, which at present is aspiring to Parliamentary honours, is just now taking active steps to secure for the inhabitants a reliable supply of pure water. During the past week tenders were opened for the construction of a service reservoir in the county of Lancaster, and a compensating reservoir near to that town, together with the necessary works connected therewith. The engineers intrusted with the superintendence of the work are Messrs. McLean & Stollman, of Westminster.

The rapidly-rising town of Castleford will shortly possess its own waterworks. The water is to be obtained from a pumping shaft in Wheldale-lane, and a reservoir is in course of construction at Red-hill.

At Oley, a thriving town near Leeds, new waterworks are in course of construction at the present time.

The inhabitants of Normanton are also busy discussing the best mode of obtaining good and cheap water.

It will thus be seen that undertakings of no small character, involving the outlay of considerable sums, are about to be commenced, so that a good deal of work may be looked forward to from this source.

The extension and construction of new gasworks in Yorkshire seem to be larger and even more extensive than are the contracts for waterworks at the present time.

The Barnsley Gas Company are laying out a new plant at Old Mill, a suburb about half a mile from the borough, so as to enable them to supply the more elevated parts of the town and

district. The works are of an extensive character, and include sheds, retort-houses, and all the necessary building for carrying on a very large business. The buildings, which are of a neat and ornamental character, are being erected by Mr. W. Robinson, of Barnsley, builder, under the superintendence of Messrs. T. & C. Hawksley, civil engineers.

At Wombwell, near Barnsley, a new company has been formed, on the limited liability principle, for the purpose of supplying the district with gas. The necessary works are in the course of construction, and it is expected that gas will be supplied to the inhabitants by the end of August.

New works are in the course of construction at Normanton, and preparations are being made to erect eight retorts, benches, or ovens, and thirty clay retorts.

The Bingley gasworks are also about to be extended, and the company now find it necessary to lay over 4,000 yards of new mains.

At Gomersal, another prosperous West Riding town, the works are to be enlarged. A new gas-holder is about to be erected on a piece of land adjoining the present plant, so as to meet the requirements of the district.

The Shipley Gas Company, near Leeds, are also about to make alterations and extensions. The company propose to erect a new retort-house, engine-house, meter-house, and make other extensions of their works, which have been rendered necessary by the increasing population and the development of trade generally.

THE MANUFACTURE OF PORTLAND CEMENT.

INSTITUTION OF CIVIL ENGINEERS.

On Saturday last, the 21st of May, a party of nearly fifty of the students of the Institution of Civil Engineers, under the guidance of Mr. Brunless, member of Council, visited, by special invitation, the cement works of Messrs. John Bazley White & Brothers, at Swanscombe, Kent, for the purpose of receiving an explanation as to the process of the manufacture of Portland Cement. The invitation was given by Mr. G. F. White, now one of the oldest associates, who was present at one of the weekly meetings of the students, when a paper was read by Mr. Preston, Stnd. Inst. C. E., on the subject of the manufacture of cement. All the members of the firm were present to conduct the visitors over the manufactory, which stands on the banks of the Thames, and covers an area of fifty acres. The mixing of the chalk and the clay, in the proportion of three parts of the former to one part of the latter, takes place in a series of double circular mills, about 12 ft. in diameter, and 3 ft. deep, touching one another, and each furnished with revolving harrows, to secure the perfect reduction of the particles. The chalk is delivered in lumps into one of these mills, which is kept constantly supplied with water, and the liquid passes thence to the other mill, where it receives the clay. After remaining long enough under the harrows the mixture is pumped up to a height of some feet, whence it flows by gravitation through wooden spouts into large reservoirs called "backs," where it lies till drainage and evaporation have disposed of the greater part of the water. While the liquid cement is in the "backs," samples of it are constantly taken and burnt in a sample kiln, so that any defect in the proportions is at once detected and remedied. The residue is then transported, first to drying stoves, and afterwards in due time to the kilns, where it is to be burnt. These are constructed on the endless principle, and are bell-shaped. They are about 30 ft. high, and are fed near the top with alternate layers of cement and gas-coke. As combustion goes on, the clinker is drawn periodically from the bottom of the kiln; and, after the rejection of any that is insufficiently burnt, it passes to the mills for grinding. Special care is taken to do this thoroughly, as the strength of cement is found to be greatly enhanced by fineness of grinding. A visit was paid to the testing-room, where samples of the manufactured cement are made hourly through the day. Some of these were selected by Mr. Brunless, and the strain required for breaking them ascertained by the machine. The Messrs. White explained that the heavier cements, produced by excessive burning, were slow in setting, although ultimately acquiring a higher tensile strength than the lighter cement; but they expressed their opinion that

the quality of cement that would insure undoubted stability, without increasing its cost by the diminution in volume that is inseparable from a very high specific gravity, was the best suited for general purposes of construction. When the inspection was concluded, the students were entertained at lunch by Messrs. White, who explained that they would be ready, on all occasions, to contribute in every way to the furtherance of the technical education of the younger members of the profession.

ST. JOHN'S, WICK, NORTH BRITAIN.

On the 13th inst. this church was opened and consecrated by Bishop Eden, the Primus of the Scottish Episcopal Church.

The edifice, which is Early Decorated in style, is built from the design of Mr. Alexander Ross, architect, Inverness, and consists of north porch, nave, chancel, vestry, and organ-chamber, the west gable of nave being surmounted by a lofty stone belfry. The walls externally are of blue Caithness stone in courses; the dressings, of white Coswade freestone.

Entering the porch, through a moulded archway, resting on carved impostes, we pass into the nave, which consists of four bays, lighted by a three-light traceried window at west end, and by lancets along the sides. The chancel is raised three steps above the nave. The chancel arch is of stone, well moulded, and with carved impostes. The chancel is lighted by a three-light east window, and by a cinquefoil window on the north side. The roofs are of varnished pine, the principal couples resting on moulded arch ribs springing from stone corbels in the walls. The benches, choir-stalls, and pulpit are all of red pine, varnished; the lectern of iron and brass.

The font, which stands at the west end of nave, is of Caen stone, with carved bowl and capital, resting on a shaft of polished red granite.

The windows are meantime filled with plain cathedral quarry glass. The church is seated for about 150.

An interesting fact connected with this church is, that it is the first Episcopal church built and consecrated in Caithness for the last 200 years, and the organ is the first introduced into the district.

THE WORKS OF WREN AND RESTORATION.

SIR.—As an ardent lover of architecture, and one who has a firm faith in the reputation of the great architects, established as the masters of their art by the consent of centuries, may I beg space for a few observations upon the late meeting of the Institute of Architects, reported in your Number of the 21st inst.?

I do not pretend to assert my own taste, but I believe in Sir Christopher Wren. With this view, ever since I have held a seat in Parliament, I have lost no opportunity of endeavouring to preserve his works from the hands of the destroyer. In 1860 I inserted a well-known clause in the "Union of Benefices Act." In 1865 I did my utmost, unhappily without result, to induce the Government of the day to purchase the Gateway of the "College of Physicians," ruthlessly pulled down, to widen Warwick-lane; and in 1868, with the assistance of the City authorities and the then First Commissioner of Works, I succeeded, notwithstanding the strenuous opposition of the present First Commissioner (Mr. Ayrton), in saving the tower of St. Mary Somerset, then under sentence of removal.

But utilitarian destructives, without the pale of art, are not the only enemies the works of Sir Christopher have to fear. There are other foes, within that pale, more dangerous in their action, and more deadly in their aim. I allude, in plain terms, to the modern church restorers, and their proceedings during the last few years. Not long ago, an eminent modern "Goth" actually prepared a plan, happily defeated, to take down the fine church of St. Dionis Baskchurch, in order to substitute in its place an eccentric extravagance of his own composition. Then followed the lamentable so-called restorations of St. Michael's, Cornhill, and St. Mary's, Aldermanbury. St. James's, Garlickhithe, fortunately escaped with a few ugly scratches, and the addition of an ugly font; but St. Swin's, Cannon-street, stands in full view of the crowds who daily frequent the great railway station, as a striking example of the incapacity of a builder to whom detail and proportion are equally unknown. I should have hoped that this last

sacrifice might have appeased the mania of the "Goths" for some time to come, but now we are threatened with a crusade to "repair and beautify" the City churches, and to deform and deface them to suit the crotchets of Mediæval revivalists. With these facts before him, Professor Donaldson might well express his astonishment at the period at which we are arrived, and point to the consternation which any proposal to improve the architecture of Wren would have created in the profession fifty years ago! I concur with the eminent and learned professor "that we have now reached an irreligious epoch as to architecture." And why is the epoch thus irreligious? Simply because our dabblers in art, misled by the follies of Pugin-ism, Ruskin-ism, and Pre-Raphaelite-ism, and other theories of artistic charlatans, have never acquired any true principles; and, with the irreverence of ignorance, venture to sneer at works of the highest merit, which this age, at least, will never reproduce.

Until modern church-builders come to their senses and learn a little humility, as well as other necessary things, I think we had better let Wren alone; for my own part, I prefer to see his unrivalled interiors in their dingy and dirty condition rather than arrayed in the gaudy vulgarity of St. James's Hall, the Albemarle Palace, and the New Foreign Office.

House of Commons.

G. C. BENTINCK.

A PLACE OPEN TO MERIT.

WE understand that there is a vacancy in her Majesty's Office of Works for an assistant surveyor. The salary is 500*l.* per annum, increasing to 700*l.* The First Commissioner, we learn, has determined to receive applications from duly qualified persons, and to deal with them on their merits, without reference to patronage.

THE BELFAST EXHIBITION.

THE Belfast and North of Ireland Workmen's Exhibition, in the Ulster Hall, has been opened by the mayor, in presence of other official personages, and the public generally.

The Exhibition occupies the Major and Minor Halls, and a considerable space of ground at the northern side, which has been prepared for the purpose. This superadded space is allotted to machinery, the Minor Hall to an ample fine-art collection, and the Major Hall to general products. It is not exclusively a Workmen's Exhibition, in the sense of being confined to a display of articles produced immediately and directly by workmen. A considerable demand upon the space was made by manufacturers and others who are also large employers. Still the display made by working men is sufficient to justify the name of the Exhibition, and to afford much promise for the future. As a typical assortment of the manifold industries of the province, it is equal to what had been anticipated by friends of the movement. The hall is gay with flags and banners, and brilliant cases of goods of every description. The centre is occupied by a trophy, composed of various kinds of linen, which, commencing on the floor, stops short just inside the lofty ceiling. Separate spinning-wheels, made by Mr. McCreery, are displayed, and many people, says our authority, the local *Newsletter*, seem to wonder what they are. On every hand there are assortments of fabrics illustrating the industry which has made this province what it is. There are also cases of architectural embellishments and building materials, among which is placed a bust—"The Sea King," by Mr. Dowell, lent by Lord Dufferin; furniture and upholstery; with a long array of etceteras.

The Lord Lieutenant was present at a *conversazione* in the evening of the day of opening.

THE SANITARY TEACHINGS OF HISTORY.*

THE health history of England, up to the close of the eighteenth century, may be distributed, Dr. Guy, the well-known sanitary investigator, thinks, into three periods, as follows:—

1. From the earliest time to the middle of the fourteenth century, the epoch of the Black Death.

* Public Health: a Popular Introduction to Sanitary Science; being a History of the Prevalent and Fatal Diseases of the English Population, from the earliest Times to the End of the Eighteenth Century. By William A. Guy, M.B., F.R.S., &c., Professor of Forensic Medicine and Hygiene in King's College, London. II. Renshaw, Strand, 1870.

2. From the middle of the fourteenth century to the year 1666, the date of the Fire of London.

3. From the year 1666 to the end of the eighteenth century.

The first period is marked by scanty records of frequently-recurring epidemics; the second, by the occurrence of the Black Death, Sweating Sickness, and Plague, concerning which we possess fuller details; and the third, by the great discoveries and reforms in connexion with the well-known names of Baker, Cook, Howard, and Jenner.

Of the London Plague we have before occasionally written, as have many others. We shall, therefore, now glean a few particulars as to its dread predecessor, the Black Death, from Dr. Guy's very interesting lectures in King's College, under his new professorship of Hygiene.

The Black Death, though usually treated as an aggravated outbreak of the Oriental plague, which is, by very general consent, traced to Egypt as its birthplace, has had assigned to it an origin more remote. Hecker fancies he finds the source of it in China in 1333, fifteen years before it showed itself in Europe; and Anglada, in his "Etude sur les Maladies étiénies," traces it by three distinct routes from Black Cathay,—the northern route by Bokhara and Tartary, the Black Sea and Constantinople, having brought it by the Bosphorus into the Mediterranean, and so into Europe. In the interval between 1333 and 1347 China was visited with drought, famines, torrents of rain, floods, earthquakes, swarms of locusts, and pestilence; and at length, in 1348, Europe began to suffer by the same visitations. The island of Cyprus was converted into a desert by a frightful earthquake, hurricane, and inundation, following the outbreak of the plague; and there was observed, what was noticed in many countries and cities afterwards, a peculiarly offensive state of the air, sometimes spoken of as a stinking mist, possibly due to the dead locusts which had "never perhaps darkened the sun in thicker swarms," and by countless unburied bodies of men and beasts. On the 25th of January of this same year, 1348, an unexampled earthquake, lasting several days, visited Greece, Italy, and the neighbouring countries, shaking down or swallowing up whole villages, and inflicting severe injury on every large city. Others occurred, from time to time, in all parts of the continent of Europe, and in England, up to the year 1360.

The Black Death reached England in August, 1348, appearing first in the county of Dorset, thence spreading through Devon and Somerset, to Bristol, Gloucester, Oxford, and London; in fact, through the whole country. It took three months to reach London. Few places are believed to have escaped, and only a tenth part of the inhabitants were thought to have remained alive. There is no room to doubt that the symptoms of this Black Death were those described as belonging to the Oriental plague. All the accounts that have come down to us, from the imperial author, Kantakuzenos, who saw the disease in Constantinople; from Boccaccio, who witnessed it at Florence; from the scholar, Raymond Châin de Vinaro; and from the "brave" Guy de Chailliac, who practised at Avignon, all the accounts conspire to justify Hecker's statement, that "It was an Oriental plague, marked by inflammatory boils and tumours of the glands, such as break out in no other febrile disease;" to which must be added, that it often proved fatal on the second and third day, in the midst of profuse discharges of offensive-smelling blood from the lungs, such discharges as we now know to attend and characterise gangrene of those organs. Guy de Chailliac, than whom we can have no better authority, divides the whole epidemic of seven months into two stages of two and five months respectively, of which the first was characterised by the bloody discharges from the lungs, the second by the characteristic plague-tumours.

The mortality due to this disease cannot be exactly ascertained, from want of censuses and registers of death; but doubtless it was on a grand scale. We infer this partly from numerical statements and partly from more general accounts. Let us take them by cities, communities, and nations.

Aleppo lost 500 a day; Gaza, 22,000 in all; and Cairo, 15,000. Genoa lost 40,000; Parma, the same number; Naples, 60,000; Siena, 70,000; Rome an incalculable number. Venice, out of a population of 200,000, lost 70,000; saw ninety patrician families extinguished, and its grand council of 1,250 reduced to 380. In Florence, 100,000 perished between the months of March

and July. In Spain, Valencia lost 300 a day, and many districts of Barcelona were depopulated. In Germany, at Vienna, the deaths were 1,800 in one day, and 40,000 in all. At Erfurt, 12,000 were interred in one cemetery. In France, at Avignon, 1,800 died in the first three days, 150,000 in the city and its environs, and at the very first, sixty-six monks in a Carmelite monastery; there, too, died Petrarch's Laura. Montpellier was very nearly depopulated, ten out of twelve consuls died, not a monk survived, and few medical men. Marzeilles lost in one month 58,000, and the bishop and his chapter all died. Narbonne suffered a loss of 30,000, from which it never recovered. Paris lost 50,000, and St. Denis, 16,000; and for many days together the Hôtel Dieu sent 500 corpses to the Cemetery of the Innocents. We lost here in London 100,000, out of a population very small by comparison to what it is now.

Passing from cities to nations, we find the mortality in China, whence the plague is supposed to have sprung, set down at *thirteen millions*; in Germany, it was 1,244,434. Europe is supposed to have lost an aggregate of forty millions, and Asia and Africa (exclusive of China) twenty-four millions.

Here, as throughout Europe, the pestilence had antecedents worth noting. The times were very barbarous. Kings were in constant conflict with powerful subjects or engaged in external wars; cities were fortresses; the roads were beset with marauders; the husbandman was a serf; human life was of little account; witches and heretics were burned alive, and the Jews subject to cruel tortures; "wild passions, severity, and cruelty, everywhere predominated," and what is more to our present purpose, the cities were "with few exceptions, narrowly built, kept in a filthy state, and surrounded with stagnant ditches." These conditions, even in those early times, were recognised as favourable to the spread of pestilence, as were personal uncleanness and intemperate habits.

The cities in those days were so built as to be eminently favourable to that overcrowding now so universally recognised as a most efficient cause of disease. Armies, also, which are crowds in the worst form, were in constant accumulation.

The accounts of the disease in England are in harmony with those which have come to us from Italy and other parts of the Continent. We read of the same atmospheric disturbances, with the addition that its advent was preceded by great floods. "It rained from Christmas to Midsummer, without one fair day;" and when it left us, "there followed a great dearth of cattle; after that a dearth and scarcity of corn." We read of 5,000 cattle dying in one pasture, of beasts and sheep going wild through fields and "corns," and dying in holes, furrows, and ditches, in innumerable multitudes over the whole kingdom, from want of keepers; of the scarcity and insolence of servants, and consequently, the next harvest, of corn rotting in the fields from want of hands.

In England, as elsewhere, the Jews were accused of poisoning the springs, and this accusation Short traces to the fact that the water was pestilential even to the fishes. Of this widespread belief in the poisoning of wells and springs of water, not in the time of the Black Death only, but during all great epidemics, as Dr. Guy observes, recent discoveries have rendered it highly probable that the people were not always mistaken as to the fact of the poisoning, but only as to its nature and the persons who caused it. In those remote times the state of the places in which men lived, and their habits of life, rendered the pollution of drinking waters by human excreta inevitable, and so secured the rapid spread of any contagious disease that happened to prevail.

The dwellings and personal habits of the English people in town and country were such as to encourage to the utmost the pestilence we bred or imported. Judging from the descriptions of foreigners, we were characterised by bad housing and gross feeding.

The people lived probably somewhat after this fashion:—Their houses, and most of their buildings of every kind, were of timber, the houses "slightly set up with a few posts and many radeles" "oast all over with thick clay to keep out the wind," with sundry rooms above and beneath, "covered with straw, sedge, or reed, and rarely with tiles or slate," and with floors of mud. In the country parts, houses, stables, and offices were under one roof. The fires were lighted against a *vere-dos*, and the

smoke escaped as best it could, without the help of chimneys; for these, though introduced in the twelfth century, were but slowly acclimated. The people lay on straw pallets or rough mats, with a log for a pillow; and the man who contrived to buy a flock bed, and a sack of chaff for his head to rest upon, "thought himself as well lodged as the lord of the town." Servants were lucky if they had a sheet above them: they had none beneath. The sheep's skin was in common use as clothing. The poor, wanting water, built at the river's edge. The Spaniards, in Queen Mary's day, wondered "when they saw what large diet was used in many of these so homely cottages," and one of no small reputation among them is credited with the not very complimentary remark, that "The English have their houses made of sticks and dirt, but they fare commonly so well as the king." The poor are believed to have lived well, in good years, on barley or eaten bread, beer, and pork; but to have been subject to famines frequent and terrible. There was an abundant supply of fish both from sea and river. Peasants tell us, that "the vineyards the Romans had planted arrived Saxons and Danes;" that "Gloucestershire was famous for grapes, and Smithfield was once ruddy with them. But gardens were of slow growth, and comparatively few fruits and vegetables had been naturalised." It is likely, therefore, that many of the people living of necessity, or through ignorance, on a diet from which the vegetable element was excluded, suffered the more severely in times of pestilence. And thus it happened, that "poisoned by marsh exhalations, wasted by ague and skin diseases, huddled together in cabins, smoke-dried, gross eaters, and uncleanly livers," the peasants suffered terribly during every epidemic visitation. Within our walled and fortified towns, the state of things was not likely to be much better. Thus a passage in Stow's Chronicles states, that even capital cities were untravelling till towards the end of the twelfth century.

"This year, 1248," he says, "the city of Lubeck was destroyed and consumed by fire," "and from that time it was ordered that they should not cover their houses any more with thatch or straw, but with tiles or such like," the very same common danger caused London to till all its houses shortly after, especially such as stood close together in a high street. "Neither were there then but few streets in London paved, nor in two hundred years after this, except Thames-street, and from Ludgate to Charing Cross, neither was the great city of Paris paved until the year 1367."

London, therefore, in the middle of the fourteenth century, was almost wholly unpaved. In the middle of the twelfth century, if we may credit the monk, William Fitzstephen, who died in 1191, London consisted of two long, narrow tracts of land, separated by the Thames, which then abounded in fish. It was surrounded with high walls, strengthened with towers and double gates, with a "tower palatine" on the east, and two castles on the west, and the king's palace in the same quarter on the river, with its walls and bulwarks, separated by two miles from the city. The suburbs were studded with the houses of the citizens, with their gardens and orchards.

Between the epoch of the Black Death and that of our next great pestilence, the Sweating Sickness,—in other words, from 1347 to 1485, a period of nearly 140 years,—England suffered something like a score of epidemics, with their accompaniments of famine and cattle-plague. Among these Dr. Guy notes one of influenza, one of small-pox, one of puerperal fever, two of bloody flux, and two of epidemic madness.

The Black Death, or great mortality of the fourteenth century, was undoubtedly the same disease as the Plague of subsequent times, differing only in degree, not in kind.

The sanitary teachings of the remote past, Dr. Guy thinks, are that whatever may be the case in warmer climates, it is true in these colder and temperate ones, that the nearer men are to nature, the farther they are from health. In those days when the chief occupation of men was the care of cattle and the culture of a few fruits, and when manufacturing industry was limited to the production of coarse clothing, flax and combustible habitations, and implements for warfare and the chase, they were the prey of frequent famines and pestilences, and subject to a rate of mortality, of which, in these days, we have happily no experience. How much the contests of rival chiefs, the insecurity of life and property, the condition of serfdom, the absence of roads, the huge un reclaimed tracts of forest and marsh, must have weakened production and strengthened disease, it is not difficult to imagine.

Passing on to the time when men began to collect in cities, and to fortify themselves by walls and moats against lawless violence; when the culture of grain took the place, to some extent, of the care of cattle; we still find both town and country, the dwellings and the habits of the people, hostile to health, favourable to the production of disease at home and the reception of pestilence from abroad.

And even when we arrive at times that may claim to be called civilised; when we had attained to a central and stable government, had long thrown off the incubus of serfdom, had established flourishing manufactures and were carrying on an extensive commerce, had largely improved our agriculture, and taken our first lessons in horticulture, our cities and houses were so squalid and filthy that the plague found itself quite at home in them.

Then, little by little, as civilisation advanced, the twin virtues of cleanliness and temperance asserted their rights. Men bathed and washed oftener, submitted to frequent changes of linen, and admitted tea, coffee, and chocolate into competition with beer, wine, and spirits. They came by degrees to live in better houses and cleaner towns. We saw the last of the plague, and were in the right way to rid ourselves of some, at least, of our home-bred pestilences. But much remained to be accomplished, even as late as the last quarter of the eighteenth century; and into that epoch Dr. Guy fully enters.

One question, the sanitary triumphs of that epoch suggest, for the answer to which we must look forward into the times of which men now living have had experience. Does the history of the last seventy years warrant us in looking forward to fresh sanitary discoveries and triumphs,—to a healthier, and therefore happier, future? He answers this question without hesitation in the affirmative. These are the grounds of his confidence.

In the first place, he is encouraged by the fact that Jenner's singular discovery has proved no idle dream of philosophy, but a great truth, fruitful in results, and in a fair way to realise the most sanguine expectations of its author.

In the second place, he attaches a great importance to the fact, that already this century can boast one capital hygienic discovery, with which the name of Dr. Snow is so honourably connected—the discovery that cholera, to which we may confidently add typhoid fever, may pass from person to person, from house to house, from district to district, in drinking-water. He recognises, too, as very important, that other hygienic discovery due to the independent researches of Drs. Bowditch and Buchanan, that there is a decided relation of cause and effect between dampness of soil and consumption. These two truths must have a grand effect on the future of water-supply and drainage, on the cleansing of our towns, and the application of their refuse, solid and liquid, to our least fertile soils.

In the third place, it is impossible not to feel the great importance which attaches to the happy results that have followed in so many towns, on well-devised measures of drainage and water-supply.

In the fourth place, he draws many inferences highly favourable to our future progress in hygiene from the modern history of medicine.

In the fifth place, it is difficult to exaggerate the value of the mortuary returns now obtained from every part of the United Kingdom, or of the special inquiries set on foot by the medical officer of the Privy Council.

And lastly, he avers well for the future from the change slowly, but surely, coming over the public mind. It is being taught in many ways, that the policy of palliation, in which we have so long indulged, is eminently unfruitful and positively mischievous. The time is evidently approaching when the preventive philanthropy (as Dr. Guy calls it) that guided the footsteps of Howard, will fill the hearts of the people, and the policy of prevention become the one rule of action of the Legislature.

NEW CAPITOL FOR THE STATE OF NEW YORK.

STATE houses or capitols are rising in various parts of the United States, and we have already given views of more than one. The site of the building at Albany illustrated in our present number is very commanding, being about 170 ft. above the level of the Hudson, and has an area of ten acres. It is bounded on the south by

State-street, and on the north by Washington-avenue, 100 ft. in width. The land falling off rapidly to the north, south, and east, this building, with its high walls, still higher pavilions, turrets, and towers, will be seen to advantage. In the exterior composition of the design, there is a general adherence to the style of the pavilions of the New Louvre, of the Hôtel de Ville of Paris, and the Maison de Commerce recently erected in the city of Lyons. The terrace which forms the grand approach to the east or principal front will form a striking feature.

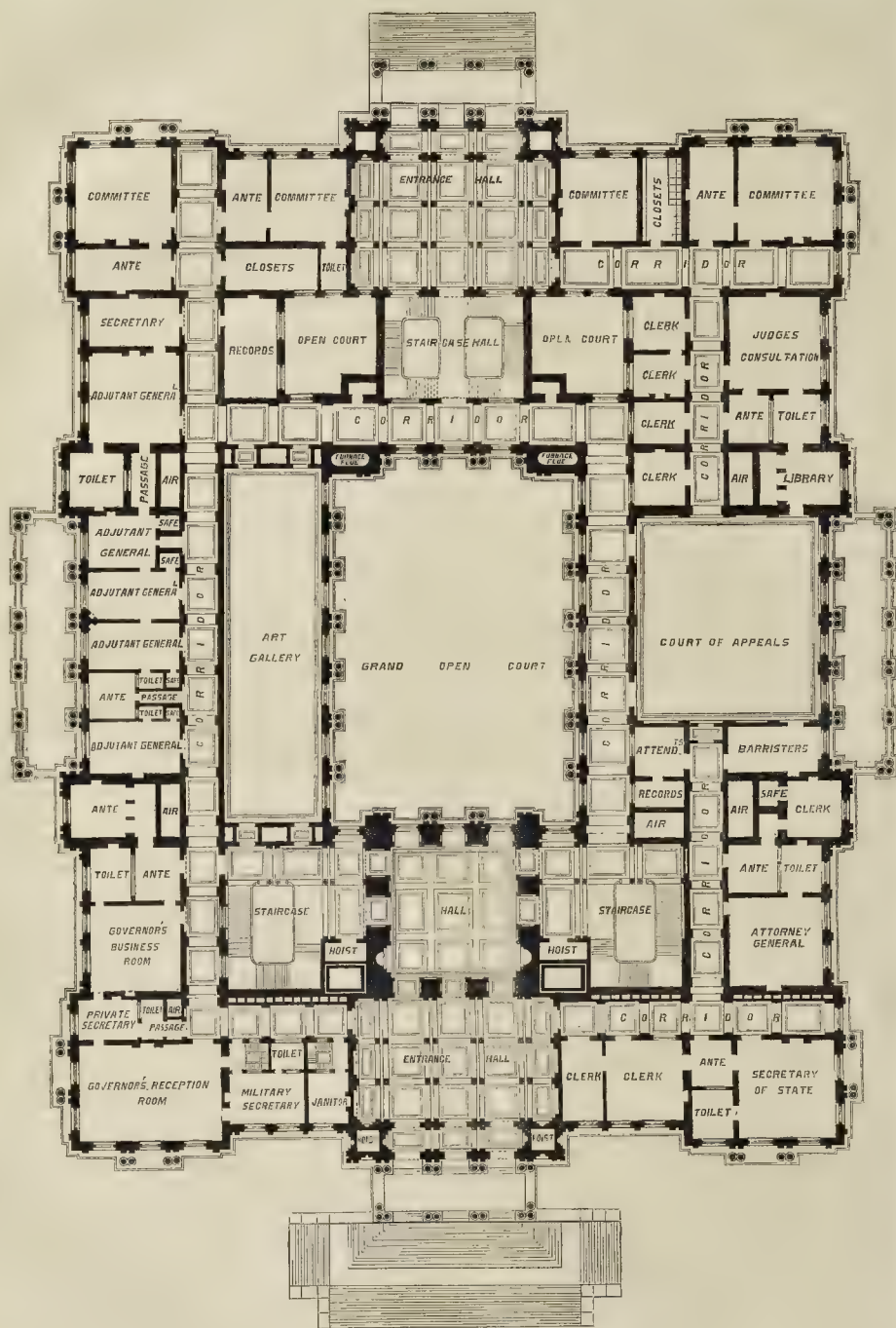
The exterior is 290 ft. long north and south, and 390 ft. east and west. The floor immediately above the level of the plateau of the terrace will be entered through the portico on Washington-avenue and State-street, and through the carriage entrance under the portico of the east front. The first or main entrance-floor will be reached by a flight of steps on the east front leading to the loggia, or hall of entrance, occupying an area of 60 ft. by 74 ft., and 25 ft. in height.

Communicating directly with this hall are two grand staircases, which form the principal means of communication with the second and most important floor. On the left of this hall are a suite of rooms for the use of the Governor and his secretaries, and military staff. On the right are rooms for the Secretary of State, Attorney-General, with corridor leading to the Court of Appeals. On the second or principal floor will be placed the Senate and Assembly chambers, and the State library, all of which (in elevation) will occupy two stories, making 48 ft. of height. Rooms for the committees and other purposes will also be placed upon this floor. The Senate Chamber will be 75 ft. by 55 ft. on the floor, with a gallery on three sides of 20 ft. in width. The Assembly Chamber will be 92 ft. by 75 ft. on the floor, surrounded by a similar gallery, which in both chambers largely increases the areas of the upper portion. The library will occupy the whole of the east front of these two stories, and will be 283 ft. long and 54 ft. wide. This will be the most attractive room in the building. Its large area and lofty proportions, its view towards the north, east, and south, overlooking the City, and bringing in the valley of the Hudson and its western slopes for miles in each direction, will make it a favourite place of resort at all seasons of the year. The main tower is 66 ft. square, and about 320 ft. in height. In the centre of the building will be an open court of 137 ft. by 92 ft. This court will be an attractive feature, being treated in the same manner as the exterior fronts, and will no doubt ultimately have its fountains and be surrounded with statuary. The entire structure will weigh 150,000 tons; but the great inequalities in the heights of the various walls, and the distribution of the enormously heavy fire-proof floors, and roofs sometimes laden with deep snows, will bring very unequal weights upon the parts of the foundation adjacent to each other, and without great care they would settle unequally and crack the walls, as is so frequently seen in modern private, and even in many public buildings. In the States the stone foundation of the walls commences on concrete, and is made of large blocks of close-cut limestone of from two to six tons weight, laid in regular courses, the first one of nearly the width of the concrete, and each successive one narrowed by offsets, until the wall is contracted to the width necessary to support the superstructure, arranged so that they will afford an equal bearing on each side of the line of the centre of gravity of the walls and the weights which they are to sustain. The work has been carried on with very rapid progress. The commissioners appointed for the erection of this building are Messrs. Hamilton, Harris, John V. L. Pruyn, O. B. Latham, James S. Thayer, Alonzo B. Cornell, William A. Rice, James Terwilliger, and John T. Hudson.

We give a plan of the ground floor, and shall give a plan of the floor above on another occasion. The architects are Messrs. Fuller & Laver, of Albany; and Mr. W. J. McAlpine is the engineer.

The buildings are being constructed by day-work, under the immediate superintendence of Mr. J. Bridgford, a well-known builder of this State.*

* We must mention that these illustrations have been some time in preparation, and that meanwhile a view of the building has appeared elsewhere. We shall in time learn to know those architects who send special invitations to half a dozen journals at the same time to illustrate a work, and say nothing of their having done so.



1 2 3 4 5 6 7 8 9 10
SCALE OF FEET

NEW STATE CAPITOL AT ALBANY, NEW YORK.
Plan of Ground Floor.



CAPITOL FOR THE STATE OF NEW YORK, U.S.—MESSRS. FULTON & LAYNE, ARCHITECTS.

SCIENCE FOR THE PEOPLE.*

THIS volume, in its sub-title, is called "a memorandum on various means for propagating scientific and practical knowledge among the working classes, and for thus promoting their physical, technical, and social improvement." It is "addressed to Lord Henry Gordon Lennox, M.P., Chairman of the Council of the Society of Arts."

Mr. Twining here gives an account of his varied progress in teaching the working classes useful knowledge, and adds some considerations respecting the general system of elementary and industrial instruction which he conceives to be wanted by these classes in this country, and in which educational facilities, like those he is engaged in organising on a small scale, might acquire a full development.

Mr. Twining says in the outset that he has,—

"Felt all along that the most practically useful lessons would be those taught by permanent collections, organised on more strictly educational principles, so that one might not only see the things to be adopted or eschewed, but learn at the same time the 'reason why.' It was in this spirit" (he adds) "that I began in 1856 to form the permanent and educational exhibition of the things appertaining to domestic and sanitary economy, which from its being devoted to the furtherance of what may be called Economic Knowledge, has taken the name of Economic Museum."

It is to the various modes of diffusing this Economic Knowledge among the people that the following pages are chiefly devoted. To attempt to compass it with a precise definition would be to deprive it of the elasticity of circumscription which enables it to promote man's physical well-being under the most varied circumstances and conditions of life; but it may be briefly said to embrace in this essentially utilitarian direction everything that every one would say that everybody ought to know. Thus it is of unquestionable importance for all classes of society, and especially for those whose income is small, to know how their dwellings should be constructed in accordance with sanitary principles; what household improvements they may derive from the discoveries of science, or borrow from the customs and appliances of other nations; what fabrics they should wear; what food they should eat, and how it ought to be cooked; how they may distinguish things which are genuine, wholesome, substantial, durable, and really cheap, from those which are cheap only in appearance; and, in short, how they may live with judgment, and get the best money's worth for their money."

To make it more clear that Economic Knowledge ought to include these scientific elements as well as their practical applications, I sometimes call it Economic Science, or substitute the more comprehensive expression of Science of Common Life; but the title which I shall take the liberty of adopting more frequently, having obtained for it the sanction of eminent scientific friends, is Practical Bionomy, which indicates more clearly the union of Science and Common Sense for our practical guidance in daily life.

What I have found to be the greatest bar to the diffusion of sound principles of Domestic and Sanitary Economy is the almost total absence of preparatory knowledge; nay, of all scientific training among the bulk of the community at large, and the consequent want of ability on their part to enter into the rationale of the merits or defects either of the things now in use, or of those proposed as substitutes. An artisan and his wife visiting the admirable Food department of the South Kensington Museum may be struck and interested amazingly by some of the sensational illustrations and labels; but they are so much at sea in all that relates to the chemistry of nutrition, that they would scarcely venture to alter one item in their daily fare in the slightest scientific dietary. They feel, indeed, as would feel many a classical scholar if he were invited to ramble through field or forest with a botanical poet on the Fungi, and to feast on a variety of mushrooms he had never touched before. He would thank you for the suggestion, but prefer sending for the old article to the old shop."

In speaking of free popular lectures on the science of common life, organised in connexion with the Twickenham Economic Museum, Mr. Twining states that his experience of four seasons is decidedly in favour of free admissions. On two or three occasions he has, in order to conform to the practice adopted at certain institutions, or by way of experiment, consented to a charge being made for reserved seats, or to the levying of a penny on non-members; but the result has been invariably unsatisfactory. The amounts obtained by this means have been insignificant, the attendance has been diminished, and as for orderly behaviour, that of the free audiences could not be surpassed.

In his remarks on practical bionomy, or the science of common life, as a part of primary education, the author says that his scheme (in which he includes the education of girls) calls for a specially trained host of teachers, male and female, not conspicuous for their proficiency in one science and their ignorance of the rest, but possessing a well-selected and well-arranged assortment of scientific knowledge, elementary and applied, embracing the whole of the normal requirements of common life.

The volume contains an account of Mr. Twining's experiments at the Lambeth Baths, and remarks on science as a part of technical instruction; on the educational wants of our

artisans, and other important subjects; together with appendices, containing a synopsis of the Twickenham Economic Museum; a programme of popular lectures; suggestions for a district museum; and other supplementary notes.

EARLY ARCHITECTS IN BATH.

IN the course of a paper, by Mr. Irvine, "On Recent Roman Discoveries in Bath," recently read there, the writer said:—

Some information from the minutes of the Corporation may not be out of place here, relative to the Royal Baths and Pump-room. From these minutes I find that although Mr. T. Baldwin had been for some years connected with the Corporation as their surveyor or otherwise, yet it is only on the 3rd of October, 1791, that he is directly elected as their "architect and surveyor," at a salary of 105*l*. Scarcely do we gaze on the water of the King's Bath, and see its gas bubbles reach the surface, ere they flicker in the sunlight and are gone. Alas! on the 26th of the same month in the same year the records show an order for Mr. T. Baldwin to deliver up all books in his custody, or have a bill in Chancery filed against him. In the minutes for the next year (1792), 11th June, the new private baths and dry pumps adjoining the King's and Queen's Baths are reported as fit for use. And on the 10th of July of that year we learn the fate of (the, I am afraid, stubborn and unfortunate) Mr. Baldwin. "Resolved that Mr. T. Baldwin of this city, surveyor, be discharged from any future employment under this Corporation, and the Town Clerk to file a bill in Chancery against him, to make him deliver up all the books, papers, and writings belonging to the city in his possession."

We may doubt whether Mr. Baldwin's plans of any discoveries had much chance of preservation among his warring litigants. Besides this other minutes show that more than one person was connected with the work of it, would seem, not only the Pump-room, but also even the private baths, usually considered the work of Mr. Baldwin; for in the minutes for the 13th of September, 1793, one of the articles to be considered is a letter from Mr. Reveley to the Mayor, offering his services as architect to the Corporation, and containing also a demand for making drawings, plans, and elevations for a new pump-room and baths. There not having been enough members present to form a hall, it is taken into consideration on December 10th, 1793, and the order is given that he is to be paid 27*l*. 9*s*. 6*d*. for his drawing-plans of the baths and pump-room. But this still does not exhaust the catalogue, as we find the Corporation committee who had to do with it requested, on the same day, to consult Mr. J. Palmer, the architect, upon the subject of finishing the said building. And the Committee's report, together with Mr. Palmer's plans and elevations, are produced on the 7th of January, 1794, and agreed on; and in October, 1795, considerable amounts are agreed to be paid to him on account of it.

THAMES EMBANKMENT.

The railway being now nearly ready, together with the stations, great exertion is used to complete the paved footway and to prepare the carriage-road for public use soon after the opening of this line to Blackfriars in the month of June. The station at Westminster Bridge being open, is connected with the line along the Embankment; the next at Hungerford Bridge; then at Norfolk-street, called the Temple Station; and lastly, for the present at least, at Blackfriars Bridge: thus dividing the distance in three nearly equal parts. This will be a wondrous accommodation to the public in general, and especially to the residents of the S.W., the W., and N.W. districts. So soon as the extension is opened to Bread-street-hill, much additional accommodation will be afforded.

Now that the noble quay walls and landings are finished, what cause most concern are the dingy and desolate aspect of the reclaimed foreshore, and the dread that the long intervals now exhibiting old ruinous stables, store-houses, and wharfs may not be occupied by buildings and façades suitable to the fitness of the site.

The river bridges, save those of the railways, are grand; the Houses of Parliament and the opposing reach as far as the Bishop's Palace, together with the range of seven hospital palaces, give dignity to the Westminster end; but the fine old achievement of Somerset House now

shows out in superior lustre, and seems to demonstrate the sort of elevation that is most appropriate to a riverine frontage. The interval between this and the Temple ought to be filled up with some design of a character suitable to the situation, with a frontage of about 300 ft.

Then comes the long space between Waterloo Bridge and the vast Hungerford Station deformity. To make a garden of such a sunken mud waste would be simply ridiculous,—a wide and healthful promenade, flanked by varied buildings, but *not in street alignment*, is all that is needed,—space sufficient for an ornamental range of limes or planes ought to be left; but beyond this any small hortulan reserve in such a position would be only a nuisance.

The last and most valuable plot is that between Hungerford and Whitehall; and here the same treatment should be observed,—opening out and extending Whitehall-place, together with Scotland-yard, leaving space for shade trees, as on the Parisian Boulevards, with seats at suitable distances. This would be a solace on the important Mall of the river; but gardens without shrub or flower would here become the resort of vice and obscenity. The site is most valuable for first-class houses, but the worst possible as a playground of children, who have the shade and picturesque shrubbery of St. James's Park so near at hand.

T. H. H.

CONVICT LABOUR.

ON reading your very sensible remarks on the utilisation of convict labour, in your issue of April 23rd, it occurred to me that you might possibly be interested in learning that the work executed by convict labour at Woking was the whole of a prison, to contain 750 females, which, with the houses for the officials and all necessary offices for the prison, including two chapels, laundry for 300 women, bath-house, hospital, rain-water tanks, deep well, 10 ft. in diameter, &c., was built entirely by convict labour.

I was employed as the foreman or superintendent to carry out this work, and, as you may suppose, found great difficulty in starting; but, am pleased to say, brought the work to a satisfactory conclusion, the time occupied being three years and a half, and the cost of materials being about 32,000*l*. I am quite sure the work will bear favourable contrast with work executed under contract; and during the whole time I was in the employ of Messrs. Cubitt & Co. I can truly say I never saw better workmanship.

I am now transferred to Pentonville Prison, for the purpose of making some extensive additions by convict labour also.

J. C. RADFORD.

THE INNER CIRCLE RAILWAY.

SIR,—The Mansion House Railway Station is a mistake, and is not really in the interest of the company or of the public; certainly not of the public.

One of the favourite ideas of the late Duke of Wellington was to have Eastcheap and the two Tower-streets widened; he even went so far as to have plans of the necessary widening prepared, and no doubt the plans exist somewhere to this day. No streets in London are more clogged with traffic than these three are; you can walk along them in the daytime faster than you can ride.

Mr. Haywood, the engineer of the Commission of Sewers, in his report to the committee of that body on the proposed Mansion House Station, dwells upon the notion that, in future, railways through very expensive parts of London must be carried out in connexion with street improvements, at the joint expense of the municipal bodies and the companies. Either work is too expensive for one of these to undertake, he thinks; they must do it together. In the matter of the completion of the Inner Circle Railway, it would seem that we may carry out some of the above ideas.

Let the Metropolitan Railway, which has ample funds for the purpose, bring its line in all its fulness to Tower-hill.

Let the Metropolitan District Railway carry its line as far as its funds will allow it, namely, to Queen-street Station.

Let a third company, in connexion with the Metropolitan Board of Works and the City, widen, and carry a railway under, Eastcheap and Little and Great Tower streets, and part along Cannon-street (which would not need widening), and so fill up the space intervening

* By Thomas Twining, Vice-President of the Society of Arts, Goodman's Strand, 1870.

between Queen-street and Tower-hill. The sum estimated by the Metropolitan District Company's engineer, as the net cost of the line between Queen-street and Tower-hill, is a million and a half, of which amount 200,000*l.* are for works, and the rest for land and compensation. Surely such a sum ought to do a great deal more than merely make a railway less than a mile long.

It seems to me that by the above plan the Inner Circle Railway would be completed, with stations nearly in the places originally fixed on; that the new street to the Mansion House would be saved from destruction; that a much-needed street improvement, the widening of Eastcheap, &c., would be effected at a small cost to the public; and that a dividend to all three railways of a surprising kind would in a few years be certain.

TRAVELLER.

EDINBURGH FLATS AND WATER CLOSETS.

The Edinburgh City Improvement Trust, the express purpose of which is to improve the sanitary state of the city, has just been engaged in expunging a salutary clause in the articles of sale of certain of their fens, which clause one of the members, Mr. Gowans, had very properly got inserted, to the effect that all water-closets in the flats or floors of the houses to be erected should be ventilated directly into the open air. The reason adduced for expunging this clause is that the builders will not purchase the ground otherwise; but Mr. Gowans states that their chief objection is to another clause as to public-houses. It seems that one lot subject to the water-closet clause has been purchased by an architect, Mr. James Connel, and another by a builder; and we do not at all see why the builders should hold it to be a vital objection that they will be obliged to ventilate the closets directly into the open air. The arrangement whereby such closets occupy the centre of the dwellings or the common stairs, and not the backs of the houses, is a very bad one, and the arrangement can be easily remedied by a change of plan.

THE ARCHITECTURAL MUSEUM.

The Report of the Council about to be issued states that the Council are now negotiating with the Royal Academy for an exchange of Classic for Gothic work; and with the South Kensington Museum for the loan of nearly 500 casts from Amiens and other places on the Continent and in this country, in return for casts from the Bartle-Prentice Indian sculptures belonging to the Council; that the formation of a library of reference for students and art-workmen has been determined upon, the sum of 10*l.* towards the necessary fittings, and some valuable works having been already promised by Mr. Henry Vaughan. It is hoped that other donations in books or in money for their purchase will follow.

It refers with gratification to the formation of the architectural art classes, under the direction of a joint committee of the Royal Institute of British Architects, the Architectural Association, and the Architectural Museum; each body contributing as it is best able: the Institute in funds and influence, the Association in the working arrangements, and the Museum in giving up a large and well-lighted room and the use of its collection. Too much cannot be urged in favour of this organisation, embracing, as it does, classes for—

1. Drawing from the flat and round.
2. Drawing from the life.
3. Modelling.
4. Colour Decoration.
5. Water-colour Drawing.
6. Perspective and Sciography.
7. Architectural Drawing.

The past year has been one of unusual expenses, necessitating, the Council regret to say, the sale of 200*l.* of their 300*l.* Exchequer Bills, to meet the deficiency in the income; but even under ordinary circumstances it is believed that the income from every source will not yet meet the bare necessary outlay for keeping the Museum open, to say nothing of additions to the collection, lectures, prizes, &c., for which no steps can as yet be taken.

As regards the Building Fund, 1,000*l.* are still due to the contractor.

The Council have been in communication with the Commissioners for the Annual International Exhibitions of Art and Industry, and have made suggestions for co-operating with them. The

council say they are at a loss to understand the absence of their president's name on a commission which includes the presidents of the Royal Academy and the Institution of Civil Engineers.

"IMPROVEMENTS."

Under the portico, crouching in fear and dread,
Staring, and not knowing whereon to lay his head,
See you an artisan, homeless and cast away;
See you a man whose vigour has passed away;
Once he was young, and could labour like other men,
And often and often befriended his brother men;
Pass him by, pass him by, death is the doom for him;
The City's improving, and there is no room for him.

Under the elms, on the damp turf near Rotten-row,
Sleeping like mother and infant—forgotten now,
Pallid and scant of dress, though once in silk and lace;
Beauty was hers, and it still lingers in her face;
Husband she's none; but why need we tell the tale?
"Crushed" "neath the train," on the cold rigid iron rail.
Pass her on, pass her on, life has but gloom for her:
The City's improving, and there is no room for her.

Under the driving sleet, in the square, singing on,
Creatures are moving, and still to hope clinging on;
Wistful they look, but from window or Broadway now
Sympathy recks not these nights on the roadway now.
It came not through fever and plague that were burnt out,
But a home tumbled down, and a family torn'd out.
Pass them by, pass them by, darkness must loom for them:
The City's improving, and there is no room for them.

Palace grounds, public squares, wall'd park and promenade,
Though common to many, must not be a common made;
Rangers and watchmen have duties, though out of sight,
Known to the homeless and beggar, but not to the night.
"The fowls have holes," and the birds have a nesting space,
But God's poor, like Christ, are scarce left a resting place.

Out with them, out with them, into the tomb with them:
The City's improving, and there is no room with them.

C. C. H.

WATERING STREETS.

Sir,—Will one of your correspondents inform me of any better mode of street watering than by horse and cart, such as hoses and jet, &c.? If so, where?
BOLTON SURVEYOR.

TENDERING.

Sir,—I beg to be allowed to confirm the letter on this subject, which appeared in a recent number.
The unfairness and unsatisfactory manner of the present method of tendering contracts is well known to all contractors. We may pay for specifications, for drawings, and for quantities, and go to much trouble in making out estimates. We send them in, and hear no more of them than if they had vanished into vacuum. No man grumbles at being beaten in a fair fight; but not to have a line of acknowledgment, much less any intelligence as to the result, after our trouble and expense, is very unfair. I have, indeed, often written for the information without getting a word in reply. The system wants amending altogether.
CONTRACTOR.

NEGLECTED APPRENTICES.

Sir,—I am pleased to see that in your last paper, "A Builder's Son," has opened this question. I think that the subject will be dropped until some practical remedy has been at least suggested, which will supply willing apprentices with the means of improvement; and at the same time encourage the indifferent towards exertion.
In this matter I think that it is the duty of masters to lend a helping hand. It is an old saying that "boys will be boys," and I think that they have a right to be boys, at least occasionally. That being the case, I ask, is it fair or reasonable to expect a boy to work, say for ten hours a day, and then for him to feel disposed to study technical details? The fact is, many of them have to rob themselves of needed recreation, by learning the "all-important three R's" in an evening school.

Now, if there be any real desire on the part of master builders to improve their apprentices, the thing is easily done by incurring a little expense; but I fear that "there is the rub." Will they incur any expense? To me it appears that as long as boys,—say, and may, too,—are tired with their day's work, the majority of them will have but small desire for study after it. Therefore I would suggest that where it is practical, the boys should be allowed a couple of hours for two days in the week; in which time they might study or practise the details of their trade, with the occasional guidance of the foreman, or some qualified person. If this were done, much improvement might be effected, and that before technical schools would have become plentiful. I am one who, as an apprentice, had to struggle against

NEGLECT, IGNORANCE, AND POVERTY.

MANAGEMENT OF THE BRITISH MUSEUM.

Sir,—I am pleased to see the management of the British Museum discussed in the *Builder*, and wish to give my testimony, the result of more than twenty-five years' experience, on certain points, some of which have been debated at different times,—I am sorry to add, with little good result.

The most important matter is the seven days' dead lock every four months. In my case, and doubtless in many others, the result is two or three weeks' imperfect progress in whatever I may have in hand; the train of thought being broken off, and every appliance having to be started up afresh. This interruption has sometimes been so serious in its consequences that the previous work has been lost, and the work over again.

The ventilation of the reading-room is most defective; usually from about twelve o'clock, or from any time when the room has filled, there are but few, I venture to say,

who do not find themselves often overcome by the inclination to sleep, caused by the excessive impurity of the air. Some constitutions are affected by this condition of the air much more than others, and some to a most painful degree.

A printed catalogue of books of reference in the reading-room was published in 1859; changes in these books are, of course, inevitable; but, I think, an interval of ten years is the extreme limit of time which should be allowed to elapse before a new edition is printed. The volume of this catalogue at present in use in the reading-room is illustrated with an unsightly, dirty, troublesome mass of MS. corrections.

Lastly, the school-room element is much too strong in the reading-room. If the present rate of increase in the number of readers continues, three or more such rooms will soon be necessary.

JULIUS.

ARCHITECTS' ACTIONS.

Sir,—Under the above head, the *Builder* last week mentioned a Chancery suit between Mr. C. J. Richardson and Mr. Whatman, as being "decided in Mr. Richardson's favour, after a very short discussion." As this conveyance, although no doubt unimpeachable, a wrong impression, you will, I trust, allow me also in your next number to state what took place.

Mr. Richardson disputed his agreement with me, and on this being arranged, the only question before the court was, whether any profit had arisen. The sale of the buildings will ascertain it, and if there be a profit, the plaintiff will receive a percentage of it, and if there be no profit he will have to pay the costs. In short, I have every reason to be satisfied with the decree, and may with truth say to the plaintiff, "Heads I win, tails you lose."

THE DEFENDANT.

THE STALYBRIDGE PUBLIC BATHS.

The public baths, built at a cost of 6,000*l.* and presented to the inhabitants of Stalybridge by Mr. and Mrs. Robert Platt, of Dunham Hall, are opened: the gift was formally accepted by the Mayor and Corporation of the borough. The baths stand at the east end of Church-street, and have been erected by Mr. Storrs, of Stalybridge, from designs prepared by Messrs. Paull & Rosson, architects. They consist of swimming baths, private baths, Turkish baths, with dressing-rooms, and the building also includes a residence for the bath superintendent. There are two swimming-baths, one of which is not yet roofed. The covered swimming-bath has a water area of 60 ft. by 25 ft., and the building itself is 70 ft. by 40 ft. inside measurement. The open bath has a water area of 82 ft. and 28 ft. Four semicircular trusses on ribbed principals support the roofs. The dressing-rooms, which are arranged along the sides of the baths, have been admirably fitted up and furnished. Galleries are erected over the dressing-rooms for the use of spectators during swimming matches. The water supply is directed from the town's mains, through a 3-in. meter, which will accurately register the quantity used. All the heating powers are furnished by a powerful steam boiler which is placed in the rear of the main building.

CAMBERWELL CHARITY ESTATES COMPETITION.

A CORRESPONDENT, Mr. Dawney, states that the design sent in by the local surveyor to the charity has been pronounced the best, and possibly is, but complains that he had access to materials shut up from other competitors. He submits that the Vestry should either have employed the trustees' surveyor, or intimated to him that he could not be permitted to enter the competition, and calls upon the vestry to refer the matter to an architect.

THE DRAINAGE OF TOWNS.

By the existing combined system of house and surface drainage, the pernicious gases which are engendered in the general network of house drains and sewers, escape continuously through the various inlets into the houses and streets all over the town. In this manner the entire atmosphere at and near the surface of the ground becomes polluted; and, as the inhabitants constantly live in and breathe this atmosphere, a depressed state of health and a high death-rate are the inevitable results.

Having regard, therefore, to the question of how best to maintain the purity of the atmosphere of towns, it is to be hoped that the present sanitary commission will extend its inquiry into the first principles of town drainage; that is, whether it is proper that the refuse or house drainage, and the rainfall or surface drainage, should be carried away by one set of drains and sewers, or by two separate sets, namely, one for the house drainage, and the other for the surface drainage. In other words, is the atmosphere of towns as pure, or is the health of towns as perfect,

by discharging the combined house and surface drainage by one system of drains and sewers, as it would be both kinds of drainage kept distinct, and discharged by two separate systems? This question, which goes to the very root of the health of towns, has never been inquired into, or considered by previous sanitary commissions.

As a system of main pipes of iron laid under the streets, with branch pipes of iron or lead, laid from the mains into the houses, supplies the houses with water, why cannot a similar system of iron piping, only larger, with trapped inlets at the kitchen and scullery sinks, and waterclosets, and properly-arranged ventilating pipes carried above the house-tops, in connexion with the chimney-stacks, be laid so as to take the house drainage clean away into the country for distribution on the land, by irrigation or otherwise? The subsoil would be thoroughly drained and kept dry, and the rainfall, or surface drainage, would be conveyed away, by separate permeable house-drains and sewers connected with the natural water-courses and rivers. This plan is eminently practicable; and, if properly arranged and constructed, would work perfectly under good management.

After all the improvements that have been effected in drainage during the last twenty years, its condition is such even now, that were it to be uncovered and exposed to public view, it would not be allowed to remain as it is for another day without the inauguration of an entirely new system. But as the eyes of the public does not see it, its heart does not grieve about it, and so the vile net-work of abomination under the surface will be suffered to go on poisoning the stratum of air in which we live and breathe as it has hitherto done. In the case of polluted streams and rivers which are uncovered and seen, the public are active enough, but in the case of reeking drains and sewers, which are covered and unseen, the public are passive from ignorance of their true condition.

Having had as much practical experience in town drainage as most men, I unhesitatingly declare that the present system is radically wrong; that no improvement in the form and construction of the drains and sewers, and no increased water supply, will thoroughly remedy it; and that the separate system must ultimately be adopted. By its adoption the many evils consequent upon that which is now in vogue would cease, the atmosphere would be purer, the populations would be healthier, and the death-rates would be lower.

JOHN PHILLIPS.

CHURCH-BUILDING NEWS.

Salisbury (Cornwall).—St. Nicholas's Chapel has been restored and re-opened. In commencing the work the whole of the flooring, except the south transept, was removed and excavated to a depth of two feet. Any vaults that were reached at this depth were filled in and covered with stone, and the whole was then covered with a layer of concrete. The aisles are laid with flint tiles on the concrete, and the flooring of the pews is of wood, raised a step above the aisles, and with a space of 15 in. between it and the concrete. The old high-backed pews have been replaced by open seats of pitch pine, varnished. The walls have been replastered. An arch in the north aisle, covered with plaster, has been cleaned off, and the Polyphant stone exposed. The windows have been put in a state of repair, and have been glazed with cathedral glass. Two new windows, with Portland stone mullions, the gift of the late incumbent, Mr. Hawks, have been erected in the south side, and a small plain Norman window of Polyphant stone, discovered in the south side of the chancel, has been opened out and filled with stained glass by Mr. W. Littleton, in memory of a brother. The ceiling has been replastered between the ribs, which have been painted blue. A new reredos has been erected in Bath stone and marble. The carving has been executed by Mr. E. Hems, of Exeter. Messrs. Ambrose & Seell, of Plymouth, were the architects for the restoration, and Mr. Shaddock, Salisbury, the contractor.

Burnham.—At an influential meeting of the parishioners resolutions have been passed for the repair and improvement of the parish church, by partial repaving and rearrangement of pews, supplying new windows, &c.; the means to be obtained by borrowing in the meantime, the meeting pledging itself to repay by instalments. A committee has been appointed to carry out the object of the meeting.

Nottingham.—A new mission chapel has been opened at Kensington, near Nottingham. It is capable of seating nearly 300 persons, a school-room in the rear being so arranged as to admit of its being thrown open to the chapel when required. The chapel is brick built, with stone dressings. The windows are narrow and semi-circular-headed, excepting that in the upper part of the principal front, which is a canted rose-window. The builders were Messrs. Warner & Son, of Ilkeston; and the architect, Mr. Tait, of Leicester.

Blechningley.—St. Mary's Church has been reopened after restoration. The old plaster has been removed, and the oaken timbers of the open roof restored to view. Where the walls were in a state of disrepair they have been made perfect; the windows are now in their original condition; the old organ-loft has been taken down, and in its place room has been provided for the parish children. The western arch has been enlarged, and the rails of the Clayton monument set back some feet so as to afford more room. All the old high-backed pews have been removed, and in their places are open oak benches, while a stone pulpit, in harmony with the rest of the building, has been erected. A new window, by Messrs. Clayton & Bell, of London, has been put up in the chancel. The restoration was done under Mr. Pearson, of London, architect; and Mr. Carruthers, of Reigate, carried out the work, at a cost of 1,740*l.*, and of 400*l.* for restoring the chancel, the rector, the Rev. F. C. Chawner, being at the expense of the latter work.

Lichfield.—The "Lonsdale" Memorial Church, or parish church of St. Mary, Lichfield, has been re-opened. The death of Bishop Lonsdale happening at a time when the church was greatly in need of repair, the suggestion was made for the rebuilding of the nave and chancel as a tribute to his memory, and as the sum of 4,000*l.* was offered in great part by his son, the present vicar (the Rev. Canon Lonsdale), the suggestion was adopted, and the old church was closed in April, 1868, previously to its demolition. The design of Mr. James Fowler, of Louth, a native of Lichfield, was selected from a numerous competition. The style is Gothic, of the Geometric period. The height of the nave, viz., 60 ft., is a feature; its length is 70 ft., by 28 ft. in width. It is an arcade of four bays, having eight two-light traceried clearstory windows on each side. The aisles are 90 ft. by 19 ft., and 21 ft. in plate, finished on the exterior with a moulded line of a parapet and hooded buttresses. At the east end of the chancel and aisles the buttresses are carried up, forming solid spire-pinnacles. The chancel is 30 ft. by 24 ft., and 55 ft. high. By opening out the tower arch and thickening the wall, an effect from the east end of the church has been produced. Owing to the insecure state of the tower, considerable expense has been incurred in bracing and raising the bells, and restoring the interior. Accommodation is now provided for nearly 1,000 persons, and the total cost of the rebuilding is from 8,000*l.* to 9,000*l.*

Lulworth.—A new church has been consecrated at West Lulworth. The foundation stone was laid about twelve months ago by Lady Selina Bond, and the building has been erected under the superintendence of Mr. G. R. Crickmay, of Weymouth, architect, the original plans having been prepared by the late Mr. John Hicks, of Dorchester. The work was begun and carried out, according to Mr. Crickmay's detailed drawings, by Messrs. Wellspring & Son, of Dorchester, builders. The old church was in a very dilapidated condition, and its satisfactory restoration was pronounced to be impossible. The new site is on open ground, about three-quarters of a mile to the west of the present churchyard. The plan comprises a nave, chancel, north aisle, transept, vestry, and tower, the latter standing in the westernmost bay on the south side, and its base forming a porch to the chief entrance. The whole of the design is carried out excepting the two upper stages of the tower. The style is Geometrical. The carved, moulded, and highly finished portions of the stonework generally are of Bath freestone, the remainder being that of the neighbourhood. The roofs of the nave and aisles are open-timbered, moulded, and varnished. The seats are of open construction, and slightly sloped. The chancel roof is of less open construction than those of the nave and aisles. It is hexagonal in shape, the angles being marked by moulded ribs. The sacarium floor is laid with encaustic tiles, the steps and footpace being of polished Purbeck marble.

Morden.—The rebuilding the old church of East Morden has been commenced, the corner stone of the new structure being laid by Mr. J. S. W. S. Erle-Drax, M.P. for Wareham. The old edifice was fast falling into ruins. Miss Drax has undertaken to bear the cost of the new church, which is estimated in round figures at 2,000*l.* The reconstruction was undertaken by Mr. Joseph Seller, builder, who has already carried out some works for Mr. Drax. Mr. Nichols is foreman of the works. In the old chancel was an ancient stone monument to the Erle family, the ancestors of the present squire. This monument has been removed, and the pieces forming it are being preserved in a large wooden case and placed in a building near the site. In making the excavations the workmen discovered a couple of carved tombs of Purbeck marble, but bearing no date. These were under the foundation of the porch, and it is thought that on the same site there stood a church even before the old building now razed to the ground. Some mural inscriptions, stone arches carved, &c., were also found. While the former building would accommodate 400 persons, the new one is to contain 500 seats. The tower will have, as before, four bells. The building will be of sandstone, and Ham-hill and Tisbury stone, the colours of which,—dark, red, yellow, and whitish,—form a contrast. The style of architecture will be Gothic. There are to be a nave, two side aisles, supported by pillars, a chancel and a vestry at the east end. A chamber for heating apparatus is also to be provided. Including the tower, the building will stand on an area of about 100 ft. by 40 ft. The dimensions of the nave will be about 70 ft. by 20 ft.; the chancel will be 30 ft. by 20 ft., and each of the aisles 40 ft. by 10 ft. At the south end there will be a small gallery for the organ and choir. There is to be an east window of stained glass, and the other windows will be filled in with cathedral glass. The pews will be high ones. The flooring of the chancel and the aisles will be of Minton's encaustic tiles.

Books Received.

Gibbs's Studies for Art Designers and Manufacturers. 14, Pembroke-street, Oxford. 1870. WHEN this work was commenced, the author, Mr. John Gibbs, proposed to publish it in parts, and we gave some particulars when the first was issued; a desire, however, was expressed, that it should be published as a complete work at once, and this has been complied with, by the production of thirty-one large plates and some introductory remarks. The author holds an opinion which is not new in these pages, that our own Romanesque affords an excellent basis for all future architectural and decorative development. He urges that the historical and archaeological associations of this style, which has several co-equals, in beautiful correspondence, in France, Germany, and Italy, may be studied with great advantage, and should be so studied with other styles; and that a complete knowledge of the laws and rules of proportion, harmony, and fitness should ever be the companions of the architectural or the designing genius. With such knowledge and taste much more may be achieved in architecture and ornament than copyists can have any idea of, and he would be as conservative as any of the best of the reproducers did he not hope and believe in the development of the style he has quoted; and for this purpose the original mind will not only grasp all that is lovely, and strong, and enduring, that can consistently be gathered from all the fields of art, past and present, but he will call to his aid many of the natural objects which grow and blossom in our fields and gardens,—ay, and in other lands, too,—that the beautiful, the true, and the lasting may be brought together proportioned into the majesty of order, the dignity of usefulness, and the harmony of repose.

"The study of decorative art," says Mr. Gibbs, "is too much neglected by most architects, and is consequently left too often to those whose duty it should be to manipulate the ideas of the designer. Every architectural pupil should study decorative art. As much as possible he should be a master in his profession, and have a practical knowledge of every trade dependent upon it. The author desires to urge the study of decorative art upon all those students of architecture who are likely to succeed as such on account of their natural abilities and energies, for they only will maintain the principles of high art, and originate new forms accordingly. They will find it more a matter of joy than difficulty, and certainly advantageous in every respect. The love and power of decorative art in all its varied forms, is now more than ever exemplified by the thousands of amateurs who practise it. To talk learnedly

of art; to draw, paint, execute sculpture and carving, work tapestry, and much else, even to the using of the jack-plane and the laying of tiles, are things great amongst the many instructive and interesting pursuits so extensively practised by many of the sons and daughters of England, yet only for the pleasure they yield. And the more the principles of design are understood by society generally, so much the sooner will our public and private buildings become works of highest art.

Some of our best buildings, it is quite true, have been disgraced by impure and tasteless and badly-executed decorations, simply because in these instances the study of decorative art has been neglected.

The designs before us include capitals, chimney-pieces, foliage, ornamental bands, diapers, panels, wall decorations, a reredos, and two portions of a supposed building, designed to show the applicability of the Romanesque style to modern purposes. They are boldly and skilfully drawn, Mr. Gibbs being an excellent draughtsman, and will make capital copies for schools of design and similar establishments. Beyond this, however, as decorative designs they will be found to afford many very valuable hints to art workmen. We shall hope to find that the author has been repaid for his large outlay of time, thought, and money.

A Description of the Roman Tesselated Pavement found in Bucklersbury; with Observations on Analogous Discoveries. By JOHN EDWARD PRICE, Director of Evening Meetings of the London and Middlesex Archaeological Society. We are indebted to the Library Committee of the Corporation of London for this very valuable contribution to the history of Roman London. Mr. Price, with pains and skill, has brought together a very large amount of information, not alone as to the pavement in question, the discovery of which we noted at the time, but concerning previous discoveries of a similar kind.—Walbrook and London Stone. The volume is illustrated with a chromo-lithograph, on a large scale, of the Bucklersbury pavement, and numerous woodcuts. The writer acknowledges his obligations to Dr. W. Sedgwick Saunders, the chairman of the Library Committee, to whose energetic action the success which attended the efforts to preserve the pavement is mainly due.

Index to Vols. II. and VIII. of the Series of Records known as the Remembrances: preserved among the Archives of the City of London. Prepared by the authority of the Corporation of London.

HERE we have another good result of the intelligent liberality of the Corporation of London. The series of books known as the "Remembrances" consist of nine volumes, embracing the period from 1580 to 1664, and include copies of correspondence on many matters of interest. Thus, under the head of BUILDINGS, we get—

No. 17. Letter from the Lords of the Council to the Lord Mayor, to prevent the erecting and overcrowding of small tenements within the City, and for the aldermen and their deputies in the various wards to make search, and in case of overcrowding to remove the inmates, according to the statute lately passed for that purpose. 6th October, 1593.

No. 190. Letter from Lords of the Council to the Lord Mayor and Aldermen, requiring them to put into execution her Majesty's late proclamation against the erection of new buildings, and divided tenements, and for committing to prison all persons found transgressing the said proclamation. 11th July, 1602.

No. 261. Letter from the Lord Mayor to the Lords of the Council, with a return as ordered by them, of the new buildings lately erected and now being erected in the City and suburbs, contrary to the order of their lordships and the Statute Chamber. 26th March, 1606.

No. 364. Letter from the King (James I.) to the Lord Mayor and Aldermen, congratulating them upon the care bestowed upon the walls of Moorfields, the re-erecting of Aldgate, and the reparation of divers churches of the City, also calling their attention to the state of the steeple of St. Paul's Cathedral, and directing the sum of £500, as a free gift towards the works, if they will take them in hand; and further appointing a commission to inquire into the expenditure of the late aldermen given towards the restoration of the cathedral. 24th July (in the first year of his reign), 1603.

We hope that the Corporation will soon find it convenient to direct Mr. Overall, the Librarian, to proceed with the work he, in conjunction with Mr. H. C. Overall, has so well begun.

Miscellaneous.

Distress amongst the Working Classes. Mr. M'C. Torrens, in the House of Commons, has given notice that on the 17th of June he will move a resolution that the continued want of employment amongst those who live by wage labour in many of the great towns of England calls for the consideration of the House, with a view to devise the best means for remedying the same without delay.

Communication with the Continent.—The Committee of the House of Commons, on group 2 of Railway Bills, Mr. Cross in the chair, has given its decision upon a Bill which has been looked to with much interest. It is called the International Communication Bill, and embodies Mr. Fowler's scheme for establishing a service of railway steam-vessels between Dover and Audreselles, a short distance from Boulogne. Both at Dover and at Audreselles harbours for the accommodation of the vessels, which will resemble floating castles, are proposed to be built. The end of a short line connecting both harbours with the railway would form a hydraulic lift, by means of which a train of 12 carriages could be run on the upper, and 12 on the lower deck of the vessel, which would be 420 ft. long, and 1,600 horse-power. Thus passengers booking at Paris or London could accomplish the whole journey without leaving the carriages. In was stated in course of the evidence that the Emperor of the French was favourable to the project. The committee has decided that the preamble of the Bill has been proved. The operation of the Act is to be restricted until the Emperor of the French has given his assent to the construction of the works, and nothing is to be done under the Act until the whole of the capital is subscribed and half paid up.

Proposed New Infirmary for Leeds.—At a recent meeting of the local guardians, a committee's report on the best system of providing increased accommodation for the sick at the workhouse infirmary was read. It recommended that a new hospital or infirmary shall be built on the pavilion principle, with accommodation in two pavilions for not less than 100 inmates in each pavilion; that the wards be about 120 ft. long, with moveable partition in the centre not less than 22 ft. wide and 15 ft. high, and that not less than 120 cubic feet of space be allowed for each bed; that the windows be constructed with the most improved means of ventilation; that the sitting grounds between the pavilions be not less than 100 ft.; that sun-lights be introduced in the various dormitories; that architects submit the most approved plan for ventilating and warming the wards; and so on. The report was adopted, and advertisements ordered to be inserted in the local papers, asking competing architects for plans, and offering two premiums of 50*l.* and 30*l.*; the plans to be delivered on or before 28th June.

The Use of Serpentine for Decorative Purposes.—A serpentine font has just been manufactured by Mr. J. Murphy, of the Serpentine Works, Penzance, and fixed in All Saints' Church, Landport, Portsea. As described by the *Cornish Telegraph*, the font is in the Gothic style. The bowl is octagonal, 2 ft. 1 in. in diameter, and stands on an octagonal plinth and five pillars. The whole is placed on an octagonal white Portland-stone plinth, 3 ft. in diameter. The serpentine has been well selected, and is a beautiful specimen of the Lizard stone. This font has been erected by the members of the congregation as a memorial of Mrs. Churchill, the wife of the Rev. C. B. C. Churchill, rector of the parish. Mrs. Churchill had often expressed a wish to see a font of this kind placed in the church at Landport, and the congregation, therefore, gracefully subscribed for this one after her death, as a memorial of herself. The Portland plinth was given by Mr. Leather, the contractor for the new docks, Portsmouth.

Oxford Architectural Society.—The second excursion for the season of this society took place on Saturday, when the members left Oxford by the Great Western Railway for Banbury, where they arrived at a quarter to three. After reaching Banbury the party walked to Broughton Castle, which was kindly thrown open to them by Lord Seyn and Sele. The party assembled on the bridge. Mr. J. H. Parker, F.S.A., called attention to the various points of interest at the castle. The next thing in the programme was a walk to Bloxham, where the party were very kindly received by the vicar, the Rev. J. Hodgson, and Mrs. Hodgson. Mr. Hodgson said that the restoration of the interior of the church cost 6,300*l.* He read a paper on the architecture of the church. At its close the party were invited to the vicarage and partook of refreshments. There was a break in waiting at Bloxham, and the party drove into Banbury, first having a look at the supposed Roman amphitheatre called Bear-garden. They returned to Oxford by the eight o'clock train, having spent a very pleasant day.

Earthwork and other Pre-Historic Remains on the Malvern Hills.—A few weeks ago the Worcester Archaeological Club were astonished at an announcement made to them by Mr. Lines, one of the members, of an extraordinary discovery of traces of ancient habitations on an extensive scale on the slopes of the Herefordshire Beacon, and also in connexion with the smaller camps on Midsomer Hill and Hollybush Hill. An exploratory visit has accordingly been made to the new field of research; and Mr. Lines read an elaborate descriptive and theoretical paper on the subject at Midsomer Hill, where he pointed out the peculiar character of the ancient camp on that hill, its convoluted entrance, and the honey-combed depressions of the whole crest, the sides being worked into terraces, and concentric rings or but circles being visible on the east side, overlooking Hollybush Hill. Mr. Lines pointed out an altar in peculiar relationship to certain religious observances, and the water triangle of ancient symbolism. An artificial cave in connexion with the remains was also visited, and what he regarded as a tumulus or cemetery; urging its excavation, with permission of the Lord of the Manor, Earl Somers; who, he thought, would feel as deeply interested in these remains as any member of the club could be.

Zinc Poisoning.—Of the dangers of lead-poisoning and copper-poisoning from the improper use, in various ways, of vessels made of those two metals, we have heard enough to make Zinc must be added to the incriminated list. Mr. E. Kinch, of the Royal Agricultural College, Cirencester, writes to the *Food Journal* that a sample of elder-wine recently came under his notice, which had been found to produce serious vomiting when partaken of to the extent of about eight ounces. The maker had used a clean galvanised or zinc-plated iron vessel, and a wooden spoon to stir the ingredients. On examination the wine proved to contain zinc, dissolved by the oxalic acid of the elder-berries, in quantity nearly equal to nine grains of oxalate of zinc per pint. Milk is well known to attack zinc surfaces, forming lactate of zinc; and a foreign chemist has lately called attention to the fact, that water kept in zinc reservoirs, or collected from zinc roofs, is invariably contaminated with the metal, and therefore should not be used for domestic purposes.

An Electrified Island.—The little island of St. Pierre Miquelon boasts of two telegraph stations. One of these belongs to an American company, which works in connexion with the Anglo-American Company's lines, receiving messages from Newfoundland and sending them on to Sydney. The other station, which is worked by the French Transatlantic Company, is finished with extremely delicate receiving instruments, which were found to be seriously affected by earth currents. It was found, says *Nature*, that part of the so-called earth-currents had been due to the signals sent by the American Company into their own lines, for the messages sent by the rival company were clearly indicated. The wires were not even in close vicinity. For the two stations were several hundred yards apart, yet messages sent to one were distinctly read at the other, through the earth. The fact is, the little island was thoroughly electrified, and could no longer keep its secrets.

The American Rubber Stamp.—An American, named Stetson, has invented an elastic stamp made of india-rubber, which is said to be an improvement on metallic or other hard stamps, for certain purposes. The design is formed on the india-rubber, and the stamp is useful in cases where metallic stamps would be useless. For example, it can accommodate itself to any irregular form or uneven surface, and can even stamp a "round a corner." In proportion to its elasticity is its special value. It does not indent the impressed surface, and produces soft and delicate impressions. The cost is small, and the durability great.

Laws of Conduct.—A course of four lectures "On the Laws of Conduct in Industrial Life, and on the Method of Imparting Instruction therein to our Primary Schools, especially addressed to Teachers," are in course of delivery by Mr. William Ellis, at the Lecture Theatre of the Royal School of Mines, Jermyn-street. The next will be given on Monday, the 30th of May; others will follow on the 13th and 20th of June, at 8 o'clock. Admission free.

The New National Gallery that is or is not to be.—On going into Committee of Supply in the Commons, Mr. Baresford Hope called attention to the delay which had occurred in proceeding with the building of the New National Gallery, and moved for papers and other information on the subject down to the present day. Mr. Ayrton promised the production of papers; but from his remarks, and those of Mr. Gladstone, it appears that the Government have no immediate intention of doing anything further in the matter, giving as a reason the great expense which other and more pressing public buildings are occasioning, and will occasion; special reference being made to the proposed accommodation for the Natural History collection of the British Museum; no promise or information as to procedure in which, however, was made either. Mr. Ayrton included the Law Courts among these public buildings which were to be gone on with at the cost of the Government or the country.

Cost of Metropolitan District Railway.—In evidence before a Parliamentary Committee, Mr. Robert Baxter, of the firm of Baxter, Rose, & Norton, solicitors to the company, said the company's line had cost:—The first portion, at South Kensington, 361,000*l.*, of which the land represented 108,000*l.*, expenses, 51,000*l.*, and works, 207,000*l.*; the second portion, from High-street, Kensington, to Pelham-street, 693,000*l.*, and from thence to Westminster, 2,096,000*l.*; from Westminster to Bread-street the cost was 986,000*l.*, of which 556,000*l.* represented land, and 430,000*l.* works; and from Bread-street to Queen-street, 305,000*l.*, of which 210,000*l.* represented land, and 95,000*l.* works. The contractors took originally 750,000*l.*, and secondly 500,000*l.*, together about a million and a quarter of the stock. Was not acquainted with their present holding, but should guess it roughly at about a million.

An Oversight in Compensation.—The *Parochial Critic* says,—"A short time ago, Kensington was promised a new police-station. A fine site was obtained opposite the principal line of buildings on the improvement lately made in the High-street. Premises at the corner of Church-court, and abutting on the wall of the churchyard, were bought for 2,000*l.*, and a similar amount was paid by the police authorities for an adjoining house. Now occurred a "hitch." The freeholder of the second piece of property came down with a claim for the extinction of his interest, the awkward blunder having been made of treating only with the lessee. A dismissal of the gentleman through whom the thing came to so absurd a pass is believed to have visited upon him severely the consequences of his shortsightedness.

Hurstpierpoint Town Drainage.—The following are the tenders received for constructing the stoneware pipes, reconstructing the bridge crossing the Chickfield-road, near the old Toll House, and other works, for draining the town, exclusive (it is believed) of the sewage tanks, &c.:—Cole, Forest Hill, 3,581*l.* 5*s.* 7*d.*; G. Harris, Shalford, Essex, 3,169*l.*; Crockett, St. Pancras, 3,155*l.*; Symonds, Redhill, 3,086*l.*; Ford, Wolverhampton, 3,023*l.* 7*s.* 11*d.*; Cheeseman & Co., Brighton, 3,020*l.*; Blackmore, Brighton, 2,999*l.*; Bloomfield, Tottenham, 2,995*l.*; Hayward, Croydon, 2,820*l.*; Goodair, Southwark, 2,755*l.*; Young, Battersea, 2,750*l.*; Vickers & Crave, Southsea, 2,747*l.*; Woodcock, Lower Walmor, Deal, 2,644*l.* Mr. Woodcock's tender, being the lowest, was accepted. Mr. B. S. Nunn, of Brighton, is the surveyor; and Mr. Edwin Anscombe, of Hurst, the clerk of the works.

Death of Mr. D. O. Hill, R.S.A.—This well-known artist, who has been long in failing health, died at Edinburgh on Tuesday. Mr. Hill was born, in 1802, at Perth, where his father was a bookseller. In 1823 he exhibited in Edinburgh, three pictures of Scottish scenery, which evinced artistic skill of high promise. In 1830 he was appointed secretary of the new Royal Scottish Academy. He was the first to suggest the formation, and aided in devising the constitution of the Royal Association for the Promotion of the Fine Arts in Scotland.

The Floating Dock "Bermuda."—Intelligence has been received of this dock having been safely floated into the camber or basin of the Royal Naval dockyard, at Ireland Island. Preparations were being made for docking in it her Majesty's ship the *Racoon*.

Portrait of the Prince and Princess of Piedmont.—At the establishment of Messrs. Henry Graves & Co., in Pall-mall, we have seen a very interesting picture, by Mr. Desanges, containing life-size portraits of their Royal Highnesses Umberto and Margherita, Prince and Princess of Piedmont, and their infant son, the Prince of Naples, which is about to be engraved. We hear, with something besides astonishment, that space for this picture was refused by the Council of the Royal Academy. The illustrious personages represented will be King and Queen of Italy, and it seems to us that if the merit of the painting had not been high, the interest of the subject, the likenesses being admittedly good, should have obtained for it a place. We have no hesitation, however, in saying that as a picture it is a work of merit, far superior to many that are hung, and that the painter of it has been very badly treated,—not for the first time. The picture is intended for the town-hall of Naples.

Monumental.—According to the *Kensington News*, the memorial of the late Rev. William Harness, M.A., vicar of All Saints', Prince's-gate, will take the form of a monumental brass at All Saints' Church, and a Harness prize for Shakespearean Literature at the University of Cambridge.—Mr. Nelson, the sculptor, of London, has been commissioned to execute the statue of the late Lord Stanley of Alderley, to be erected in Alderley Church, Cheshire.—The Duke of Devonshire, the Chancellor of the University of Cambridge, has notified that the statue of the late Prince Consort, as chancellor of the university, on which Mr. Foley has been for some years engaged, being now completed, his grace, acting on behalf of the subscribers, makes a formal offer of the memorial to the senate.

Plaster of Paris for Modelling.—When 2 to 4 per cent. of finely-pulverised althea root (marsh mallow) is mixed with plaster of Paris, it retards the hardening, which begins only after an hour's time. When dry, it may be filed, cut, or turned, and thus become of use in making domino-stones, dies, brooches, snuff-boxes, and so on. Eight per cent. retards the hardening for a longer time, but increases the tenacity of the mass. The latter may be rolled out on window glass in thin sheets, which never crack in drying, may be easily detached from the glass, and take on a polish readily by rubbing them. This material, incorporated with paints, and properly kneaded, gives imitations of marble, can be coloured when dry, and be made waterproof by polishing and varnishing.

Archaeological Discovery.—Mr. J. R. Mortimer, of Driffield, has just completed the examination of a tumulus-like mound, situate about one-sixth of a mile north-west of the village of Fimber, on the Yorkshire Wolds. The discovery is of peculiar interest, being only the third of the same orciniform platformed nature yet recorded. The first was made at Helperthorpe, in the Wold Valley, a few years ago; and the second, closely allied to Mr. Mortimer's, was made at Swinton. The mound just examined was known as the "Mill Hill" by the oldest inhabitant. Mr. Mortimer suggests the desirability of a proper record and investigation of places which bear the traditional name of "mill hill," "moor hill," or "cross hill," which are not uncommon. There is a Mill Hill in Middlesex.

The Colour most Striking to the Eye.—Experiments made to ascertain what colours are most quickly and easily perceived by the eye, seem to show, according to the *Photographic News*, that bright yellow is the colour most easily distinguished, and it is therefore suggested for railway signals. It is remarkable that yellow yields dark shades in photographs: thus, a yellow-haired person is apt to have black or dark hair, and yellow dresses never turn out light.

Society for the Encouragement of the Fine Arts.—Some of our readers may be glad to know beforehand, that at the next meeting of this Society, June 2nd, Dr. Westland Marston will read a paper "On the Tragic Elements in the Drama of Fiction." On that occasion, appropriately, Dr. Doran will preside.

Free Libraries Act, Derby.—At a public meeting of the ratepayers of the borough of Derby, held in the Guildhall, and largely attended, it has been unanimously resolved to adopt the Free Libraries Act.

Civil Engineers' Conversazione.—The conversations of the President of the Institution of Civil Engineers will take place on the 31st inst.

Glass and the Sun.—M. Bontemps, the managing director of the glass works at Choisey-le-Roi, states that the best and whitest glass made at St. Gobaix turns to a distinct yellow after three months' exposure to the sun. Crystal glass, made with carbonate of potash, litharge, and silica, was not at all affected (the other varieties referred to contain carbonate of soda); English plate-glass, from the British Plate Glass Company, of a distinctly azure blue tinge, also remains unaffected. The colouration, which begins with yellow, and gradually turns to violet, is attributed to the oxidising effects of the sun's rays upon the protoxides of iron and manganese contained in glass. It is well known, however, that the association of sodium with yellow colours is frequent.

England's Character on the Wane.—A sentence in the last report of the chief engineer to the Great Western Railway of Canada is so significant that we quote it without further comment:—"Very serious defects pertain to a large proportion of all the rails imported from England of late years, and the consequence is that all the leading railways are now either introducing steel rails, or they are purchasing American rails manufactured from a superior quality of native iron."

Demolition for the New City Library.—The destruction of several large buildings on the west side of Basinghall-street, closely contiguous to the Bankruptcy Court, will shortly give opportunity for the foundations to be put in, and the new and extensive buildings commenced. The erections will be fitted for the joint purposes of a library and museum, with accommodation for readers. 25,000*l.* is the amount decided to be conditionally granted for the purpose out of the City's cash.

Proposed New Street through Leicester-square.—Capt. Grosvenor, M.P., and Mr. W. H. Smith, introduced a deputation to the Metropolitan Board of Works last week, praying that body to consider the importance of constructing a new street from Charing-cross to Tottenham-court-road. The proposed new thoroughfare would involve the purchase of Leicester-square, and its gross cost would be about 600,000*l.* The matter was referred to the General Purposes Committee.

Proposed New Church for Wednesbury.—Messrs. Elwell, of Wood Green Works, through whose liberality a new church school-room was recently opened at New Town, now propose the erection of a new church in the same neighbourhood, and offer 3,000*l.*, or 1,000*l.* each, towards the cost of the work. The site proposed is in the upper part of Wood Green, close to the cemetery, with a front entrance from the Walsall-road.

Meltham.—The foundation-stone of the new almshouses at Meltham, in course of erection by Mr. J. Hirst, has been laid by Mrs. Hirst, in presence of a large concourse of people, mostly residents in Wiltshaw and the neighbourhood. The architect is Mr. Kirk, of Huddersfield.

National Provincial Bank, Birmingham.—With reference to a recent notice of the New National Provincial Bank at Birmingham, in our pages, we are asked to mention that all the safes, doors, strong-rooms, and linings were made by Messrs. Chubb & Son.

The Proposed New Town-hall for Winchester.—A memorial has been drawn up by those opposed to the scheme of the Town Council for a new town-hall, to be presented, when signed, to the Lords of the Treasury, praying them not to sanction the erection.

The Architectural Exhibition.—The conversations held on Tuesday evening last, under the presidency of Mr. Jas. Ferguson, was fairly attended. A military band was present under the direction of Mr. Bodderley.

New Park for Bradford.—The Bradford town council have decided to accept the offer of Mr. Lister to sell the estate of Manningham Park, valued at 60,000*l.*, for 40,000*l.*, in order to form a second public park for the borough.

TENDERS.

For new residence at Saluburst, Sussex. Mr. G. Beck, architect:—

Bridgeland.....	£884 0 0
Parks (too late).....	649 0 0
Slumer.....	609 8 4
Bullock & Brooker (accepted)...	375 0 0

For new infirmary and alterations to old infirmary, &c.,
Tisbury Union. Mr. Shoppe, architect. Quantities
supplied by Mr. Sidney Young:—

Crabb & Vaughan	£2,762 0 0
Cullum	2,431 0 0
Roswell	2,438 0 0
Hanson	2,684 0 0
Hayley	2,608 0 0
Goodman	2,463 0 0
Taylor	2,463 0 0
Nightingale	2,474 0 0
Crockett	2,425 0 0
Jackson & Shaw	2,430 0 0
Tarrant	2,397 0 0
Wicks, Bangs, & Co.	2,380 0 0
W. Hays	2,368 0 0
Hill, Keddell, & Waldram	2,328 0 0
Farnside & Son	2,294 0 0
Cooke & Green	2,285 0 0
Kealey (accepted)	2,197 0 0

For a house at Croydon for Mr. C. Fielder. Mr.
Alfred Porter, architect. Quantities supplied by Mr. J.
Leaning:—

Dove Brothers	£1,295 0 0
Merritt & Ashby	1,273 0 0
Coleman	1,228 0 0
Hart	1,188 0 0
Drake Brothers	1,068 0 0
Marriage	1,068 18 8
Hoborne	1,050 0 0

For repairs and alterations at Spanish and Portuguese
Jews' Infant School. Mr. F. Lett, architect:—

Heaps	£228 10 0
Rigg	828 0 0
Nightingale	233 10 0

For china works at Hanley, for Messrs. R. G. Scrivenor
& Co. Messrs. R. Scrivenor & Son, architects. Quantities
supplied:—

Bailey	£1,239 0 0
Barton	1,220 0 0

For villa residence for Mr. W. Stubbs. Messrs.
R. Scrivenor & Son, architects. Quantities supplied:—

Bailey	£1,118 0 0
Bowden	1,059 0 0
Bennett & Cook	1,050 0 0
Woodbridge	1,040 0 0
Clews & Uden	1,038 12 0

For house and shop, Edgeware-road, Kilburn. Mr. C.
Foulsham, architect. Quantities supplied by Mr. Thos.
Nixon:—

Carter & Son	£1,598 0 0
Thompson	1,578 0 0
Gammam & Sons	1,631 0 0
Ebbs & Sons	1,622 0 0
Scrivenor & White	1,448 0 0
Rankin	1,530 0 0

For rebuilding two dwelling-houses, with shops, lately
destroyed by fire, at Bridgewater. Mr. Edwin Down, architect:—

For Mr. Whitty, Doal-seller.

Kitch Brothers	£1,178 0 0
Preese	1,120 0 0
Searle & Son	1,080 15 0
Chedgoy	1,084 0 0

For Messrs. Mure, Blacker, & Co., Drapers.

Kitch Brothers	£1,470 0 0
Searle & Son	1,451 19 0
Preese	1,400 0 0
Chedgoy	1,375 0 0

For finishing four houses in Blackstock-road, Seven
Sisters-road, Holloway, for Mr. J. Fowler. Mr. R.
Gover, architect. Quantities by Mr. Shrubsole:—

Saby & Son	£420 0 0
Bridgman & Nuthall	531 0 0
Hansfield	779 0 0
Guyver	770 0 0
Blackmore & Morley	720 0 0
Cole	698 0 0
Warne	690 0 0
Prentice	680 0 0
Maths	661 0 0
Newson	655 0 0
Norman & Son	625 0 0
Pitcher	599 0 0
Red	596 0 0
Harrison & Edwards	593 0 0
Holding & Dickens (accepted)	557 0 0
Cooper & Mulvey	460 0 0
Chapman	405 0 0

For shop and residence at Chertsey, for Mr. Waterer.
Mr. Thos. Wonnacott, architect:—

Tulley	£1,675 0 0
Adamson & Sons	1,392 0 0
Goddard & Son	1,322 0 0
Easton Brothers	1,305 0 0
Nightingale	1,216 0 0

For building new premises, No. 56, Bath-street, City-
road. Mr. Henry T. Gordon, architect. Quantities supplied:—

Conder	£1,448 0 0
Hill & Sons	1,400 0 0
Bowman	1,377 0 0
Heaps	1,290 0 0
Wright	1,206 0 0
Scrivenor & White	1,183 0 0
Perry Brothers	1,127 0 0
Ebbs & Son	1,117 0 0
Blackmore & Morley	1,073 0 0

For forming roadway, Lett's Wharf Lambeth. Mr. J.
Tanner, architect:—

Griffiths	£278 0 0
Booth (accepted)	287 0 0
Butley	355 0 0

For doing certain repairs and alterations to a house at
Kingston-on-Thames, for Mr. H. Nash. Mr. John S.
Elliott, architect:—

Dolling	£230 0 0
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For erecting shop at Loughton, for Messrs. J. & B.
Price. Mr. J. Tanner, architect:—

Wells	£106 7 6
Greenaway (too late)	337 8 0
Cuthbert	226 16 0
Egan (accepted)	278 0 0

For the erection of four cottages, New-street, Henley-
on-Thames, for Messrs. Harris & Hewitt. Mr. Frederic
Hassan, architect. Quantities supplied:—

APPS	£285 10 0
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Scott	379 0 0
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Clements	367 0 0
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Wills	365 0 0
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Simonds	354 0 0
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Sadler (accepted)	360 0 0
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For additions and alterations to Woodside, Caterham,	
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for Mr. Joland Davers. Mr. Richard Martin, architect.	
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Quantities prepared by Mr. Frederick Sparrow:—	
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Chappell (accepted)	£270 0 0
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For enlargement of St. James's Church, Clapham.	
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Messrs. F. & H. Francis, architects:—	
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Cole & Son	£5,550 0 0
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Higgs	5,135 0 0
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Myers	4,938 0 0
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King & Son	4,770 0 0
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Deards	4,768 0 0
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Brown & Robinson	4,617 0 0
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Dove Brothers	4,558 0 0
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For finishing six houses at Friars-place, Acton, for Mr.	
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William Hooper. Mr. Edward Hewett, architect:—	
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Miller	£1,011 0 0
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R. & F. Pargeter	881 0 0
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Glover (accepted)	898 0 0
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For building warehouse and offices in North-street	
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Messrs. Gadsden, Ellis, & Scorer, architects:—	
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Simson	£276 0 0
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Parkins	619 0 0
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Sharpton & Cole	555 0 0
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For finishing three warehouses on the Charterhouse	
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Estates. Mr. J. Collier, architect:—	
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Cole & Vaughan	£1,693 0 0
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Cullum	1,496 0 0
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Newman & Mann	1,486 0 0
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Nightingale	1,333 0 0
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Kealy Brothers	1,240 0 0
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Sharpton & Cole	1,297 0 0
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Kilby	1,283 0 0
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Ferry Brothers	1,273 0 0
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For alterations at 28, Cheapside. Mr. J. H. Rowley,	
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architect:—	
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Crabb & Vaughan	£418 0 0
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Scrivenor & White	374 0 0
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Boston	360 0 0
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Merritt & Ashby	355 0 0
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Sharpton & Cole	352 0 0
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Shepherd	340 0 0
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King & Sons (accepted)	315 0 0
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For Preston Police Station. Mr. H. Card, county sur-	
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veyor. Quantities supplied by Mr. B. H. Nunn:—	
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Nightingale	£1,444 0 0
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Rosell & Botting	1,430 0 0
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Hollands	1,380 0 0
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Barton	1,345 0 0
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Barnes	1,330 0 0
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Chappell	1,309 0 0
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Cheesman & Co.	1,291 0 0
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Nash & Co.	1,250 0 0
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Lockyer	1,150 0 0
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Hanmond	1,176 0 0
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Blackmore	1,129 0 0
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Miles (accepted)	1,092 0 0
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For workshops in Charterhouse-square, Hull. Mr.	
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R. G. Smith, architect. Quantities not supplied:—	
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Marshall	£490 0 0
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Charleson	380 0 0
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Fluster	384 0 0
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Thompson & Son	376 0 0
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Heas	363 0 0
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Jackson	369 0 0
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Barnitt	352 0 0
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Evington & Warram	335 15 0
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Hookley & Liggins	333 10 0
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Hart Brothers	315 4 0
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Reynard	333 0 0
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Stanley	327 0 0
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Robinson	325 16 0
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Jackson	325 0 0
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Steele & Darnley	310 0 0
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Hutchinson & Son (accepted)	313 10 0
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For sewers at Stockton-on-Tees:—	
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Prior	£719 0 0
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Young	610 19 0
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Spooner (accepted)	686 2 0
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Adams	663 0 0
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For new stabling, coach-house, and other works at New	
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Mables, for Mr. Charles Woodroffe:—	
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Reaport	£244 10 0
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Summers	180 0 0
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Jones	169 0 0
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Adrick & Salmon (accepted)	148 10 0
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For the erection of stores, Gun-street, Reading, for	
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Messrs. Chancellor & Anderson. Messrs. W. & J. T.	
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Brown, architects. Quantities supplied:—	
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Harncoat	£200 0 0
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Matthews	741 0 0
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Sheppard	730 0 0
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Wheeler Brothers (accepted)	695 0 0
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For works at Messrs. Waters & Sons, Chertsey.	
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Mr. T. Wonnacott, architect:—	
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Tulley	£1,675 0 0
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Adamson & Sons	1,392 0 0
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Goddard & Son	1,322 0 0
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Easton Brothers	1,285 0 0
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Nightingale	1,216 0 0
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For fifty cottages at Thorncliffe Iron Works, near
Sheffield. Messrs. W. G. Habershon & Fife, architects.
Quantities supplied:—

Naylor	£5,420 0 0
Groom	4,920 0 0
Palmer	3,861 0 0
Moss	3,731 0 0
Patkinson	3,587 0 0
Taylor	3,468 0 0
Fretevel & Henderson	3,460 0 0
Chadwick & Thirlwall	3,476 0 0
Best	3,214 0 0
Medley & Proctor	3,175 0 0
Wilson & Roberts	3,080 0 0
Slack & Grayson	3,079 0 0
Goodyear	2,914 0 0
Killen (accepted)	2,918 0 0
Carr	2,880 0 0
Clements	2,421 0 0

For warehouse, &c., for Mr. T. Stamford, in Sussex-
terrace, Brighton. Mr. J. Hill, architect. Quantities
supplied by the same:—

Colewell	£290 0 0
Ancombe	544 0 0
Nadin	530 0 0
Hampton, Holcombe, & Dillaway	504 11 10
Ryan	468 0 0
Rice	472 0 0
Newham	438 0 0
Elliott	432 0 0
Blackmore	440 0 0
Chappell	424 0 0
Nurcombe & Knight (accepted)	420 0 0

Srs.—In your last publication respecting the Aber-
deen Market contracts it is said "the former contractor
having failed." I beg to state that is incorrect; but the
architects and the commissioners have failed in their part
of the contract, which caused the stoppage. The whole
matter is now under legal investigation, and the particulars
of which must shortly appear.

A. RIDOUT, Contractor.

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F. H. C. A. R. S. R. G. P. J. T. M. W. J. F. H. C. G.
C. R. J. W. G. (we are not able to interfere as to the said)
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the duties of the said Office. He will be required to perform all the duties of the

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The Builder.

VOL. XXVIII.—No. 1426.

Salisbury, Sarum, and Surroundings.



H & C

ONEY does not flow in very abundantly at present for the restoration of the Lady Chapel at Salisbury, as a memorial of the late bishop. The works, however, are being proceeded with gradually; the Parbeck columns, now all to pieces, are being mended and polished, some of them being taken down and half renewed, and the result will doubtless be to bring back to its original condition one of the most interesting and elegant portions of the cathedral. At present, the works here and in the choir,—where Wyat's coarse, ugly canopies of the stalls are being removed, and will give place to something that is sure to be better,—Mr. Scott directing, have enforced the erection of a temporary screen at the east end of the nave, that necessarily

destroys the interior effect. Salisbury Cathedral has always seemed to us an over-praised building. Talk of it in the same breath with Westminster, Lincoln, Ely, or Canterbury, we will not. It is particularly valuable, its history is so clearly handed down; we have before us an almost newspaperish account of the people who were gathered together by Bishop Poor, on a certain day in the year 1220, to lay corner-stones. We are aware that it was consecrated in 1258; that it cost 27,000*l.* in the money of the day, exclusive of the spire, which was built a hundred years later; and we even know that the first clerk of the works was Elise de Dereham; and that after so serving for twenty years, he was succeeded by one Robertus. The very fact that it was carried out continuously in one style, as its admirers boast, prevents it from competing in interest with a building that has the history of centuries written in its various parts. It is wanting in sculpture, wanting in mind-work; and even the west front, charming as it is in many respects, is full of what would be called faults in a modern front. It is very much a mere screen, to begin with,—a thing of itself, and not the actual outgrowth of the plan and section of the building; the quatrefoil string, so to term it, that runs along the front over the second tier of windows, is greatly too large and coarse for the other parts of the design, while the way in which the arcades are nangled in parts is inartistic and indefensible; nevertheless, it is, as we have said, very charming after all, and especially so the central compartment, with its beautiful triplet. Indeed, when we qualify our praise as we have done, it is only in opposition to those who claim too much. The picture presented by the cathedral to the visitor entering the Close (the closed place) at the north-east is one not easily equalled and not soon forgotten. The pyramidal outline of the group, springing from a well-kept, brilliant sward, the central spire reaching heavenward some 404 feet, is perfect; and, approaching closer, the effect produced by the outline of the two

transepts, and the dignity of their elevation are very striking. The lofty north porch, too, is a very fine feature.

The oneness of the design is the more remarkable, remembering the extent of the building. An ancient local rhyme gives some idea of this extent when it says,—

"As many days as in one year there be,
So many windows in this church you see.
As many marble pillars here appear
As there are hours through the docting year.
As many gates as moons one here does view,
Strange tale to tell, yet not more strange than true."

On the other side of the cathedral the view would have been much improved if the chapter-house, when it was under repair, had received a high-pointed roof, such as, we find no reason to doubt, originally crowned it, or was intended.

This chapter-house, by the way, is a work of rare merit and interest. The vousoirs of the arch in the vestibule and the spandrels of the arcade below the windows in the chapter-house itself contain the most interesting series of Mediaeval sculptures anywhere to be found. Those in the vestibule represent figures of the Virtues trampling on the Vices, and are full of life and spirit. The series in the chapter-house sets forth in its own way the history of man from the Creation to the delivery of the Law to Moses. When the chapter-house was restored, a few years ago, under the direction of Mr. Clutton (not Clutterbuck, as accidentally printed in Murray's "Handbook for Wiltshire"), these were also dealt with, and the whole, as well as the arcade and other parts, were discreetly polychromed by Mr. Hudson; a tile floor, stained glass, Parbeck shafts, and colour in the vaulting, making the whole consistent and cheering. It is matter for great regret that much of this colouring is already destroyed, and that much more of it is doomed. A fatality seems to attend all our efforts to re-introduce colour in decoration. It appears, that in order to get a good surface for painting on, coat upon coat of paint was given to the stonework of the arcade, and the result is that this is now separating in a body from the stone. It comes off in such a thickness that it is difficult, without careful examination, to avoid the belief that the painting has been executed on paper or canvas, and that this is now separating from the wall. This is a very serious and regrettable matter, and we earnestly urge the dean and chapter immediately to call together a committee of advice on the subject, who should seek resolutely for some means to arrest the evil.

There is monumental sculpture in the cathedral well worth study, as every one interested in such works knows; notably the effigy of William Longespée, Earl of Salisbury, who had King Henry II. for father, and "fair Rosamond" (*Rosa Mundis*) for mother, and died in 1226, at his castle in Old Sarum, where the cathedral originally was. The effigy, of stone, is full of charming feeling; the basement on which it rests is of wood, and was richly painted, gilt, and silvered. Such vestiges of the decoration as remain should be most carefully preserved. The very respectable verger of the cathedral, when showing to us the monument, was running into the old story of the connexion between the name of the earl and the length of the sword by the side of the effigy, but, seeing that he was being looked at, wisely glided off into "at least it used to be said so, but—" and so on. We wonder if he still points out the miniature effigy on the north side of the nave as that of the "Boy Bishop." It is hard to give up an old tradition and something to talk about, but we go fully with Mr. Planché in repudiating this appropriation. The story is probably well remembered. The choristers were in the habit of annually electing a bishop who sustained the office with mock dignity for three weeks, and the tale told for many years and now of the miniature effigy is, that it represents one of these play-bishops,

who in the thirteenth century died during his brief reign. The tale will not bear examination. Who would go to the expense of a monument for such a purpose? Moreover, miniature effigies, reasonably supposed to indicate that a portion only of the remains (the heart, for example) had been deposited near them, are not uncommon. It might as well be said that the miniature female effigy in the Abbey of Jarrow, near Melun, commemorated a little fourteenth-century Queen of the May, and that the well-known cross-legged statuette of a knight in the Church of Horsted Keynes, Sussex, represented a crusading Tom Thumb of the Mediaeval times. It seems a pity that Mr. King, in his "Handbook of the Cathedrals" (1861), should have repeated the story of the effigy of the Boy Bishop, as if it were unquestioned.

Glancing at some of the modern memorials, it will be seen that the brass that was put up against the west wall of the north transept, in honour of John Britton,—active, energetic, useful John Britton, the historian of the cathedral,—a brass put up at the cost of certain members of the Institute of Architects, has, like most other modern brasses that we know of, a rusty, wretched appearance, and that the lettering is scarcely readable. It will be desirable in any future works of the kind to avoid "rubrication," which, in the course of a few years, usually presents a ridiculous aspect, the coloured letters either staring out all alone, in a ghastly sort of way (while the rest of the inscription is undecipherable), or disappearing altogether, when the remainder of the words has a disposition to allow itself to be read.

If we get out at the west door and look again at the front, we shall see how much work has been recently done there. Mackenzie's admirable drawing of this front in Britton's volume, a drawing so correct that a photograph does not shame it, shows that only eight statues remained in the niches; there are now probably eighty, the work of Mr. Redfern, and which have been put in within the last few years. Looked at from a distance, they arrange themselves in five lines, exclusive of the Saviour "in Majesty" filling a vesica in the point of the centre gable. The figures are made to illustrate the *Te Deum*, commencing, "To Thee all angels cry aloud;" "To Thee cherubin and seraphim continually do cry;" and so on. Accordingly, there is a tier of angels, a tier of Old Testament patriarchs and prophets, a tier of apostles, a tier of doctors, virgins, and martyrs; and a set of worthies eminent in the English church,—*"The Holy Church throughout all the world doth acknowledge Thee."* The authority for this arrangement in this special case must be small, nor do we know that the vesica originally contained a figure. Mackenzie's drawing, to which we have referred, shows it filled with a quatrefoil. However, the scheme serves perfectly well as a foundation for devising a series of statues to complete the front, and some of them are remarkably well executed. They can only be regarded as decorative sculpture, and are necessarily valueless from any other point of view; very unlike, for example, the statues in a similar position at Wells, which, while they remain untampered with, serve to show the state of art in this country at the date of their execution, and to illustrate costume and ornament. Let us express a hope that in carrying out the intention which has been expressed to fill the vacant places at Wells, and repair the existing statues, the latter will simply be repaired and maintained, and that the new figures will be carefully marked as such.

The central niche of the eleven at Salisbury over the central door contains a representation of St. Christopher, with the infant Christ upon his shoulder; so that if the ancient superstition still prevail, that,—

"To him who St. Christopher's figure shall see,
Nor weakness nor failure on that day shall be,"

the good people of Salisbury may easily make themselves happy by good assurance every morning of their lives. This west front, we may mention, is later in date than the rest of the body of the church, even if the ball-flower ornament on the pedestals of the statues nearest the ground were sculptured after the front was finished.

The early history of Salisbury and its cathedral cannot be fully grasped without walking out to Old Sarum; but what we have to say of this and of other surroundings,—such as Wilton, and Longford Castle, with their marvellous collections, and the Museum in the city,—must wait for another occasion. Meanwhile, however, let us add a dozen lines on a domestic matter, first enjoying a peep into the cloister-garth, where loving hands for some months past have daily decked with flowers the grave of the late Bishop, and a charming view in the close, made up of ancient houses, dainty gardens, and the old grey archway. On "bly the May-day" when we were there, apple-trees were ablaze with such exquisite blossom as we have not often seen.

The hall of John Halle, the woolstapler, a well-preserved piece of domestic architecture of the reign of Edward IV., and some other remnants of the old times, may yet be found in Salisbury. The long-standing hotel, the White Hart, with its big columns in front, is now the "White Hart, Limited,"—word of omen dire to knowing travellers seeking comfort; a word suggestive of rooms flaring with new paint and paper, without pictures on the walls, a china cup on the mantelpiece, or an old-fashioned chair in the corner to awaken an interest; of extravagant charges, and utter inattention on the part of the overlooker, no longer a "host" but a "manager." We know of more than one party visiting this very White Hart, Limited, each staying two or three days, having private sitting-rooms, hiring carriages, and otherwise spending money, who yet never saw the manager, male or female, during the whole time. In the comfortable old-fashioned hostel,—take, for example, the charming "Peacock," at Rowsley, or "The George," at Northampton, full of knick-knacks from top to bottom,—it is the custom of the landlord or landlady, as the case may be to bring in the first dish at dinner, and a good custom too; and it is pleasant to find in many parts of Germany and elsewhere, the landlady, when the bill has been paid, waiting to see her guests depart, and handing a *bouquet* to Madame, with hopes for a kind word in her favour to friends coming that way. The "managers" in England for hotel companies, "limited," are either too great people or too entirely stupid to adopt any such course of proceeding. If hotel companies wish for satisfactory dividends, they must set to work to educate a race of good managers, and lower their prices, so that the advantages and pleasures of travelling in England may be extended to larger numbers than can now venture upon the attempt to obtain them.

HOMERIC ARCHITECTURE: THE PALACE OF ULYSSES.

THERE is something more than mere archaeological interest in an endeavour to recover some details of the palace of Ulysses,—of its plan especially, from the scattered notices in the *Odyssey*—of the palace that is, as conceived by the poet, and manifestly taken for granted by him as a model familiar to his original auditory. A lively realisation of localities and distributions of space is certainly not so necessary for the enjoyment of this poem as of the "Divina Commedia," and, as the Greek poet doubtless referred to a scheme of well-known arrangements, there is no reason to credit him here with even a portion of that marvellous faculty of inventive construction that often disposes us to exclaim—whether descending from circle to circle, or ascending from sphere to sphere—"How great an architect was in Dante lost!"

Still, the great crisis of the poem, at the contest with the suitors, in the 21st and 22nd books, involves so much going in and coming out of, and moving about the palace, that we may do injustice to the simple consistency of the poet, unless

we can place ourselves at that point of view of the field of action that he might fairly expect those who should be interested in his story to occupy.

We proceed at once to the scene where the notices that we are chiefly interested in, and the occasions of their interest, lie most closely together. We shall take the liberty for other than mere typographical considerations, to substitute italic equivalents for letters from the Greek font, unless when moved to an exception.

It is in the seventeenth book that Ulysses—disguised, indeed metamorphosed into the semblance of a beggar—comes in sight of his home after an absence of twenty years. He is as yet unrevealed even to the loyal servant Eumæus, who by command of Telemachus, at present sole possessor of the secret, is conducting him; confident as the much-enduring man may be in his self-control—he has just endured to be spared visibly by one of his own slaves without retaliation, without a word,—he greets the place in terms calculated to explain away any slightest sign that might escape him of recognising what he was professing to see for the first time. He breaks out in admiration: the structures (*dāmata*) are too beautiful not to be those of Ulysses,—easily would they be identified though amidst many others. Their extensiveness is also indicated (v. 288), one set follows on in connected order with another; the court (*aule*) is finished off with wall and coping-doors, which, with the double or folding doors, make a thoroughly effective enclosure. We have thus the general image of a palace that reminds us—though apart from the town—of the principle of the vast pile of the Strozzi in the midst of factation-worried Florence, or of an English castellated mansion in Medieval times. Offices and homestead are comprised within a solid external wall, and a main entrance is well closed by a door of corresponding stoutness. It is here at the approach to the portals (xvii., 297) admitting to the enclosure of the *aule*, that the affecting incident occurs of the dog Argus recognising his master with expressive ears and wagging tail, but—too old and weak even to crawl towards him—dying as he greets him again,—again, after the twentieth year. Incidentally this leads to the mention that here, full in front of the entrance—but we are by no means bound to suppose close to it—was the heap of manure from mules and oxen accumulating till it should be carried away by the servants and spread over the vast *temenos*, or domain of Ulysses. Ro kingship is presented to us in Ithaka as a mode of life as mixed up with the primitive and predial, as the authority of any chairman of quarter sessions that ever was interested in the question, "how a score of ewes at Stamford fair?"

The situation of the palace, we may note, is away, but not very remote, from the town, whither the suitors habitually repair to the agora, and every night to sleep; and it is within view of the sea; for when the suitors have sallied forth from the "megaron out beyond the great wall of the *aule* in front of the portals" and are debating how to notify to their comrades at sea the return to Ithaka of the waylaid Telemachus, one of them turning his head bursts into laughter as he sees their vessel just entering the port bootless from the murderous expedition (xvi., 343).

In the first book we have another description of an arrival at the palace,—Minerva, no less, in disguise, personating a Taphian prince, appears at the *prothyra* (here in the plural), the vestibule or, at least, space before the doors, of Ulysses, standing on the threshold of the *aule* (*oudos auleios*, l., 105). Here she finds the suitors "in front of the portals"—the same phrase that is used for the position of Argus—amusing themselves at draughts or dice (*passos*); they sit on the hides of oxen slaughtered for their revels. Telemachus, who is seated among them brooding over his discontent, sees the stranger at the doors, makes direct (v. 119, *ὅδε προθύρα*) for the *prothyron* (singular), to welcome him, conducts him to within the lofty *domos*, sets his spear against a tall column in the well-smoothed *daurodake*—"spear-holder" (original suggestion, it has been thought, of the fute),—and prepares a hospitable welcome.

While the suitors amuse themselves, the servants are preparing within for the feast, mixing the wine, sponging and placing the tables, and cutting up meat. As Telemachus leaves the suitors to proceed to the *prothyron*, they are not to be conceived as lying about within an actual vestibule outside the door of *aule*, but merely in the general space in front of it; so, on the later occasion, they are exercising

themselves with the discs and throwing the spear on a *tukton dapelon*, a made or levelled plot, *ῥάποδς*, in front of, the *megaron* of Ulysses; and thence, called by the herald Medon, they proceed into the *domos* or the *domata* (xvii., 175—178) to the feast.

Megaron, it is clear, is used here, as we shall find it occasionally hereafter, in a general sense, like *domata* and *domoi* frequently, and the scene was thus exterior to the *aule*; indeed in front of it, like that of the dice-playing, "before the doors."

Eumæus, leaving the supposed beggar to follow, enters the building, the *domoi*, and proceeds direct to the *megaron*, *ἔνθ' ἐμεγαλοῖ* (xvii., 325) to the feasting suitors. Ulysses speedily follows, and seats himself on the ashen threshold, "the *melinos oudos*, within the doors, and leaning against the door-post of cypress-wood that the joiner on a time had skillfully smoothed and set up vertically by the *stathme*," or rule. Here he is seen by Telemachus within, who sends him food, and from hence, at his suggestion, he rises to beg of the suitors in order.

The wooden—*melinos*—threshold and highly wrought doorway indicate a doorway to a chamber, not to an open court,—to the *megaron* proper, or, as the derivation implies, great chamber, the dining-hall of the men. Thus the *aule* is first entered from its *prothyron* over the *oudos oudos*, and from the *aule* by the *melinos oudos*, the *megaron*, or dining-hall.

But it is while Ulysses is seated here that the vile mendicant Irus arrives to abuse and challenge him,—miserable and aged as he seems; and his first greeting is, "Be off from the *prothyron*," the vestibule we have to assume pertaining to the *megaron*, and comprising its threshold. An altercation quickly arises before the lofty doorway, thus rather without than on the inner side (*ὑποπόδες*, xviii., 32) upon the "smoothed threshold." The suitors all rise up and crowd about to foment the fray, encourage the seemingly unwilling Ulysses, and drag the really reluctant Irus (*ὁ μέγας*, v. 83) into the middle, but to which side of the threshold does not at present appear. Ulysses, fearful of being recognised or suspected, determines only to injure his adversary moderately, not kill him outright. Anticipating the pugilistic canons of Jackson, he contemns a blow on the right shoulder in order to plant one,—decisive,—on the neck of Irus below the ear, breaking his jaw, and felling him helpless to the ground. The suitors are charmed, as were charmed English peers and princes of a generation now fast dropping away; but Ulysses, taking him by the heel, dragged him "out through the *prothyron* till he came to the *aule* and the doors (*thyrai*) of the *aiethousa*" (xviii., 101), of which presently; there he set him up leaning against the *erkion* of the *aule* (the external wall of the *aule*), and left him, giving him a stick to keep off dogs and swine, and a moral lesson in humility and modesty to ponder over.

He himself resumes his wallet and his place at the threshold, and the suitors (v. 110) "came in," laughing heartily and applauding his victory.

It would seem to be clear from the description of its sequel that the battle took place "in the midst" of the dining-hall, or *megaron*, in the space left vacant by the seats and small tables that are always described as in rows on either side of this that Ulysses dragged Irus by the heel, and through its *prothyron* into the *aule*, and thence again through the outer door, the external gate. Both the *aule* and the *megaron* have, as we have seen, each a portal; that of the *aule* admitting into the building from without; that of the *megaron* intermediate between it and the *aule*; and each portal has its own *prothyron* or vestibule.

It is said, however, that the suitors come in (*ἵκω*) after witnessing the fight, which seems to imply, inconsistently, that it took place in the *aule*, unless we suppose either that the ring was formed in the *prothyron* of the *megaron*, or that they followed Ulysses as he dragged out the groaning and defeated bull.

After the phrase, "till he came to the *aule* and the portals of the *aiethousa*," we are bound to identify the portals of the *aule* with those of the *aiethousa* as admitting to it. But what, then, is the *aiethousa*, and was it within or without the *aule*? On these points we may gather collateral illustration from the descriptions in the poem of other palaces. The presumable derivation of the name implies brightness, warmth, as from direct admission of the solar rays.

* A report has reached London that a German *amateur* engaged in exploring the plain of Troy, while making some excavations near the village of Cypar, came suddenly on the ruins of a cyclopean wall, about 8 ft. thick. The works were actively pushed on, and from what has already been brought to light, the writer is convinced that he has at last discovered the remains of the famous palace of Priam. Indeed, he asserts that the part of the ruins already uncovered exactly tallies with the description of the place given by Homer in the "Iliad."

In the palace of Menelaus (iv., 302) proper and, indeed, luxurious beds are made up for Telemachus and his companion in the *prodomos* of the *domos*, under the *athousa*, which here, and constantly, has the epithet *ipódutos*, or sounding; and, again, their bedsteads and beds were set in a corresponding place in the house of Nestor (iii., 339). This was for bachelors. Nestor himself, as Menelaus likewise, retires to his conjugal chamber,—the *muchos* of the lofty *domos*—a retired apartment in an upper story.

Ulysses also—a beggar truly—but hospitably favoured by Penelope (xx., 1) sleeps in the *prodomos*, though with no bedstead. Fleeces are laid upon a bull's hide, and he is supplied with coverlets which in the morning he takes into the *megaron*, carrying the hide, *Sipalē*, without. In the palace of Alcibiades he has like dignified accommodation as his sons (vii., 343).

The *athousa* is thus a member of the *prodomos* at Pylos and Sparta, as of the *aule* at Ithaka; its occupants are always spoken of as in the *prodomos*, but under, not in, the *athousa*. The *prodomos*, therefore, had its *athousa*, as well as the *aule*,—or rather we have to infer that the *athousa* extended round the *aule*, but on the side of the *domos* a *megaron* received a certain development as its *prothyron*, and by closer connexion with the house and its offices became distinguished collectively as the *Prodomos*. Here there is no unbecoming accommodation to be found for a sleeping-place, while at the remoter side, near the main gates, goats and cattle brought up to supply a festival, are fastened up. It is under the *athousa* that Philoctetes finds the piece of ship-timber with which he blockades from within "the portals of the well-fenced *aule*" when the time is coming on for the onslaught on the suitors.

The epithet "sounding" or "resonant," is manifestly applicable enough to a long roofed corridor or lean-to open at one side.

As regards the *prothyron* of the *aule*, no proof so far appears—let us rather say, no presumption—that it was covered like an advanced portico. The following notices settle some points, but leave this still open:—Telemachus and Pisistratus draw up their horses at the palace of Lacedæmon as Nausicaa her mule-car at her father's, in the *prothyron* of the *domos* (iv., 20; vii., 4). But when Telemachus takes leave of Menelaus, the horses are put to, and they drive forth of the *prothyron* and the sounding *athousa* (xv., 191). The great door of the *aule* was thus wide and spacious enough to admit horses and chariot, which agrees with the massive timber that Philoctetes employed to block them. We may now also infer that the stables were within these, where the servants on their arrival (iv., 39) had put up, and fed the horses, and propped the chariot against the bright walls *enopia sigalœnta*. Hence, also, is explained how the dung-heap of Ulysses came to be placed so naturally, however unhandsonely, near the entrance of the *aule*. The goats and steer brought for the suitors' feast are fastened in the *athousa* (xx., 178—189). The swine are left to feed about the *epœa* (xx., 164). Thus we are brought to the distribution described in the Greek house of Vitruvius, where the main entrance admits horses as well as foot passengers, and the stables are arranged on either side of it, and thus close to the road and as remote as may be from the inhabited rooms.

The *aule*, it is now clear, must have had considerable extent, and is not to be confined to the limits of a mere apartment; it was answerable to the bailey of a Mediaeval castle, surrounded by a wall, well-built, lofty, and with strong coping. It had one main and strong door,—the space in front of it, whether covered or not, most probably, I think, including a covered portico, is the *prothyron*,—the door has double leaves, and within are stable and stall for mules, horses were unsuitable for Ithaka, and oxen; for the latter possibly only, as they were brought up for slaughter at sacrifice and festivity.

On the return of Telemachus from his excursion, his first care is to reassure his mother; on reaching home, he placed his spear against a tall column, and went in (*ēiōn* = "ben") himself and stepped over the stone threshold (*lathnos oudos*), and here Penelope meets him issuing from her *thalamos*,—which, for anything that appears, is on the ground floor, the rather as on quitting her he goes "through out from the *megaron*" (xvii., 61).

This stone *oudos*, or threshold, is mentioned again (xxiii., 88) when Penelope descends from her upper chamber, and "entered passing over

it" to where Ulysses is seated by a tall column in the flat blaze of a fire that has been lighted to purify the *megaron*. This, therefore, is the threshold of the door that separates the more public from the private, the *andronitis* from the *gynaiconitis*—the domestic and women's division of the palace. Penelope descends by stairs from an upper chamber (i., 330) to expostulate with Phemius for the painful subject of his Trojan song, and thrice with the suitors, and presents herself before the *megaron* each time "standing by the *stathmos*—'door-post' probably—of the firmly wrought *tegos*," or roofed structure (xvi., 413. Cf. v. 449), and again in almost similar terms (xviii., 206, and also xxi., 64). It must be on the inner side of this doorway that she sits "by the *stathmos* of the *megaron*" (xvii., 96), probably the same as that of the *ryōs*, reclining and whirling the spindle while Telemachus and his guest take refreshment before her, after issuing from the bath provided under the customary tending of the female servants.

It is in this position that the maiden Nausicaa stands to interchange those last words with Ulysses that have touched the tenderest and strongest hearts for thousands of years (viii., 458).

The room which is thus entered from the *megaron*, is perhaps rather of the nature of a corridor, having the spaciousness of a hall, like the *tablinum* of a Pompeian house; we have seen that one *thalamus*, at least, opens into it. It seems to pertain to the division of the general structure, or assemblage of structures, that is sometimes specially designated *dōpa* or *ryōs*.

In the 19th book we have an example of how the same word is used, in both a collective and distinctive sense, within a few lines. Ulysses, after all have retired, remains alone in the *megaron*. Hither comes Penelope from her *thalamus* to inquire his news of her husband; and the female servants, who had previously been locked out from the *megaron* by Euryclia (xix., 15—20), came out from the *megaron* (xix., 61—60), and proceeded to clear away the remains of the feast,—the tables and cups of the retired suitors,—literally, therefore, they come out from the *megaron* into the *megaron*; the same observation applies to their entrance (xxii., 497); so in the touching remonstrance of Ulysses with Amphinomus *melathron*, elsewhere, particularly the blackened roof-tree,—is used as general term for the palace,—and to move across the *megaron*, or dining-hall—the "great chamber" of Master Slender, is to proceed *διὰ δōπα* (xviii., 150—153). Penelope, again, speaks of her flock of geese feeding from troughs *κατὰ οἶκον* and *ἐν μετόπισθε* (xix., 535).

The conclusion hereafter.

PICKINGS AT THE ROYAL ACADEMY.

THE 1,229 pictures and other works of art exhibited this year in the galleries of the Royal Academy have been talked about at such length in so many places that, in view too of more than ordinary pressure on our columns, we were disposed to confine ourselves to a review of the architectural drawings. We cannot, however, bring ourselves quite to this; but shall, nevertheless, restrict our observations to comparatively few works.

The general opinion entertained that the Exhibition of 1870 is not quite up to the mark of some of its predecessors is probably chiefly due to the absence of those special stars or universally-admired favourites which, on some former occasions, have taken the public by storm. Of the highest grade of merit illustrated (and that we regard by no means as a contemptible one), there probably will be found a larger number of works than usual; and the absence of very bad pictures, though by no means total, is tolerably satisfactory.

The veteran Landseer, who last year did not increase, even if he could be thought to maintain, his high reputation in his own branch of art, comes to the front with two very remarkable pictures. There is the more cause for congratulation that this should be the case, since Sir Edwin has permitted himself to send for display a picture noticeable for its size, and eminently deserving attention for its subjects, but, in other respects, fit only to be passed by in solemn silence. How this great artist, unless fettered by "command," could have completed and sent for exhibition such a work we can explain to ourselves only by the same merciful disposition of Providence which seems to protect puny,

sickly, and deformed children by an especial share of their parents' love.

Sir Edwin's "Voltigeur, Winner of the Derby and St. Leger, 1850," catches the eye before the visitor enters the first gallery. Devoid of the slightest trace or attempt to make a picture, it looks, from that spot as well as on a nearer approach, a live horse, and a very noble one; its blood showing in the delicate nostril, its points fully defined, and its lustrous skin, not too recently currimbed, gleaming with apparent swell and rotundity of muscle. Two wonderful cats mutely call on the spectators to share their own evident admiration of the grander quadruped. The background of stall and litter is slightly, but not too slightly, painted in; and we see what a race-horse not only should be, but actually was in 1850. The second of these portraits of our four-footed cousins has a bad title, which may be taken, we feel sure not correctly, as a skit on a very noble and self-denying profession. It is called, (265) "Doctor's Visit to Poor Relations at the Zoological Gardens." We would take it that the hour of the visit is alone intimated; and that the supremely unconscious black monkey, who sits perched upon a rail behind the larger green ape tending her sick offspring, is not intended for a medical visitor intent only on his fee. The black ingrate holds a large fruit in his hind hands, without prejudice to their function of maintaining him on his perch, at the same time that he is eagerly emptying a similar luscious morsel, which he holds in his anterior graspers. Naturalists find a dozen errors in the picture, but the sick look of the baby monkey and the anxiety of the parent are life itself.

The question has been raised as to the true secret of the wonderful manner in which the animals of Landseer lay hold on the mind. It is not by truth to nature alone. It has been suggested that the painter represents human passion under the guise of animal nature. This, however, is caricature, and not one of the six animals we have mentioned approaches a caricature. We hold that the kernel of the matter lies deeper. There is, to a certain extent, an actual community of passion, and almost of intellectual, nature between man and many of the vertebrate animals, more especially with beasts and birds. The common emotions of parental instinct, greediness, fawning admiration, quiet enjoyment, as illustrated in the paintings before us; the agony of flight or the ardour of the chase; the fierce resolve that turns to bay; the sense of duty, evinced in the performance of the functions of a sentinel; to refer to some others of the best known of Sir Edward's pictures:—all these are sentiments natural to, and powerful in, both man and beast. The painter who seizes these sentiments in the moment of their most vivid entirety, clothes them in well and truthfully rendered animal form, and thus brings "our poor relations" before us, as part of that great family of which we hold the primacy, gives a more deep and truthful lesson than he may himself altogether apprehend; or, if so, he apprehends it, as we admire it, by instinct and not by argument.

It seems somewhat uncharitable to name such a portrait as that of the Marchioness of Huntley after the animal life of Landseer; although the public curiosity has probably followed this order in seeking gratification. The large price of two thousand guineas, which is known to have been paid for this portrait, hardly affords so good a reason for giving it minute attention as may be found in the beauty of the subject, and in the brilliant skill of the painter. But the truth is to be held to above all things, and the truth we take to be, that Mr. Millais has scarcely consulted his own great reputation, of which we all feel justly proud, by the style in which he has turned out of hand this, as well as some others, of his later works. From a certain standpoint the effect is magical. But something more is needed in a picture that is to live. The lady is represented as standing in a conservatory, with a basket of flowers on her left arm, and her garden scissors hanging from her right hand. Attitude and expression are noble and dignified; the features are beautiful; and the close bands of dark hair set off a thoroughbred head. In play and sparkle of colour, lighted up by the contents of the basket, and relieved by the ground and background greenery, there is nothing left to be desired. But the tropical plants behind the noble lady are indistinct almost to smudginess. The trees woven in a fairy bower, if viewed from a distance, display splashes of white paint, which seem as if laid

on with a trowel, when looked at closely. It is to be feared that a picture torned out of hand with this roughness will not be durable.

We write with an unaffected regard for the fame of an artist as to whom we think that England can no more afford that he should waste his time in fanciful experiment, than it could in the regrettable case of Sir Joshua Reynolds. We see, in the satin bows of Lady Huntley, in the ribbed trowsers and felted coat of Mr. John Kalk, a result of a visit to M. Doré's gallery. But it is the handing of his Francesca, not that of his Alcece Knitters, by which M. Doré will wish to be remembered; and a similar opinion will, we have no doubt, hereafter be that of Mr. Millais.

Of the other pictures by this artist, that of the boyhood of Raleigh is, perhaps, the finest. There is more careful painting on this canvas than on those we have cited. On the other hand, there is a luxuriant wealth of colouring that almost fatigues the eye. The blue of the sea, the green of the lad's dress and hat, the Brazilian shimmer of the heap of pebbles, the fiery glow of the rusty anchor, the strong but not inappropriate colouring of the tattooed vagabond who is feeding and intoxicating the lad with tales of travel until his soul seems ready to leap from the blue depth of his eyes,—all evidences of a wonderful mastery over colour. The attitude of the boy is admirable. This is a picture which, somewhat toned down by age, the painter may be proud to leave behind him.

Another charming work by Millais is "A Flood" (No. 91). A wooden cradle, containing an unconscious infant, is floating, or, perhaps, stranded, on a muddy lake, caused by a sudden overflow of the fens. On a tree, dripping with brilliant rain drops, and with its branches encrusted with such emerald and ruby lichens as grow next in any but fairy fens, sits a wet chaffinch. In the danger of the hour, the child's fellow traveller, a miserable, drenched kitten, mews forth her alarm, unattracted by the vicinity of the bird. The parents are putting off in a boat in the dim, Dutch distance. The patchwork coverlet, and the floating jug of yellow ware, give a homelike truth to the scene.

But the work of Mr. Millais which, in the present Exhibition, has most interest to those who look to the future of art in this country, is No. 202, "The Knight Errant." A beautiful woman, entirely undraped, is bound to a beech standing in the centre of the picture. A knight, clad in full plate armour of the sixteenth century, is cutting the rope that binds her. The corpse of one of the ruffians, whose handiwork he is undoing, is visible in a dell hard by; and the distant figures of two other brigands are defined in misty flight against the horizon. The tree is a miracle of forestry. The face and attitude of the knight are tender and gentle; the colouring of the picture is worthy of the pencil of Mr. Millais. But how about the main motive,—the captive? The reply to this question is a matter of no ordinary importance, and yet we will not here pursue it.

The name of J. L. Gérôme appears with the initials denoting an honorary foreign associate, and pictures from this artist are on the walls of the Academy. No. 18, "The Death of Marshal Ney," is a powerful, gloomy sketch. The form of the "bravest of the brave" lies extended on the ground. The firing party is hurriedly retreating, as if ashamed of their work; an officer glancing over his shoulder as he follows his men. Two or three fresh marks on the plaster of the wall, above the fallen man, tell a sorry tale in a fearful language. The great dome of the Invalides soaring through the mist beyond seems to speak of the murder of the soldier, when the errors of the man clearly have been forgotten. A still further demand on the capacity for awe and romantic sympathy is made by (985), "Jerusalem." Yet this well-known picture so outrageously defies not only realistic truth, but the harmony of historic incident, that it will not bear the slightest criticism in this respect. A long, picturesque group of Roman troops, preceded by white-robed Jews, is winding along a road leading from the Olivet hills, east of Jerusalem, towards the Holy City. The double gate towards which their course tends is, apparently, meant for St. Stephen's Gate. But the wall is about as much like that of Chester as that of Jerusalem. The locality seems to have been rudely sketched from a drawing, by Count de Vogüé, of the present state of the city, neglecting the great changes effected by the siege under Titus, as well as by subsequent events. The mighty wall of the Haram has

dwindled to a mere parapet. The deep cleft of the Kedron valley is nowhere. On the area filled by the courts and cloisters of the Temple, and by the fortifications of Antonia, grow trees, like those in a modern cemetery. Ridiculous little bits of building, miniatures of the mosques El Sakrah and El Akshah do duty for the gorgeous temple of Herod. Nor is the want of truth topographical alone. The group following the soldiers, from the ladder and other insignia which they bear, as well as from the mysterious darkness spreading over the scene, appear to be intended as proceeding to the Crucifixion. They could no more have approached Jerusalem from the east for such a purpose than a review in Hyde Park could have conducted Lady Jane Grey to the Tower. The gloomy, drifting veil, towards which two of the groups are, very theatrically pointing, seems intended to indicate the supernatural darkness of the hour. The idea suggested that the effect produced is of volcanic origin, is one which is not unfamiliar to those who are accustomed to these awe-striking phenomena. But the moon, which was at the full at the Passover, is represented as a crescent! Nor is the actual progress of the profound darkness in which stormy volcanic ashes veil a landscape such as is here represented. It advances like a wall of night. Before it, all laughs in sunshine; behind, or beneath it, all is obliterated from the view. It is like throwing a mask of ink over a landscape.

Alma Tadema contributes three of his Roman interiors, gleaming with marble and paved with mosaic. The faces, although for the most part Roman in their outlines, wear a look of sadness. These graphic restorations of the buried life of the Campanian cities might almost serve as illustrations of the occupations of the Elysian fields.

Of Mr. Calderon's four pictures, one is a very charming one, "The Orphans" (143). A girl, dressed in mourning, playing a harp, as a wandering minstrel, in the snow; her little brother, the sorrow of their mourning heightened by the incongruity of his stained red stockings, looking on with eyes that must be seen, not described. We do not envy the man who can look at this touching picture without feeling a tightening in the chest, or a mist coming over his eyes.

Mr. E. M. Ward, R.A., has produced a picture that will live, in (208) "Judge Jeffreys and Richard Baxter." It is full of striking contrasts, all blended and bound together by the story. The vulgar, insolent judge thundering from the bench—the dignified, sorrow-stricken form of the defendant,—the manly, indignant self-control with which his supporter regards the unjust judge,—the courtier pointing jestingly to the scurrilous song,—the old dame, in a Welsh hat, expecting to see some sign from Heaven to rebuke the harsh impiety of Jeffreys,—the patched lady of fashion moved almost to tears,—these are only some of the many telling points of this admirable picture. No. 363, by the same, "The Daughter of a King," is well known, from an excellent engraving.

Mrs. E. M. Ward's "First Interview of the Divorced Empress Josephine with the King of Rome" (No. 916), is characteristic and suggestive in expression, full and rich in colour, and careful and level in finish. It is no small praise to say that it seems to us the best picture of our accomplished countrywoman has yet painted.

There is something very charming in Mr. G. O. Leellie's "Fortunes" (104), a group of pretty girls watching the course of the roses which they throw into a little mill-stream at their feet, to indicate, by their prosperous or adverse voyage, the course of their own true loves. The picture would have gained by additional height, as the park scenery stretching behind gives a background of unbroken green, to the exclusion of the sky. No. 216, "Carry," by the same artist, a flower herself, contemplating other flowers, is also very pleasing.

The water in No. 45,—"Clare Island; the wind going down with the sun," by J. Brett,—seems actually to swell and heave on the canvas. A scene on the west coast of Ireland, No. 126,—"Contiguous to a melancholy Ocean,"—is another fine sea-piece by the same artist.

"Michael Angelo," in No. 134, by H. O'Neill, does not grasp his chisel like a sculptor, least of all like the most fiery of sculptors. He is working too tenderly, and in his own shadow. The subject is well chosen.

One of the most pleasing pictures in the exhibition is (157) "Sir Roger de Coverley and the Perverse Widow," by W. P. Frith. The artist has admirably expressed the selfish, unimpre-

sionable character of the coquetish widow, under all her beauty and rare attraction. Poor Sir Roger! who could resist that adjustment of the tucker? The confidante is just malicious enough; one can see how her mischief would burst into flame when the knight was gone. His manly beauty is of a noble type—the perfectly-arranged dress, the honest, earnest, manly love that beams from his figure as well as from his face. The soft Persian tints of the screen and the carpet unite with those of the dresses in a well-adjusted harmony. It is a charming picture. Not less so, in design and execution, is No. 267, "The Pulse, the Husband, Paris," No. 364, "Mrs. Rousby as Princess Elizabeth in 'Twixt Axe and Crown,'" is, not Princess Elizabeth, but Mrs. Rousby. It is none the less charming for that defect.

"Louis XIII. and Louis Quatorze" (No. 161), is a subject which we suggested to Mr. Calderon for a theme some three years ago. It is admirably rendered by Mr. Elmore. The contrast between the pal of the dying king, the fresh health of the infant dauphin, whose likeness is most truthfully preserved, and the anxious, boding, look of the lady who has him in charge, is very fine. "An Arab Toilet" (No. 986), by the same, is bright with Oriental life and colour.

Mr. Cook has some fine landscapes, clear and distinct as those of Canaletti, with more depth and power than is often evinced by the Venetian painter. (87) "Venice," a moonlight view; (189) "A Calm Day on the Scheldt;" (266) "A Topo, or Lagoon Fishing-boat, Venice," a happy with the repose of Italian noon; (365) "Landing Fish—Coast of Holland," with its characteristic Dutch boat, and leathery sails, are all pictures full of the beauty of nature.

We cannot pass 409, "St. Francis preaches to the Birds," by H. S. Marks. The saint has a more respectable and attentive audience than always falls to the lot of his followers nowadays. All birds most rare and bizarre in beak and plume, and ruff, and whisker, are there. The hungry pelican crouches on the ground; the kingfisher pursues its prey unheeding the words of peace. The preacher is a little like Dean Stanley. The birds are much more lifelike than the stuffed remains that sicken under secular coats of dust in the British Museum.

Mr. Fied's little Irish boy slipping out of his garments "when the day is done" (192), is very true to nature. The "Highland Mother" (968), though rather rough, is effective.

We must not omit to notice the life, and movement, and full, stirring, incident of the last production of MacLise, (197) "The Earls of Desmond and Ormond." The fiery gestures with which the prisoner throws up his arms is reflected, as it were, by the arch of the rainbow. It is thus that a hope, which is not altogether of the earth, earthy, attends on the indomitable struggles of genius and perseverance, in days of menace and of evil.

MINTON'S CHINA WORKS.

FOREMOST among the industrial "lions" connected with the ceramic art, stand the china works of Messrs. Minton, at Stoke-upon-Trent, some account of which will doubtless interest many readers of the *Builder*. The works were established in the year 1789, by the late Thomas Minton, a native of Shrewsbury. Mr. Minton was a practical engraver, and clever at his art. He commenced at a time very favourable for progress. The labours of Wedgwood, which had attracted so much attention to English pottery, had paved the way for success, and called for an increased production. An import trade had in fact been converted into an export one. English pottery then commanded a high range of prices, and it may be interesting to remark that the old "willow" pattern was first introduced at these works (copied from an old Chinese plate, the production of Ching Chang Foo), and was then sold at 5s. 6d. per dozen plates, whereas the present price averages about 2s. The productions of this house were for a number of years principally confined to useful articles; and being of a good durable material, without much reference to artistic decoration, soon commanded a good position in the home market. Mr. Minton's career was highly successful throughout, and he died in 1836, leaving a handsome competence. He was succeeded by his second son, Herbert, who obtained, as is well known, great eminence as a potter. He was possessed of a fine cultivated taste, with indomitable energy to carry out his views of im-

proving the art. He invoked the aid of the best talent at his command, both English and foreign; and the specimens in almost every variety of style shown at the Exhibition of 1851 may be referred to as proofs of his success. On that occasion, the first specimens of Minton's majolica ware, now so celebrated, were exhibited; as was also for the first time a combination of Parian statuary with decorated porcelain for dessert services. The service of this class was purchased by her Majesty as a present to the Emperor of Austria. Mr. H. Minton was commissioned by her Majesty to make the presentation; but, as great coolness had arisen between the two courts on account of a speech made by Lord Palmerston, some delay and difficulty occurred in obtaining an audience; but it was at length satisfactorily accomplished; the present was graciously received; and cordial relations were soon afterwards resumed. Mr. Minton was throughout his career as much distinguished by his philanthropy and liberal support of every benevolent object as he was for his skill and eminence as a potter. It may be mentioned that amongst his many other good works he built and endowed the beautiful church at Harta-hill at his sole cost. After a brief retirement from the active pursuits of his calling he died at Torquay, in 1858. It should have been mentioned that to Mr. Minton the public are indebted for the revival of the art of making encaustic pavements, now in such general demand for churches and other public as well as private buildings. It will illustrate the character of the man if we state that for many years he pursued this branch of business at a very considerable annual loss; and when on one occasion he was urged by his partner to give it up, his characteristic reply was, "Say no more, now: I will make encaustic tiles if they cost me a guinea each." Mr. Minton took an active part in preparing for the Paris Exhibition of 1855, and had repeated interviews with the Emperor, who presented him with the Grand Cross of the Legion of Honour.

Mr. Minton was succeeded by his nephew, Mr. Colin Minton Campbell (High Sheriff of Staffordshire last year) and Mr. Michael Dainty Hollins; and these gentlemen worthily emulated the conduct of their deceased relative by doing all in their power to continue the fame that had been achieved, until they dissolved partnership in 1868. The encaustic tile department devolved upon Mr. Hollins, and all the other branches of manufacture are carried on as usual by Mr. Campbell, in conjunction with his cousin, Mr. J. W. L. Herbert Minton, so that the old name is not likely to become extinct.

The manufactures of the firm embrace nearly every article of the potter's art; so much so, that any one embarking in the retail trade might, from these works alone, completely furnish his shop, from the richest and most costly ornament, to the requisites for kitchen use. The cost expended in modelling these varied manufactures, has been enormous, as any one would readily imagine who paid a visit to their show-rooms, which contain only their own productions. The annual value of the ware produced has averaged of late years about 105,000l.

The number of hands employed, is between 1,600 and 1,700, and amongst them there are upwards of 600 females, a fact of especial interest to the Society for Promoting the Employment of Females; but the products of the industry of this large number will make but an indifferent show at the forthcoming "Workmen's International Exhibition." The females are variously employed. The greater number are employed in enamelling; that is, in colouring patterns that are printed in outlines. Others are engaged with the printer transferring the prints to the ware; some attending the throwers and turners; and many engaged in the ware-houses. There is only one lady painter in the establishment, and she boldly challenges competition with the sterner sex. The art-director of the establishment is Mr. Leon Amoux. There are two clever German painters; all the rest are English, some of them superior artists, and who derived much advantage from their course of study at the School of Art, conducted at the building erected as a memorial of the late Herbert Minton, in this town.

The firm gained the concol medal at the Exhibition of 1851, and the *médaille d'honneur* at the Paris Exhibition, 1855.

"A Place Open to Merit."—Several correspondents inquire for further particulars. We must refer them to the Office of Works.

SIR JAMES Y. SIMPSON, BART.

SIR,—From his endeavours to aid in the improvement of the construction of hospitals, and the proposal to place a monument of him in Westminster Abbey, a separate memorial note of Sir James Simpson may, perhaps, be allowed to appear in the *Builder*.

In reference to his attack on hospital crowding, Dr. Millington, who was a pupil of his, says,—

"One matter, from its vast and increasing importance, must not be passed over. The humane mind of Simpson had been directed for years before his death to a subject which is only just now receiving the attention it ought long ago to have done. He had long been shocked at the result of amputations in large hospitals; and after ten years' investigation he began an attack on hospital crowding, and the direful evils which result from it. His vigorous mind was to the very last occupied with what has taken the name of 'Hospitalism'; and the results of his labours have yet to come; and will, in the opinion of the writer, be productive of incalculable good; though the subject has not yet been investigated so thoroughly that the exact cause or causes of the mortality after amputations performed in large hospitals can be said to have been thoroughly ascertained."

Dr. Millington states, that Dr. Stanley, the Dean of Westminster, had readily consented to the burial of Simpson's body in the abbey; but by that time preparations had been made for a public funeral at Edinburgh; and seventeen hundred persons followed his remains to the grave.

In the numerous accounts of Sir James's doings which have appeared in the newspaper press, there are a few shortcomings, errors, or omissions, in reference to old events, which it may be allowable for one, even here, to note, who was intimate with him, and honoured with his friendship, as I was, at a time when the baker's son had not many friends. One of these notes is in reference to his great discovery of the anæsthetic power and use of *chloroform* in child-birth. That others preceded him in the use of *ether* in tooth-drawing, or even in other surgical operations, may, doubtless, be the fact; as it was, indeed, that Sir Humphrey Davy had, many years before, called attention to nitrous oxide, as a power which had rapt him up, out of the fleshy and pain-feeling state, into the quasi-spiritual; and induced him, while in that state, to announce, as an "infallible" oracle, that "nothing exists but ideas." That Simpson, however, was the exclusive originator of the professional practice of destroying pain in child-birth; and had the idea, too, of doing so, previously altogether to Morton the American dentist's professional experiments with *ether* in 1846, the writer of the present note for one can testify. Before that time, Simpson and he were associated in an investigation into the reality or falsity of artificial entrapment, by what is called mesmerism; as many of the most noted citizens of Edinburgh, who witnessed our joint experiments, well knew; and, although some of these,—such as Sir William Hamilton, Dr. Combe, and others,—are now dead; others, such as Mr. Robert Chambers,—and Professor Balfour, of the Edinburgh University, who kindly introduced me to Dr. Simpson,—still live. So, I presume, does Mr. James Gall, son of an early inventor of a system of printing for the blind, who took part in our investigation; as also, for a time, did the late Mr. W. B. D. Toraball, Advocate, or Scottish Barrister, but lately of the Rolls Office, London, a family connexion of mine, whose persecution in the House of Commons by the Exeter Hall patrons killed him.

Now, at that time, or between 1835 and 1840, Dr. Simpson steadily entertained the idea of using the "deep sleep" and pain-killing power of artificial entrapment in midwifery, or for the facilitation of the natural birth; while my object had a curious antithetical co-relationship to that, as it related to an investigation of the *spiritual* birth of the life of entrapment itself, which has since been more fully carried out at Glasgow and London. A writer in the *Scotsman* newspaper, ignorant of Dr. Simpson's one grand object even at that time, thinks proper to speak of him in terms of regret, and almost censure, that he should have dabbled, idly, as he seems to think, or without a direct purpose, in what was then (if it is not still) a sort of tabooed line of research amongst medical men. Simpson's un concealed experiments, however, only showed his steady purpose, and his superior sagacity and moral courage, although he failed to render either artificial entrapment, or *ether*, or nitrous oxide, subservient to that grand and destined purpose of his life. It was to him quite a secondary matter, certainly; but I have seen him also experimenting on the possibility of performing surgical operations on the entranced, by singeing with a red-hot poker

the eye-brow and the flesh of entranced patients in the Lock Hospital, at Edinburgh, of which he was at that time the superintendent. And neither did he spare himself in his experiments with chloroform; for before any other human being had ever been rendered insensible by it, he tried it on himself and his assistant; and his first knowledge of its level-ling power was acquired beneath his own table, where he found himself lying when he "came to himself." This anecdote I have long known, although I had by that time left Edinburgh, and did not witness it. I mention it now because I have not seen it stated in any of the numerous memoirs of him at present in circulation. Nor have I observed another interesting anecdote of Simpson, with reference to his election by the Town Councillors of Edinburgh, as successor to Dr. Hamilton, the Professor of Midwifery in the University there, which election I had the pleasure of promoting through friends of the councillors. There was a strong opposition, and the election was at one time very doubtful. A serious objection to him as Professor of Midwifery was that he was not a married man. This "bull" Simpson at once "took by the horns." He immediately prepared a house for his intended bride, a most attractive and amiable lady, a cousin of his own, whom he had long previously, I believe, selected as his choice; and at his "house heating," before his marriage, I had the honour of taking a prominent part. His marriage then took place; and, no doubt, to the surprise and mortification of some of his opponents, the serious objection that he was unmarried no longer existed at the time of his election. JOHN E. DOVE.

KENSINGTON GORE ROAD, HALL OF ARTS, AND THE PARK.

THE proposed change of roadway and elision from Hyde Park of an elongated strip of 25 yards in width by 500 yards in length, from the Queen's Gate to the Prince's Gate, have caused much public anxiety, and even more serious alarm to the residents of the now extensive and fashionable vicinage of South Kensington.

As the stupendous Colosseum approaches completion, and the lustrous monument to Prince Albert will soon be divested of its scaffolding, some alteration of the roads and grounds have doubtless become requisite; but the conversion (now in progress) of the old ride along the flower-walk into shrubbery, and the substitution of a new driftway from the Serpentine Bridge to Exhibition-road, not only met the difficulty, so far as the monument is concerned, but effected a great public accommodation.

What now seems to be desired is to divert this the principal thoroughfare at the West-end, so as to remove it a greater distance from the Hall of Arts, and to make it quadrate with the Horticultural grounds and conservatory, with which the longitudinal axis of the Colosseum is at right angles. It would baffle to have an enlarged footway in front of the portico and chief entrances on either side of this magnificent structure; and if this can be done without invading popular privileges of park, and, above all, without removing a range of fifty ornamental and nearly full-grown trees, surely the Commissioners may feel satisfied, even although the enlarged road and pathways may not critically square with their oval.

If the long reach of park required should be conceded to them, adieu to the sylvan and ornate character of this portion of Hyde Park. Not fifty, but nearly double that number of vigorous and umbrageous foresters must be displaced, to be lopped 20 ft. up the stem, banded as those in Park-lane have been for two years, so as to attain afterwards a sickly vegetation; and all this at an enormous expense and waste of woodland scenery.

Having, many years back, given, through the *Builder*, hints as to the removal of the old park wall along Piccadilly, and the preservation of the dozen planes which now grace the footway, as on a Parisian boulevard; and since that time (about 1858) having recommended, through the same source, the widening of Park-lane, and its extension through Hamilton-place, at the same time showing that the range of about thirty vigorous and spreading planes might be left in the park-side footway; perhaps, although my views in the latter case were not fully agreed with, I may be allowed to suggest a plan which may meet with general approval, and possibly reconcile difficulties "*de part et d'autre*."

To cut away and desolate three or more acres of the park, in this its most valued part, cannot be tolerated; while to utilise a narrow strip, without disturbing a branch, if it tend to general enjoyment and convenience, may meet the difficulty.

In brief, then, my plan is to leave every tree as it is.

The outer row of elms, with some planes, chestnuts, and birch, number fifty-five between the Queen's Gate (Albert-road) and Prince's Gate; and thence to the barrack stables there are ten more. This range of vigorous foresters, well spread, and in height from 30 ft. to 50 ft., stand, on an average, 6 ft. inside the park rails, two only being within 5 ft.

The park-side footway averages a width exceeding 12 ft.

The driftway varies from 44 ft. to 34 ft., and the paved footway on the south side from 8 ft. to 10 ft., giving an entire width of causeway, in some parts of 55 ft., and between Albert and Exhibition Gates of 74 ft.

Now, it is quite clear that, if the present railing were withdrawn parkward, and ranged 18 ft. inside the row of trees, forming a gravel walk of that width (shaded also at intervals by many old standards), the width of the present external footway, together with the interval of 6 feet between the tree range and the now-standing fence, would increase the carriage driftway by 20 ft., and thus leave ample scope for widening the paved footway on the south side: thus an external footway of 18 ft. (besides the diameter of the growing trees—say, 2 ft.) might be secured to the public, without any apparent loss of extent in the park grounds, whilst such an arrangement—*vide* Park-lane, *vide* Birdage-walk—would rather give apparent extent to the park, at the same time conferring improved value on the vicinage and inestimable solace to those who wend their way about.

The site and direction of the Queen's and Rutland Gates would appear to favour such an adjustment, as they both stand back (inward) from the line of railing; viz., Queen's Gate 18 ft., and at Rutland Gate the railing curves outward 15 ft. towards the cavalry stables.

As to the Guards' barracks, their structural unsuitness for troops, the incalculable damage they inflict upon the grandest site of the western metropolis, the impossibility of extending improvements towards Knightsbridge whilst they are continued there,—this part of the subject has been fully treated years past in the *Builder*; it is therefore deferred, only remarking now that the position and aspect of the officers' quarters, mess-rooms, &c., may, in some degree, strengthen the position; otherwise, Chelsea, for cavalry, would surely be near enough, if our Foot Guards find it agreeable.

QUONDAM.

CARLISLE BRIDGE, DUBLIN.

It has been stated that the design by Messrs. Lanyon & Co. is to be carried out at the estimated cost of 60,000l.; and the citizens of Dublin are inquiring why Mr. Charles Geoghegan's plan, which would give all they want for 30,000l., Messrs. Courtney & Co. having offered to do the work for that sum, should be superseded. We have not yet seen any sufficient answer to this inquiry.

FAILURE OF COLUMNS, ST. SWITHIN'S, LINCOLN.

We are informed that the pillars in the church now building in the old Sheep-square, Lincoln, have failed. The local *Gazette* says the parish committee has examined the pillars, and not only are they of opinion that they must be taken down and rebuilt, but the architect (Mr. Fowler, of Louth) coincides in this opinion. A few days ago a meeting of the Building Committee was held in the vestry, and it was determined that the blame attached to the architect, and he was required to pull down the interior pillars, and rebuild them at his own cost. To this resolution Mr. Fowler demurred. He admitted that the pillars must come down; but he did not think that he was called upon to rebuild them. On Friday morning another meeting of the committee was held, and Mr. Fowler admitted the necessity for immediately pulling down the pillars, which have cracked in all directions, but affirmed that the cause of their giving way must have arisen from accident, or from bad workmanship; whilst several members of the committee insisted that the giving way of

the pillars was caused by the material that had been used.

After discussion, it was ultimately resolved that Mr. Christian should examine the pillars, and report the cause of the failing. If the cause arise from improper design, or from the material used being inadequate to bear the superincumbent weight, then the architect is to bear the cost of rebuilding; but if the defect arise from bad workmanship, then the cost of rebuilding is to be borne by the contractor,—the costs of the reference to follow the decision. This resolution was agreed to by the architect and Mr. Lovele, the builder, and both parties signed the resolution.

TUNBRIDGE WELLS INFIRMARY.

The re-opening of the Infirmary here has just taken place. It is situated in Grosvenor-road. The building has been renovated and enlarged, under a contract with Mr. Strange, builder. Almost three-fourths of the place have been built, the old infirmary being composed of nothing more than ordinary rooms, which are now enlarged to good-sized dining-rooms, and capable of accommodating twenty-four persons. Some new rooms, however, have been added, and taking all the rooms into consideration, accommodation can be found for thirty-eight persons. There are two men's wards, 16 ft. by 46 ft. and 14 ft. high, to which are attached bath-rooms on the first floor, and laboratories on the second. In conjunction with these there is a man's day-room, furnished with carpets, pictures, tables, chairs, &c., by the Hon. F. G. Molyneux. This room is to be used by the convalescent, and for their amusement several games are provided. There are two women's day wards, furnished by Lady Georgiana Molyneux in a similar style. Clocks have been presented to each by Mr. and Mrs. Molyneux Williams. There are three convalescent wards, but they are rather small; a large waiting-room for out-patients, and three consulting-rooms. There is likewise a private set of rooms for the matron and resident surgeon, with bedrooms adjoining. There is a large wash-house, with laundry, cooking-kitchen and scullery, larders, cellars, and store-rooms. In the hall a lift has been invented, 7 ft. by 5 ft., to take up three at a time,—the patient and two assistants. On the opposite side is a lift of smaller dimensions, for sending up dinners, &c. There are a great number of pictures in all the rooms, and quotations from Scripture.

METROPOLITAN BUILDINGS BILL.

It is unnecessary to pursue our comments on the Bill before the House, as we have no doubt it will be withdrawn. We have before us several letters on the subject, and some observations by Mr. John Liddle, the Whitechapel Medical Officer of Health; but it would be needless to print them. The Board of Works must be more careful next time. This is not the first withdrawal, and such work costs money.

PARLIAMENTARY.

New Law Courts.—In answer to Mr. Alderman Lawrence, Mr. Ayrton said he was unable to place block plans of the New Law Courts in the library of the House until they received the sanction of the proper authorities.

Leicester-square.—In answer to the same hon. member, Mr. Ayrton said that some years since an Act of Parliament was passed, enabling the local authorities to take possession of any vacant space in the metropolis for which an owner could not be found. The local authorities had done so in the case of Leicester-square; but an owner at once turned up, and established his title. The square, therefore, being private property, nothing could be done until they found a law enabling them to dispossess the owners. The sooner the better, add we.

Workmen's Inventions.—In reply to a question from Mr. Hughes, the Attorney-General stated that proper steps would be taken to protect the unpatented inventions of workmen in the forthcoming International Exhibition. He believed that the Act of 1865 would be insufficient, in consequence of the interpretation that had been put on it that when a workman exhibited an invention another person might take out a patent for it. He proposed to introduce a short Bill, giving the workman protection for his invention for six months from the commencement of the

Exhibition. He had arranged with the secretary of the Exhibition for a list of the inventions of workmen to be exhibited.

The Supply of Water.—Mr. Whalley asked the Home Secretary, with reference to the recommendation of the Royal Commissioners that the supply of water in the metropolis should be on the system of constant instead of intermittent supply, whether it was the intention of the Government to adopt any and what measures, with a view to giving effect to such recommendation. Mr. Bruce said that the Royal Commissioners went much further than the mere question of the intermittent or constant supply of water. They proposed that all the property of the private companies should be transferred to a central body, and that from that time forward every householder should be obliged to take water on the condition that he was constantly supplied. The necessary preliminary to giving effect to that recommendation was to create a central authority. He had been in communication with the Metropolitan Board of Works, and he had come to the conclusion that this measure could only be properly carried into effect when the measures for creating a general municipal government for the metropolis had been matured.

BARRACKS IN WINDSOR.

The British soldier in full training is an expensive article. We are reminded of this fact year by year as the army estimates are brought forward in the House of Commons. Whether he be an article of necessity or of luxury, it is not within our province at present to discuss. If it be true of the army generally that it entails heavy expense, it is more especially so of that portion of it known as the household troops. The duties of the regiments of guards in ordinary times never extend beyond our own shores, and seldom to any other places than the metropolis and the royal borough of Windsor. The only exception to this is, perhaps, an occasional month under canvas at Aldershot. The household brigade is admitted, and deservedly so, to be the *élite* of our army. In dress, drill, and equipment it is unequalled. It is not often that we indulge in any grand military show, but whenever this is done, our guards form a sight of which any Englishman may well feel proud.

But although we have always been careful to have these troops well clothed, well fed, and have maintained their equipment and drill at a high point of excellence, there has until lately been one great defect. The barrack accommodation for this portion of our military force was not only not the best, but was certainly below the average. This was especially the case at Windsor, where both the cavalry and infantry barracks were defective and insufficient. It had become a well-known fact that the rate of mortality in these regiments was much too high. Taking into account the care exercised in the selection of recruits, and that these troops had not to endure any of the hardships more or less incident to the life of a soldier, the high rate of mortality among them could only be accounted for in one way. It could only arise from the inferior accommodation afforded by such barracks as those in Sheet-street, Windsor, or Portman-street and Charing Cross in London.

The matter having, of necessity, forced itself on the attention of the military authorities, inquiries were instituted by the War Office. This led to a determination to enlarge, remodel, or, as in London, to remove the barracks to more eligible situations, in order to secure the better health and longer life of the guards. It was, therefore, determined to make very extensive alterations as well as additions to both cavalry and infantry barracks in Windsor; and in the present paper we purpose giving some account of what has been done to the latter.

What must now be called the old barracks had its entrance in Sheet-street, at a point where the street was narrowest. It occupied nearly the four sides of a quadrangular site, the entire area of which was a little over a third of an acre of ground. The parade-ground (if it deserved the name of one) covered a space of about 2,000 square yards, and was scarcely large enough to muster the troops in garrison. The main block of building faced Sheet-street. It contained thirty-two rooms, measuring some 50 ft. by 21 ft., and about 10 ft. in average height. Each of these rooms was occupied by twenty-eight men, thus giving a superficial area of 40 square feet, or 400 ft. cubical measure, to each man.

It will thus be seen that the men were huddled together in very insufficient space; and it could hardly be wondered at that their health suffered in consequence. Nor did their officers fare much better; for their quarters were of a description not at all befitting the rank and position of the gentlemen usually holding commissions in the Guards' regiments.

Then, again, there was no accommodation whatever provided for the married soldiers. These were obliged to live out of barracks, either in lodgings or in small cottages, wherever they could find them in the town. This was not only very inconvenient, but often entailed a heavy expense on the men themselves.

It will be readily supposed, that in a space so confined as that we have described anything approaching to free exercise or recreation was out of the question. As a natural result following this, a considerable proportion of the men were often found either incapacitated for duty by actual sickness or showing that want of robust health which always, more or less, marks those who live in confined spaces.

It may reasonably be doubted whether any other European government would have suffered its choicest troops to be accommodated as our Foot Guards were at Windsor; and hence our national credit was somewhat at stake. Although many royal and distinguished visitors came to the royal borough to see its castle and the attractive scenery around it, or to be the guests of Her Majesty, yet amongst the many sights worthy of their notice we could never include the infantry barracks, except it had been to disgrace us in the eyes of those who saw it. Now, however, all this is changed. It is well known that the Queen has taken a deep personal interest in what has been done to secure the comfort and health of the troops. To do this a large outlay has been absolutely necessary, both in the purchase of ground and in the erection and alteration of the buildings; but, even financially considered, this outlay has been a wise one.

Previously to the alterations there stood in Sheet-street, and close to the barracks, a block of old, decayed almshouses. These being sold, the War-Office secured the site, with a view to commence the necessary alterations. Behind the main block of the barracks, which we have already described, was a narrow lane, and, further in the rear, a large space occupied as gardens, in which stood some eighty or ninety one-story cottages. Most of these were little better than hovels, and were simply a disgrace to the town. The authorities at the War-Office ultimately succeeded in securing the whole of this space, and shortly afterwards the whole of the cottages were cleared out, to commence operations.

The additional area of ground thus acquired amounted to nearly five times as much space as that of the old barracks, its parade-ground included. Since then an additional site, occupied by a public-house known as the Five Bells, has been purchased, at the southern extremity of the old barracks.

The first part of the undertaking was to provide the much-needed accommodation for married soldiers. The block for this purpose was erected partly on the site of the old almshouses already mentioned, having its end abutting on, and the block itself standing at right angles to, Sheet-street. The contract for this was taken by Messrs. Myers & Sons, of London, and it is substantially built. It is quite plain in style, if we except the outside galleries, by which the rooms of the upper stories are reached. The block is three stories high, and access to the second and third is gained by a common staircase leading to the galleries. These galleries are constructed of iron, supported by pillars, and give the whole a very neat if not ornamental appearance. Accommodation is provided for thirty-two married soldiers, each occupying one room; the dimensions of which are 16 ft. by 13½ ft., and 10 ft. in height, thus giving a cubical space of 2,160 ft. The rooms are each provided with a small cooking-range, with oven. The water-supply consists of three tanks, two of which hold 430 gallons each, and the remaining one 800 gallons. Each room is lighted from both sides. The arrangements for ventilation are very simple, but in practice are found effective. In fact, there is more reason to complain of draught than of want of ventilation. A separate shaft for each room carries away the foul air to the top of the building, while fresh air is admitted from each side by means of perforations.

The second part of the undertaking, and included in the same contract (about 14,000L), was the erection of quarters for the staff-sergeants and sergeants. This block, which stands on the north side of the new quadrangle, has somewhat greater pretensions to architectural taste than the one already described. It contains thirty-two living-rooms, besides the mess establishment. Fourteen of these are occupied as double rooms by those entitled to this privilege, and the remaining eighteen as single rooms. The mess-room is one of fair proportions, measuring 42 ft. in length by 24 ft. in breadth, and 14 ft. in height. With its draped windows, its walls decorated with engravings and photographs, its billiard, bagatelle, and writing tables, it wears an air of comfort very much in contrast with old quarters occupied by these officers. Behind the mess-room is the kitchen, admirably fitted up with everything that such a place requires. Near to it are the cook's room, the larders, cellars, and other necessary conveniences. Water is supplied from four cisterns, and there are sinks and water-closets on each floor. The height of the rooms and the arrangements for obtaining ventilation, along with the other improvements introduced, cannot fail to have a beneficial effect upon the health and appearance of the officers, as well as upon their wives and children. Nor will the social and moral effect be less pleasing; for here they can have enjoyment and recreation, such as will, it is hoped, be preferred to spending time and money elsewhere.

When this block had been completed, the guard-house block was commenced near the new entrance in Victoria-street. Meanwhile, the whole of the new area had been walled in with a paneled wall 14 ft. in height. The guard-house buildings are only one story high, and include a room for holding court-martial, a room for the commanding officer, an orderly-room, a guard-room, and a lock-up with five cells. Behind these is an enclosed exercise-ground, for the use of prisoners who are in custody. Outside the two frontages of this block are raised pavements, which are roofed with rough plate glass, the framework being supported on pillars in front. These are available as a sentry parade in wet weather, and as a protection for those on duty at the guard-house. The contract for this was also undertaken by Messrs. Myers & Sons, the cost being about 2,000L.

The new entrance-gates are of open ironwork of an ornamental character. The two gate-pillars are of considerable height and are surmounted by large globular gas-lamps, which give a finished appearance to the entrance, strongly contrasting with that lately used.

Between the married soldiers' quarters and those of the sergeants already described another block of building, corresponding in architectural features with the latter, has been erected. This includes the canteen establishment, the reading and recreation rooms, library, &c. The canteen occupies the portion of the building to the right of the main entrance. Its arrangements are carried out on the co-operative principle. The profits are divided amongst the men in proportion to the amount of purchases made by each. The canteen not only supplies ale, beer, and spirits, as was formerly the case, but also groceries, vegetables, and other necessities. The soldiers avail themselves of the advantages offered to a large extent.

To the left of the main entrance is the recreation-room, with the reading-room and library over. These rooms are large and well-proportioned, being lofty, well lighted from both sides, and ventilated. The recreation-room is furnished with every convenience. There are billiard and bagatelle tables, chess and draughts, dice, dominoes, and cards.

The reading-room is over the recreation-room, and is of the same size and proportions. On entering, it presents a very pleasing appearance. On the walls are hung a variety of maps and useful diagrams, and the tables are well supplied with newspapers and periodicals. There are also provided tables, with writing materials. Artificial light is supplied in the evening by a brilliant sunlight burner near the ceiling. A small room on the same floor is devoted to the purposes of a circulating library.

There are rooms in this block for the librarian and the sergeant who has charge of the canteen. The entire block forms what may be rightly designated a soldiers' club, and as such the men avail themselves of it. Throughout the whole of the arrangements here their comfort and con-

venience have been carefully studied. The block is supplied with water from a tank containing 6,500 gallons.

The work for this part was undertaken by Messrs. Piper & Wheeler, at a cost of about 5,000L.

On the south side of the new quadrangle, and opposite to the building now described, the main block has been erected. In this there are twelve large rooms, each being 76 ft. in length, by 22 ft. in breadth, 12 ft. high. Each room has accommodation for 24 men. It will thus be seen that for each man there is a superficial area of 70 ft., and over 800 ft. cubical space, as contrasted with 40 ft. superficial, and 400 cubical feet in the old barracks. If nothing more had been done, there can be little doubt that this alone would have very much improved the health of the troops.

The block has two principal entrances, and is three stories in height. Opposite the entrances are the staircases, and on either side, as well as on the landings above, are rooms for the twelve sergeants who have charge of the men while in barracks.

The sergeants' rooms, which measure 15 ft. by 12 ft., and 12 ft. high, are so arranged that they command a full view of the larger rooms in which the men live and sleep.

The rooms are warmed by stove grates, invented by Captain Galton, late of the Royal Engineers, and with which some of our readers are doubtless familiar. The object of the invention is that of a better utilisation of fuel and heat. This is accomplished by having an air-chamber around the back of the stove, to which pure air is admitted from without. This air, after becoming warmed in the chamber, is delivered into the room. The foul air is carried off by ventilating shafts. Each of the large rooms has two of Galton's stove grates, while each sergeant's room has one.

There are ablution-rooms, fitted up with every convenience, latrines within the building for night use, and others outside, at the back of the block, for day use. An abundant supply of water is secured. For the water service of this block there are six slate cisterns, each capable of holding 500 gallons. In addition to these there is a large iron tank, holding 3,500 gallons. This is used principally for supplying the baths.

Along the front of the building there is a covered parade, formed of pillars and iron framework, and glazed with rough plate, the latter being protected by wirework. The erection of this block was entrusted to Messrs. Piper & Wheeler. The contract also included the erection of a new cook-house, bowling alleys, and magazine, &c., the amount being from 12,000L. to 13,000L.

To the west of this block, and on the same side of the quadrangle, stands the magazine, and beyond this the officers' stables. At the eastern extremity is the new cook-house. In this is an oven capable of cooking rations for 200 men, and a smaller one for 100 men. There are also eight boilers, each cooking for 50 men. These boilers are supplied with water from a large tank placed immediately over them. The old block used for cooking, which stood at the north-eastern corner of the quadrangle, has been entirely removed, thus giving an uninterrupted view of the whole of the barrack buildings. Near the cook-house there are store-houses for meat, bread, vegetables, &c. The ground to the rear of this, formerly the site of the "Five Bells" public-house, has been used for the erection of a new armourer's shop, fitted up with forge, browning trough, and stands for ninety rifles. There have also been built a block for laundry purposes, with all necessary fittings, a bedding store-room, a coal-store, and other useful offices.

Previously to finishing the latter portion of this contract, the quadrangle was made complete in its buildings by the erection of the officers' quarters. These are of very handsome architectural appearance, and consist of a centre portion, flanked by square towers and two wings. The basement is well arranged as a department for the messmaster. The cooking kitchen is replete with apparatus, all of modern construction, so that there is every convenience for steaming, boiling, baking, broiling, roasting, frying, and all other operations of the culinary art. A small lift is used for passing the dishes up to the mess-room above. In connexion with the messmaster's department there are his living-rooms, and all the necessary store-rooms, offices, and wine-cellars.

The ground-floor of the block is raised about 5 ft. above the ordinary level. This adds very

much to the general effect of the façade. The centre part is used as a mess-room, and is certainly one of the handsomest in the country. On each side are entrances, reached by flights of steps, leading to the mess-room, the principal staircases, and the officers' private rooms. Over the mess-room, and of the same size, is the billiard-room. The block contains accommodation for twenty-two commissioned and four field officers, besides the quartermaster, who has two rooms and a kitchen. The water-supply is obtained from a tank at the top of the building, containing 5,000 gallons. This portion of the work was contracted for by Mr. W. Higge, the estimate being about 14,000l. The work is very substantially done and well finished.

A considerable portion—about two-thirds—of the quadrangle enclosed by the buildings now described has been levelled and laid with grass turf, while the portion near the officers' quarters has been planted with evergreens. The spare ground near the wings of this block is also planted as ornamental shrubberies; the remaining portion is levelled and laid with gravel, and is used for drill and parade purposes.

In the old block, the back of which now forms the eastern side of the square, and previously mentioned as containing thirty-two rooms, a considerable improvement has been made. It now accommodates, not only a much less number of men, but has undergone alterations to add to their comfort. Projecting from what is now the back of the building, four blocks of ablution-rooms have been built. These are supplied by a tank containing 5,000 gallons. The lower portion of the building, part of which was formerly the officers' mess-room, is used as a band-room and for other purposes. In the old barrack-square the guard-room, orderly-room, and engine-house have been removed, and in place of these has been erected a gymnasium.

The dimensions of this room are 80 ft. in length by 40 ft. in breadth, and some 20 ft. in height. A portion of the length (about 15 ft.) is occupied by a vestibule, on the right of which is a dressing-room, and on the left a room for gymnasium sergeant or instructor. Over these three is a gallery for spectators, with an ornamental railing in front. The gallery is reached by a staircase from the vestibule. The large room, or gymnasium school, as it is more appropriately named, is well lighted with windows from both sides, and has also a large octagonal lantern in the centre, with sashes which can be lowered for ventilation. The artificial lighting is secured by six groups of gas-burners, with reflectors fixed close to the side walls, so as to be out of the way of the various athletic apparatus with which the school is filled.

This apparatus consists of a large mast, which rises from the floor to the top of the lantern. Around this are arranged a series of ropes for climbing. Some of these latter are plain, while others have knots, wood roses, pegs, and other projections to assist the climbers. There are other ropes attached to the beams, fitted as a trapeze, and others, again, with rings for swinging. A row of each is fixed on each side of the room. A strong walking-bar, as thick as a small mast, is fixed horizontally in a strong, oak frame, in which it can be raised or lowered, and is used for teaching the men to balance themselves where only a narrow foothold can be had. On the right of the room single and double sets of climbing-poles are fixed at an angle of about 45 degrees, while similar poles hang vertically in the centre, to be used in a similar way to the ropes. A strong, iron rod, well supported from the roof, extends for some distance on the right, and can be used by a large number of men at one time. Beyond the climbing apparatus stand the parallel bars. Near these are the vaulting bars, moveable to various heights, in a frame.

On the left hand, and extending almost the whole length of the room, is fixed, horizontally, the elastic ladder. This consists of two wire ropes, between which are fixed staves, or rounds, at equal distances throughout its entire length. The staves are round, with square bosses at the ends, these latter being fixed firmly in brass sockets, to prevent them slipping or turning round when grasped by the hands of the gymnasts. The whole is raised some 7 ft. from the floor, and tightly stretched. On the same side are fixed two inclined planes. One of these, called the ladder plank, has spokes projecting from each side, by which the gymnast can draw himself up either with his face or his back to the board, either of which will give fine exercise for the muscles of the shoulders, arms,

and chest. The back of this can also be used for climbing with the arms alone.

The lower end of the room is occupied with a bridge-ladder, extending across the room, the extremities being vertical, the centre portion forming two inclined planes, and between these are horizontal portions.

The wall at this end of the room has been prepared and fitted with apparatus for escalating purposes, such as scaling the walls of forts, either by the hands alone, or by means of grappling-hooks. On each side of the room are large vaulting-horses. In different parts of the room mattresses are laid on the floor.

A space is left clear at the entrance of the room for sword-practice, fencing with foils, single-sticks, as well as the use of the bayonet. There is an ample supply of boxing-gloves, masks, cutlasses, swords, and dumb-bells. These latter range from 10 lb. to 50 lb. in weight. In addition to the ordinary dumb-bells, there are French barbells, of from 20 lb. to 60 lb.

The entire fittings of the room are as complete as the most enthusiastic athlete could desire. There can be no doubt as to the benefit in health and physical development which the men will derive from the frequent use of the means thus provided.

Some alterations have been made in the old officers' quarters, to adapt them to new purposes. One part has been fitted up with galleries, desks, &c., and is now used as an infant school, and suitable accommodation has been provided for the school-mistress. Other rooms are used by married soldiers, engineer officers, and others connected with the barrack establishment.

It only now remains to speak of the drainage. The whole of the barrack property is drained into the main sewer of the borough. For some time past plans have been discussed before the Local Board of Health with reference to a new system of drainage and means of diverting the sewage from the Thames. The conservators of the river require that it shall cease to be polluted. Surveys have been made with the view of adopting the "separate system" of Mr. Menzies. When the new ground was acquired for the extension of the barracks, it was decided to lay in drains on a "separate" plan. There are, therefore, a double set of drains; one taking the surface water or rainfall, the other the sewage proper. At present both these pour their contents into the main sewer, but are so arranged as to be separated at any time.

With all the improvements and additions we have described, not only do the Windsor Infantry Barracks form a pleasant contrast with what they once were, but the general appearance of that part of the town has been improved. It has given the authorities of the town the opportunity of opening up a wide road leading from Victoria-street to the Prince Consort's Model Cottages, which will, no doubt, be continued to All Saints' Church and Frances-road.

ANTHOLOGIA TECHNICA.

ANENT RATS. "Rats!" exclaims the reader; "what the deuce have rats to do with art?" A great deal, sir, as every professional architect or builder knows to his annoyance and cost. However, it is with the historical instead of the building rats we have to do this time.

Our *ego* speaks for us. Dr. Jackson, a prebendary of St. Paul's, has lately published a work for the young, entitled "Our Dumb Neighbours," with the laudable design of implanting knowledge and kindly feeling towards animals.

A contemporary says, "Dr. Jackson remarks it is strange that no classical writer has ever mentioned 'rats,' which, he says, first visited us from Asia in the fifteenth century."

Well, we shall prove that "rats are as historical as the Pyramids, and that architects are aware that Vitruvius has alluded to them among others. If the learned Canon, or his less erudite critic, had hunted up authorities, he would have read the "Batrachomyomachia" of Aristophanes. *Mus* was the generic term for rats and mice in the days of Homer, who first gave birth to the legend of the mountain in labour and the mouse.

Ἰν ὄρεϊ Ζεὺς ἰσχυρότερον, ῥοὶ δ' ἔκρεν μῦν.
(The mountain was in labour. Jupiter got frightened; but it brought forth a mouse.)

A line imitated by Horace in the 139th line of his "De Arte Poetica" is—

"*Parturiunt montes: nascitur ridiculus mus.*"
Dr. Jackson ought surely to have known the

Latin word as *sorex*, a rat, and that *Colonus* has written of the *Mustella Alpina*, the Alpine or mountain rat; or the *Mus Indicus*, or Egyptian rat; the *Mus Pharaonicus*, the wonderful little ichneumon, which, from the time of Ptolemy down to the days of Champollion, has the credit of visiting unbidden the inner apartments of the sleeping crocodile, when he found the monster's door open, and killing the villainous saurian by devouring his vitals.

In *Plautus*, too, who merits the name of a "classic writer," these words are met with,—*Toricina Nenia*, the squeal or squeak of a rat when caught in a trap; *Nenia*, in the mythology, being set down as the goddess of funerals, and by *Metonymy* as signifying a dirge or death-wail. And brave old *Vitruvius*, speaking of the villas of *Baine*, the Roman Brighton, suffering from the inroads of the *mus aquaticus*, and inviting the workmen to a grand *luttus sorices insectare*, to hunt the rats, telling the *quæstidæ*, or rat-catchers, how to make a *soricum decapitulum*, or rat-trap; and does not the word *suboles*, or the more refined term *persentisica*, manifest that the ancients knew how to "smell a rat?"

Bravo, *ego*! you have made out a case. When learned doctors undertake to teach the young, they ought, as a preliminary, to "read up."

Archery was once a fashionable, as well as an indispensable accomplishment in the British islands. It is not unlikely to become fashionable again, and it is a more healthy and bracing employment for the fair sex than croquet. As a military resort, it is extinguished for aye, although prior to the invention of firearms the bow was the principal missive weapon. Its use is coeval with society. In modern times there were three forms of bows in use,—the Roman bow, the long bow, and the cross-bow. The former was about 3 ft. long, used generally on horseback, and drawn to the breast. It was the general weapon of the Scythian, after whom it was sometimes called the Scythic bow. It was also in use among Germans, Britons, and Celts (Irish). The cross-bow, or *arballus*, was the more favourite weapon of the French. It was fixed on an axis or shaft, and was from 1 ft. to 3 ft. long. The favourite weapon of the English was the long bow, from the thirteenth to the sixteenth century. "Drawing the long bow," is a saying well understood to-day. The English were not the original inventors. The long bow was a formidable military weapon, and it is said owes its origin to the Hindoos. It came into use in Europe, perhaps, about the time of the Crusaders.

The English were expert at the use of the long bow. The long bow and broad arrow played sad havoc at Agincourt and Cressy. Even after the introduction of firearms, the English had bowmen in the flanks of their armies. By a treaty between Charles IX. of France and Queen Elizabeth, 1572, the latter was obliged to furnish the former with 1,000 English archers, and in 1627 the English shot arrows into a fort, on the Isle of Rbe. After this archery became almost obsolete. Clubs or companies, however, kept the custom alive. London had its "Pinsbury Archers," Dublin its "Archers' Club," and Edinburgh its "Royal Company of Archers."

Evidences are again cropping up tending to confirm the belief that another race of people occupied the central portion of North America before the present, and that they quarried, built, and manufactured, and were proficient in several of the arts. Now none of the Indian races have been known to mine or throw up intrenchments or to raise huge cairns or heaps of stones in commemoration of their battles. A Mr. Bartram, who was a professor in the College of Philadelphia at the close of the last century, instances these monuments and fortifications, but he was not the first. In the *Journal des Savans* for March, 1681, are to be found statements from the memoirs of John Leder, of Hamburg, who was a resident in America for ten years, but we are not informed who this early race of people were who inhabited America. Nor do we get any great clue or sane conjecture. An anonymous writer, who also alludes to the above authors, says,—"*It is probable part of the speech of these ancient people was adopted by their successors, as some of the Celtic is now found in the German and Gothic tongues.*"

We are inclined to believe that the American continent received inhabitants from Europe long anterior to the time mentioned in our histories. The first navigators found a large population in

Mexico and Peru. Whence did they come? It is not unlikely that the great American continent received its first contingent from other quarters besides Europe. We want some light yet about the primal population. Were they a separate creation?

Embalming has something to do with the history of monumental architecture, so we shall have a word to say upon it. The Egyptians were great at this art. We are told that St. Anstin, coming into Egypt, was surprised at the sight of Ptolemy and Alexander the Great so fresh in their sepulchres. A fixed alkaline salt was first used for the purpose, and afterwards balams. The Romans were nearly as expert at embalming as the Egyptians. A body found in the Apian Way in the time of Pope Paul III., was floating in some unknown kind of liquor, with a perpetual lamp at its feet burning, the hair fresh and yellow, and the other parts firm and entire, though buried 1500 years. The inscription declared it to be Tullia, Cicero's beloved daughter. Claudia, a celebrated embalmer of the seventeenth century, made a strong solution of fixed alkali in water, and in this he let the body lie for two or three months, according to its size, and then dried it in a stove. More expeditious, as well as more elaborate modern methods are in use now, but we are not inclined to describe them. We are more interested as sanitary and social reformers in the preservation of the health of the living, than the embalming of the dead. The moth will conquer the greatest ingenuity of man in the end, and the inevitable laws of nature will at last stand confessed, amid the crash and ruin of worlds—"Ashes to ashes, and dust to dust."

The building craft contributed something to the perfection of timekeepers. John Harrison, an Englishman and a carpenter, led the way in clocks and chronometer watches; and he was the first and most successful in constructing timekeepers for telling and correcting the longitude at sea. In 1726, as a working carpenter, he made two clocks, chiefly in wood, to which he applied an escapement and compound pendulum of his own invention. These went well for ten years, scarcely erring a second in a month. The motion of the pendulum being liable to derangement if used in a ship at sea, Harrison set himself to construct a watch, which was used in a voyage to Lisbon and back. So correct did it keep the time that it corrected an error of a degree and a half in the ship's reckoning. After this Harrison's other attempts were more and more successful, and obtained premiums to the extent of 20,000l. In 1772, Harrison made a timekeeper for the king's private observatory at Richmond, and at the end of ten weeks it varied only four seconds and a half.

There is a good interval between Richmond-hill and Harrison of 100 years ago, and Lindgate-hill and Benson, the country carpenter and the wealthy citizen chronometer maker. Such men as the carpenter Harrison are pioneers of civilisation and builders of nations.

Earth houses, or rather dwellings in the earth, are of very ancient origin. They exist in many northern countries. Numbers of them have been discovered at different periods in Ireland, England, and Scotland. They were used as places of safety or refuge, to which the early inhabitants could retire, carrying with them their provisions and effects. In the Irish language they were called *Caiscallanhs*; in Icelandic, *Jardus*—meaning in both tongues earth houses. Behold the epitome of architectural history,—from Cave to Castle, from Excavation to Building. CE.

BRISTOL OFFICES OF THE LIVERPOOL, LONDON, AND GLOBE INSURANCE COMPANY.

The elaborately-ornamented building of which we publish a view in our present issue has been erected in Corn-street, Bristol, as the West of England and South Wales district offices of the insurance company named above. Mr. V. Bruce Gingell was the architect. The façade presents a frontage of 55 ft., with a height from the footway to the apex of the pediment of 70 ft., and is Italian in character, freely treated. The lower story is divided into five bays or compartments, the central one wider than those at the ends—the bays being formed by ten attached columns of the composite order, eight in couples, and the end ones single, stand-

ing on rusticated pedestals of blue Pennant stone from the Stapleton quarries; the rustics vermiculated, and the moulded subbase continued over the heads of the windows lighting the lowest rooms, supported by consoles on the jambs. The fabulous bird known as the "liver," which is the crest in the arms of Liverpool, where the company have their head offices, has been introduced in a central position among the foliage in the capitals of the columns. In each of the three central compartments is a large window, glazed with one sheet of plate glass, and in each compartment is a doorway, one being the entrance to the company's offices, and the other to the suites of chambers that are arranged for the occupation of professional men. On the first, second, and third floors of the building. The piers between the windows, and to which the coupled columns are engaged, have moulded and vermiculated rustics, and terminate with impost caps, from which spring the arches over the openings. The archways of the two entrances are similarly finished, and each of the five openings has a sculptured head on the key-stone; that to the centre opening symbolising Time, with the hour-glass, sickle, serpent, and other emblems; those to the two other doorways being firemen, classically treated; and those to the windows being river gods, one representing the "Mersey" for Liverpool, and the other the "Thames" for London. Above the doorways are panels filled in with banded laurel-leaves, over which are swags of flowers and fruit; and then the lower order of the front is completed with an entablature, broken over the columns, the cornice having dentils and enriched mouldings; the architrave is also enriched, and the frieze over each column decorated with swags of fruit and flowers. The principal story of the façade, although one architecturally, is divided into two internally. The order used is Corinthian, the columns having their axes over those of the basement story, and mounted on pedestals having the dado of each enriched with drops and festoons of fruit and flowers, with ribands. The capitals are carved with acanthus foliage, among which is introduced the owl, as an emblem of the wisdom of prudence. The piers to which the columns are engaged are channelled and rusticated, and form jambs to the windows of the first floor, at the head of which moulded caps and carved consoles support a splayed and moulded heads, forming part of a frieze running through between the columns to sever the first and second floors, and decorated with swags and drops, over which runs a cill course with enriched mouldings. The piers are continued to form the jambs of the second-floor windows, and from which spring archivolts running round the semi-circular openings, and finished with carved key-stones. A bold effect is given to the capitals of the columns by recessing the spandrels of the circular window-heads so as to admit of the upper part of the columns becoming whole above the impost, instead of three-quarters, as below, and thus finishing with entire capitals instead of parts. The upper order terminates with an entablature broken over the columns, and with frieze and architrave omitted in the three central bays. The attic story presents five semi-circular-headed window openings, each having panelled jamb pilasters, with moulded caps and bases, moulded and enriched archivolts, with carved key-stones and carved spandrels, finished above with moulded cornices. Before the piers between the windows, and upon pedestals, stand eight sculptured female figures, arranged in pairs to correspond with the coupled columns below, and representing the elements and the seasons—the four central ones being Fire, Air, Earth, and Water; and the others, Spring, Summer, Autumn, and Winter. Each figure is nearly 8 ft. high, and has suitable emblems and decorations. The responds are wrought as rusticated pilasters, with moulded caps and bases, and before each is a large sculptured vase or terminal, ranging with the single column below. The entablature is broken over each pair of figures, and is supported by them, the frieze over the figures being panelled and carved into water-leaves and flowers, and that over the centre windows carved and decorated with swags of flowers, and over the others panelled, and filled in with laurel-leaves and bands. From the entablature, over the four central figures, rises a carved pediment, the mouldings of which run into and form scrolls in the tympanum, wherein also are cornucopias with fruit. From the entablature extending over all the figures rises a large angular pediment, which is entirely filled in with sculptured figures, emblematical of the wisdom and duty of

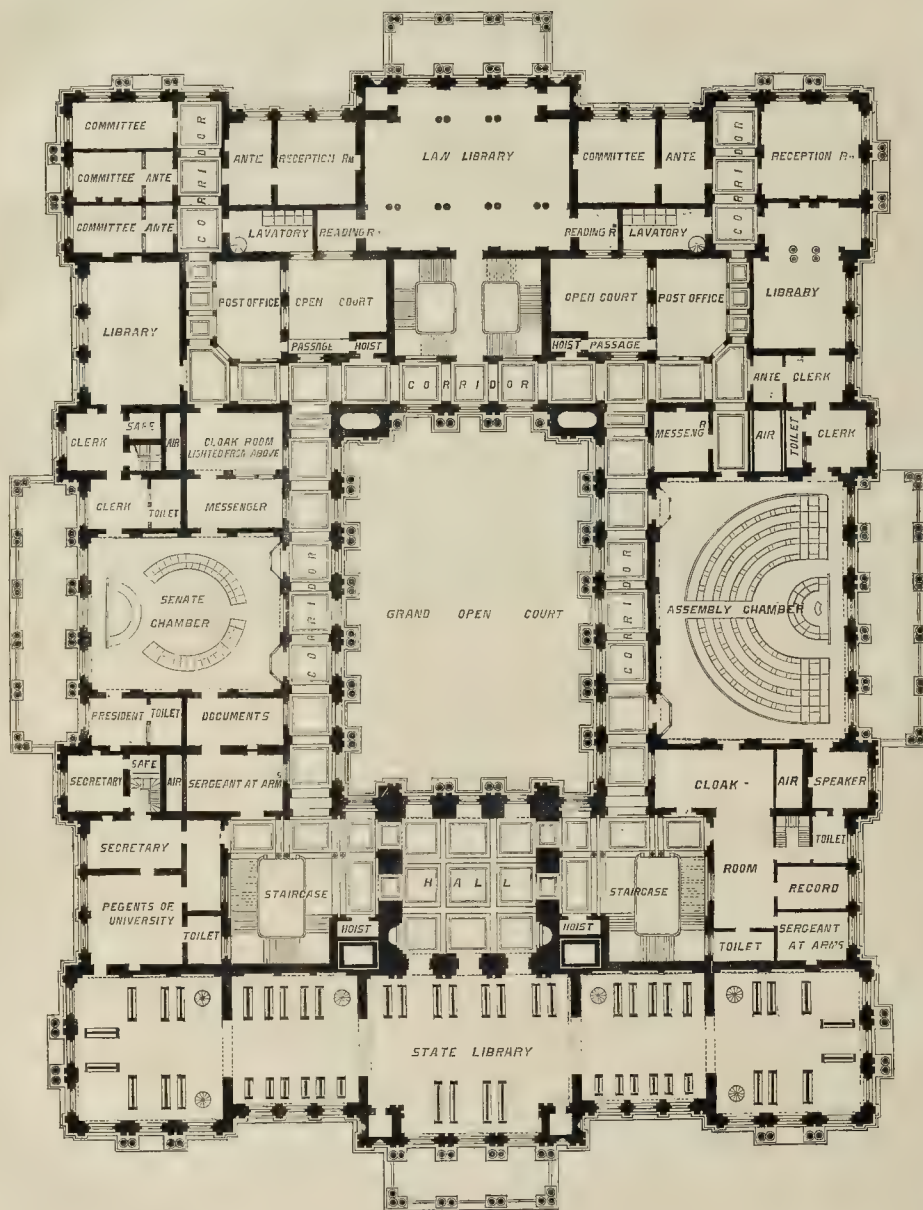
guarding against the suffering that may be caused through fire, or death, or old age. A figure of Minerva occupies the central position, and with outstretched arms is directing her attendants to dispense gladness and aid to the widows and orphans, the aged and unfortunate, who, by some prudent steps, have been brought under her protection. Two large and richly-carved terminals stand on pedestals at the sides of the pediment, against which are large moulded scrolls with cornucopias.

From the doorway to the company's offices a large lobby is entered, having a tessellated pavement, and with walls finished with Corsham stone, and decorated with a pedestal course, on which stand eight pilasters, with carved capitals. To the right is a doorway to the Board-room, for the private use of the directors, decorated with architraves, panelled jamb pilasters, and carved consoles. An entablature runs round this lobby, breaking over the pilasters, and the ceiling has coxes, ribs, groins, centre flowers, and other decorative plaster work. Passing through large folding doors, a vestibule is entered, the walls of which are of Corsham stone, and the floor has a tessellated pavement. The ceiling is coved and panelled, and the light is admitted through stained glass. This vestibule leads, by large glazed doors, into the public office, wherein is carried on the general business of the company. This apartment is 56 ft. extreme length, 32 ft. extreme breadth, and 23 ft. high; the walls finished with Corsham stone, and decorated with pilasters and columns, and entablature of the Corinthian order. Four angle pillars and four detached columns are of the finest red Mansfield stone, harmonising in colour with the Corsham stone. The floors are paved with tesserae in an ornamental pattern, and the room is lighted from above by large quadrantal and one semi-dome light, all filled in with stained glass of an azure tint, having patterns thereon in purple, orange, and white. The ceiling has diapered ribs, with flowers at the intersections, and bold coxes and groins, and barrel vaults at the ends. The counter, desks, and fittings are of oak, with bronze ornaments. On one side of the room is the secretary's office, and on the other the medical examiner's room; and at the extreme end are the clerks' cloak-rooms, lavatories, &c. From the Corn-street end of the public office the board-room is entered, which is a fine and lofty room 20 ft. square, lighted by two large windows, and finished with panelled dado, and a plaster ceiling with coxes. In the basement is a large repository, and a lunch-room for the company's clerks. The remainder of the basement is a large cellar with two front offices, let to wine-merchants. The lower doorway in the front is the chambers' entrance, and leads to a staircase, having flights of stone steps up to the first, second, and third floors, which are let as professional chambers. On the top of the building is a residence for the company's messenger. The whole of the structure is fire-proof, upon the system of Messrs. Fox & Barrett, the flat roofs being covered with asphalt, by Mr. Pilkington, of London. The tessellated pavements were executed by Messrs. Maw & Co. The carving and sculpture, and the modelling for the same, and for the plaster enrichments, were executed by Mr. T. Colley, of Stoke's-croft, Bristol, late of London. The warming apparatus is by Messrs. Haden & Son, of Trowbridge. The general contractors were Messrs. Jones & Sons, of Gloucester, but, they failing to complete the work, the remaining masonry, &c., was done by the company, through Mr. Tucker, the clerk of the works. Mr. Gorett executed the carpentry and joinery, and fittings; Messrs. Lewis & Sons the plastering and painting; Mr. J. Harris the smiths' work; Mr. Palmer the plumbing; Messrs. Adam & Sons the gas-fitting; and Messrs. Hancock the furnishing. The stained and embossed glass was executed by the St. Helen's Company. The total cost, exclusive of the land and the architect's commission, was about 11,000l. The cost out of this of the external carving and sculpture, and the modelling for it and for the internal plaster, was 1,780l.

STATE CAPITOL, ALBANY, NEW YORK, U.S.

In addition to the illustrations of the Capitol now being erected for the State of New York published in our last, we give, as promised, the plan of the first floor.*

* See pp. 425, 426, and 427, ante.



10 20 30 40 50 60 70 80 90 100
SCALE OF FEET

NEW STATE CAPITOL AT ALBANY, NEW YORK.
Plan of First Floor.



BRISTOL OFFICES OF THE LIVERPOOL AND LONDON INSURANCE COMPANY.
MR. W. BRUCE GINGELI, ARCHITECT.

THE PORT OF LEITH.

A SEAPORT TOWN now-a-days is the great *pons asinorum* of the sanitary economist; and there are very few in the country, if we exclude Liverpool and Glasgow, more deserving of attention and study than the port of Leith. Not so much of itself, perhaps we should admit, as its neighbourhood; for it is impossible to arrive at any correct conclusion with regard to the death-rate of Edinburgh (to which we recently devoted some space), without at the same time taking into consideration the sanitary condition of its surroundings; and with the adjacent town and seaport of Leith, the capital of Scotland has from time immemorial been associated. Leith, in fact, has not only excellent materials within itself for observation; but it is, and has always been, the seaport of a capital city, and during several centuries it was also the principal port of an independent kingdom.

Leith, we find, is one of the eight principal towns of Scotland which every quarter supplies, *pari passu* with Greenock, the highest death-rates in the Registrar-General's reports. It has certainly possessed for many years the highest returns of mortality in that which is now termed the *zymotic*, or, in plainer language, the contagious and epidemic class of diseases; and in this abnormal feature of its "causes of death" it ranks higher than Dundee or Greenock, much higher than Aberdeen, and nearly twice as high as the city of Perth. We find from the last published and most recent detailed annual report of the Registrar-General for Scotland, which relates to the year 1867, the following trustworthy particulars:—Of the eight principal towns, the mortality from the zymotic class of diseases was heaviest in Leith, and lightest in Perth and Aberdeen. Thus, in every 10,000 persons in each town, 25.6 died from the zymotic diseases during the year in Perth, 36.7 in Aberdeen, 57.6 in Edinburgh, 58.7 in Greenock, 63.1 in Glasgow, 63.4 in Dundee, 67.3 in Paisley, and 70.3 in Leith. If we compare the proportion of zymotic deaths to the total deaths, the towns arrange themselves in nearly the same order—Perth and Aberdeen with the smallest proportional mortality, and Leith the highest. Thus in Perth, 12.16 per cent. of the deaths were caused by the zymotic class of diseases; in Aberdeen, 15.14 per cent.; in Greenock, 19.63; in Edinburgh, 21.21; in Dundee, 21.27; in Glasgow, 22.93; in Paisley, 23.92; and in Leith, 25.38 per cent. This fact of itself is strongly suggestive of there being something wrong with its sanitary condition.

A very few words regarding the history of Leith will make our subsequent remarks more intelligible. For several centuries it was, as we have said, the only, or at least the principal, seaport town in Scotland. Its site and its name had, of course, been determined by the little river on whose banks it is situated, and divides it into two parishes, North Leith and South Leith, and which of late years has acquired such an unenviable notoriety from its extremely filthy and polluted condition. Logan of Restarig, a fierce baron of the feudal period, held the original grant of lands, and also of the mills of Leith, under a charter of Robert the Bruce.

Leith was up to this period a strongly-fortified town (a portion of its citadel walls still exists), and from this reason it occurs that the great—the only grand incident of its history—is the celebrated siege which it sustained against the English army at that eventful period, when Elizabeth thought it necessary to the stability of her throne to reduce the power of the Guises. It was defended, as all readers of the history of Scotland know, by Mary of Guise, with the aid of French troops; but, referring our readers to Mr. Hill Burton, or, better still, to Mr. Anthony Froude, for a minute account of this celebrated siege, we may venture to transcribe a little story from the last historian, which illustrates more pointedly than many pages of political disquisition can do the manners and customs of the contemporary warfare. There was, it will be remembered, a conference arranged between the leaders of the armies for a capitulation or an evacuation—we forget which—and two sets of commissioners were appointed. The conference opened on the 17th (between the French and English commissioners) an armistice was allowed for a week, and the armies had leisure to exchange courtesies. The French and English officers met at a sort of picnic on Leith sands, each bringing with him such victuals as he had in store. From Grey's camp came hams, capons, chickens, wine, and beer. The French

produced a solitary fowl, a piece of baked horse, and six delicately-roasted rats. The last, they said, was the best fresh meat in the town; but of that they had abundance.*

After the accession of James to the throne of England, Leith lost its position as a fortified town; and again after the union of England and Scotland it also seems to have lost much of its importance as a seaport. In other respects it seems to have retrograded; for it was always more or less borne down and held in subjection by the city of Edinburgh, which had, by purchase, we suppose, at an early period, succeeded to the feudal superiority and inheritance of Logan. Although most of these rights have been acquired or abrogated, it is curious that Leith up to this very hour pays a sum of 2,000*l.* to the Edinburgh Presbyterian clergymen, in commutation of an ancient claim of one mark per ton, security for which is still provided for by a lien over its dock and harbour dues.

Those who wish to obtain a bird's-eye view of the port of Leith should ascend the Calton-hill of Edinburgh, take their stand under the shadow of that group of massive pillars, with their broken entablature, which seem designed to reproduce the ruins of the Parthenon, and turn their eyes to the north. Such a scene seldom sees and never forgets. Edinburgh, we discover, is connected by an unbroken series of regularly planned although unfinished streets and buildings with the town of Leith; and the distance from centre to centre,—say from the Post-office in Waterloo-place to the upper draw-bridge over the harbour,—may amount, as the crow flies, to something like two miles. Between the foreground and the sea a number of nurseries and market-gardens give the scene something of a rural and suburban aspect, which is greatly enhanced by the Links of Leith and the verdant meadows of Craigentiny. To the right lies the fashionable watering-place of Portobello, famous for its marine parade and also its potteries; to the left the fishing village of Newhaven, celebrated for its stalwart and industrious fishermen.† The view is bounded on the one hand by the fertile champagne country of East Lothian, and promontory of North Berwick Law; on the other by the picturesque coast of Fife, and the sloping eminences of the Ochil hills; while the whole expanse of the middle distance is filled with the "dark blue waters" of the Firth of Forth, with its pretty green islands glistening on its azure bosom. We need not put in the ships at anchor, the white sails, the smoke of the steamers, the forest of masts in the docks, or the steeple of the parish church. This last feature of the picture unfortunately does not exist. We are more concerned with a multitude of tall chimneys, gigantic glass cones, and sugar-house and coke work furnaces, and boiler works, all of which are more or less the means of actively discharging foreign particles of matter into the surrounding atmosphere. It is a pity to find such a pleasing landscape and seapiece destroyed by accidental effects like these, which at first glance we are sure must be capable of remedy.

We shall now proceed down Leith-walk, which is the great artery of communication between the city and the seaport. The walk from Princes-street, in Edinburgh, to the Kirkgate, in Leith, *via* this thoroughfare, is something like going from Regent-circus to Baginbode Wells-road. South Leith kirk, which we pass on our right hand,—a rather successful restoration of the Medieval Gothic fabric, by Mr. Hamilton (minus the spire, however), stands in the centre of a small and highly over-crowded graveyard. Surrounded as this churchyard is by a dense population, piled up in the tall tenements, with the inevitable common stairs, it must be highly injurious to health, and we have no hesitation in saying that it ought to be shut up without delay.

As to the rest of the public buildings in Leith, we may briefly dispose of them. The townhall, which contains the council chambers and the police court, is situated at the intersection of Constitution-street and Charlotte-street, and is rather a favourable specimen of municipal archi-

tecture in Scotland, of the Græco-Italian style, so fashionable in Edinburgh fifty years ago. If, however, the expense which has been lavished on the Ionic pillars that are attached to its northern elevation had been devoted to the enlargement and improvement of its staircase, there would have been an obvious gain to the community. The assembly-rooms, of which we have only an elevation of pilasters and pediment, are now converted into merchants' offices. The corn exchange is rather a tasteful building, by Mr. Cousin, a sort of composite French and Italian design, with an octagon dome. The custom-house in North Leith, which is the best building in the port, is a solid and substantial reproduction, on a smaller scale, of its prototype in Lower Thames-street. The Presbyterian churches are either above or beneath notice; and the Early English Episcopal chapel, by Mr. Gilbert Scott, has been previously noticed in our columns. The great buildings in Leith are the docks, the most recent of which, the Victoria Dock, is in every way creditable to the engineers, the contractors, and the community.

The Tolbooth-wynd, in which is situated the jail of the borough, turns off at right angles from the Kirkgate towards the harbour; and is a curious irregular street, opening obliquely, and sloping downward at the same time towards the fish-quay. It contains several narrow dingy alleys, communicating with St. Andrew-street; but the nuisance here that principally attracted our attention was the smell of putrid fish proceeding from the codsmongers' stalls on the quay, and from the *debris* and entrails profusely scattered around them.

Turning to the left, we looked into the interior of an ancient tenemented dwelling, which is divided into single rooms. Our visit was during the day, and most of the male inhabitants were abroad. But, judging from the number of women and children, squalid and dirty, we could not but suppose that overcrowding the poorer population had reached its climax in this part of the port. The mass of disease and filth must be very great, which is concentrated in such unmistakable plague-spots. Water-closets there were none; in fact, there was no water nor soil-pipe—no water supply at all but that which was derived from the scanty and uncertain source of the public wells. Similar instances we rapidly glanced at in the adjoining streets of the Peat-head and the Cable-wynd. Certainly, these were some of the worst examples of overcrowding we saw.

We now retraced our steps, and came eastward along the "shore," as it is called, or rather that ancient line of houses which overlooks the harbour, some of them dating, we believe, from the sixteenth century. We did not go up-stairs on this occasion: we went *down*, among the collar dwellings with which the whole street is lined. It is hardly necessary to say that they were thickly populated. Ostensibly occupied during the day as public-houses and subterranean cook-shops, they were, it cannot be doubted, during the night devoted to worse purposes. The sound of a hurdy-gurdy, and a German girl's voice also grinding at the everlasting song of "Slesvig Holstein," reminded us that the foreign sailor was here trying to find his hours of relaxation ashore, and led us to think with astonishment at his appetite for such enjoyment. It is gratifying to report that the sanitary inspector of the burgh is looking sharply after these hovels.

Passing on our way to Quality-street through one of these narrow, dingy closes, into which the light of the sun can never penetrate, we were forcibly and even dangerously reminded that we were at that moment in a country in which the lower class of citizens think it no disgrace to project the contents of their pails on the public roadway. Why must this horrible practice continue to exist in Scotland? Since the poor people will persist in doing such frightful things in spite of Police Acts and Summary Procedure Bills, in spite of fines or even of imprisonment, could some sanitary engineer not invent a cheap form of a cast-iron trough, or "Jawbox," as they say in Glasgow, copiously supplied with water, into which they might legally and honestly discharge their pails? To be sure the surface manure would in such a case be lost to the dung contractor, but that is surely not a paramount consideration.

Quality-street, which we have incidentally mentioned, was at one period the fashionable quarter of the town, when the Leith Races, as the poet Ferguson describes them, flourished in all their glory. It is now composed chiefly of warehouses and corn-lofts; and we were speedily

* Randolph to Killigrew, June 22, 1561. MS. Rolls House. *Fide* Froude's "History of England" (Reign of Elizabeth), vol. i., p. 265.

† Leith, Newhaven, Portobello, and the adjacent fishing village of Musselburgh, of which it was long ago said:—

"Musselburgh was a burgh
When Edinburgh was nae;
Musselburgh will be a burgh
When Edinburgh is gane!"

These four places constitute, in Parliamentary parlance, "the Leith District of Burghs."

made conscious of the powerful effluvia of guano proceeding from one of them,—a commodity, we believe, which constitutes a staple trade of the port. Immense quantities of guano, which it is hardly necessary to explain is the decayed excrement of sea fowls, are constantly being concentrated in Leith, *i.e.*, imported and exported; and although some people profess to say that its gases are innocuous, we are not able to share in the opinion. The buildings in Leith, we may observe, are largely composed of warehouses and lofts, chiefly constructed for purposes of storage during the *régné* of the corn laws; but no general provision seems to be made for their ventilation.

Before leaving the harbour we must say a word or two about the drainage of the Water of Leith. As far as our observation goes, and our inquiries support us, it has not turned out altogether successful as regards Leith. Some of our readers may remember how the public indignation was excited in Edinburgh about the state of this pretty but polluted stream. An Act of Parliament was procured and a heavy assessment levied (70,000*l.*) for the purpose of its purification. An improvement commission was appointed, as the fashion is in Scotland, with a staff of paid officials to superintend the job. Without inquiry,—without any public report at least,—and without a public competition, Messrs. Stevenson were employed to lay down a cast-iron pipe in the bed of the river, reaching from the Caledonian Distillery to the Black Rocks, a point in the channel of the estuary which is reached by the scour of the Forth. Not only is this sewage lost for ever to the adjoining meadows of Granton, but the harbour of Leith, which was the principal source of complaint, still rejoices in its filthy slimy bed, which, when the tide is out, and the sun shining, vomits forth its poisonous exhalations as bad as ever. The only good thing that can be said of this particular drainage scheme is that the distillery wash has been carried out to feed the fishes in the Firth of Forth.

But we are afraid that the whole system of sewerage in Leith is rather defective; as, indeed, we may learn from any gully-hole. Most of the main sewers, of course, are laid below the high-water level. The exit valves must therefore be defective or unsuitable; and a very pernicious practice seems to exist on the part of the large manufacturers, who appear to discharge without the slightest regard to consequences, their waste steam into the sewers. There is no provision for ventilation that we could hear of.

The water supply is also sadly deficient. Leith and Portobello are at this moment supplied from the same sources as Edinburgh, and are parties to the recent Act of Parliament which denudes the Joint Stock Company and vests the property in the corporations. This, we have already said, is a step in the right direction, if properly carried into effect. The shipping in the docks are very well supplied, of course; but the poorer districts, as we have seen, are very ill supplied indeed; and it is precisely in these quarters where contagious diseases are constantly present in one form or another. Leith, we may add, has a small source of independent water supply in a neighbouring loch, situated on the rising ground halfway between Leith and Restalrig (Lochend). But as this basin of water receives the natural drainage as well as the sewage of the districts of Norton and Mayfield in Edinburgh, the water is rendered unwholesome and unfit for use. It had, therefore, some years ago, to be discontinued as a supply for the public wells, and is now, we believe, restricted in its use to the purposes of the manufactories and public works.

We may add here with pleasure that Leith is the only town in Scotland in which we have discovered public water-closets: a great step in advance, the honour of which, we believe, is due to Mr. Superintendent Grant. One or two we looked at in Storrer's-alley and Bargess-close seemed to be kept in proper order and cleanliness. There are still, however, some very filthy public and private privies about the shore which should be improved.

We have now pretty well exhausted our list of grievances under which the port of Leith is at present suffering; but one still remains which is, perhaps, the greatest and most important. We have said that guano, that is, the decayed excrement of sea fowl, and, therefore, a quasi-natural manure, is a staple trade of the place. We must now add that dissolved bones, an artificial manure, is also another staple. Leith, indeed, seems to be

the grand emporium of artificial manures in Scotland. Coprolites, the fossil excrement of certain extinct species of molluscs, is imported in large quantities from the coltic beds of the Rhine and the Danube, and these, we understand, constitute the profitable admixture with the genuine bones just as chicory does in the case of coffee. But, whatever it may be along the sea beach of South Leith, at Salamander-street and Tower-street are situated a range about a mile in length of chemical works. Bone-works, gas-works, manure-manufactories, and blubber-boilers, who contrive to infect the whole atmosphere with such a villanous compound of noxious gases and bad smells as baffles all ordinary language to describe. Sulphuretted hydrogen, hydro-sulphuret of ammonia, carburetted hydrogen,—the gases which proceed from decayed bones, putrid fish, boiled oil, and fried blubber,—these and a multitude of others combine to disseminate through the surrounding atmosphere an effluvia so disgusting and intolerable that it must be smelt to be understood. Had Dante lived in our day and passed through Salamander-street, he would certainly have added a chapter to his immortal work! No doubt these manufactures are profitable, and largely increase the trade of the port. But look at the sad results, the death-rate, and think of the price which the inhabitants of the port have to pay for this modern scientific manufacture. Those curious series of old glasshouse cones, six we counted, were never built or intended for such vile uses as those to which they are put at present. Where, by the way, has the once celebrated bottle trade gone to?

We have said enough to suggest inquiry and to promote progress. The irrigated meadows of Craigentuny are not managed as they ought to be; and we need not stay to point out how easily in such a case a blessing may be converted into a curse. A great and irreparable blunder has also been committed by the authorities in allowing the different lines of railway that encircle the coast to approach the town at such a level as to block up, like so many boundary walls, the view from the houses which are situated near the beach, and so to destroy the amenities as well as to injure the value of the property. The macadamised roads in the suburbs are generally in a shocking condition; and, indeed, as a rule, the sweeping of the streets is inadequate, if we take into consideration the heavy traffic of the port. We were also informed that the lower classes more especially are notoriously intemperate in their habits, which is, however, by no means a special characteristic of the poor people of Leith. Their food, perhaps, consists too much of stale stock fish and salt herrings.

Let us add, that we are not seeking to find fault with the local government; on the contrary, it is but fair to admit that no town in Scotland has made such large strides in so short a time in the not very agreeable process of self-purification. Numerous Acts of Parliament and Provisional Orders have been obtained, and taxes of course have been levied; many ruinous tenements have been pulled down and the streets widened; and the suburbs, including Newhaven, have been drained, paved, and lighted with gas. But with all this and more, the sad result remains,—a deplorable death-rate; and with this staring them in the teeth, no municipality whatever can be permitted to rest on their oars. The public officers, it is proper to mention, are all persons of standing and experience in their respective departments of the public service. We have thus an unusually favourable opportunity of observing the constitution and administration of a local authority in circumstances which are confessedly difficult, and of studying its operations and action in connexion with the recent sanitary legislation for Scotland, of which it may with justice be said that Leith was at once the birthplace and the cradle. It is almost unnecessary to mention the name of Provost Lindsay, the predecessor of Mr. Watt in the civic chair of Leith. The unwearied legislative diligence and skill of this gentleman in constructing Police Bills and Public Health Acts for Scotland, has not, we fear, been sufficiently well appreciated by his countrymen. A very well-chiselled marble bust in the town-hall,—a good portrait, we were told,—serves in the mean while, however, to commemorate his services to the burghs of Scotland, and more particularly to the port of Leith.

Mr. Carlyle, in a very characteristic letter to the late Dr. Robertson, of Leith, speaks of these great bottle cones as the only thing he recollects of Leith after an interval of forty years.

THE LATE JOHN WOOD, PAINTER.

JOHN WOOD was born in London, on the 29th of June, 1801. His father, a man of considerable ability, was originally intended for a literary profession, but ultimately took to business. John Wood's first idea of art he probably owed to his father. At four years old he stood on a little stool by his parent's side, intensely watching the sketch his father drew, and then eagerly copied it.

His education was completed at Aspley, in Bedfordshire, where he was under the charge of an uncle, who was much attached to him. Love for art strengthened with his years. At school he sketched his schoolfellows, and at earliest dawn, while others were sleeping, rose to make outlines from the works of Raffaello. On leaving school, his career was for some time a dreary one. His father possessed the will but lacked the means that would have paved the way for the qualification of his son's desires; much valuable time was consequently lost before he was enabled to take a step in the right direction. At length a friend (Mr. Barnes) introduced him to Mr. Henry Sass, and in his studio he made the drawing that obtained him admittance as a probationer at the Royal Academy. Three months after he obtained his student's ticket. This was in March, 1819.

As a student he worked on zealously and enthusiastically. Medals were awarded, and he obtained the notice of Sir Thomas Lawrence, under whose auspices he made his first step in life. The Gold Medal in 1825 was the crowning reward of his student's career. From this period until about ten years previous to his death he was indefatigable in his exertions, his failing health preventing him from following his occupation. His maiden effort as an exhibitor was the picture of "Adam and Eve lamenting over the dead Body of Abel," in 1823, which attracted considerable attention. This was followed by other works of great merit, and he rapidly advanced on the road to fame and independence. In 1836 he obtained the Manchester prize; in 1844, the commission to paint the Bermondsey Altar-piece, in a general competition; and, two years after, the 1,000*l.* premium for the "Baptism of our Saviour in the Jordan."

These prizes were honourable awards in the life of one who had fought his way in the world, and he never omitted returning thanks to Providence for these crowning results of his pencil. John Wood died unmarried. His house was kept by a beloved sister, who, during the lengthened period of his illness (close upon ten years) attended upon him with devoted affection. After a life rendered happy from being employed in a chosen pursuit, dignified by perseverance and kindness of heart, he passed away on the evening of the 19th of April last, in the sixty-ninth year of his age, dying in the house he had occupied for upwards of forty years. His productions are numerous and varied.

C. J. A.

CHURCH-BUILDING IN LEICESTER.

The foundation-stones of two new churches, one dedicated to St. Paul and the other to St. Mark, were laid recently, with Freemasonic and religious ceremonial.

The Church of St. Paul will be situated on the Dane Hills, one of the most salubrious sites circumscribing the town, on which a new colony is arising.

The site, on various trials, was found to have been previously excavated of the superficial sandstone rock, which no doubt had been made available for building the Roman structures of the town, and subsequently filled up with debris therefrom. This has been removed to a depth varying from 3 ft. to 11 ft. (which has entailed a considerable expenditure over and above the cost of an ordinary foundation), so that the basis of this structure may be materially founded upon a rock.

The superstructure will accommodate 800 persons, free. The funds have limited the operations of the founders to the building of the tower only so far as the apex of the roof. The church is to be built of Montserrat granite, bounded and interlaid with Derbyshire red grit stone, covered with the Swithland grey green slating, so as to attain unity of mass in body and colour. The dimensions are subjoined.—Tower: 21 ft. square (62 ft. high for the present); additional height required for belfry and spire, 125 ft., making the total height nearly 200 ft. Nave: 91 ft. long by 31 ft. 4 in. wide, 38 ft. 3 in. high to eaves of roof, 60 ft. high to ridge. Aisles: 38 ft. 6 in. by 17 ft., 13 ft. 10 in. high to eaves,

28 ft. high to ridge. Chancel: 43 ft. by 29 ft. 2 in., 36 ft. high to eaves. Vestry: 18 ft. by 14 ft., by 12 ft. high. Heating-chamber beneath vestry, for the reception of warm-air apparatus, furnished and applied by Messrs. Haden, of Trowbridge.

Messrs. Osborne have undertaken the execution of the work, comprising all the casualties, at a sum under 5,000l.

The design was selected from a general local competition. That submitted by Mr. F. W. Ordish, of Queniborough, was selected, with whom is now associated Mr. J. C. Traylen, engaged in practically developing the work. Mr. McAllister, a resident of the town, has to see that the whole is carried out in accordance with the wishes of the committee.

St. Mark's Church has been designed to fit a site of very irregular form. In plan it consists of nave and chancel of equal width throughout, the latter terminating in a semicircular apse; north aisle of parallel width, with vestry at the eastern end; south aisle in three bays, each projecting beyond the other farther south, to meet the incline line of street boundary. The tower is at the eastern end of the south aisle, and between it and the chancel will be an organ-chamber. There are three western entrances open to a spacious vestibule entered from a porch with double western doorway, and the south aisle also opens to the tower. The length of the nave is 62 ft., its width 31 ft., and its height to the point of the arched ceiling, 53 ft. The chancel is of similar width, and equal height, and is 37 ft. 6 in. deep to the centre of the apse. The north aisle is 15 ft. wide, and the south aisle about 12 ft. in the western, and 26 ft. in the easternmost bay. The tower is 25 ft. square above the base, 79 ft. high from the pavement to top of the parapet, and thence to the top of the spire, 89 ft.

The walls of the church are to be built of plate stone from Mr. Herrick's quarries, lined internally with red brick and freestone from the Doulting quarries, in Somerset. The same stone is to be used for all external dressings, and for the spire throughout. The nave is to be divided from the aisles on each side by an arcade of three arches, supported by four pillars, having shafts of polished granite, from Shap, in Westmoreland, and richly carved capitals. The arches are to be of Doulting and red Mansfield stones in alternate courses. The arcade is to be surmounted by a lofty clearstory of single-light windows, enriched internally with shafts and carved capitals. The same series of windows is continued round the apse, with tracery in the lights, and with pillars of stone externally and of marble within. The nave is also lighted at the western end by a five-light window of large dimensions, and the south aisle by a lofty three-light window under each gable.

The tower is to be almost entirely plain up to the base of the bell-chamber story, but the latter is to be richly decorated, wholly open, with deeply-recessed windows of two lights each, on each of its four sides. The angle piers of this story are to be furnished with large pinnacles, surmounted by figures of the four Evangelists.

The architect is Mr. Ewan Christian, of London. The contracts for the building of both churches are in the hands of Messrs. Osborne, Brothers, stonemasons, of this town. Their foreman, Mr. W. Lindley, will carry out the plans.

Upwards of sixty masons, besides wallers and bricklayers, are engaged in the erection of the two churches.

ERECTION OF A NEW WORKHOUSE FOR PENKRDIDGE.

The Guardians of the Penkridge Union having selected a suitable site at Cannock, the new workhouse is now being erected under the direction of Mr. Edwd. Holmes, architect, of Birmingham. The general aspect of the proposed building is south. The front block has been set apart for the board offices, immediately behind which is placed the vagrants' and receiving wards. The main block of the building runs parallel with the board offices. The dining-hall and also the kitchen-offices communicate with the main building and schools by means of corridors. The general school, boys' day-room, and play-ground are on the right of the dining-hall, while the girls' are on the left. Spacious dormitories are arranged on the first floor of this building. The infirmary, comprising the sick wards, occupies the western portion of the site, and the fever wards, which are also a detached building, are placed on the north end

of the site. The accommodation provided in the main building is for 47 infirm and aged males and 10 able-bodied males, making a total of 57 males; and for 39 infirm and aged females and 20 able-bodied,—total, 59 females. The dining-hall is 38 ft. by 24 ft. 6 in., and will be arranged so that each class of adults as well as children may assemble without mixing; a division up the centre will separate the males from the females. It is intended to use the dining-hall as a chapel. School-rooms are provided for 24 boys and 31 girls and infants. The accommodation provided for in the infirmary is as follows:—Males, sick, 9; itch, 4; fever, 4; total, 17; females, sick, 5; itch, 4; lying-in, 4; fever, 4; total, 17. The method adopted for ventilating the building is by the use of air-bricks covered on the inside with finely perforated zinc, to be inserted at distances of from 8 ft. to 10 ft. apart near the floor level, and over them near the ceiling, except where the rooms are ceiled above the wall-plates, in which case circular ventilators, 16 in. diameter, will be placed in the ceiling and covered on the under-side with perforated zinc. Louvers will also be provided in the roofs. The building will be constructed of brick with stone dressings. The estimated cost is 6,745l. Messrs. Farnell & Son, of Rugby, are the builders.

STAGNANT LINCOLN.

In some respects, there is not a more delightful city out of England than Lincoln is, not to live in. It may be divided into two parts, High Lincoln and Low Lincoln, or Lindum and Lincoln. The upper portion, in which stands that glorious monument of Mediæval architecture the cathedral, is not, in another sense of the word, the highest; but the dwellers there have important advantages over their neighbours beneath, who form the majority. This is situated on a fen which has been rendered comparatively dry by numerous dykes, filled with stagnant water, in which the sewage, or rather refuse, of the whole city, of some 27,000 inhabitants, ferments, and fills the atmosphere with "a most ancient and fish-like smell." How such an abominable stench can be tolerated for even a day in this year of grace 1870 is a mystery to every one whose experience is not wholly confined to Lincoln. It may not be unhealthy for such, who appear to thrive as, it is said, a certain domestic animal, not altogether unknown to Lincolnshire farmers, does; but, to say the least, it is not refined. There is, nevertheless, a local board and an inspector of nuisances; but what substantial thing that body has yet accomplished is not recorded. How to purify the air of such a flat and swampy place is, doubtless, a difficult problem to solve; this, however, does not justify no action in the matter. It may arise from a deplorable apathy or from a miserable spirit of economy.

It is not upon this particular subject alone that no desire to progress with the age is evinced, and things are tolerated with a spirit of patient forbearance that can scarcely be paralleled by any city of equal importance in England. To show how benighted and wrapped up in administering to the wants of the inner man,* I need but say that that great organ of progress and enlightened civilisation the *Builder* is scarcely known, and there are barely five hundred dailies sold that hail from the metropolis, and these do not reach Lincoln till London is devouring its evening papers; yet the distance between the cities could be travelled with ease in three hours and a half. Situated in the centre of the finest agricultural and, at the same time, one of the wealthiest and most flourishing counties in England, containing thirty-five market towns, this is remarkable, and naturally leads to speculation as to the enlightenment of its subordinate towns. On market days almost as many carriers' carts pour in as may be seen at the Old Bailey; and the streets are so thronged with gaping bumpkins, in their "Sunday-go-to-meeting clothes," that they are quite unpassable.

The High-street is a noble street, and only wants better architecture, and a row of trees,—which would tend to purify the air,—planted, and a continual stream of clean water from the river Witham, running down the east and west channel, to make it "a thing of beauty." There appears to be almost an aversion to anything sylvan or floral; and the paucity of trees where

they naturally would flourish is calculated to make a worshipper of Nature in her pristine beauty weep. So that the gastronomic organs be well supplied with work, John Bull,—*Punch's* typical J. B. abounds,—does not care what his olfactory organs and the senses which raise man above his fellow-creatures undergo. If there be any flower at all in his garden, it is sure to be a cauliflower. There is one refining haunt where Londoners are wont to regale their souls that Lincoln would do well to notice: this is Battersea Park, so recently converted from a swamp to a well-arranged semi-tropical garden. No place offers greater facilities than Lincoln for the formation of a similar delightful resort.

It is not likely that a people who entertain so small a regard for the beauties of nature have much for those of art, oil-cake being the nearest approach to anything likely to be seen at Burlington House, and a windmill the only instrument that essays the inspirations of Mendelssohn, Verdi, or Offenbach. It cannot, however, be said that the Lincolnians are less moral or straitlaced than the inhabitants of other cathedral towns; but it must be admitted by the rapidly-increasing population, and the abundance of well-fed and clad pledges of affection, that the doctrine of Malthus is not much considered. In fine, it is incumbent upon the authorities to prepare for a large population, and not to shun a progression that may touch the rate-payers' pockets directly, to save them indirectly in the shape of doctors' bills, and inability to compete with their fellows. GARGOYLE.

MUSIC.

At a concert given by Mr. Henry Lahee in the Hanover-square Rooms on Monday last his cantata, "The Building of the Ship," was performed for the first time in public, the vocalists being Miss Edith Wynne, Miss Julia Elton, Miss Emily Spiller, Mr. E. Lloyd, and Mr. Wien, with 100 selected voices of the Tonic Sol-Fa Association as chorus, under the direction of Mr. Proudman. Longfellow's fine poem,—the poem in which he urges that—

"The heart,
Giveth grace unto every art,"

and adds—

"It is the heart and not the brain
That to the highest does attain,"—

is known to most of our readers; and when we say that the music is worthy of the words, they will know it is not slight praise. We have no hesitation in asserting that this cantata is a work of very high merit, and places the composer in the front rank of his profession. A song to Marlowe's well-known words from "The Passionate Shepherd,"—

"Come, live with me and be my love,"

and a part song, "The Thresher," were other excellent specimens of Mr. Lahee's ability that were set forth on this occasion. Miss Emily Spiller is a very promising young contralto. The concert was altogether a success.

REPAIR OF ST. ANDREW'S SPIRE, WORCESTER.

THE height of the tower and spire in St. Andrew's, Worcester, is 245 ft. 6 in. Some repairs at the summit being requisite, Mr. George Frith, of Coventry, builder, who recently repaired a spire at Hereford by simple and inexpensive means, has been employed in this case also, as in others besides Hereford. Standing in Paine's meadow, he flew a kite carrying a holding string, which was so manoeuvred as to be securely passed over the top stone of the spire and round the rod which supports the weather-cock. To the thin kite-line was then attached one somewhat thicker, which was drawn over and substituted, in its turn to give place to a rope something under an inch thick. To this rope was fixed a block, through which another rope of similar thickness was drawn; and the block having been raised to the top, and the rope to which it was attached crossed tightly round the spire and securely fastened, the other hanging by the tapering sides of the spire, formed the means by which the adventurous climber reached the top. From one part of this was suspended, by means of cords passed through the four corners, a small piece of board, just large enough to form a seat; and to the rope on the other side of the block were fastened several large weights, 12 stones in all. The

* For "inner," read outward: a common mistake.—Ed.

space between the seat, or carriage, and the weights was just about the entire height of the spire; and, the purpose of the weights being to form a counterpoise, when the carriage was up the weights were down, and *vice versa*. The ascent did not occupy more than a minute, being accomplished with the greatest ease. In the ascent Frith kept himself from the wall with his feet by a walk-like motion. Arrived at the top, he left his seat and stood on the top stone, upon which the crowds below burst into a loud cheer. "Steeple Jack" answered the cheer from aloft, after which he took off the weather-cock, examined, and replaced it. He then resumed his seat, and, having lowered himself sufficiently, swung himself partially round the spire to the place where a defect existed in the lightning conductor. Here he satisfied himself as to what would be necessary, and forthwith descended to *terra firma* to get it. The conductor, he discovered, had been all but severed in fixing it. A careless workman had driven a staple almost through it; and the wonder is, not that it broke, but that it held together so long. Later in the afternoon this was spliced, a copper tube being passed over to render another severance impossible, and next day portions of defective stonework were also repaired.

BUILDERS' BENEVOLENT INSTITUTION.

A GENERAL MEETING of the subscribers and friends to this charity was held on Thursday (26th ult.), at Willis's Rooms, King-street, St. James's, to elect two pensioners on the funds,—one male and one female,—from a list of twelve candidates. The chair was taken by Mr. J. M. Macey, the president.

The chairman referred to the condition of the funds, which then enabled them only to elect two pensioners, from a list of twelve candidates. He was aware that many builders and persons connected with the building trade did not subscribe to the institution, which he thought might be owing to the general depression of trade. He trusted that in future there would be increased subscriptions, so that a greater number of candidates might become recipients of the benefits of the institution.

The poll was then proceeded with, and at its close the following were declared duly elected:—Richard Bardett and Martha A. Martin.

On the motion of Mr. Simpson, seconded by Mr. Thorn, a vote of thanks was accorded to Mr. Cozens and Mr. Stirling, scrutineers.

Mr. Joseph Bird addressed the unsuccessful candidates, and urged them not to relax their efforts in obtaining as many votes as possible for the next election, when he hoped the subscriptions would have greatly increased. The candidates must at length be elected, as their votes were brought forward from time to time.

THE MUTIPLICATION OF ARCHITECTURAL STYLES.

Sir,—Your number for May 21st contains strictures on an extremely Boottian case of architectural criticism on the part of a contemporary. May I venture to suggest, that such a state of public ignorance as permits the crude writing in question to pass muster, is in some degree due to the latitudinarianism indulged in by architects themselves in respect of styles of architecture? Half a century ago, a sort of sumptuary law virtually prevailing, hindered architects from wilfully mixing together Chinese architecture with Greek, or Gothic with Italian; and under this state of things it became possible for persons of moderately liberal education to acquire a few architectural terms, and apply them without talking nonsense. The Oracle of the drawing-room could pronounce a portico to be Ionic, in a sonorous voice, and without circumlocution. In the present day, he is afraid of being tripped up when he draws a distinction, and so omits architecture from the list of his topics.

The claim which an art has to the regard of men of general, as opposed to technical, education is, its association with history and with literature:—Greek architecture with Plato and Socrates; Roman, with the Augustan era; Gothic, with chivalry, and also with ecclesiology; Elizabethan, with Bacon and Shakespeare; red brick walls and Palladian dressings, with Pope and Addison; &c. But, if an architect says, "I care not for all these associations: my works are Victorian, and nothing else: if I use Roman

or Gothic details, I think no more of their origin than Dr. Johnson thought of Queen Eleanor when he spoke of Charing-cross;"—in this case the public revenge will be taken upon the art, by consigning its details to an equivalent position with the details of modern dress: to Dux collars, Siphonia overcoats, and Sydenham trousers.

"How much a year does your house cost you in taxes, and in what style of architecture is it built?" asks the friend after dinner. Answers the host, annoyed at the familiarity, "I only think once of the taxes, and that is when I pay them; and, as to style, my fellow of an architect confounded all my notions of geography and chronology with his combinations of terms;" and added "freely treated," by way of finish; "so I suppose that I and my house are altogether in the 'freely treated style.'" G. M.

MODEST!

Sir,—In *The Church Builder* I find a communication from Mr. J. H. Parker, Hon. M.A., on the subject of "Cement Construction," wherein he says:—"I gave a lecture on this subject to the Royal Institute of British Architects some years since, and I am told, that since that time concrete walls and Portland cement (which is the same thing as the old Roman cement [nonsense] or Roman mortar) has come into much more general use. The principle was not understood by many of the architects until I explained it to them." This is said of the body who had printed your own Essay on Concrete years before. A cooler piece of impertinence I have not read for some time. When the Institute made Mr. Parker an Honorary Member, was it for thus enlightening them? I shall be tempted to believe that what his Holiness the Pope said of Mr. Parker, the other day, is true.

AN OLD FELLOW.

RESTORATION OF CHESTER CATHEDRAL.

FROM the second annual report of the committee, the restoration of the cathedral appears to be progressing satisfactorily. Much time and money have necessarily been spent in underpinning the whole of the eastern part of the fabric, but this work has been completed from transept to transept, the choir and the lady chapel having thereby been rendered secure. Considerable progress has been made, especially in the lady chapel, the designs for the gable and roof of which will be carried out without delay. The restoration of the clearstory of the choir has also been carried out to completion, and the aisle of the choir will be immediately commenced. Meanwhile the south wall of the aisle is approaching completion. The central tower will be fully restored in the course of the summer, and already the decoration of its upper part is coming to view. It is hoped to bring out more fully the sound of the tower bells. This is included in Mr. Thompson's contract, which also comprises the restoration of the whole south side and west end of the nave, which are gradually advancing, together with the lower stage of the unfinished south-western tower and the south porch, which abuts upon it. There is to be a new roof to the nave, and it has been determined, while the scaffolding is in its place, to proceed with the groining of the nave and its south aisle. It has been determined to raise a special fund of 5,000*l.* for the purpose. The balance in the bank at the end of the past year was about 8,500*l.*; and though, at the end of March, the amount in hand had risen to about 11,500*l.*, the augmentation was chiefly due to the 5,000*l.*, which were received from the Ecclesiastical Commissioners.

WEDNESFIELD CHURCH, NEAR WOLVERHAMPTON.

AT Lichfield, on Saturday week, the Chancellor of the Diocese gave judgment in an application by the Rev. W. Stephens, incumbent of Wednesfield, for a faculty for the repair and alleged improvement of the church; and also for sanction for alterations and repairs he had caused to be made. He was represented by his proctor, Mr. Hodson, and opposed by Mr. Chinn, on behalf of Mr. Bradburn, churchwarden, and certain other parishioners. The opposition opposed internal alterations until the fabric itself, and especially the churchyard wall, was put into a thorough

state of repair. The decision of the Chancellor was as follows:—1. That the chancel remain as it now is. 2. That the organ and choir be placed in the west gallery. 3. That the font be removed to the west end of the church. 4. That the coals be removed from the north-east porch of the said church, and that it be used henceforward for the entrance and exit of the congregation. 5. That free seats be placed down the centre aisle as before. 6. That the present stoves be removed from the centre aisle, and the church be heated by hot-air apparatus. 7. That the pulpit and reading desk be placed in the most suitable position for hearing and seeing according to the decision of a vestry meeting to be called for the purpose of deciding that question. 8. That the churchwardens be called upon to repair the churchyard wall, but that such repairs do not require the authority of a faculty. The judge condemned Hodson's parties in the sum of 30*l.* *nomine expensarum* of the contentious cost of Chinn's parties. Hodson protested of a grievance to his parties, and gave notice of appeal to the Archdeacon.

CHURCH BUILDING IN THE ORKNEYS, &c.

EFFORTS are now being made to secure for this northern island district, church and school accommodation for the poor Roman Catholic population. There is neither a chapel nor a school for them. At Thurso, in Caithness, on the main land of the north of Scotland, it is the same. At Wick, through the labours, donations, and collections of the poor Irish labouring population and others, a small chapel-house with school, has recently been erected. This is said to be the first since the days of John Knox. For want of funds the church remains without furniture.

The poor immigrant Irish have, during the last half century, built nearly all the Roman Catholic chapels and schools in Scotland, by their subscriptions and collections; but the Scottish clergy, as a body, are slow to acknowledge the fact. As soon as the mission in the Orkneys is established, there is no doubt but the Norwegian Missionary Apostolic, now labouring with might and main, will have to give way to a new-fledged student from the college of Blair, or for a native of Exeter or Banff.

AN ECHO FROM ORKNEY.

RAILWAY MATTERS.

THE extension of the Metropolitan District line from Westminster to Blackfriars was opened for passenger traffic on Monday morning. The line is, of course, in a state of complete efficiency, but much work yet requires to be done before the stations at Hungerford, the Temple, and Blackfriars will be thoroughly fitted for comfortable use. At all the Embankment stations there will be entrances from the Strand and the river platform. There will be train service at short intervals from early morning until near midnight.

Proposed Mansion House Station.—The Committee of the House of Lords have decided on the Bill as follows:—

"The Committee have given very anxious attention to this Bill, and have listened with all attention to the arguments adduced for and against it by the learned counsel on either side. The Committee have unanimously come to the conclusion that they will not sanction that portion of the Bill which authorizes the construction of the railway from Bread-street to the Mansion House. With respect to the Metropolitan Railway Bill, the Committee will not consent to the abandonment of the Railway extension from Aldgate to Trinity-square, but they are prepared to recommend that there should be an extension of time, if it is desired, for the completion of the works."

The little line of narrow railway running between Festiniog and Tremadoc, North Wales, with its "Fairlie" engine, the "Little Wonder," are likely to earn for themselves a wide repute. The length of the line is only 13 miles, with a gauge somewhat under 2 ft., and the miniature "Fairlie" engine, although so diminutive in size, is equal to 440 tons of load, and of running at 15 miles an hour, the diameter of the bogie-wheel being 2 ft. 4 in. Mr. Fairlie, C.E., who has introduced this cheap system of railways into England, was sent for to St. Petersburg, to explain to the Emperor all the working details of this model line, and the Emperor issued a commission, with Prince Bobrowsky as its president, to visit this country, and personally inspect and report upon the working details of this model line. The inspection took place on February 11th, in the presence of the Duke of Sutherland, and the representatives of all the Continental powers. The experiments were so

satisfactory, that four lines of narrow-gauge, 12 versts in length, have been ordered to be made in Russia, and Messrs. Sharp & Stewart, of Manchester, have received the order for the engines. Thus, a little line of Welsh railway has set an example to Europe as to the construction of cheap narrow-gauge lines, which will doubtless be followed by India and other countries, where great distances are to be travelled.

WATER GLASS FOR WALLS.

Sir,—Permit me to inquire, as one of your subscribers, in reference to water-glass as a preservative of moisture in walls. In the *Builder* of December 5th, 1867, is an article about it, apparently recommending its use, and I wish to ask whether experience has proved it to be efficient and lasting. I am building a hospital, and I desire to make the walls impervious to moisture and non-absorbent of exhalations peculiar to the atmosphere of a hospital. Our walls are usually "plastered" with a good quality of lime and sand mortar, and finished with a coating of plaster of Paris; upon this I propose to use water-glass, if it can be recommended.

CARL FRIEßNER.

New York.

SWANSEA WATERWORKS.

WITH reference to some particulars recently quoted in our pages, at the request of inhabitants of Swansea, from the *Cambrian*, we are asked to print the following from the same journal, and most willingly comply:—

"The New Waterworks.—In an article in reference to the leakage at the New Waterworks, in our issue of the 13th inst., we inadvertently stated that the new works were carried out under the immediate supervision of Mr. Stansfield, the resident engineer of the borough. We very much regret that we should have fallen into such an error, but regret still more to find that the mis-statement has been copied into the *Builder* and other metropolitan papers, and comments made therefrom reflecting unfavourably upon the professional reputation of Mr. Cousins. We need not say that we had no desire to unduly reflect upon the skill and attention of our surveyor—the only inference intended, and the only inference which we believe the public drew from the article, was that, notwithstanding the great care taken in the examination of the works (they being superintended by those in whom every confidence was justly placed), so great a leakage now exists. However, another inference has been drawn; and, as we have before stated, we regret the error which we inadvertently committed. Mr. Cousins has nothing whatever to do with the new waterworks, and consequently cannot be held in any way responsible for the leakage. Doubtless, the *Builder* and other metropolitan papers which copied our mis-statement, will as readily give insertion to this correction, and thus remove any false impression which arose therefrom as to the professional reputation of our surveyor."

WINDOW FRAMES AND THE BUILDING ACT.

Sir,—I doubt whether many of your readers will consider the defence set up by Mr. Power in vindication of the clause in the Building Act relative to sash-frames quite satisfactory.

Those who have given the question their serious attention know full well that the reasons he places on record for its retention vanish directly the following facts are stated.—That the clause in no way enforces us to rebate the jamb for the frame, and that it does not compel us to keep the frame flush with the reveal.

It is impossible to understand how the mere setting back 4½ in. can prevent the frame, in case of fire, from being shunted out, and it is equally impossible to understand how the provision prevents the spread of fire, while it allows the exposure of nearly any quantity of facial woodwork, provided it is in the required recess.

We trust, I repeat, I trust, that the clause so modified, so as to be a really potent guard against accident, and, at the same time, not to deprive fenestration of one of its greatest charms.

Shortly after the Great Fire, when houses such as those still existing in Chesham-walk were built, window openings were treated as settings for glass, but in these days of anybody lecturing everybody on the principles of truth, they rarely rise above the level of holes in the wall. But are we not living in the age of burlesque?

JOHN F. BENTLEY.

LICENSE FEES FOR HOARDING.

THE QUEEN'S, THE COMMISSIONERS OF SEWER FOR THE CITY OF LONDON.

This was an application (Court of Queen's Bench, Westminster) on the part of Mr. Brancey, the contractor for the new buildings at the General Post-office (St. Martin's-le-Grand), in the City, for a mandamus to compel the Commissioners of sewers to grant him a licence to erect a hoarding on the site of the proposed buildings, according to the conditions of the local Acts, which, he contended, they had violated, by imposing upon him conditions they had no right to require. These conditions were that the licence should be only for two months; that separate licences should be taken out for each of the new buildings (that 10l. should be paid for each; and that no placards or advertisements should be exhibited on the hoardings. To these conditions he objected, especially to the first, his contract being for works which would occupy two years in the execution.

Mr. Mellish, Q.C., and Mr. J. Raymond, were for the applicant; Mr. J. Brown, Q.C., was for the Commissioners.

The Court, after some discussion, were of opinion that the limitation in point of time was unreasonable, and they held that the other conditions as to the hoarding, except as to payment, were not authorised by the statute; and that, therefore, the applicant would be entitled to be allowed to put up the hoarding as he required.

CAMBERWELL CHARITY ESTATE COMPETITION.

Sir,—Will you kindly insert in your next impression the following copy of a letter which I have sent to the Chamberwell Vestry, in the interest of all who have engaged in this competition?

GEO. GOUGH.

"The *Builder* of to-day contains a notice of a competition by Mr. Dawney, stating that 'the design sent in by the local Surveyor to the Charity has been pronounced the best,' &c.

As one of the competitors, I have often applied at the Vestry Hall for information relative to the progress of the competition, but without effect, until the last occasion, when I was informed that the names of some of the competitors having ceased out, and the committee being therefore unable to agree, it had been determined to refer the decision on the plans to the Vestry Surveyor.

I understand that the terms 'Surveyor to the Charity' and 'Vestry Surveyor' are synonymous; and as it would be manifestly favourable to the progress of the competition, but without effect, until the last occasion, when I was informed that the names of some of the competitors having ceased out, and the committee being therefore unable to agree, it had been determined to refer the decision on the plans to the Vestry Surveyor.

I have sent a copy of this letter to the editor of the *Builder*, requesting him to insert it in his next issue.

ARCHITECTS' ACTIONS.

Sir,—The suit brought before the Master of the Rolls in April last was with the view to determine the nature of the agreement existing between the parties,—the plaintiff alleging it to be one of partnership, the defendant denying it. The result proved the plaintiff was right.

The suit is now in a position rather unusual, as it appears from the defendant's letter, which appeared in your late number,—the decision of the Master of the Rolls satisfying both parties.

THE PLAINTIFF.

OWNERSHIP OF ARCHITECTS' DRAWINGS.

NORTHERN ARCHITECTURAL ASSOCIATION.

At the quarterly meeting of this society the following resolution was passed:—"That the universal custom in the north of England has been for contract plans and drawings, and all other plans necessary for affording a complete knowledge of a building, to belong to the architect; and the plans to be retained by him on the completion of the work." The president stated that on the 16th of April, 1861, the association adopted a scale of professional charges, and a note was printed with the charges to the effect that the copyright of designs and drawings was in all cases the property of the architect. It was resolved that a copy of this note should be forwarded to the Institute with the resolution.

ANCIENT LIGHTS.

NEW BUILDING ACT.

It is greatly to be desired that some few clauses should be inserted in the new Act now contemplated to define and restrict the laws of ancient lights in London. In so vast and crowded a city there ought to be special regulations which, on the one hand, would prevent men injuring, annoying, or encroaching on their neighbours by overgrown buildings, and, on the other, would allow builders to erect handsome and commodious structures without vexatious restrictions. When Sir William Titie and others bought up the India House, and constructed upon the site the present fine block of offices, an action was brought against them by the owner of a house on the opposite side of Leadenhall-street, for obstructing light and air by means of the new buildings being some dozen feet, perhaps more, loftier than the low-browed edifice they supplanted.

Now, without going into all the merits of that particular case, it appears to us unreasonable and outrageous that from the opposite side of a principal thoroughfare of London such a claim should be set up. In the first place, the new buildings are only of the average height of houses in the City; and cannot be attacked as overgrown, or out of rule. In the second place, they left much more than space enough to strike an angle of 45 degrees from the front-door steps of the houses opposite. Probably nine out of ten of the City streets are less than 30 ft. broad, and here was a street 35 ft. to 40 ft. wide. To deny handsome buildings in a main thoroughfare of that class is to deny them altogether. If we remember, an injunction was obtained to stop the building of another house or warehouse some years ago, in a good thoroughfare or in near

Upper East Smithfield, upon a similar objection. Any clauses in the new Act might reasonably apply to controlling the erection of very lofty buildings, back to back, within a few feet of each other.

And a second regulation in the new Act might justly be the graduation of height of buildings in narrow lanes. These two subjects would work together. We see with pleasure that clauses are already introduced to limit the height of buildings, but think they might be improved by a little extra thought.

H. & R. POWELL.

CHURCH-BUILDING NEWS.

Llangunillo.—The old parish church has been replaced by a new edifice, which has been opened for divine service. The new church has been built from designs furnished by Mr. Middleton, of Cheltenham, who is also the architect of the church that is now being rebuilt at Cenarth. The carpenter's work was done by Mr. D. Davies, of Llywngwern; and Mr. D. Thomas, of Penrhylan, did the masonry. The work throughout was superintended by Mr. J. Rees, of Lookabout, the churchwarden. The carving and coloured decorations will cost £100; and the entire cost of the building, we believe, will be about £1,800. The church is built upon the site of the old fabric, and is very nearly of the same dimensions. The style is Geometrical Middle Pointed. The edifice will accommodate about 200 persons. The walls are lined with red brick and Bath-stone bands, relieved with ornamental patterns of red and white brick. The seats are open, and of pitch pine, with white deal panels.

Little Stamburgh.—The restoration of the church of St. Mary in this village having been completed, it has been re-opened for public worship. The chancel, the foundation of which had given way during the extremely dry season of 1868, has been entirely rebuilt, and a three-light window inserted in the east end. The church has been refloored and fitted up with open seats. By the liberality of Mr. W. T. Allen, of Little Stamburgh Hall, two new windows have been placed in the north and south sides of the nave, and we are informed that it is the purpose of the same gentleman to place a new window of stained glass in the west end wall as soon as it can be prepared.

High Ham.—The re-opening of the ancient church of High Ham, after restoration, has taken place. The work just performed has been strictly that of restoration rather than embellishment. The whole of the roof and ancient benches have been restored, and the remainder of the church re-seated and refloored. The internal stonework has been cleaned and repaired, and the walls replastered. The architect, from whose plans the work has been executed is Mr. Wood, of Bristol, and the contractor Mr. B. Gillett, of Langport.

Peterchurch (Hereford).—The parish church of Peterchurch has been re-opened by the Bishop of Hereford, after repairs and restoration which have cost about £1,200. This church was in a very dilapidated condition, but it is an interesting example of Early Norman architecture. The walls, externally and internally, have been cleaned and pointed; new stone copings and crosses have been built over the apse and first chancel archways; and the old stone tiles replaced with Broseley tiles. In the south wall of the nave, which has been rebuilt, a new two-light window has been added to admit light, as the eleven Norman slit windows throughout the church admit but little. The Norman doorway was also replaced in the same position in this wall. The old galleries and seating have been removed, and the three chancel arches internally for the most part rebuilt. Considerable additions have been made to the stonework generally. A new pulpit placed in the south-east angle of the nave, and new gates erected in the churchyard. The nave and apse roofs are new, the others repaired. All these roofs, now opened, were ceiled and whitewashed. The seats are new throughout the church. The gaggways have been paved with tiles, and the church heated. Some further restoration is contemplated to the spire and tower, and porch, when funds will permit. Mr. Thomas Edgar Williams, of London, was the architect employed; and Messrs. Lewis & Day, of Hereford, the contractors.

Glanfield.—The ancient parish church of Glanfield has been re-opened for divine service. In removing the walls, several curious relics of the ancient building were brought to light, including a small unglazed window in the outer

wall of the north transept, corresponding with another in the chancel wall, so as to enable lepers to see and hear from without portions of the service, without risk to the worshippers within the church. With the exception of the plain square tower, every portion of the church has been rebuilt, the opportunity being taken to enlarge it considerably. The chancel has been erected at the cost of about 200*l.*, borne by the lay rectors, Captain J. H. Elliott and Mr. W. Collett. The greater portion of the cost of the remainder of the work, about 1,000*l.*, had been raised before the re-opening. The architect was Mr. J. Luker, of Southend, whose designs have been carried out by Mr. E. Smith, of Highworth, and Mr. H. J. Clinch, of Charlton-on-Otmoor, the last-named having undertaken the chancel. The walls have been built of Brize-Norton stone, with freestone dressings. In the nave the wall stones have been faced and pointed; but in the chancel they are simply picked out and pointed. In all cases the old materials have been supplemented by stone of the same description. The chancel arch is nearly double the span of the old one. The north aisle has been reduced and deepened, so as to afford additional area in the nave. An old gallery which obstructed the west end has been removed, and the tower thrown open to the church, revealing the west window, which, like that of the chancel window, is of three lights. The high and close pews have given place to low open ones; and the sitting accommodation, by this means and the enlargements, nearly doubled. The entrance porch has also been made more spacious. The roofing of the interior of the church is of polished wood, with plastered panels.

Folkestone.—Christ Church has been re-opened after enlargement. The alterations comprise an extension to the westward, over which a gallery has been erected, capable of holding about 400 persons. The organ has been removed to the north chancel, and the choir seats are now placed in the chancel. The floor has been relaid with ornamental tiles, and new gas standards have replaced the old ones. The old porch on the south side has been removed to the north, and a new one erected in its place. A tower has been commenced. The building will now hold 1,150 people, a third of whom may occupy free seats. The expense of the alteration will be about 2,700*l.*, of which sum 1,600*l.* have been obtained.

Chiddingfold.—Progress has been made in the restoration and enlargement of the parish church, and a large increase of seat accommodation has been effected; but the cost of these important and necessary works will exceed 3,000*l.*; and the proposed sum of 1,000*l.*, the raising of which by the parish was made the condition on which one parishioner had generously agreed to defray all further expenses incurred, has not yet been reached. An appeal is made to the parishioners and landowners to combine their efforts to raise the sum of 200*l.*, which is necessary to make up the required 1,000*l.*

Lacey.—The church here has been restored and re-opened. The north aisle, above the foundation, is entirely new, the cost of which is defrayed by Mr. Geo. Brooks, a resident of the parish. The chancel arch is also new, and is the gift of Miss Bell. The nave and chancel, which formerly had low ceilings, have been covered with new open roofs of stained pine. The chancel, vestry, and south porch are new, the south porch being erected at the expense of Miss Brooks, the ancient arch of the porch being retained. In fact, all those relics worthy of preservation, it is said, have been preserved. A painted glass window has been placed in the north aisle, by Mr. Wm. Heaford Daubney, in memory of a member of his wife's family: the subject is Christ blessing little children. In the south wall of the nave is a painted window representing the four prophets, Jeremiah, Isaiah, Ezekiel, and Daniel, with inscription, in memory of Mr. William Brooks. There is also in the same wall, on the east side of the porch, a small Norman window, on the painted glass of which is represented St. Margaret, the patron saint of the church. This little window had been blocked up, but is restored. On the west side of the porch has been added a corresponding window representing St. John the Baptist. The old octagonal font is remodelled. The tower has been newly floored and the bells re-hung. There are three bells. The great bell has the following inscription: "Soli Deo gloria; pax hominibus, 1712." The second bell is dedicated to St. Mary of Hawardby, and has the inscription, "Mary of Hawardby, of us have mercy." The third bell is inscribed, "Ista campana fit in honore sancti Augustini." Both of the latter are of the pre-

reformation period. The church is heated with hot air. The architect employed was Mr. James Fowler, of Louth; and the contractor, Mr. Wm. Worth, of Lacey.

Whitfield.—The new parish church of Whitfield has been consecrated by the Bishop of Peterborough, amidst the rejoicings of the whole parish. On the 1st of February, 1869, during a very heavy gale of wind, the tower of the old parish church, supposed to have been built in the thirteenth century, was blown down, and Mr. Woodyer, architect, of Grafham, near Guildford, was consulted as to the state of the whole building. In consequence of his report a parish meeting was called, and the rector and the churchwardens were requested to take the necessary steps to have the old church pulled down and a new one erected. When the sum of 1,500*l.* had been collected instructions were given to Messrs. Mansfield & Booth, of Buckingham, who had sent in the lowest tender, immediately to commence the work according to designs furnished by Mr. Woodyer. The cost of the edifice, which will be about 3,000*l.*, was raised before the day of consecration. The new church is constructed in the Early English style. It consists of a nave, north aisle, chancel, organ-chamber, and vestry, and has a low pinnacled tower. It is a larger church than the old one, and is capable of seating about eighty more persons. The roof is a high-pitched, open roof, of deal, stained and varnished. The old-fashioned high pews of the old church have been replaced by open seats, also of deal, stained and varnished; and the flooring is of boards. The aisle is paved with Staffordshire tiles, and the chancel with Wheatstone's tiles. There are two porches, a grand west porch under the tower, and a south porch. The pulpit is of stained deal like the pews, and the communion-table is of oak. A brass lectern has been presented by Mr. French, one of the churchwardens. It was manufactured by Messrs. Cox & Co., of London. A temporary organ has been placed in the chamber; but as soon as funds can be obtained a new one will be erected. The warming apparatus is by Mr. Remington, of Skipton, Yorkshire. The church has a peal of five musical bells, manufactured by Taylor & Sons, of Loughborough; they weigh about 27 cwt. The whole work has been carried out under the personal superintendence of Mr. Salmon, clerk of the works.

STAINED GLASS.

Ingestre Church, near Stafford.—A stained-glass window, by Messrs. Lavers, Barrand, & Westlake, for Lady Shrewsbury, has just been placed in this church. It represents the meeting between our Lord and Nathaniel. The text is, "Behold an Israelite indeed, in whom there is no guile." The style of ornamentation and manipulation is Cinque-cento. The window is erected to the memory of the late Earl, and is placed on the south side of the chancel. The cost was 75*l.* It is an adaptation of the style and tone of colour used in the early part of the sixteenth century. The novelty of the design is the introduction of swags and borderings of pansies in lieu of those used commonly in Cinque-cento work. This was at the suggestion and desire of the present countess, as was, in fact, the general composition. Pansies were used because the youthful Lord Ingestre placed one on the coffin of his grandfather. The swags are over large. The window is especially remarkable for the effective use of white glass: this gives to the rubies, olives, &c., the richness and power of early Cinque-cento work. The window possesses points of very great merit.

Kinnoul Church, Perthshire.—Messrs. Lavers & Barrand have recently placed a large window in this church, which they have worked out in conjunction with Mr. J. E. Milais, R.A. The subjects are a series of fourteen of the Parables, which he illustrated some time since. The window is presented by Mr. Gray, of Perth (Mrs. Milais's father). It is successful, and very much out of the usual track. The window is a large Gothic one, at the west end of the church. It is 21 ft. in height and 11 ft. in breadth, and is divided into five lights. The lower portion is divided into ten compartments: over these the mullions branch off, and the upper tracery includes four other compartments, which are filled in with subjects of the same description as those below. The fourteen pictures are representations of Scripture parables. There is no overcrowding of the figures or the scenes. The scenes in the largest or centre lights in the window have,

in the open squares of glass above and below, an ornamental cluster of flowers, consisting of Scriptural emblems; and the surroundings in the other compartments are also filled in with appropriate ornamental shields. The local superintendence of the work was entrusted to Mr. Smart, architect. The cost of the window will, we understand, amount to about 500*l.*

Pershore Abbey Church.—A stained-glass window, in memory of the late Captain Davies, has been inserted in one of the lancet lights of the north aisle of the Abbey Church, by Messrs. Lavers, Barrand, & Westlake, of London. The centre of the window is occupied by a small medallion portrait of St. Luke the Physician, above and beneath which are larger effective groups, the upper one "Healing the Sick," and the lower one "Giving of Alms."

Books Received.

The Dictionary of Chronology; or, Historical and Statistical Register, alphabetically arranged, and brought down to 1869. By W. H. Overall, F.S.A. London: W. Togg, 1870.

Triven founded on "Tegg's Chronology," this must be regarded as an entirely new work, and much care seems to have been bestowed to make it a reliable authority for the data of all historical occurrences. It will be found especially full in statistics of the City of London, in consequence of Mr. Overall's connexion with the City as librarian to the Corporation. It is a very useful volume for the writing-table.

VARIORUM.

The Revue Decorative (Asher & Co.), with 72 plates per annum, edited by Edouard Lièvre, author of "La Collection Sauvageot," is intended to contain varied examples from ancient and modern master-works, thus enabling subscribers to draw useful comparisons and opening new views and ideas to them. These examples and models will be taken chiefly from architecture, decoration, furniture, ceramic art, tapestry, and so on. The autographic process has been adopted, save in the works of the old masters which will be given by heliography, to secure faithful reproduction of the originals. The two parts before us creditably carry out the intention. The novel, "Man and Wife," by Mr. Wilkie Collins, in *Cassell's Magazine*, goes on swimmingly. The thunder-cloud has broken, and the terrible difficulty up to which the principal characters have been working, long obvious to the reader, is now seen by themselves. One main purpose the author has in view is to show the evil of immoderate devotion to merely physical development. The current number of *London Society* has a quaint chapter by the well-known New Zealander, showing how, in the year 187—, all England emigrated to Australia, taking with them their best buildings. The idea is amusing, and deserved a fuller development. The first volume of *Cassell's Household Guide* and the fifth volume of *Cassell's Educator*, now completed, are full of useful things. The *Educator* is especially valuable. The quarterly part of the *Family Friend* (Partridge & Co.), at 4*d.*, is a marvel of cheapness, full of interesting cuts and writing.

Miscellaneous.

Harrogate Improvements.—At an adjourned monthly meeting of the Local Improvement Commissioners, respecting the plans sent in for the improvement and development of the Victoria Baths estate, the Board decided that the three best plans should be selected and their authors requested to furnish fresh ones, or more definite instructions to be issued by the Board, such new designs to be the basis of awarding the premiums. The plans rejected were those by "Desdichado" (Mr. Ridley, Starbeck), and "Vincere Certo" (Mr. Birst, Bristol); and the three to be awarded premiums were those of "Alpha" (Mr. Bown, Harrogate); and Messrs. Nelson, Leeds), "Square within a Circle" (Messrs. Dyson, Leeds and Harrogate), and "5,500" Mr. Hiscox, Harrogate).

New Street, Whitechapel.—With reference to our notice of the opening of the new street, Whitechapel, we are asked to state that Mr. J. B. Marshall, of Stratford, and Mr. William Maxwell, Plaistow, were the contractors.

Air, Water, and Health.—Dr. Playfair, in the course of his address at St. Mary's Hospital, Paddington, when distributing the prizes, said the causes of disease had lately undergone a searching examination, and the close connexion had been established between disease and putrescent matter. No epidemic could resist cleanliness and ventilation. Dr. Christian gave as a formula, "Cleanliness and ventilation will extinguish any epidemic." In the very simplicity of the formula lay its danger: it was too like the "wash and be clean" of the prophet. In 1847, from 30 to 40 deaths annually in the 1,000 of a civic population was held not extravagant. Now the average had been reduced to 25 in the 1,000, and hygienists believed in a reduction to 12 in the 1,000. If they could make the dwellings of working men as healthy as the felon's cell, they would add from eight to ten years to the life of the former. It was a terrible reflection that 17,000 school-children died annually from foul air and filth. In what field was it necessary to labour to remedy these evils? Hippocrates spoke of air, water, and soil, and these were what they had in their day to work upon. They must prevent people from cherishing their filth in cesspools, or allowing it to run into rivers, to poison the dwellers on the banks. In concluding his address, Dr. Playfair said it was a great mission prescribed to sanitary reformers to stand between the living and the dead, and bid the pestilence to cease.

Congleton Public Park.—The joint committee of the town council and the inhabitants, for the establishment of a public park and playground, have made an appeal for subscriptions in aid of the object. Mr. Kemp, the manager of the Birkenhead Park, proposes to lay out the town wood in walks, and to form the whole of the land between it and the river Dane into recreation and ornamental ground. The chief part of the land is already the property of the borough; and Sir Charles Watkin Shakerley, bart., has kindly offered to place the remainder, which is his property, at the disposal of the town council for the purpose of the park, on very favourable terms, on condition that the whole cost of the scheme be defrayed by voluntary subscriptions. To place upwards of 20 acres of land, commanding fine views of the surrounding scenery, at the service of the inhabitants of the borough for the purposes of health, recreation, and improvement, will require the outlay of 3,000*l*. Subscriptions have already been promised, including 100*l*. from Mr. R. Wilbraham, the high steward; and 50*l*. each from Messrs. R. Beales (mayor), J. Statham, J. Dakin, F. W. Warrington, M.D., D. Bradwell, and J. Wilson.

The Fatal Well Accident at Barking.—At the inquiry as to the deaths in this accident, and after the evidence had been led, the coroner stated that he had seen Mr. Russ, a competent engineer, on the subject, and he was satisfied that where there was no previous intimation of foul air being in the well, it was quite impossible to guard against such an occurrence as had taken place. There being no further evidence to offer, the jury returned a verdict that the deceased men were accidentally suffocated by carbonic acid gas while descending a well-hole at the Chartered Gas Company's Works at Becton. One would think Mr. Russ might at least have added that the insensibility of one of the men might have rendered it quite possible to guard against the occurrence of any more deaths, even although we were to admit, which we do not do, that the simple test of a lighted candle was not to be expected to be used in such a case before the descent of the first man. No such "previous intimation of foul air being in the well" was sought for; how, then, was it likely to be found or guarded against? It can only be found by precautionary search for it.

A Library for Swansea or Caernarvon.—The late Rev. Rowland Williams, D.D., according to the *Cambrian*, has bequeathed his library, under certain conditions, to the first Welsh town which shall provide a suitable repository for it; giving Swansea the first offer, and Caernarvon the next. He has also bequeathed the residue of his personal estate in the same way as a library fund. The rev. gentleman was Vice-Principal and Professor of Hebrew in St. David's College, Lampeter. The library, says our authority, is to be open to all creeds, colours, and nationalities. The Swansea Town Council has accepted the bequest, and will, of course, provide a suitable building.

Preservation of Blackheath.—A public meeting has been held at Lewisham for the consideration of the draft scheme of the Metropolitan Board of Works for the preservation of Blackheath as an open space for health and recreation. After a discussion of two hours, the meeting expressed its disapproval of the heath being planted or enclosed, considering that the great charm of the heath was that the people could saunter over it, and do as they liked, without the restraints attached to ornamental grounds. A committee was appointed to attend the meetings of the Inclosure Commissioners. At an open-air meeting held on Blackheath, convened by the Advanced Liberal Association of Greenwich, to protest against the proposed scheme now before the Inclosure Commissioners, for placing Blackheath under the jurisdiction of the Metropolitan Board of Works (2,000 persons being present), a letter of apology for non-attendance on the part of Mr. Gladstone was read, in which it is said:—

"I have to assure you that Mr. Gladstone cordially subscribes to the necessity of preserving open spaces for the exercise and recreation of the inhabitants, and I am directed to call your attention to the Bill which has been introduced into the House of Commons by the Under-Secretary of State for the Home Department, with the sanction of the Government, relative to the preservation of commons and waste lands. Mr. Gladstone is confident that any application to Mr. Knatchbull-Hugessen respecting the particular case of Blackheath will receive immediate attention, with a view to inquiry as to how far the provisions of the above-mentioned Bill might be made applicable to that locality."

Mausoleum at Headfort Domesne, Kells, Ireland.—The *Belfast Newsletter* states that the consecration of this structure, erected by the Marquis of Headfort, has taken place. The architect was Mr. J. F. Fuller. The mausoleum was erected by Mr. H. Sharpe, of Kells. The building is in the Gothic style of the early part of the fourteenth century. The plan is octagonal; the centre portion, which is supported by eight arches, on moulded columns, rises to a height of about 100 ft., terminating with a cross. The total width at the base is about 42 ft. The gable over the entrance doorway is filled with Gothic tracery, containing in the centre compartment the arms of the marquis, surmounted by the coronet and crest. The entrance archway is moulded, and the jambs have double marble columns. The floor is laid with encaustic tiles, and the tower is ornamented with bands of red and black stone.

Coloured Decorations, Gloucester Cathedral.—Last autumn some of the leading firms of decorators were asked to submit designs for the adornment of the choir vaulting, and the Chapter, a few weeks ago, accepted the design of Messrs. Clayton & Bell. Already the decoration of about one-third of the choir from the east window has been effected, and the remainder will probably have been completed in about two months. The bosses are gilded, the angel figures are partly gilded, and colour has been applied to the tracery; the panels are left untouched. Messrs. Grylls & Burlison are painting the vaulting of the chapel east of that of St. Andrew,—a chapel which is to be restored in memory of the late Sir C. W. Codrington.

The Detroit River Tunnel.—A tunnel is about to be cut beneath the Detroit river, for railway conveyance between the Michigan Central Railway and the Great Western of Canada, to do away with ferry-boats. The tunnel company has been organised among the proprietors of these railways, and the Canada Parliament has passed an Act for the work. Mr. E. S. Chesbrough, city engineer of Chicago, has prepared the plans and estimates. The substratum is stiff blue clay. The length of the two parallel tunnels to be made from the Detroit to the Canada portal will be each 8,568 ft. They will be cylindrical, and 50 ft. apart; interior diameter of each, 18 ft. 6 in. The shell will be of brick masonry, 2 ft. thick. The grade on each side of the river will be 1 in 50, with 1,000 ft. level below the river. The estimates for the entire cost of tunnels and approaches, with steel rails, &c., amount to 2,650,000 dollars.

A New Rock Driller.—The Burleigh Rock Drilling Machine, used at the Hoosac tunnel and elsewhere, in America, has been shown at work in Deptford. A certificate, signed, F. S. S. Darby, and W. Conisbee, engineer, Atlas Works, S.E., states that it drills a hole 3 ft. deep by 2½ in. in diameter, in a block of the hardest Cornish granite, in four minutes. It is worked either by steam or by compressed air, in which latter case it aids ventilation in boring tunnels.

Monumental.—A meeting of the Senate of Cambridge University has discussed the question of a site for the statue of the late Prince Consort, who for some time filled the office of Chancellor of the University. They recommend that either the Senate-house or the Fitzwilliam Museum should be adopted as the site. After paying for the statue, there will remain a surplus of 1,000*l*., which it was suggested should form the nucleus of a subscription for a corresponding statue of her Majesty the Queen, to be placed in the central hall of the Fitzwilliam Museum. The Vice-Chancellor reports the deliberations to the council.—It is proposed to erect a statue of Sir Titus Salt, the proprietor of Saltaire, who is not only a successful "merchant prince," but an excellent friend to his workpeople and their children. No contribution is to exceed 5*l*.

Australian Timber.—The Jarrah timber of Western Australia, also called Mahogany, is about to be cut on a large scale, by a new company, to be called the Western Australian Timber Company, who have obtained, from the Colonial Government, exclusive right to the timber on 320 square miles of the best district for it, on condition that they construct works of a certain character, in a secure bay, called Geographe Bay, favourable to shipping, with saw-mills, railways, jetties, &c. The Jarrah timber has been often spoken of, we recollect, as a very valuable sort for sleepers, posts, piles, ship-building, dock gates, and other purposes. Another kind, called Torar, will also be available. Messrs. Ditchburn & Co., of Ballarat, inform us that the works will be ready within eight months from March last.

The Proposed Greek Church in Wolverhampton.—The conversion of the late little Primitive Methodist chapel in the Waterloo-road, for the purposes of a Russo-Greek church, proceeds very slowly. Three crosses on the gables of the building, and the closing of old doors and the opening of a new one, are the external signs of progress; while inside, the raising and railing off a portion of the floor by the east of the four walls, are the internal signs. As the number of those in Wolverhampton who are likely to worship within the building in the Russo-Greek style is extremely limited, the projector, Mr. Hatherby, is dependent upon foreign aid for assistance, which has not been wanting, however, at the hands of two or three Russian travellers who have looked in upon him.

Road Steamer and Patent Omnibus.—The Lord Provost of Edinburgh and a party have been trying the working capabilities of Thomson's road steamer, with a new omnibus attached for the conveyance of 65 passengers—44 outside and 21 inside;—rather large, we fear, even for a London street omnibus, to be economical. This road steamer, it may be remembered, has wheels covered with india-rubber tiring. It is now in use (apart from the omnibus) in various parts of this and other countries. A Versailles omnibus, too, for 50 passengers, is drawn by one of Thomson's road steamers. The rate of speed in Leith Walk was about six miles an hour, and the conveyance was exceedingly manageable, as in turning corners, stopping on a steep incline, &c. The street horses generally paid little attention to it.

Improvements in Roadmaking.—Experiments are to be tried in one of the suburban parishes of London with a steam road-rammer, which, if the promises held out by the patentees, Messrs. Gore & Green, be fulfilled, is calculated to effect a revolution in roadmaking, and entirely supersede the steam roller as yet but slightly in use. The advantages claimed for the invention are, that it combines a traction-engine and rammer: hence it can be readily and easily moved from place to place. The machine is said to be equally applicable to roads paved with granite cubes and macadam. The blow from the hammer can be regulated. The machine is said to be so simple that any one of ordinary intelligence can work it.

Hancock's Door and Picture-frame Protector.—This is a simple little sixpenny affair, but well deserves to be known. The object is to protect picture-frames, skirtings, and so on, from the effect of a door opening against them. A little half-sphere of wood, with convenience for screwing it on where needed, receives in a hole over the screw-head a little buffer of india-rubber. There are many situations in which this will be found very useful.

A Halfpenny Card Postage.—The Marquis of Hartington has stated in the Commons that the Government had decided, in connexion with a reduction of postage on newspapers and printed matter, to adopt a halfpenny card postage. That was to say, cards would be issued bearing a halfpenny stamp, on one side of which the address would be written, and on the other any communication, whether in writing or print, He thought this would be a great accommodation to the public, and extremely convenient to the Post-office, and would not materially interfere with the revenue.

Interesting Discovery at Oldcoates.—As one of the men in the employ of Mr. Athron, builder, of Doncaster (who is the contractor for the erection of the new Roman Catholic Church, built on the site of the Manor-yard), was digging a hole in connexion with the works, he came to a Roman tessellated pavement, in a capital state of preservation. The stones, which are placed in cement, are $\frac{1}{2}$ in. square, some of limestone and others of red sandstone. They are placed together with great skill, in diamonds and circles. A number of Roman tiles were also found.

Value of Land at Trowbridge.—At a sale of property at Trowbridge, by Mr. Graham Foley, two pasture fields, containing 10 a. 0 r. 2 p., were knocked down after a spirited competition between Mr. W. Willis and Mr. W. Gouldsmith, to the former gentleman for 4,450*l.*, or nearly 350*l.* per acre. Another field, of 3 a. 3 r. 28 p., was purchased by Messrs. Rodway & Mann, solicitors, for 900*l.* Another field adjoining, containing 3 a. 0 r. 10 p., fetched 700*l.*, Major Clark being the purchaser. A field of 6 a. 3 r. 8 p. was knocked down to Mr. J. Usher for 1,000*l.*

Fall of Watford Church.—On the 20th ult. some of the workmen employed in the restoration of Watford Church found that a considerable portion of the south aisle was giving way. They immediately removed to a safe distance from the dangerous part, and soon afterwards the wall, roof, windows, and doorway of the western part of the south aisle fell in with a loud crash, smashing the pews, and destroying a marble tablet to the memory of a son of Mr. Robert Clutterbuck.

Sculpture.—A statue of St. Joseph holding Jesus in his arms has been erected in St. Wilford's pro-cathedral in York. The statue is 6 ft. high, and stands upon a lofty pedestal of light design. It occupies the opening between the choir and the chapel of "Our Lady." The design was by Mr. George Goldie, the architect of the church, and the work was executed by Mr. R. L. Boulton, of Cheltenham.

New Infirmary, Durham.—The guardians of the Durham Poor-law Union have recently determined to erect an infirmary and detached fever wards at the north-west end of the existing workhouse. The tender of Mr. John Forster, jun., Durham, to execute the works for the sum of 3,989*l.* 17*s.* 6*d.*, the lowest received, has been accepted by the Board. Mr. W. Crozier is the architect.

The Southampton Sewage.—It is stated that the authorities of Southampton have finally determined on the adoption of the A B C process of utilising sewage, and preserving the local waters from pollution. The necessary works will be commenced at once. Leeds, Halifax, Bolton, and several other towns have decided on the same course. The works at Hastings and Leamington have been in operation for some time.

The Institution of Civil Engineers.—On Tuesday evening, Mr. C. B. Vignoles, F.R.S., president of the Institution of Civil Engineers, entertained a numerous company of gentlemen at a *conversazione* at the house of the Institution in Great George-street. The library contained a collection of fine pictures, brought together for the occasion; and in the meeting-room were displayed a large number of models, instruments, or objects of remarkable interest.

Self-acting Velocipede.—Our idea of a self-acting velocipede, we observe, is still occupying the attention of the ingenious. We do not much like the use of steam as a propelling power, however. In the West of England one so propelled has been running at the so-far promising rate of six to eight miles an hour. It requires two persons to manage it, one to attend to the miniature engine and another to steer.

Demolition of a Martello Tower at Rye. An experiment with gun cotton was made at Rye upon the martello tower No. 36. This tower, the walls of which were 12 ft. thick at the base, was entirely and safely demolished by 200 lb. of gun-cotton, divided into three charges and fired simultaneously by electricity. The gun-cotton was in 5-in. discs; and none of the debris, not even in single bricks, was blown away to the extent of fifty yards from the building.

Hanley School of Art and Science.—In appointing a successor to the late head-master of this school, the committee have kept in view the great desirability of providing efficient means of instruction for the promotion of scientific as well as the more important art studies hitherto carried on. This requirement being fully appreciated, the opportunity recently presented has led to the appointment of Mr. Alfred A. Bradbury, of London, and a proposed organisation of several new classes.

The Tenders for New Cottages at Thorncroft.—The Sheffield Independent, in giving these tenders, remarks, in reference to the highest (5,420*l.*) and lowest (2,421*l.*), "It will be seen that the difference between the highest and the lowest tender was actually more than the amount for which the work was let, the highest being nearly 3,000*l.* in excess of the lowest tender."

Erith.—A mission chapel is in course of erection on a site adjoining the National School. Mr. Willis is the contractor in conjunction with Mr. Watts, who has undertaken to perform the brickwork. The foundation has already been laid. The building will be 66 ft. long and 24 ft. wide. Mr. Abel Saunders, of London, is the architect.

District Surveyorship, St. Margaret's, Westminster.—On Friday, the 27th ult., this office was filled by the election of Mr. Drury, of the firm of Drury & Lovejoy. The Metropolitan Board of Works on this occasion did grave injustice to an individual, to which we may consider it our duty heretofore to refer more formally.

Competition: Industrial Schools, Eccles, near Manchester.—After the committee had examined the designs, the Government inspector was consulted, and pronounced in favour of No. 8. On breaking the sealed envelope, the author of No. 8 was found to be Mr. Edmund Kirby, of Liverpool, architect, who will be entrusted with the carrying out of the works.

Kidderminster Water-Works.—The local board of Kidderminster have decided to proceed at once with the construction of water-works. The matter has been long under consideration, but has been delayed through the opposition of a certain section of the ratepayers. Mr. J. F. Fairbank, C.E., of London, is the engineer.

Dublin Crystal Palace.—Sir Arthur Guinness, bart., and his brother, Mr. Cecil Guinness, have purchased the Dublin Exhibition Palace for 53,000*l.*, and intend to spend 10,000*l.* more in completing the building, to preserve it to the citizens as a place of amusement.

New Church in Westminster.—A church is about to be erected for a new district, which is to be formed out of the parish of St. James, Piccadilly. A site has been secured in Great Marlborough-street, and the church will be dedicated to St. John the Evangelist.

Architectural Association.—On the 20th ult., a paper on "Monumental Sculpture" by Mr. T. H. Watson, was read; Mr. Ridge in the chair. The paper dwelt on the difficulty imposed on modern sculptors by modern costumes.

A Costly Chapel.—It is stated that the cost of the new Roman Catholic chapel which the Duke of Norfolk is erecting at Arundel will be about 50,000*l.*

The Institute of Architects' Conversation.—The annual conversation for 1870 will be held at the Rooms of the Institute on Wednesday, the 22nd of June.

Whitwood Mere Church, near Castledorf. A memorial window, executed by Mr. J. W. Knowles, of York, has been erected in this church. The subject is, "Christ blessing little children."

TENDERS.

For house at Tufnell Park, for Mrs. Borot. Mr. G. Trueitt, architect:—
Williams (accepted) 21,190 5 0

For rebuilding, repairing, making good, and reinstating damages caused by fire, at 210 and 212, Pentonville-road. Messrs. Laidlaw & Pollard, architects:—
Nightingale 2126 0 0
Cullum 365 0 0
Batchelder 347 0 0
Bowman 317 0 0
Marr (accepted) 273 0 0

For alterations and additions to house at Paddock Wood, Kent, for Capt. Edgworth Horrocks. Quantities by Mr. T. Ladds:—
Ainscomb 1,709 0 0
Adcock & Keen 1,716 0 0
Strange & Son 1,571 14 0
Matthews 1,533 9 0
Lambidge & Dennis 1,491 0 0

Re-seating and restoration of the nave of Chaldon Church, Surrey. Mr. R. Martin, architect:—
Francis 2,486 0 0
Low 1,937 15 0
Chappell 367 5 0
Saker (accepted) 309 16 0

For new kitchen, bakehouse, and stores, at Grove Hall, Launceston, Devon, for Mr. E. H. Byles, executor of the will of the late Mrs. Byles. Messrs. Tolley & Dale, architects:—
Rivett 21,473 0 0
Williams & Son 1,463 0 0
Conder 1,387 0 0
Ratnor 1,329 0 0
Kilby 1,256 0 0
Sewell & Son 1,224 0 0
Wicks, Bangs, & Co. 1,140 0 0

For new transepts and lecture-rooms to Rock Ferry Church, Cheshire. Messrs. W. & J. Hay, Liverpool, architects:—
Forde 21,400 0 0
Booth & Richards 1,300 0 0
Fisher 1,277 0 0
Hartley & Dempsie 1,273 0 0
Cameron 1,248 0 0
Hurst 1,246 0 0
Bleakly 1,209 0 0
Low 1,199 0 0
Thomson & Cook 1,187 0 0
Dobson (accepted) 1,164 0 0

For new school-room, Prince's Park, Liverpool. Messrs. W. & J. Hay, architects:—
Jones 2,695 0 0
Yates 940 0 0
Roberts 929 0 0
Thornton 860 0 0
Nicholson & Ayre (accepted) 794 0 0

For Congregational chapel and schools, Splottlands, Cardiff. Messrs. G. Habershon & Pite, architects:—
Jones 21,628 0 0
W. & T. Webb 1,460 0 0
Franklin 1,488 0 0
Seager 1,423 0 0
Shepton 1,219 0 0
Bolt & Co. 1,160 0 0
Pries 1,145 0 0

For completing seven houses at Addiscombe, for Mr. Woolroffe:—
Carpenter 2,616 0 0
Pierpoint 563 0 0
Thornhill 370 0 0
Souper 319 0 0

For chapels, lodges, boundary-walls, and formation of roads, for new cemetery, at Masbrough, Yorkshire. Mr. W. Blackmoor, architect:—
Chadwick (accepted) 21,790 0 0

Accepted for new church schools, at Eastwood, Rotherham. Mr. W. Blackmoor, architect:—
Ripley (mason and bricklayer) 2,322 10 0
Gardner (carpenter and joiner) 145 8 0
Jarvis (slater) 49 10 0
Gummer (plasterer) 18 10 0
Greenwood (plumber and glazier) 31 0 0
Wright (painter) 12 0 0

For the erection of a house and shop in the Roman-road, Old Ford, for Mr. J. Macdonald. Quantities not supplied:—
Kovett 2,630 0 0
Pavitt 467 0 0
Alexander 465 0 0
Lee (accepted) 480 0 0

For new rectory at Broadstairs. Mr. E. J. Tarver, architect. Quantities supplied by L. C. Hiddett, surveyor:—

	House.	Stabling.
Wilson	2,276	4194
Sutton & Wilson	2,173	396
Shearburn	2,173	794
Capps & Riter	2,062	178

For alterations and additions to residence, at Godalming, exclusive of graining, papering, &c. Mr. H. Peak, architect. Quantities not supplied:—
Punk 21,798 0 0
Moon & Son 1,680 0 0
Mitchell (accepted) 1,670 0 0

For enlargement of the male infirmary, at the Guildford Union. Mr. H. Peak, architect:—
Taylor & Down 2,402 0 0
Mason 879 10 0
T. & J. Lee 313 0 0
Dickinson 339 6 0
Garnett (accepted) 323 8 0

The Builder.

VOL. XXVIII.—No. 1427.

Salisbury, Sarum, and Surroundings.

BEFORE exploring Old Sarum, which is close to the thirteenth-century city of Salisbury, and where, as we have said, the early history of the latter can be best grasped,* those who are visiting the neighbourhood for the first time should go on to that stone puzzle, Stonehenge, and try to satisfy themselves, if they have looked into the arguments on both sides, or rather on all sides, whether it be pre-Roman or post-Roman, — pre-historic or merely non-historic, — whether reared by the mystic Druid when

wild in woods the British savage ran long before Caesar had heard of him, or in that strangely obscure period, the Arthurian Round-Table time, in between the going of the Roman and the coming of the Saxon, — who it is known called the place *Stanhengist*, or the hanging stones. It was evidently an antiquity of unknown origin in the eighth century, and we see stronger reasons for believing that it was set up before the Roman domination than that its erection followed their departure. This marvellous memorial, looking like "the bowels of a mountain turned inside out," as Stakeley graphically describes its present aspect, should be religiously preserved. The plough and rights of property are gradually breaking down the outlying barriers and ancient ways; the cultivator approaches it nearer and nearer; and the time is not far off when it will be incumbent on the country to secure its inviolability by purchase of the site. The fallen stones, too, where the original position is obvious, should be raised and replaced — a good work for a good body, the Wiltshire Archaeological Association, to undertake. Once seen, Stonehenge can scarcely be forgotten: the dignity of the great trilithons is something surprising.

Coming back to Old Sarum we find, with much for doubt, a great deal that is certain and unmistakable. If there be no positive evidence that this remarkable elevation, with its crater-shaped central mount, and early known as *Sorbidunum*, the dry down, was a British fortification, there seems great reason to believe that it was; and we do know by testimony undeniable that it was occupied by the Romans, who left scattered over the soil in every direction dated metal memorials of their occupation, in the shape of coin from Hadrian upwards. That it was an important Saxon city the evidence is conclusive: we have documents dated about the year 720, conveying lands to the church of St. James, in "Sarisbyrig," and an order by the great Alfred, dated 872, translated thus:—"I, Alfred, king and monarch of the English, have commanded Earl Leofric, of Wiltshire, not only to preserve the castle of

Sarum, but to make another ditch to be defended by palisades." Afterwards comes here William the Conqueror, to impose military tenure. In his successor's reign, it is made the seat of the episcopal see in place of Sherborne; and then a cathedral is built, and part of the fortified area is held by the clergy and part by the castellan. This arrangement lasts a century, but with many squabbles, and at last the church throws off the military rule, and the new cathedral, such as we see it, is commenced in the plain below.

The Pope's Ball, A.D. 1218, for the removal of the cathedral, says,—"that forasmuch as your church is built within the compass of the fortifications of Sarum, it is subject to so many inconveniences and oppressions that you cannot reside in the same without great corporeal peril; for being situated on a lofty place, it is, as it were, continually shaken by the collision of the winds; so that while you are celebrating the divine offices, you cannot hear one another, the place itself is so noisy: and besides, the persons resident there suffer such perpetual oppressions, that they are hardly able to keep in repair the roof of the church, which is constantly torn by tempestuous winds: they are also forced to buy water at as great a price as would be sufficient to purchase the common drink of the country: nor is there any access open to the same without the license of the castellan. So that the people were sometimes denied entrance."

It was a "dry down" in more senses than one. The church being gone, Old Sarum dwindled on until Edward III. gave a formal order for its destruction, granting to the dean and chapter all the stone walls of the former church for the improvement of the new cathedral and close.

A walk around the place is full of interest. It is not one of those earthworks that call for faith and imagination: the whole plan is clear. The area within the entrenchments is called about 28 acres; the outer fosse is from 80 ft. to 100 ft. deep; the west and east entrances are strikingly obvious, and near the latter are seen some large masses of concrete, part, probably, of the gateway in the Mediæval outwall. Close by, in the plain, lies the New Sarum, with the cathedral uprising in its midst. Were we not right in saying that its early history could be best grasped amidst the neighbouring earthworks?

Of the more ancient church there is still a memorial. In uncovering the foundations of the cathedral in Old Sarum, a large key, doubtless that of the building, was found near the site of the west door, and, with a smaller key, discovered near the site of the high altar, is now to be seen in the Salisbury Museum, and serves to lock together with tangible bonds the old and the new.

This museum contains many things of interest, and has been well looked after by Mr. Nightingale, of Wilton, and Mr. E. T. Stevens. Salisbury has seldom been without a cultured man or two taking interest in its antiquities and history. The late Dr. Fowler, whose portrait hangs over the door in the Museum, and who would have been 100 years old if he had lived two years more (he was born in 1765, and died in 1863) was one of the most valuable of them. That he early took an interest in science is shown by the circumstance that when he died he was Father of the Royal Society.

The value of a local museum of this sort is immense: it serves, amongst other good offices, to prevent the dissipation of matters of interest. Thus a cross of Limoges Champlevé enamel turned up a fortnight ago, has already found its way there, and is safe.

The greater number of the Mediæval objects were found during the excavations that were carried on in Salisbury a few years ago, for drainage purposes, when active friends carefully preserved all the relics that were brought to light.

As might be expected, few are earlier than the thirteenth century, at which time, as already said, the inhabitants of Old Sarum began the new city.

Attached to the county collection is a singularly valuable museum, founded by Dr. Blackmore, and which bears his name. At his cost a handsome open-roofed building, in the Mediæval style, designed by Mr. Harding, and decorated by Messrs. Harland & Fisher, was erected at the back of the county museum, and with its contents, munificently made over to the city for ever. The collection illustrates exclusively the pre-, or, at any rate, non-historic times, and is arranged under four heads,—Remains of Animals found associated with the Works of Man; Implements of Stone; Implements of Bronze; and Implements of modern Savages,—which serve to throw light on the use of similar objects belonging to pre-historic times. Recollecting that it was not longer ago than 1840, when the late M. Boucher de Perthes first called attention to the human-worked flints found in the drift of the Somme valley, and that it was in 1857 when Mr. Prestwich and Mr. John Evans verified the discovery on the spot, the enormous collections of such implements made since in all parts of the world are little less than astounding. The various kinds of Celts that have been discovered,—not *Kelts* by the way, the name has nothing to do with races, but comes from *celtis*, a chisel,—may be well studied in the Blackmore Museum, as may be the ancient lake dwellings of Ireland, Switzerland, and America. The modern discoveries on which the fact was established that early inhabitants of Switzerland lived in huts supported on piles above the surface of water must not be dated farther back than 1853. Herodotus describes a Thracian tribe as living in such dwellings in Lake Prasias, now in modern Roumelia; and we have accounts of African and other tribes doing the same thing still. The illustrations of tumuli and mound cities are valuable, and there is a very interesting model of ancient pit dwellings explored at Highfield, near Salisbury, in 1866. These pits are chiefly in groups communicating with each other. They are of beehive form, ranging in diameter at the bottom from 5 ft. 6 in. to 7 ft., though in some few cases they measure 14 ft. They are carried down to a depth of from 7 ft. to 10 ft. in the soil, and a shaft about 3 ft. in diameter seems to have afforded entrance to each group of pits. The men of Salisbury of that period did little more for their personal comfort than rabbits, and something less than beavers. Implements of flint and of bone were found in these pit dwellings, including some horn combs, with the teeth broken off, that closely resemble some in recent use by the Esquimaux for scraping fat from the backs of skins, excepting that the latter were made of wood with the sharp claws of birds lashed to them.

It will afford a contrast if we go from the contemplation of these retreats of our early predecessors to one of the historic homes of the neighbourhood, say Wilton House, "Pembroke's princely dome," filled with works of art and ingenuity—results of the highest intelligence—enjoyments and elevators for all time.

This house is about three miles from Salisbury, and is most liberally opened to the public. Holbein and then Inigo Jones were concerned in its first erection. It is best known by the collection of antique sculpture it contains, commenced in 1678, when the then Earl of Pembroke bought part of the Arundel marbles. It is curious to note how much less pleasure the majority of visitors find in the examination of such works than in viewing a collection of pictures. Many, indeed, who would contemplate with interest the sculpture round the doorway of a Mediæval cathedral, often distorted and ill-drawn, even if vigorous and expressive, look coldly and carelessly on the more perfect pro-

* See p. 437, ante.

ductions of classic art, scarcely recollecting, even, the astounding fact that these in many cases unapproachable works were executed two thousand and more years ago. The reason is not difficult to find, but we will not stop just now to look for it. The marbles at Wilton greatly differ in value and interest. The same may be said of the pictures, though the collection as a whole justifies its reputation. The large Vandyck, representing Philip Earl of Pembroke and his family, although greatly injured by time and restorers, is a noble picture worth a journey; to say nothing of the same painter's Charles I. Holbein's Father of Sir Thomas More, and the remarkable little diptych of King Richard II., the second leaf having on it a presentation of the Virgin and Child. Having been painted early in Richard's reign, it has been mentioned as evidence that oil-painting had been practised previously to its supposed discovery by Van Eyck about 1414, but Waagen points out what seems to us correct, that it is in tempera. The execution is singularly delicate. In the grounds, a bridge by Holbein, a view of Salisbury Cathedral, seen between two masses of trees, and recollections of Sir Philip Sidney and his "Arcadia," occupy the thoughts.

Every one knows of the church at Wilton, built at the cost of the late Lord Herbert of Lea, then Mr. Sidney Herbert, and fully described in earlier volumes of this journal.* The design is founded on the churches of Santa Maria and San Pietro, at Toscanella, and the interior glows with marbles, mosaic work, colour, gilding, and stained glass.

There is nothing better, however, in the building let us say, than the two monuments in memory of Lord Herbert and his mother, the Countess of Pembroke, executed by Mr. Birnie Philip, and illustrated in the *Builder* in 1864.

How far the erection of this costly church helped to lead the widow of its illustrious founder to the Church of Rome has yet to be traced.

Going out another three miles on the other side of Salisbury, Longford Castle, much less known than Wilton House, is met with,—a quaint casket with rare contents. The collection of pictures is surpassingly interesting. Waagen, in his book, grumbles greatly about the way in which, having obtained admission with great difficulty, he was hastily driven through the rooms. A different system prevails now; for, though our visit fell on a day when the rooms are not supposed to be open, we were received with the greatest politeness, and allowed to loiter as we would. And a rare treat it is. So far as regards Holbein, it is not too much to say that, to appreciate fully the merits of that great master, Longford Castle must be visited. Here is found the life-like portrait of Erasmus that he brought to England, with a letter from the original, to introduce him to Sir Thomas More. On the frame is this quotation,—"*E tenetis clarum doctrinæ tollere lumen qui felici potius primus Erasmus erat.*" Holbein's portrait of Egidius, the traveller, to whom also Erasmus had introduced him, is another fine work; but the grandest of his pictures is a large canvas, showing two male figures, the size of life, richly dressed, with a table, philosophical instruments, and music. The title given to it, the Two Ambassadors, is unsatisfactory. A little study would, probably, bring out something less so. The German words on the music are readable; the dagger of one of the figures and a book are both marked, "*Al sum, 29.*" With or without the desired knowledge, however, this is a wonderful work. Claude's well-known "Morning" and "Evening;" Titian's portrait of a sculptor; the Escorial, by Rubens; Carlo Dolce holding his own profile; Teniers, by himself; Guido's head of a Magdalen; a Queen Elizabeth, by Zuccheri; and a Spanish admiral, by Velasquez, are other pictures to remember. Nor can we omit to note in the not very attractive chapel, a triptych which, if not by Albert Dürer, as was long thought, is, nevertheless, a remarkable painting. On all sides are notable things; amongst them the marvellously worked steel chair, with its hundreds of small figures in relief, which was presented to the Emperor Rudolph II. by the city of Augsburg, and excited astonishment at South Kensington awhile ago. Thomas Raker, who made it in 1577, has put his name to it. He was one of whom all the Smiths may be proud.

* See also a paper "On Early Christian Buildings and their Decorations," illustrated by Wilton Church," by Geo. Garton. *Journal of the British Archaeological Association*, vol. xv, p. 131.

The castle, so called, is curious in form. Sir Thomas Gorges, married to a Marchioness of Northampton, employed the well-known John Thorpe as his architect, and built it about 1591, in the shape of a triangle with huge circular towers at the angles, and a moat around.* The late Lord Radnor began to turn it into a hexagon, but left it unfinished. The towers give it a character of its own, but the details do not pay for close inspection. Gwilt says a diagram of the Trinity was drawn in the middle of the triangular court: we had no opportunity to see if this still remains. Gossip longer, however, we may not, though these are but a few of the surroundings of Salisbury and Old Sarum.

NEW PALACE AT WESTMINSTER.

PROPOSED ADDITIONS AND ALTERATIONS FOR NEW REFRESHMENT ROOMS.

EVER since the year 1863, the necessity of enlarging the dining-rooms of the House of Commons has been recognised, and the architect (Mr. E. M. Barry) has, as our readers are aware from notices in these columns, prepared numerous designs for the purpose. The select committee on this subject, of which Mr. Ayrton was chairman, has just issued a report, recommending the adoption of a plan. This plan is somewhat oddly termed the First Commissioner's plan, but having examined it, we find it, in fact, a part of Mr. Barry's scheme of last year, having been copied from his plans, which have been approved by committees of Lords and Commons. It proposes, 1st, the conversion of the conference-room and adjoining tea-room into new dining-rooms; and, 2ndly, the erection of a new peers' committee-room, in lieu of the conference-room. It appears that Mr. Barry suggested the first arrangement in 1867, when the kitchen committee thus reported on his plan:—"That Mr. Barry has now suggested a new plan for improving the accommodation, viz., by converting the present conference and adjoining committee-rooms into a large dining-room for both Houses of Parliament, in lieu of their present separate dining-rooms, which could be used for tea-rooms, or for other purposes; and they are of opinion that this plan is preferable to any yet produced before your committee, and from inquiries they have made, they have reason to believe that such an arrangement would give general satisfaction." The same committee reported last year, that "they saw with satisfaction that in the new plans lately laid before the House by Mr. Barry, it is proposed to adopt the original proposition of converting the present tea-room and the conference chamber into new dining-rooms."

In order to meet objections raised by the Lords' Committee, Mr. Barry suggested the second arrangement respecting the substitute for the conference-room in 1869, and the Lords' Committee thus reported upon it last session:—"The committee approve of the new conference or committee room proposed in the new plan submitted this day by Mr. Barry." They now further report (p. 8) that they "approved" Mr. Barry's plan of last year, and are willing to "accept" Mr. Ayrton's version of it, if he will alter the entrance in accordance with Mr. Barry's proposal.

We are credibly informed that Mr. Barry's design has not been paid for, as he only asked for a fee of fifty guineas for attendances on the committees' and the preliminary negotiations, expecting, according to custom, his remuneration when the plans were carried out.

Various grave objections to the present plan will occur to our art-readers from an architectural point of view, and there are, in addition, some obvious practical inconveniences in the changes made in Mr. Barry's plan. Thus (1), the entrance to the new committee-rooms is so contrived that the public must ascend five steps in order immediately to go down five more before entering the room. (2) The serving-room has no external light or ventilation, and will be very objectionable. (3) The kitchen is narrow, being 14 ft. 9 in. wide, and only 12 ft. 8 in. high, or a few inches higher than the present kitchen, the lowness of which is inconvenient. (4) The rooms on the ground-floor under the new committee-room will be much darkened. All these defects are interpolations.

It will be easily seen from the foregoing remarks that the work requires architectural

* Gorges died in 1617, and has a monument in Salisbury Cathedral.

skill; it is no mere matter of routine which can safely be entrusted to a clerk of works, as is shown by the fact of Mr. Ayrton's estimate being no less than 6,600*l.* It embraces new building, as well as alterations, and will affect the architecture and convenience of the palace both externally and internally, and Mr. Gladstone and Mr. Lowe led the House of Commons and the public to believe that an architect would be employed for such works, and that Mr. Barry should be that architect. We have therefore a right to claim the redemption of this pledge.

As much is now said about cheapness, it is right to add that the present plan is a small portion only of Mr. Barry's general design of last year; for in that scheme was included, by order of the Government, a new library, dining-rooms, and committee-rooms for the lords, and also extensive offices for the purpose of joint refreshment-rooms for both Houses of Parliament, in connexion with the plan for a new House, recommended by the Select Committee on House of Commons Arrangements. This part of the scheme is now abandoned. The proposed new peers' committee-room is, however, Mr. Barry's suggestion; and, as Mr. Ayrton has copied his proposal, this part of the estimate of the latter admits of comparison with Mr. Barry's estimate of last year. Mr. Ayrton's estimate, including the entrance, is 2,450*l.*; Mr. Barry's was 3,135*l.*, but Mr. Barry's room was 2 ft. wider, and the floor was raised to get height for the new kitchen beneath, and so avoid the steps down. Mr. Barry's entrances were also larger and more convenient. It is therefore clear, that for the same things Mr. Ayrton's estimate and Mr. Barry's would not greatly differ. Moreover, Mr. Barry stated to the committee, last year, that his was a "covering estimate," and that he fully expected to be able to get the work done for less than was stated therein. On this subject we may quote, with approval, from the present Report, the following extract from the Report of the Lords' Committee (p. 8). "Their lordships state, that 'they are very sensible of the importance of observing reasonable economy in all public expenditure; but they feel that, in making permanent provision for the accommodation of the Houses of Parliament, it is desirable that all should be done in the best manner.'"

We say the same. It is not fair to the public to allow a public building of elaborate architecture to be tinkered by those who, by their own confession, are ignorant of architecture and incompetent to deal with it. It is not fair to Mr. Barry to appropriate his ideas, which he has given to the public on the supposition that, if they were adopted, he would be engaged to realise them, and to allow others to carry them out in a mutilated and unsatisfactory manner.

OLD STAINED GLASS IN ENGLISH CHURCHES.

To possess an adequate acquaintance with the series of historic and artistic representations yet extant in the stained and painted windows of the cathedrals, chapels, churches, and ancient mansions of England, is a matter of no trifling importance to all professors, students, and lovers of architecture and of art in general.

We trust, therefore, that the following statement, drawn up, in the first instance, from the materials collected in the "Universal Art Inventory," referred to in a former number of our journal, will be found of use. As, however, the total number of buildings included in that catalogue falls short of a hundred, there can be little doubt that the list, although we have ourselves doubled its length, is still susceptible of very considerable augmentation.

The first step to this desirable end we take to be that now accomplished. What has been collected by the care of Mr. Cole, is now presented in a clear and compact form, separated from the foreign examples, and augmented by collection of the best authorities, to our readers.

Every architect, every clergyman, every proprietor of a historic mansion, in England, may now see, by a glance at our pages, whether the existence and the character of any stained-glass windows under his care, are duly recorded or no. In the latter case, we trust that few of such guardians of these relics of an important art will hesitate to fill up the gap which exists, and which is now brought to their own personal knowledge, or to communicate, in the proper quarter, the information at their command.

They should specify, 1st, the nature of the

building; 2dly, the locality; 3dly, the form of window; 4thly, the subject and mode of treatment; and, 5thly, the date, with the reasons for its determination. If any existing description be accessible, it should also be indicated.

The stained glass known to be now existing in this country, of date earlier than the year 1800, A.D., may be divided into seven groups, each containing the production of a century.

Glass of the Twelfth Century.

Only five examples of twelfth-century glass are recorded in the Inventory.

A window of the church at *Brabourne*, Kent, was at one time considered to be the only example of glass of the twelfth century in England. It contains geometrical patterns, slightly painted.

In the north aisle of the choir, and also in the Trinity Chapel, of *Canterbury Cathedral*, is stained glass of this period, representing the figure of Thomas à Becket, and medallions filled with minute figures.

In the vestibule of the Chapter House, *York*, are fragments of Norman glass.

In the Church of St. Denis, *York*, are the remains of a "Jesse window," attributed (doubtfully) to the year 1200.

The most important example of Early English stained glass in England is to be found in the great rose-window in the north transept of *Lincoln Cathedral*. It is dated "about 1200 A.D." In the central part is a representation of the blessed in Heaven, with Christ sitting in the midst. In the sixteen circles forming the outer part of the window are symbolical figures; and in each of the four trefoils at the angles is an angel tossing a thurible.

These two last examples, if the dates are correctly determined, mark the period of transition from the Norman to the Early English period of architecture. Glass fixed in the year 1200 A.D. must have been executed before the close of the twelfth century.

Glass of the Thirteenth Century.

Fourteen buildings adorned by English glass of the thirteenth century, are named in the "Universal Art Inventory."

In the aisles surrounding the Trinity Chapel, *Canterbury Cathedral*, are three painted windows, representing the miracles of Becket. In that on the north side, on a medallion, is a representation of Becket's shrine, with the prelate issuing from it in full canonicals, to say mass at the altar.

In the Church of Little *Casterton*, Rutlandshire, is a lancet window, with stained glass, consisting of lozenges described by margins of different colours, forming panels, with bosses in the centre differently constructed and richly coloured, the general ornament being foliage creeping over the whole surface. This is referred to the latter part of the thirteenth century.

The east window of *Chichester Church*, Berkshire, is of Early English glass, with pictures introduced into a white pattern. Date, 1265—1270.

The rose-window of the south transept of *Lincoln Cathedral* is filled with fragments of glass collected from different parts of the cathedral, and chiefly Early English. The colouring is very rich. The east window of the choir aisle contains medallions of Early English glass, thought to represent incidents in the life of St. Hugh. The east window of the south aisle contains medallions of the same series. Date, 1235.

The north window of the Jerusalem Chamber, *Westminster*, is filled with glass representing the Slaughter of the Innocents, the Stoning of Stephen, the Last Judgment, the Descent of the Holy Ghost, the Ascension, St. Peter walking on the Sea, the Decollation of St. John the Baptist, and a mutilated shield of late execution, bearing the arms of Bishop William, those of the See of Lincoln, and those of the Deanery of Westminster; all more or less patched. The date attributed is about 1272 A.D.

In St. John's Chapel, *Merton College, Oxford*, are painted side windows, of white patterns with pictures inserted, of the latter part of Edward I.'s reign.

Salisbury Cathedral contains in the nave and aisles the remains of an Early English Jesse window, dated about 1240 A.D., and medallions, representing Scriptural subjects, not earlier than 1270 A.D. In the side aisles are windows of ornamental patterns, varying in date from 1240 to 1270 A.D. In the south transept, and in the cloisters are remains of Early English glass.

There is a five-light east window, of a Deco-

rated white pattern with pictures inserted, of the latter part of the reign of Edward I. in the church of *Selling*, Kent.

In the Chapter-house of *Southwell Minster* are remnants of glass of the reign of Edward I. There is a small medallion in the second window from the east, on the south side of the nave representing a knight on horseback, tilting with a long spear under his arm, of the same period.

In *Trumpington Church*, Cambridgeshire, are windows attributed to the thirteenth and fourteenth centuries.

In the Church of *Westwell*, Kent, the east window contains what is called "the only known fragment in Early English mosaic painted glass existing;" two figures only, of the Almighty and the Virgin, remaining of the original four. In one of the side windows are "quarrels," of brown lines, enclosed in a richly foliated border. Date A.D. 1220.

In the north transept of *York Minster*, is the beautiful window of five lancets, known by the name of the Five Sisters, filled with glass, representing foliage and the principal geometrical forms, in coloured and ornamented glass bands and leads. Date latter half of thirteenth century.

In the church and in the refectory, of the Hospital of St. Cross, *Winchester*, are fragments of Early English, mixed in with other glass.

The contents of two boxes filled with fragments of Early English glass, brought from New College, *Oxford*, are placed in the cloisters of the library at *Winchester*.

Three windows of stained glass were added to the Norman Chapel of St. John, in the Tower of *London*, in the year 1240 (see the "Guide to the Tower of London"). They are not referred to in the Inventory. It is also questionable whether the glass last mentioned as being placed in the cloisters of *Winchester*, is correctly attributed to the thirteenth century, as it is also stated to be "principally of Wykeham's time," which was the close of the fourteenth and commencement of the fifteenth century.

Glass of the Fourteenth Century.

Examples of glass of the fourteenth century are about as numerous as those of the thirteenth century. The Art Inventory cites thirty-one.

The east window of *Bristol Cathedral* is filled with painted glass of the date 1320 (restored in 1847), representing a tree of Jesse. The lower lights contain figures of the Virgin and infant Jesus, prophets, and kings; in the upper tracery lights is a display of heraldry. Four side windows in the chancel are filled with coloured glass of the same date.

The east window of the choir of *Carlisle Cathedral* is filled with stained glass of the time of Richard II., representing the general Resurrection.

Painted glass of the close of the reign of Edward I. exists in the chancel of the church of *Chartham*, Kent.

The east window of the church of *Cheekley*, Staffordshire, has a window, of five lights, decorated with pattern glass, with pictures inserted; the Crucifixion in the centre, knights and bishops and saints on each side. The date is 1320. There are two side windows, each with three lights, with one tier of medallions.

At *Cranley*, Surrey, the east window of the church is of painted glass; one of the spandrels containing the figure of the Saviour sitting in judgment, with the globe in his hand, upon which three great periods are emblematically indicated. The lower third is wavy, to denote the flood; the centre contains the tables of the law; and the upper part bears the cross.

The east window of the choir of *Exeter Cathedral* is filled with painted glass; that in the lowest and middle rows representing figures of saints under rich and varied canopies; in the uppermost row, figures of Abraham, Moses, and Isaac; at the bottom, shields of early bishops and benefactors.

The head of the east window of *Froyle Church*, Hampshire, is filled with glass representing heraldic subjects, of the latter part of the reign of Edward I.

The great east window of the choir of *Gloucester Cathedral* is filled with the finest stained glass of this period in England. It represents a long series of saints, prophets, and Jewish kings, larger than life. Date, 1345. The side windows of the clearstory retain much of their original glass, of the same date with the east window.

In the Lady Chapel, *Hereford Cathedral*, is a window, from St. Peter's Church in the same

city, representing our Lord bearing the Cross and the Crucifixion, &c.

The east window of *Hitcham Church*, in Buckinghamshire, is painted in compartments, the upper ones containing figures of angels, each standing on a wheel, inscribed, in Lombardic capitals, with the mystic titles of the orders of the heavenly hierarchy,—"Virtutes, Dominationes," &c. The other windows of the chancel contain considerable remains of stained glass of the same date, the middle of the fourteenth century.

In the Church of *Kingdown*, Kent, is a light containing a representation of the Virgin bearing the Infant, of the same date.

The west window of the nave of *Lincoln Cathedral* has the upper tracery filled with glass of the middle of the fourteenth century.

The same date is assigned to the east window of the Church of St. Lawrence, *Ludlow*, which represents the history of St. Lawrence, in twenty-seven compartments.

In the chapel on the south side of the choir of the Priory Church, *Great Malvern*, Worcester-shire, are three four-light windows, two of which are divided into compartments by labels, and represent Scriptural scenes from the Creation to the Deluge. The third window contains full-length figures of St. Peter and St. Andrew, the heads of which are gone. At the sides are angels bearing the emblems of the Passion,—the spear, the reed, the sponge, the scourge, the ladder, and the nails. Date, fourteenth century.

In the chancel of the Church of *Norbury*, Derbyshire, are windows of white patterns, with shields of arms inserted. There are painted windows in other parts of the same church, also of the fourteenth century.

Remnants of fourteenth-century glass are inserted in the west window of *Christchurch Cathedral, Oxford*. In the middle of the large five-light window of the north transept is represented the murder of Thomas à Becket, the archbishop kneeling before the altar of St. Benedict, his cross-bearer, the Saxon monk Grim standing at the side, the figure placed upon a diapered ground of red and blue. This is attributed in the Inventory to the fourteenth century, but it should be noted that the portrait and the miracles of Becket in the Trinity Chapel, at *Canterbury*, are ascribed to the twelfth and thirteenth century. Becket was murdered in 1175 A.D. It is hardly likely that his miracles would have formed a theme for the glass-painters of the fourteenth century.

In the ante-library of All Souls' College, *Oxford*, is a painted window representing John of Gaunt wearing a regal crown, with the globe and cross in his right hand, and the sceptre in his left. He wears a blue mantle fastened under his chin with a gold brooch. Beneath is the inscription in old characters, "Johannes Rex Hispania, Dux Lancastria." This window is thought to have been placed in All Souls' by the founder, Archbishop Chicheley.

In the ante-chapel and Chapel of New College, *Oxford*, are windows filled with figures under canopies, and with a series of angelic choirs, dated 1379-1386. In the Chapel of Queen's College is also some fourteenth-century glass.

In the east window of *Oxted Church*, Surrey, are four large quatrefoils, containing the mystic beasts, or symbols of the Evangelists,—the angel, the lion, the ox, and the eagle, upon diapered ground,—fourteenth-century work.

The east window of the Church of St. Rew, Cornwall, consists of five lights filled with glass representing the Stem of Jesse, with branches containing figures of kings, prophets, saints, and the Virgin and Child. Date, fourteenth century.

There is some glass, apparently of the reign of Edward III., in the window of the north aisle of the Church of St. Thomas, at *Salisbury*.

Large remains of the original painted glass, doubtfully attributed to the fourteenth century, are to be found in the windows of the Church of *Stanford*, Leicestershire.

In the choir of *Tewkesbury Abbey* are several figure and canopy windows, containing full-length figures of kings, knights, and saints. Date, A.D. 1320-1327.

In the west window of *Wells Cathedral*, amid some French and German glass of the sixteenth century, are the figures of King Ina, and of Bishop Ralph, of Shrewsbury, dated about 1355. The eastern and two adjoining windows of the choir represent a tree of Jesse, terminating with the Crucifix, Abraham, David, the Virgin and Child, Solomon, Daniel, Ozias, and an undetermined figure, in the upper compartments, and the Day of Judgment in the tracery lights.

St. George, in armour of character appropriate to the date, is in the north-east window. In the Lady Chapel the windows are a confused mass of fragments, with the exception of the east window, which has been admirably restored by Willement. The colouring of the whole is superb. In the chapter-house are fragments containing the arms of Mortimer, and those of France and England quarterly.

In the Church of St. Nicholas, at *Wilton*, near Salisbury, is some French stained glass, in the Early English style; one panel representing the Marriage at Cana in Galilee. The date is about A.D. 1400.

The stained-glass border of the east window of the chancel of St. Peter's Church, *Cheeshill, Winchester*, is attributed to the fourteenth century.

The west window of *Winchester Cathedral* is filled with the remains of painted glass, selected from different parts of the church after the destruction of the rest by the troops of Cromwell. The top central light of the east window of the choir is filled with some glass of *Wykeham's* time. (This is stated on p. 148 to be the fifteenth century, and on p. 149 to be the latter half of the thirteenth century. William of Wykeham died in 1404 A.D.)

The heads of two canopies in the east window of the chancel of St. John's Church, *Winchester*, are also attributed to the fourteenth century.

In the clerestory and aisles of *York Minster* are windows of stained glass, all of the time of Edward III.

There is glass of the fourteenth century in the western window of the north aisle of the Church of St. Martin-cum-Gregory, *Tork*.

Portions of glass remaining in the windows of the College Hall, *Westminster*, bear the initials N. L., being those of Abbot Liddington, A.D. 1376—1386. The wreck of the splendid windows of *Westminster Abbey* has been niter. When we find that even the substantial, solid, bronze saints that adorned the grille surrounding the monument of King Henry VII. have for the most part been mutilated or stolen, we can but wonder that so little glass should have escaped the ravages of fanaticism, or of mere mischief. St. James, St. Bartholomew, St. Michael the Archangel, and St. Edward, King and Confessor, and founder of the abbey, seem alone to have been respected by the Londoners. The weight of each of these spirited statuettes is such as to make it no easy matter to tamper with its integrity. The abbey is now being gradually filled with stained glass, twenty-two windows having been thus ornamented within the last five years.*

ARCHITECTURAL STUDIES.

ONE letter out of a dozen, to the same effect—

"Dear Sir,—If you or any of your readers will tell me the usual course of studies or duties that a pupil has to go through to become a thorough architect, you or they will infinitely oblige—An Inquirer."

We wonder how many anxious architectural pupils, or would-be pupils, *habitués in sicco*, are puzzling themselves for a satisfactory answer to the question which reached us in the above form a few days since. The very wording of the request is an indication of the uncertainty with which the subject is beset. "Studies or duties," there is the rub. Which is it to be, after all? Is our term of pupillage to be spent mainly in studying systematically under the direction of an experienced teacher, or does the existence of "articles" merely bind us to the performance of whatever commands our principal may lay upon us, with the chance of picking up in time what we can from the details of his practice? That is the question, or one of the questions, which has to be answered, and which the less careless and more industrially-inclined of our embryo architects are beginning to ask rather pertinaciously, in various forms and through various channels. What is the usual course of duties that an article pupil is expected to perform, in a great number of cases, is an inquiry not difficult to answer. He will copy the letters and specifications, and will perhaps take the former to the post-office. He will be initiated into the delicate art (requiring some nicety of manipulation) of laying drawing-boards and mounting tracings on paper or calico. If in a metropolitan office, he will answer the "office bell," if in a provincial one, he will do battle with intruding "travellers"

at the counter. If he acquit himself honourably in these duties, and acquire a habit of using his instruments with neatness, finish, and despatch, he will be promoted to copy the working drawings for the contractors' use, and may, in time, acquire sufficient insight into the mysteries to enable him to assist in drawing out plans and sections from the rougher sketches of his employer, with the aid of figured dimensions or verbal directions. And here, if he be possessed of no more than ordinary sense and application, he will probably remain, and, at the close of his articles, will find himself in possession of such a degree of knowledge of technical terms, of the general language and provisions of specifications, of the usual mechanical process of getting up drawings, as will enable him to make a respectable appearance in the eyes of his friends and relatives, if called upon by their kind partiality to furnish drawings for a house or a shop-front. If, on the contrary, he be a clever young man, with a natural ability for drawing and designing, he may acquire during his pupillage sufficient knowledge of his master's style of designing to render material assistance in turning out ornamental detail and even to improve upon the established design of his office, and may have the satisfaction, before his articles have expired, of contributing largely to the effect of buildings, the credit for which goes, of course, to the principal in whose name they have been erected. This is, on the whole, we believe, a pretty fair résumé of "duties" of architectural pupils in offices which represent the average of the profession; and, on the whole, it may be said that the master, if he receive a good premium with the pupil, has the best of the bargain; since the pupil, even if thoroughly stupid, is, at all events, merely a slight hindrance in the progress of the work; and, if clever, or even fairly sensible and industrious, he is pretty sure to be positively useful, without necessarily entailing any trouble on his principal, who is (practically, at all events) supposed to do his full duty to the pupil in letting him have the run of the office, and the facility for picking up familiarity with whatever constructive or ornamental work is going on. How far this can be called "education" towards the desired end of becoming a "thorough architect," we endeavoured to point out some time since in a paper,* to which we may refer those of our readers who are specially interested in the subject. In the "usual course" of things, we are not aware that any particular line of studies is recommended to, or exacted from, the architectural pupil, so that the most comprehensive answer as to what is required of him at present, would be "duties—disagreeable—studies—none."

We do not mean to imply a sweeping condemnation of all members of the profession who take article pupils; although we fear that with regard to the course pursued in a good many offices no condemnation could be too strong. In other cases it may be said that the system is more to blame than the individuals who, partly from mere habit, fall into the usual way of working. An architect in busy practice has really little time to bestow on training pupils; and is, nevertheless, if he be a man of any note in the profession, probably often solicited to take them rather against his will. Nor, on the other hand, would we say that the system of office apprenticeship is without certain advantages which are wanting in the far more systematic academic system of France. Living amidst the routine of work, and in the way of seeing the actual carrying out of the buildings for which drawings have been made, must, if properly made use of, confer on the pupil a better and readier knowledge of the practical working of his profession than can be attained by only producing ideal designs in an *atelier*; though we fear even this advantage is often practically denied, for we have heard complaints from many architectural pupils that they were never commissioned to visit buildings in progress, and saw nothing of the work beyond the stage of the drawing-board and T-square. Taking the apprentice system at its best, however, it has the practical advantage referred to; and we would rather desiderate a union of this with the academical system, than an entire relegation of architectural education to the latter. It is not our object, however, just now, to indicate the bearings of a thorough reform in architectural education, which must be a work of

time, but to give some hints which may be useful to students for the present. The serious defect in our present educational system is, in fact, its utter want of system; all systematic knowledge of the history and principles of his intended profession must be acquired by the student's own private studies out of office hours; and though we do hold, most positively, that every architect who accepts a pupil is bound to give him the best advice and suggestion in his power on these matters, we are willing, on behalf of the students, to give such hints as may tend to supply the direction which each ought by rights to obtain from his own professed and (generally) paid teacher.

In the first place, then, we would say to the young article pupil, make yourself acquainted with the general history and (as far as you can) the general principles of architectural design. This is commonly the very last thing that is done or recommended; and the consequence is, as we have before pointed out, that a student merely learns, not the art of architectural design, but the peculiar manner of his own master, which may be bad or good, artistic or inartistic. Many men thus fall into a facility for rapidly producing drawings in an acquired manner, and achieve a pecuniary success in their profession thereby, without leaving behind them one building which is the result of artistic thought and study, or anything better than mere mannerism. The only way to steer clear of this is to take a wide view of the subject at first, to acquire a knowledge equally of all the leading styles of architecture, and especially of the two purest and most typical styles, the Greek and the thirteenth-century Gothic, together with some idea of the conditions both of society and climate under which they arose, and of the antecedent imperfect styles out of which they were developed. Such a study, if carried on in an intelligent spirit, even without going minutely into historical dates and details, cannot fail to aid the student in attaining a clear conception of the real nature and importance of the art, which he is endeavouring to learn; and to the same end we would recommend him to endeavour to form and retain something like a definite conception of the general principles which should govern architectural design as distinguished from other arts. We say this not with a view to encourage idle and utopian theorising, for which there was never less time than at present, but to urge the architectural student to consider what it is which he is undertaking to do in becoming an architect, and not to be a mere blind follower in the groove in which he happens to find himself. We will not just now recommend a regular list of works for perusal; but we may mention, as books which will assist a beginner towards a comprehensive view of the history of his subject, the "Course and Current of Architecture," by Mr. S. Huggins (accompanied by a chart representing at a glance, by a simple method, the chronological and topographical relation of the various past styles). Among works dealing with principles of design, too, we may recommend attention to Mr. Garbett's little work on that subject (published in "Wentle's Series"), and to Mr. Ferguson's "True Principles of Beauty in Art"; not as endorsing all opinions to be found therein (for, in the latter especially, there is much from which we should dissent), but as works thoughtful in themselves, and suggestive of thought to their readers. Hope's "History of Architecture," may be read, too, with advantage, as also various papers, both in recent and in earlier numbers of the *Builder*; and the student having, through these or such works, acquired a general idea of the history and scope of his profession, will be in a position to take up a more detailed study of various styles, of which Mr. Ferguson's well-known "Handbook" will, perhaps, furnish the readiest means in the first instance of study and comparison of leading characteristics of style, while there are numerous works, many of which we hope are to be found in most good libraries, giving more detailed information and illustration of the most important varieties of architectural style. What we specially recommend in reading, as will be perceived, is a regular progress from general history to detail: by this course the student will obtain a much clearer and more intelligible notion of his subject, as well as a better judgment in regard to modern architectural works, than by merely reading promiscuously and at random, however diligently. We must know something of the whole before attempting to judge of parts and those who have formed a pretty comprehen-

* "Generalisation in Architectural Education," in the *Builder* for September, 1868.

* Remainder in our next.

sive idea of the whole history of architectural taste will be the less likely to be led away by the false and often almost barbarous taste of the present day, and the *ignes fatui* of some modern writers on art.

So much for literary study of architecture. While pursuing this course of reading hinted at, the student will have been gradually acquiring, we shall suppose, in his office, familiarity with the use of his pen and pencil, and with the general aspect and meaning of architectural drawings, plans, sections, &c. He should combine his theoretical and his practical knowledge for the production of designs of his own (which he ought to be allowed and encouraged to do in the office on occasion, instead of being, as he commonly is, compelled to confine this kind of exercise to his home or his lodging). And here, the best plan is to propose to himself designs in certain given styles of certain dates and work them out, with attention to the known details of the style chosen. General plan and composition may be practised in this way with sufficient scope for invention, while the endeavour to obtain correctness of detail in accordance with the style chosen will help to fix the characteristics of the style on the memory, and, at the same time, lay the foundation of a true feeling for refinement and consistency of detail. This latter quality of consistency is an important one; and though (as our readers know) we should be among the last to advocate mere copyism in architecture, consistency of treatment is essential to the good effect of a building, and can be best fostered and attained by the study of consistent and complete styles of architecture, before the pupil has learned to think for himself. The attempt to cook originality intentionally, and "of malice prepense," is very likely to result in mere oddity and grotesque; a fact of which we are not without illustrations. A very improving practice too, and a very pleasant one, is that of sketching imaginary architectural groupings and scenes, wherein the sketched may sometimes, even unexpectedly to himself, strike out hints and ideas worth storing up for future use. Detailed ornament and decoration should also be studied; wherein Mr. Owen Jones's "Grammar of Ornament" will be found very suggestive and instructive, giving the basis and leading characteristics of each of the most important schools of architectural ornament; and the student will do well to note the ornamental details of the buildings which he sees in progress from time to time, and observe which are most effective, and which retain their effect longest. We give these general recommendations towards cultivating and stimulating the faculty of architectural design, where it exists. But as to the feeling for balance and harmony of composition, and the power of invention in plan, outline, or ornament, of this it must, in a great measure, be said, *Nascitur, non fit*; and those who are without this natural and innate faculty will scarcely achieve it by study, though they may become good archaeologists and useful practical architects or surveyors.

For of course we must not ignore the fact that architecture, though indubitably in its highest forms a fine art, is based on practical needs, and has its very important practical side: as to which it may be said that in the generation just passed away the practical view of the subject too much took precedence of the artistic, while at present there is some ground for saying that the reverse is the case. As to what degree of practical knowledge, and of what kind, is necessary to render a man "a thorough architect," it is difficult to say anything very decisive, the boundary of the profession being so very indefinitely marked. No one man could possibly be even fairly proficient in all the subjects which are considered to come, or are, at all events, from time to time brought, into the architect's province; and the opinions of architects themselves, as evinced by their professional practice and studies, are very various on this point. A general acquaintance with mechanical statics and dynamics will be the first desideratum, though even this is a knowledge which many successfully practising architects do not, we imagine, possess. Thence we should naturally proceed to a more detailed acquaintance with the principal materials in which we have to work; of building stones and timber of various descriptions, their peculiar qualities, enduring capabilities, and resistance to atmospheric effect; knowledge which will determine which material should be used in special situations. With this should be joined an acquaintance with the manner and principle on which various materials are worked and put

together, on some of which heads there are several well-known treatises; but not, as far as we are aware, any that are very recent. Weale's Series contains several exceedingly useful little works giving the outlines, and sometimes a good deal more than the outlines, of various practical subjects, such as practical masonry, concrete, drainage, &c. A proper knowledge of the method of working materials will prevent the young architect from using a material in a manner and in situations unsuitable for it, and enable him to check contractors in so doing,—not in unimportant point; for we have known builders of some pretensions, when not sufficiently looked after, put together masonry as if it were joiner's work; and as to joiner's work done to imitate masonry, that is, alas! an everyday occurrence. What we should call a true feeling for the right and truthful use of material, is one of the qualities which distinguishes a genuine architectural designer from a jerry builder, or a mere draughtsman: in connexion with this subject the student may derive some hints from a paper on "Design in Relation to Material," in the *Builder* for January 2nd, 1869. The study of drainage and ventilation, what has been done and what remains to be done in these matters, must receive attention, and on these and other practical matters we should impress the student with the importance of keeping from the first a note-book in which to enter whatever special observations he may be able to make on practical points, both for impressing them on the memory and for future reference; remembering Bacon's aphorism, "that reading maketh a full man, writing an exact man." There are of course other materials besides what we have named, the conditions of which must be taken account of, as terra-cotta, tiles, slates, and other roofing materials, and methods of roofing, cements and plaster (the latter, let us say, to be used mainly for practical purposes, and very sparingly, if at all, in decoration). Then the architect, if he commences operations with a commission in domestic architecture, will find that his client expects him to be deep in the mysteries of cooking ranges, heating apparatus, bell-hanging, and other like matters of permanent house furniture, of which the more he knows the better, certainly; but concerning which we have our doubts whether they come so completely and decisively within the architect's province as is commonly supposed: at all events, he cannot compete with the tradesman who manufactures and the workmen who fix these things in practical knowledge of them, and must, in the end, trust a good deal to their honesty, though able to direct them as to general principles and methods, as to which Professor Kerr's work on "the Gentleman's House" will give useful information. A more important part, in our view, of the domestic architect's duties should be the overseeing and directing of the designs of the furniture and fittings in any house of any importance. Commonly, the architect's aid is dispensed with just at this point, so that too often the principal rooms of the mansion which he has designed with care are made hideous with upholsterers' designs of unmentionable nature, and bearing no relation whatever to the general design of the house. Architects should study furniture design and decoration, and endeavour to get this part of the business more under their control, which would be a first step towards seeing something more artistic displayed in the show-rooms of our leading manufacturers. Acquaintance with the use of the theodolite, and some degree of practice in surveying, may be considered part of an architect's education, as he will often find it necessary to survey a site himself; though we do not recommend the general union of the professions of architect and surveyor, which are, in fact, quite distinct in their nature and objects. In a general way, a knowledge of the leading facts and principles of chemistry (on which several published works supply adequate information), will give the architect greater certainty and facility in dealing with and providing for various possible failures of material; and a knowledge of geology in general, and of the particular strata of the district in which he is about to build, will not carry him "too far a-field," but will materially assist him often in the important duties of providing firm foundation, adequate water supply, and efficient drainage for the building he is about to erect. In such matters, however, experience and observation must go hand-in-hand with theory.

As to proficiency in drawing, in the method

of exhibiting ideas upon paper, a thorough knowledge of and aptitude in perspective drawing is, of course, necessary; for an architect should, in fact, design in perspective, in his brain if not on paper; the geometrical elevation being the necessary method of putting his design into a workable and measurable form. This is, in fact, almost purely a matter of practice and habit; for although elaborate treatises on perspective have been written, giving numerous examples of the method of dealing with various objects, &c., there is, in fact, but one problem in perspective drawing, viz., to find the apparent position on a plane of any given point on a geometrical plan and elevation, and any student who has once learned this can put it in practice in any form. After knowing the general principle of perspective, sketching from existing buildings will be one of the most certain and ready methods of attaining ease and rapidity therein, as well as being a most useful practice in calling the student's attention to details in the working out of a design which, on a mere inspection of the building, he would miss, in nine cases out of ten. He must, however, if he is able to make sketching tours, beware of misapplying the knowledge and practice so gained, and of working up in his own designs, without due consideration, materials which are only fitted for the position in which he has sketched them. Sketching is not to supply materials for "cribbing" from, or to supplement, but only to stimulate the architect's own exercise of thought. The use of water-colour in getting up views of buildings for committees and for other purposes, is of a certain value, and is a very pleasant study in itself, but of less practical importance than is sometimes supposed, as it does not necessarily tend to any furtherance of the capacity for strictly architectural design; on the contrary, a showy water-colour drawing is often made available to conceal various defects and lapses of design. The power of sketching the human figure with general truthfulness and spirit will enable the architect to indicate the sculptured decorations of his building in a presentable manner, and will further put him in the position to consider, in conjunction with the sculptor, the nature and character of the design which will be most suited to his building; but let him not be carried away with the idea of being sculptor (or cartooner) and architect in one. Any sculptor or painter will assure him that to design a large figure-subject well and correctly requires undivided study given to that one object: if he do not believe this, let him look at some specimens of architects' sculpture which are occasionally to be seen in drawings and in buildings (chiefly Gothic), and if these do not convince him, our caution is in vain.

In putting together some general hints on architectural study, suggested by the request which we have placed at the commencement of this article, we have purposely abstained from referring to the many facilities which exist in London for self-education, in the way of museums, exhibitions, lectures, and so on, as we are writing for the students of this country generally, and not for the metropolis alone. In conclusion, let us add, that no degree of general education which does not involve neglect of special education, will come amiss to the young architect; a knowledge especially of one or more of the continental languages will often put him in the way of getting more extensive information on subjects connected with architecture than he would otherwise obtain, and may qualify him for a commission which he could not otherwise conveniently carry out. It has been truly observed by an eminent writer* that there is no line of study which, if taken up thoroughly and carried out to its furthest limits, will not bring the student into contact with the widest fields of human interest and knowledge; and of no profession can this be more truly predicated than of architecture.

Velocipedianism.—According to the *Liberty*, a bootmaker has just invented a boot with small wheels, which will enable us to go as rapidly as a horse, with the facility of stopping at a moment's notice. What is this, however, but skating on wheels, which we have all seen at the Crystal Palace or elsewhere. It is a curious and no doubt pleasant recreative mode of locomotion, or velocipedianism, but can it be made suitable to roads? That is the question.

* Mr. Frode, in his "Inaugural Address at St Andrews University."

DRINKING FOUNTAINS AND PURE SPRING WATER.

It is a curious thing to note how the great powers that be sometimes go about things. There are two important questions at this moment before the British Parliament, of most momentous import to the whole British public: one is, that the said public shall be from henceforth compulsorily educated; and the other is, that intoxicating liquors generally should either cease to be drunk altogether, or, at least, the sale of them confined to very fashionable localities; and, to help to wean the poor helpless public from the temptations of alcoholic liquors, a society some time since sprang into existence, and a series of fountains, as they are termed, have been put up by it in all the poorer districts of London, for the purpose of supplying people with what the Drinking Fountain Society call "pure and wholesome water." Now, it is a curious fact, that all the fountains are carefully loaded up and the water-supply from them made to cease during the whole of the winter-months and cold weather; indeed, just at the time when the sale of spirituous liquors is at its maximum, "to keep the cold out." Why is this? Surely the public, the lower orders, must drink in the cold weather as well as in the hot; and the temptations to go astray are quite as great, if not greater, in the cold of winter as in the heat of summer. But so it is, and doubtless it is all right and proper; but as the season has just commenced when all these boarded-up fountains are uncovered, and the water from them allowed to flow again (at least by day, for we have found them shut up through the night, even in summer), it seems worth while to say a few words about these drinking-fountains, on the fountains themselves, architecturally, and on the sort and amount of water which they supply. For this purpose we would call attention to the recent elaborate and instructive Report, with an appendix, on the subject of the London water supply: it would seem to call for some notice beyond what it is likely to meet with at the hands of those who look on it only as a sanitary matter. We are what is called a practical people, so that in the event of any change for the better taking place, either in the kind of water supplied to Londoners, or in the mode of its supply, we may be quite sure that *art* will come in but for very meagre notice, if for any at all. A few words, therefore, may not come amiss about it before anything is finally determined on. To begin at the beginning. *Rain*, says the "Report," is the source from which all water-supply is obtained, and there are three modes by which the water thus provided by nature is made available for the supply of towns. We ask attention to them. The first is to bore down into the porous strata, and thus to come directly to the purest of all water, that which springs up into wells, and which sometimes reaches the surface and bubbles up as springs. Secondly, that which is obtained from rivers, and which is the natural drainage of a country. The Thames thus drains not less than 6,000 square miles of land, *i.e.*, the rainfall over this area falls into the river bed. The third mode is by forming large reservoirs in hilly districts, and then to collect and store up in them the rain or surface water, this being conveyed by pipes to where it is wanted. So it observed, that none of these methods ensures the collection of *pure* rain-water, the water being necessarily mixed with earthy and mineral matter by the fact of its passing through or over the ground on which it falls. It seems, therefore, a pity, as we have before urged, that some plan has not been devised for collecting pure rain-water from the tops of houses into tanks or cisterns. This would be a fourth mode of water-collecting. *Rain*, it is said, is the very purest and softest of all waters, it being the result originally of simple evaporation. If a glassful of Thames water be simply allowed to settle so as to become clear by the mud falling to the bottom of the glass, this water on being tasted will be found to be soft and almost like June rain-water. Or, should any one be bold enough and hardy enough to bathe in the river, he will find the water delightfully soft and pure—pure barring the mud. If, then, after these two simple but bold experiments, the same person will dive into a common plunge-bath, and venture to taste the water from one of the common drinking-fountains, as they are so poetically called, he will discover that though the water be said to come from the same source—the Thames, the

bath water will feel like pounded ice, and as hard; and the taste from the "fountain" like unto some diabolical semi-warm mixture of he knows not what; as hard as cast iron and about as palatable! What, therefore, we would ask, do the water companies do with the water? Why not leave it alone, and allow the pure river water, after depositing its mud to find its way into baths and fountains in its natural state?

But, it may be asked, why take the "river" water, with all its impurities, about which there is so much in this Report, all the great scientific authorities contradicting each other about it, no two of them seeming to agree? Now, it so happens, says the Report, that no less than two-thirds of the Thames basin consist of porous and permeable strata, such as chalk, coaltic limestone, and sand and sandstones of various kinds, all of which receive and absorb a large proportion of the rainfall, and store it up in vast subterranean reservoirs, forming well and spring water, water made pure and palatable by great natural processes, costing nothing but the getting at it, by the sinking of wells and pump-pipes. This grand natural process reduces organic matters to a minimum, and mineral matters to the smallest amount, is independent of the seasons, gives uniform temperature, and the filtering process as perfect as can be; for, as the "sections" show, from 50 ft. to 300 ft. thick of sand, or limestone, or chalk, are gone through. It is something wonderful what an amount of evil is put up with by the poor British public. There is all this exhaustless supply of the purest and best of water under our very feet, and needing only the most common of mechanical appliances to come at; yet is it never even thought about, while the substance called water in common use is really unfit for any purpose whatever, either for washing or drinking.

But there is another aspect of this important subject which will, if not at present, at some future day, meet with the attention which it is worth. If we travel into countries and towns uncivilised and barbarous enough, such as Constantinople, or Damascus, or even Utah, on the Salt Lake, it will be found that not only is there a plentiful, nay, a magnificently liberal supply of the purest and most delicious of water,—but no pains and expense have been spared to render this supply not only complete, but pleasant to eyesight. The reader will see nothing of this in the Report. London and Constantinople or Damascus are wide enough apart; but in the last-named cities the water is *alike utilised and made beautiful*. Instead of the little dribbling, sickly streams which flow from our drinking-fountains, and which take their time to fill a wine-glass, and which in most cases spout out of a foot or two of paving-stone into a shallow basin, the size of a common dinner-plate, the real fountains to be found in those far-off and barbarous cities are really works of art, to be seen a mile off, with water enough to be at least seen and heard as it falls; a something to pause to look at, and a happiness to see. A photograph of a beautiful fountain worthy of the name, near the "Sweet Waters" of Asia, and quite a gem of Moslem architecture, may be seen in Gautier's Constantinople, together with another,—but far too big and luxurious for our shopkeeping nations,—that of the fountain of the Sultan Selim. Constantinople, be it observed, is a barbarous and almost heathen place, and a remnant of old and fast-fading times and ways of work, and unhappily modern improvement will consist, when it thoroughly seizes hold of this place, in doing away with all these quaint "water supplies" and substituting "taps" everywhere. Let the intelligent artist reader balance the loss and gain mentally and bodily. London improvements would seem now to consist mainly in pulling down as many houses as possible, and forming large, awkward, open waste spaces: would it not, we would ask, be a good plan to occupy some of these with drinking-fountains worthy, at least, of the name, with the water supplied from the lower strata, as explained in the Report,—*i.e.*, with well or spring water, of which there is such an inexhaustible supply. Such water is always pure, drinkable, and of even temperature, and constant in quantity. In these fountains the water for which they are constructed should show itself visibly,—*i.e.*, it should be seen that the fountain was made for the water, and not the water for the fountain;—large open basins and a perpetually-running stream. It would be difficult to devise a plan more likely to be acceptable to the public, especially

the poorer and out-door public. It would be easy to name some score of open spaces where "fountains" such as we have indicated would be useful and desirable. Nothing can be worse than the now so fashionable mode of improving London. Everything is destroyed, and there is nothing in idea to replace the old plan of streets, bad as they are thought to have been, or are. We may, before it is too late, learn something from Constantinople and other of those distant and really wonderful places, truly called cities, built and planned so long before science and "art principles" had any existence, but yet at a time and by a race of men whose ways we may well try to recall and humbly imitate and follow. There is, surely, a long distance between a Turk and an Englishman; and if the Sultan and his subjects are to be civilised by the adoption of English ways, let us borrow something from them before it is lost for ever.

One other thing there is in this water-supply question which ought not to pass without notice, as it is not a little curious, and shows the universality of the great laws of nature. Everybody has heard of the impurity of London river-water, one way or another; but the Report says, that taking properly-filtered samples of Thames water, we shall see an "extraordinary regularity in the albuminoid character of good town waters during summer months." Thus it would appear, that Thames water, Manchester water, Edinburgh water, and Glasgow water from Loch Katrine, show in a most remarkable way the great constancy in the amount of such impurities as ammonia. Thames water gets even sewage. Manchester water comes off the moorlands of Derbyshire, so it is pure; Edinburgh, from springs some miles from the city itself, yet is the per-centage of ammonia nearly uniform. It is certain, therefore, that there are great natural processes at work, always tending to equalise the quality of all natural water that is freely exposed to air and light.

EDINBURGH PROSPECTS.

WHEN George Heriot, goldsmith to James I., left his means and estate for the purpose of building and supporting an institution for the maintenance and education of poor boys in his native city, he set an example which has been followed by numerous imitators. Such is the plethora of wealth devoted to this purpose in Edinburgh that it has come to be looked upon as an evil, and means are being taken with the view of breaking through the monastic system, which is found to have a baneful effect upon the boys, and for giving a wider scope and aim to those richly-endowed institutions. Our readers will be surprised to learn that the endowments of these pauper palaces nearly equal in amount the whole educational endowments of the metropolis. Besides being hurtful to the boys, the use of these institutions has a demoralising effect upon well-to-do parents perfectly able to maintain and educate their offspring. In short, the building of pauper palaces has reached its acme, and those wealthy nobodies who wish their names to be associated with some grand structure must look for some other outlets. We may call the attention of such to the fact that Edinburgh has no town-hall, public library, or public baths,—deficiencies we hope are long to see supplied in this or some other way.

No city of its beauty and importance that we know of has less ecclesiastical architecture worthy of admiration than Edinburgh. Trinity Church disappeared to make way for the North British Railway Terminus; Holyrood Chapel is in ruins; St. Giles's worse than a ruin; and the modern churches,—Classic and Gothic,—are mediocre in the extreme. This defect is likely to be remedied by the munificent bequest of the late Miss Walker, of Coates, to the Episcopal Church of Scotland. The estate left by the deceased is estimated at about 250,000*l.*; and, after paying all preliminary calls upon it, a sum of upwards of 200,000*l.* will be at the disposal of the trustees. The bulk of the estate consists of building-ground at the west end of the city, from which an excellent site,—at the western termination of Melville-street,—has been reserved, and on this is to be erected a cathedral at a cost of not less than 40,000*l.*

Provision is made for the officiating clergy; and in order to procure a suitable design, four or six architects are to be asked to compete. Other churches may be built and endowed by the trustees, the first of which to be at the east end of the city, to supersede St. James's, we

presume, which has an ordinary street front, in union with the line of houses of which it forms a part.

At the southern suburb of Grange a new church is in course of erection, intended to commemorate the name of the late Dr. James Robertson, professor of church history in the University of Edinburgh. It will occupy a commanding site at the angle of Kilgraston-road and Strathearn-road, and is to be seated for a congregation of 900. It is to consist of nave and transepts, with a spire, 150 ft. in height, in the centre of the west gable. It is to cost 6,000*l.*, and the design is the first realized one, in this branch of art, of Mr. Robert Morham. We shall watch its progress with interest.

A meeting has been held with the view of taking steps for the erection of a suitable memorial of the late Sir James Young Simpson.

A subscription list is also open to raise funds for a monument to the late eminent divine, Dr. Chalmers.

The Albert Memorial is still in the hands of the sculptors: we hope the question of site will be reconsidered. The Queen's Park, at the foot of Arthur's Seat, is about the last place where we would think of placing an equestrian group. The last public act of Albert the Good was to lay the foundation stone of the Radcliffe Museum. No more appropriate site for his monument could be found than in front of that building when the new street shall have been opened up.

KNIGHTSBRIDGE BARRACKS AND HYDE PARK.

BETWEEN the Corner and Albert Gate, and thence to the Guards Barracks, a distance of nearly one-third of a mile, the narrow border, varying from 100 ft. to 30 ft. in width, discloses the most perfect and tasteful example of shrubbed landscape gardening. With every difficulty to contend with,—a dull boundary wall, the backs of mean houses, and range of lofty, wide-spreading trees,—simply by raising and varying the surface with grassy hillocks and flowering shrubs, this hitherto repulsive margin has been transformed so as to excite the admiration of promenaders; and, together with the vicinal dell at the foot of the Serpentine, has become a thing of beauty. Here, however, all enchantment ends; for onwards, nearly a quarter of a mile as far as Prince's Gate, the Cavalry Barrack, with dull walls, gates, and open windows, borders the drive, without any intervening space. Sentinels at the entrances patrol the route; and, save that the officers' quarters stand back, presenting something of a more decent elevation, any factory or antiquated workhouse would form a boundary as appropriate to this route, which ought to be the promenade of fashion.

From the barracks westward to Queen's Gate, a little over a quarter of a mile, the park border is beautifully timbered, forming a wider margin to the drive; and here a shrubbery continued to the lovely flower walks, connecting Kensington Gardens, would perfect the whole circle, and prove a real solace to the walking community, as well as those who ride and drive; but so long as the barracks, which border the way for nearly 400 yards, occupy that position, it would be idle to attempt any further improvement; for, in fact, the quadruple range of carriages on the loughing drive turns back from the Serpentine Hall towards Hyde Park-corner.

Our metropolitan landscape gardeners certainly deserve public gratitude for the perfection of their floral display, and that under all the disadvantages of London smoke: the security of the flowers, and the admiration they attract, are sufficient evidence of the value of their labours. They have made a little Eden of the site of the old demolished guard-house, opposite the late toll-bar entrance to Kensington; and now the whole Park circle, save the interval from the barracks to Queen's Gate, has become a place of resort the most agreeable and refreshing.

Ten acres covered by the Knightsbridge Barracks is rather over 4 acres: they occupy a quadrilateral space of 220 yards by 60 yards, and then the stables cover a plot of 153 yards, diminishing in width to 30 yards at the western extremity. Long since, on an inspection of the quarters, the building and its arrangements were condemned as unsuitable to troops. The first floor of dormitories, built over the stables, is but 8 ft. in height. In front it looks into the most important highway of the metropolis; in the rear the windows open upon the fashionable drive, and the troopers

lounge and recline in undress in full view of the passing traffic.

When first built, perhaps 150 or more years back, the location was no doubt appropriate: it was then ultra-urban, and on the road to the Royal Palace: it is now closed in by a dense population; and, as in all instances of the kind, the vicinage is tainted by night rambles, and the low value of property there, save in public-houses (of which there are seven within 200 yards' distance), contrasts remarkably with the mansions and sites on the Kensington-road line.

At present the south side of the park has become of twentyfold value, excepting only this immediate line, where the barrack wall constricts the public highway along its whole course; and being in a densely peopled neighbourhood, it is not so suitable for troops as a position somewhat more distant, such as Chelsea, for instance, where the infantry guards have been for some time advantageously stationed. There they have certainly better barracks, good air, and more appropriate position; and, if not too far for infantry, it cannot surely be an inconvenient quarter for a cavalry regiment.

Taken in a financial point of view, the ground occupied at Knightsbridge, if sold or let for building, would realise an amount sufficient to erect barracks for the whole regiment of guards; whereas the present building accommodates but 420, and new barracks, near the infantry guards, would give domestic comforts to the men, while their withdrawal from the park would at once treble enhance the value and change the aspect of the richest and most prized position of London,—the range between Knightsbridge and Kensington.

There is still another consideration which, as it affects the whole population, ought to have some weight, and that is the necessity for widening the Great Western-road, and the formation of a park side-walk under the shade of the fine range of trees extending along the whole south road to Kensington. The surrender of 18 ft. or 20 ft. of park border, preserving the forest trees intact upon the footway, and throwing the present external footway into the carriage-road, as recommended in last week's *Builder*, would in no sense diminish the effect of the park, whilst it would enlarge the driftway, on an average, 12 ft., and thus effectuate the improvement so earnestly desired by the Commissioners of the Hall of Arts, and by every resident of this fine quarter. The rapid advance of the Hall of Arts, of the South Kensington Museum-buildings, and of numerous residential structures which now occupy the important south-western district, demand the concession of an improved road and footway. The population has increased; and as the city spreads, every foot of free intercourse and park privilege becomes of vital importance. When the Kensington Guard Barrack was demolished, Government converted the space to a garden. A similar dedication to public uses of the Knightsbridge Barrack site would, doubtless, meet with general approval and gratitude.

CHURCH OF THE HOLY INNOCENTS, FALLOWFIELD, MANCHESTER.

THE corner-stone of the Church of the Holy Innocents, at Fallowfield, was laid on the 4th inst., with full Masonic ceremonial, in the presence of the Grand Lodge of East Lancashire, by Brother the Hon. Wilbraham Egerton, M.P.

The site of the new church, which has been given by Lord Egerton of Tatton, in addition to 1,000*l.* subscription towards the building fund, is on the north side of the new road leading from Fallowfield to Chorlton, and adjoins the Disbury high road. Space is also provided for the erection of schools and a parsonage. The church comprises a nave, about 80 ft. by 25 ft. wide, and about 62 ft. high from the ground to the ridge. On each side of the nave are aisles about 13 ft. wide. This portion of the church is lighted by a two-light window, having ornamental heads in each bay of the aisles, and by a large window of bold design in the west end of the nave. The clearestory consists of lofty coupled single lights, with cusped heads, in each bay, the pier between supporting the intermediate roof principals. From the moulded corbels at the foot of the hood moulds to the nave arches rise wall-shafts, with moulded caps and bases, which support the roof principals. The chancel is about 38 ft. long and 22 ft. wide, and is raised above the floor of the nave by several steps,

which occur in the centre of the chancel-wall. The chancel is lighted by three clearestory windows on each side, and five in the apse, which is on plan a semi-decagon below and a semicircle above. On the south of the chancel are two moulded arches, opening into a side chapel or aisle, which is also connected with the south aisle of the nave by a single arch. On the opposite side of the chancel are the vestry, a lofty organ-chamber, with arches opening into both chancel and north aisle of the nave. The pulpit is placed at the north-east corner of the nave, touching the foundation-stone. The font is near the south porch, at the west end of the south aisle. The tower, which forms a second porch, and a spire, are at the east end of the south aisle, next to the chapel, and have been most carefully designed with reference to their appearance when executed. The exterior of the building will be executed *en pierre point*, with stone dressings to windows, &c., and the window-tracery may be of Berlin red terra-cotta; the main internal columns and arches to be worked in red Runcom stone, with white stone for caps and bases. The church will accommodate about 700. The builders are Messrs. Ellis & Hinchliffe, and the architects are Messrs. Price & Linklater, of Manchester and London.

SOMETHING MORE OF GLASGOW.

THE majority of the city graveyards in and about Glasgow are in a very wretched condition. The Necropolis is very well looked after, as are two or three more minor ones, but we have visited a few which are simply a disgrace to any civilised community.

Extramural burial in Glasgow must become the order of the day. In a Roman Catholic burial-ground "Lairs" have been purchased and paid for, and yet others besides the owner's family and relatives have been buried within. A mean, money-grubbing, and unchristian desire has been shown on the part of those who receive the burial fees in this graveyard, with an utter carelessness and heartlessness demanding censure if not reprobation. Two or three miles outside Glasgow, at a place called Dalbeth, there is another Roman Catholic burial-ground, which was enlarged a few years ago. There are graves here, let us say charnel-pits, into which shattered humanity has been carried and shovelled down, not unwept by some,

"But unhonoured and ununged."

Poor Pat and poor Sandy have gone down here through infernal traps in deal boxes, or coffins if you will, with a few shavings for their shroud, but no *De Profundis* for their souls. "It was good enough for them: if their relatives could pay for it they would have it the same as others." So runs the refrain. There are some natures who will speculate on making fortunes by the dead as well as by the living, and who, to use the words of Wordsworth,

"Would peep and peep and botanise
Upon their mothers' graves."

The laying out of old city graveyards, and making them places worth visiting instead of avoiding, making them contribute to the beauty and health of their locality—has not yet been attempted in Glasgow. London has, however, given a precedent, which may well be followed out with advantage.

Window gardening, which has done so much to elevate the taste and feelings of the poor in the low quarters of London of late years, is an occult science in Glasgow. We looked in vain through the dreary passes of Glasgow for these bright oases in the desert, but found them not. Where there is a love of flowers there cannot be a love of filth.

On the north and south sides we noticed several old thatched structures, and some of these are in the vicinity of factories, where a spark at any time might, during the night, do the work of an incendiary, and result in a conflagration and loss of life that the city of Glasgow would never forget. These thatched houses on both sides of the Clyde ought to be at once condemned and removed; but we doubt if the sanitary authorities of Glasgow at present will dream of touching such picturesque bits on their social canvas, as they are so exquisitely charming and so highly influential.

At Whitechurch, a few miles out, there are some self-contained dwellings in course of erection for the working-classes. We may have occasion hereafter to say what we think of them. Of that class within the city we have spoken with truth and without exaggeration.

The present City Railway construction through Glasgow will not add to the beauty of the city, though it will certainly add to its prosperity. But we do not see why the underground system should not be attempted, as it could be with every chance of success. A tunnel under the Clyde, on the line of the Bromielaw, will also be soon, if it is not at present, a necessity.

CONDITION OF LINCOLN.

SIR.—Under the head of "Stagnant Lincoln," your last week's issue contains a letter that requires contradiction.

There are no fens in Lincoln or its immediate vicinity. The subsoil is lies, capped on the summit with the oolite, from which the cathedral, the castle, and other stone buildings are erected. The lower portion is covered by an alluvial deposit of sand, some two yards in thickness. The stone, sand, and lias clay are extensively used for building purposes and for brickmaking.

There are no dykes filled with stagnant water. The Witham, a running stream, delivers into a navigable pool called the Brayford, which also receives the waters of the Fossdyke, a canal cut by the Romans from the river Trent at Torksey, to the Witham at Lincoln. The Fossdyke is connected with the Trent by locks; and as the passage of every vessel through the locks necessitates the issue of a large body of water into the canal, it cannot be called a stagnant water.

The Brayford pool is bounded on two sides by wharfs and warehouses, on the other by the railways. The Fossdyke and Witham, flowing through it, run down to Boston. Locks are placed at their exit from the city, to enable vessels to unload upon the wharfs along their course.

With the exception of the new towns that have sprung up in the recently-developed iron districts, few places have progressed so much or kept so well up with the times as Lincoln; neither does the writer know a prettier place. Approached from any side it is a splendid picture. The blending of the various tints of the slates, tiles, stone, and bricks in the ancient and modern buildings on the crest and escarpment of the hill, mixed with the foliage in the grounds and gardens, is beautiful.

Along the edge of the table-land are built the Cathedral, the County Hospital, the Castle (including the county prison and Assize Courts), the Lunatic Hospital (where the system of non-restraint was first practised), the Penitent Females' Home, the Workhouse, and the N.L. Militia Barracks and Store-rooms. The city Assize Courts and prison are built lower down; and on the opposite side of the valley stands the County Pauper Lunatic Asylum.

Lincoln is the metropolis of the portable engine and agricultural implement trade. Its four principal factories employ several thousand work-people, whose productions are sent all over the world. There are also two large chemical works. An extensive trade is done in flour, malt, and grain. An excellent cattle-market is held weekly; and five lines of railway radiate from the city.

The assertion that the *Builder* is scarcely known in Lincoln is simply nonsense. Daily papers are brought in from Nottingham, Leeds, Manchester, Hull, Sheffield, and London; the first at five a.m., the others in due course as the trains arrive. Then there are the evening papers from Manchester and London by last trains. Three local newspapers are published and well supported in Lincoln. The *Mechanics' Institute* and Reading-room has been established many years with great success; the terms are low, and it is well attended.

A school of art was started a few years since, and its pupils rank among the highest in the Government reports. In the Grammar-school are educated many scholars, at a moderate charge. A fair proportion of them have obtained university distinctions, two recently at Cambridge.

An Act of Parliament was obtained a short time since, authorising the sale of some acres of commons land, out off by a railway. The proceeds were spent in draining, planting, and improving the remainder, and a good class of houses are being erected on the land sold. Another Act now waits the royal assent to convert a further portion of commons land into an arboretum, a strip along the top to be sold for the erection of a superior class of villa residences. A large balance accruing from these

sales is invested, and furnishes small annuities to aged householders and freemen.

All the churchyards are levelled, planted with shrubs, and enclosed. The cemetery-grounds are beautifully laid out, and kept in admirable condition.

Owing to the increase in population by the development of the local trades, original shares in the Waterworks Company, Gas Company, Corn Exchange and Covered Markets Company, and Bank are very valuable.

Workmen's cottages are in great demand, many being bespoken before the roofs are on. The following are some of the principal works now in hand:—New gaol for the Lindsey division of the county to hold 200 prisoners; two churches, one to accommodate 1,000, the other 500 sitters; Wesleyan schools, new infirmaries at the workhouse, a private estate of some four or five acres is laid out, and villas are being built upon it.

Tenders are accepted for pulling down the present Baptist chapel, and replacing it by a larger. The guardians have accepted tenders (about 1,300l.) for improving the sanitary condition of the workhouse, by altering the privies into water-closets, remodelling the drainage, and constructing tanks for filtering the sewage. Between 3,000l. and 4,000l. were recently granted by the county magistrates for the purchase of land, and arrangements for conveyance thereon of the sewage from the County Pauper Lunatic Asylum.

Market days are attended by a class of farmers second to none in wealth, appearance, and intelligence: a large influx of their servants visited the city lately, being May-day time; they were respectfully dressed and well conducted; and to exemplify their prudence, in addition to their large purchases of drapery and other goods, 1,700l. were paid into the Lincoln Savings Bank by them in one day, exclusive of what might be paid into the Post-office Savings Bank.

When the new Lindsey prison is completed the few prisoners in the city gaol will probably be confined therein, the city assize courts and gaol removed, and the site appropriated for a new town-hall which is talked about, and is much wanted.

In passing through the city the river receives much of the sewage; and although it is flushed occasionally by means of the sluice-gates at the Brayford, a proper system of drainage is required. This is only a question of time: the Corporation have three schemes, by eminent engineers, and when the learned men of the country settle upon the best mode of disposing town sewage, that method will doubtless be adopted in Lincoln.

The want of a row of trees along the High-street cannot be construed into an aversion of the citizens to foliage in its proper places. If a man likes the church there is no reason why he should bestride its ridge. The Witham level is too low to admit of a continual stream of clear water flowing from it along the street channels; and I fear your correspondent, "Gurgyle," is not a ratepayer, or he would have reason to know that the Local Board are doing something.

A LINCOLN HOUSEHOLDER.

WIND PRESSURE ON ROOFS.

In an article on this subject, the *Engineer* says:—

Having ascertained the conditions of strains due to a uniform load upon the various parts of the roof, and tabulated the results, let another table be compiled showing the effects of a partial loading, and then the necessary counterbracing can be introduced. But there yet remains a very important element of stiffness to be added, namely, the wind ties. These are required not only to assist in resisting the external violence of a storm or hurricane, but also to prevent the pressure from underneath literally "blowing up" the roof. If the wind once gets "well under" a roof nothing but the fact that the greatest care and precaution has been bestowed upon its bracing will prevent it being carried away. We have known an instance in which, from want of attention to the proper tying together of the principals, the whole roof was lifted bodily off the side walls and landed in an adjoining field. The storm continuing, the walls gave way also, and the cost of restoring matters to their original condition amounted to 1,500l. The fault of most wind-ties is that they are not carried down low enough. There is no necessity for tying the principals together by wind-ties. They are already amply secured by the purlins and the whole covering in general. The point

to be aimed at is to tie them back upon the respective supports, so that the principals could not be lifted without taking the foundations with them. Basing our estimate upon the data already assumed for the maximum pressure of the wind, the upward force would be equal to 55 lb. per square foot, and would consequently lift nearly that weight vertically. Unless, therefore, the insistent weight of the roof per square foot were greater than this amount, it would at any rate be able to be seriously shaken by a force of that intensity. The aid, therefore, of some further mode of securing the principals is evident, as roofs of moderate, and even large spans, do not equal in weight the figures arrived at by observation for the maximum wind pressure. The strength required to be given to a roof will be most accurately calculated by a due attention to those principles which theory dictates, and practice sanctions, but its rigidity and stiffness will be best provided for by experience, combined with a little of that "artifice" which every thoroughly qualified engineer knows when and how to employ.

SALISBURY CHAPTER-HOUSE.

SIR.—Permit me to state that I ascertained last autumn that the decay of portions of the ornamental wall-painting, inside the Chapter-house of Salisbury Cathedral, is most certainly owing to the effects of damp. I was told that exposed parts of this ornamentation owe their permanence to the use of a backing of slate.

A. H. GENT.

LABOURERS' COTTAGES.

ARCHITECTS WHO KEEP THINGS TO THEMSELVES.

DECENT dwellings for farm labourers are being built on the Deddison Estate, near Bridgford, for the Rev. F. H. Wolryche Whitmore, at Caynam Court, Ludlow, for Sir Wm. Curtis, bart., at Rowfant, Sussex, for Sir Curtis Lampton, bart., at Jernyns, near Ramsey, for Mr. E. G. Linzee; and at Kirby Maxlow, near Leicester, for Miss D'Oyly. These works are being carried out from the designs of Mr. Birch, architect, who gained the Society of Arts' premium for such designs. Each cottage will contain a living-room, three bedrooms, entrance-porch, scullery, pantry, fuel-store, piggy, privy, cesspit, and ashpit. Architects who are afraid of having their plans published may take a lesson from these cottages. When Mr. Birch obtained the premium, he gladly availed himself of our pages for the wide publication of his drawings. Another architect who was asked to afford facilities for the publication, about the same time, of his design for such cottages, was "not such a fool," he said, "as to give the public the benefit of his plan for nothing."

What was the result? Mr. Birch has been engaged all over the country carrying out the plans he had frankly thrown open, while the careful gentleman, who was "not such a fool," has never been heard of since.

NOTES ON THE INCLOSURE ACTS AND THEIR RESULTS.

A PAPER on this subject was read by Mr. Richard Hall, Vice-President, at the ordinary general meeting of the Institution of Surveyors, May 23rd. In concluding it, the reader said,—

From the sketch of the legislation on this important subject up to this point, it will be seen that Parliament has fully recognised the great advantage of inclosing wastes and unprofitable land, and removing any rights that interfere with its free cultivation. From time to time, however, provisions have been inserted in the various Acts, in order to preserve open spaces for the public, and for large populations. Village greens cannot be inclosed, and recreation grounds and allotments for the poor may be set out, if necessary, in the cases of inclosures of waste land. Any proposals for dealing with commons near London, or other large towns, have been regarded by Parliament with great jealousy, and in the year 1855 a Committee of the House of Commons reported on the best method of preserving to the public open spaces in and around the metropolis.

Their attention was directed to the question of the inclosure of portions of commons by "improvement." This process is authorised by an old Act of Parliament, passed in the reign of Henry III.,—20 Henry III., cap. 4,—and known as the Statute of Merton. It was intended to enable the lords of manors to inclose (probably

for the purpose of improvement or cultivation) such portions of the waste as were in excess of the requirements of the commoners. The Committee recommended, amongst other things, that this statute should be repealed; at all events, so far as suburban commons were concerned.

In the following session, 1866, an Act was passed for the purpose of preventing the inclosure of commons, under the Inclosure Acts, within the metropolitan police district, 29 & 30 Vict., cap. 122. This measure also provides machinery to enable persons interested in such commons to apply to the commissioners to prepare schemes for their management, which, after the observance of certain forms, are to be submitted for Parliamentary sanction. By the commissioners' report this year, it appears that applications have been made to them in eight cases, but no scheme has yet been completed.

In the present session, a Bill has been introduced to extend the provisions of the Act of 1866 to commons within certain distances of towns containing 5,000 inhabitants and upwards.

Last year, a committee reported on the subject of the public recreation grounds and allotment gardens, set out under the Inclosure Acts, and suggested some alterations in those Acts, with a view to enlarging the powers of the commissioners. This session, the Government has introduced a Bill, proposing that as much as one-tenth part of the whole value of any waste land shall be appropriated for those purposes; and giving the commissioners power to reserve a recreation allotment in the case of common field inclosures, if the public have been in the habit of using any portion of the land to be dealt with for such a purpose. Common fields have hitherto been exempt from this condition. Rides and drives for the public may also be set out, and the assent of the local authority is required before any land can be enclosed within certain specified distances of towns containing 2,500 inhabitants and upwards.

The beneficial effects which have resulted from inclosures can hardly be estimated too highly. In the cases of common fields the removal of the complicated rights and customs, which so much interfered with their profitable cultivation, has increased their value in a very great degree; it has also enabled the owners to effect operations of improvement, such as drainage; and the new roads which have been constructed have not only benefited the land dealt with, but afforded improved communication for the public and the neighbourhood.

I have frequently had occasion to make valuations in parishes enclosed by my father thirty or forty years previously, and have found the value four or five times as great as it was at the time of the inclosure. But land is not only improved from an agricultural point of view; it is frequently converted into building sites; and some inclosures of common fields, which I carried out in the neighbourhood of Cheltenham, may be referred to as instances in which, probably, the value has been increased tenfold. I remember a small common field, property which was looked upon as of so little value that it was left quite uncultivated, and hardly possessed an owner; the process of inclosure soon changed its character, and since that time it has been built over.

The inclosures of waste lands have also exhibited very interesting results. At Framfield, Sussex, the quantity dealt with was 2,000 acres, and the lands in respect of which rights of common were exercised extended into seven parishes, and comprised about 12,000 acres. It was very generally thought in the neighbourhood, that the value of the whole of the waste would hardly suffice to pay the expenses. The results were, however, satisfactory; for the portions sold to defray the expenses did not exceed one-eighth of the whole. Some of the land was comparatively worthless; but the prices obtained averaged about 20*l.* an acre, which was but little less than the price at which inclosed land had been selling.

I will not, however, weary you with instances of the improvements which are so generally familiar to us. Many members of this Institution can, no doubt, call to mind various interesting cases. It is satisfactory that in no single case within my own experience has the cost been so great as to render the inclosure unprofitable.

In reviewing this brief sketch, it appears that the working of the Inclosure Acts, under the superintendence of the Inclosure Commissioners, has very successfully carried out the intentions of the Legislature. The cost of inclosures has, probably, been reduced by as much as 50 per

cent.; and, at the same time, the process has been accelerated and rendered uniform and certain. The interests of the public, as well as those of the poor inhabitants, have received their share of attention; and the present legislation is apparently tending towards the encouragement of the inclosure of rural commons, whilst it seeks to preserve open spaces for the recreation of large populations.

THE NEW WORKHOUSE FOR DARLINGTON UNION.

The local Board of Guardians, towards the close of 1867, offered premiums of 40*l.*, 30*l.*, and 20*l.* respectively, for the best three plans of a model workhouse. In response 116 designs were forwarded, and an architect from London examined them, and decided in favour of "Nota Bene" (Mr. C. G. Adams, of Stockton), "Economist" (Mr. G. Syams, of York), and "A" enclosed in a circle (Mr. W. Snowden, jun., of Bishop Auckland). The Board decided to give the first premium to Mr. C. G. Adams, whose plans they accepted. Tenders for the contract were invited, and Mr. Joseph McCormick was announced to be the successful competitor, at 11,759*l.* The work has since progressed under the direction of the architect, and the supervision of Mr. W. Simpson, the clerk of the works appointed by the Board. It has now nearly approached completion.

The length of the front of the main building is 157 ft. 10 in. It has moulded brick bases and moulded brick stringing running along at the height at which commence the springing to the arches, with a fascia of black and white bricks placed alternately on each side of the central part of the building. In the centre is the principal doorway, with columns, bases, and carved capitals, moulded semicircular splayed arch, &c., and carved representations of animals. The whole front and returns of the main building are finished with a moulded blocked cornice. The roofs of the main building, and of the board-room, the porter's lodge, and receiving-wards are covered with Taylor's patent roofing tiles, and have the appearance of a gutter and ridge tile placed alternately. On the ground floor, at the east end of the main building, there is the master's room, 17 ft. 3 in. by 18 ft.; master's office, 18 ft. 6 in. by 18 ft.; infirm men's day-room, 20 ft. by 18 ft.; able men's day-room, 22 ft. 3 in. by 18 ft.; and two infirm men's night-rooms, one 30 ft. by 18 ft., and the other 20 ft. by 18 ft. Similar rooms are allotted to the able and infirm women, in the west end of the building. Separate hanging staircases, having iron balusters and hand-rails, lead to the men's and women's night-rooms. The main staircase is composed of wood, with cast-iron ornamented balusters, and mahogany hand-rail. This leads to the first floor, which is divided equally between men and women, similarly to the ground floor. On this floor is a staircase which leads up to the tower.

The infirmary, which is of considerable size, stands on the south side of the main building. It has a frontage of 77 ft. 10 in., and is 26 ft. in height. Attached to it are two wings, one at either end, which are each 49 ft. in length and 22 ft. 4 in. in height. All the walls and ceilings are plastered. The fever ward, which is also on the south side, is 85 ft. 4 in. in length, and 22 ft. 4 in. in depth. Attached to this building are a separate wash-house, laundry, and drying-room. The Board-room buildings comprise a porter's lodge, Board-room, receiving ward, vagrants' wards, clothes-rooms, drying closets, examining-rooms, with stone-breaking sheds, workshops, corner's and dissecting room, and hearse-house, all one story high. The whole of the buildings are supplied with heating apparatus. Water-pipes are laid all round the building, with fire-plugs inside and out. The ground is laid out for the service of the different classes in the workhouse.

The new workhouse will accommodate 250 inmates and 50 vagrants, whilst the one at present occupied has only accommodation for about 135 inmates. The sub-contractors respectively were:—For joiners' work, Messrs. Gargett & Sons; for slating, Messrs. J. & G. Wharton; for plumbers' work, Mr. T. Johnson; for heating apparatus, Messrs. G. Clough & Co., Stockton; for donkey engine and boiler, Messrs. J. W. Lewes & Co., Middlesbrough; for stoves, kitchen-ranges, laundry fittings, J. Lear & Sons; and for laying out the ground, Mr. J. Prior. It is expected that the original contract price

will be exceeded by about 400*l.* or 500*l.* for the additional works.

A new church is about to be built for St. Paul's district, and the first stone has been laid. The position chosen is a few yards further up Durham-road than where the present church stands, on the opposite side of the road. The total cost of the church, with tower and spire, is estimated at 4,100*l.* Of this about 3,350*l.* have already been raised, sufficient to meet the contract for the church, with tower and spire, but exclusive of paying for and laying out the enclosure of the land.

THE NEW OPERA-HOUSE, PARIS.

In a former article on the French Mind we endeavoured to draw attention to the spirit of centralisation which is ever influencing the thoughts and actions of Frenchmen. We shall now try to show how the plans of French buildings are the organic outgrowths of that centralising spirit.

The new opera-house of Paris will suitably illustrate our meaning. A French playhouse postulates five requirements:—1. The Stage; 2. The Theatre Proper, comprising the pit, the boxes, the galleries, and the orchestra; 3. The Foyer or public promenade; 4. The Manager's Offices; 5. The Approaches.

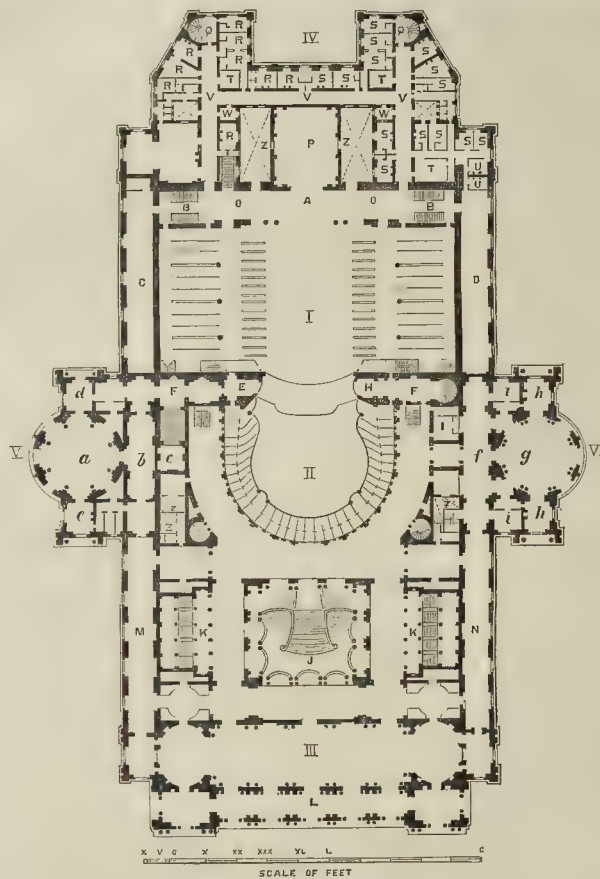
The puzzle, then, for the architect of a playhouse is to find a simple system of lines which will both satisfy the demands of the five main divisions of the house and the spectator's instinct of organic unity. If the architect be happy enough to hit upon such a system of simple and continuous lines, not only will he produce a practical and beautiful structure, but its erection will be easier to carry out, and will prove more solid than otherwise, because the walls, being in one line, can, so to say, be chained together.

M. Garnier's opera-house is an oblong rectangle, with projections or annexes in the middle of its long sides. Few geometrical figures are more regular and elegant. Roughly speaking, the house is not unlike a steamer balanced by her paddle-boxes. Two galleries run the whole length of the building on each side of it. These galleries, on account of their unbroken oneness, have a logical though unobtrusive beauty, which commends itself highly to the mind of a French architect. They form, indeed, a framework to the inner building, and thus bind up its five divisions in one majestic whole; ay, they shoot past the annexes so independently that they leave the spectator's understanding quite clear as to the subsidiary relation of these annexes to the main edifice.

In the opinion of French architects, such relations of parts must be distinctly legible in the general drift of the main lines of a building. Ay, more,—the French architect is not satisfied with impressing the cursory sight-seer with the purpose of every part, but he thinks he ought to plan every part, be it ever so subordinate to the main building and independent from it, so as to make that part neatly harmonise with the building by its leading lines and its position. In order to suggest the filiation of the annexes to the building, M. Garnier placed them symmetrically to the building's major axis, raising their principal walls in the prolongation of the principal walls of the house. By this simple system of lines the annexes seem to link arms with their parent erection, and thus the feeling of constructive unity is fully gratified.

But the question will be asked by Englishmen,—Is it always practical, is it always feasible to shape a part or a main division of a building to the requirements of geometrical unity? The Frenchman replies,—Certainly not; but the division of a building, which is most privileged to an eccentric individuality, *i.e.*, to an individuality, the outcome of necessity, is the principal division. Now, the principal division of a playhouse is the stage, because the stage, without which all the other portions of a theatre are meaningless, is, even when deprived of supplementary buildings, quite sufficient for histrionic purposes. Like the stage of a Punch and Judy show, the stage of a playhouse may be said to be the all-in-all of that playhouse. So the stage in M. Garnier's opera-house, occupies the whole breadth of the building, and is thus characterised by vast size rather than by special form.

Next in dignity to the stage is the Theatre Proper, with its pit, boxes, galleries, and orchestra. It fills the middle of the building, lies symmetrically to its major and minor axes, and



PLAN OF THE NEW OPERA-HOUSE, PARIS.—M. GARNIER, ARCHITECT.

is flanked by the annexes. Surrounding the theatre are corridors giving access to retiring-rooms, cloak-rooms, and other minor apartments. The theatre and its adjuncts have a oneness of their own, for they are unified by a rectangular framework, consisting of the stage wall, the two inner walls of the building, and the northern wall of the grand staircase.

The *escalier d'honneur*, as the grand staircase is called, is a building complete in itself, placed under a splendid rectangular dome, and surrounded by a broad and imposing rectangular gallery. This gallery is meant to impress the visitor with the official grandeur of the staircase, on the right and left of which branch out smaller stairs to the upper stories of the theatre. In order to give an overwhelming significance to the *escalier d'honneur*, the architect has not used all the intramural space available for the smaller stairs, but he has deliberately narrowed them by lining them with closets. The same device of optical contrast has been resorted to in order to bring out the importance of the foyer, with respect to its auxiliaries, the open loggia, and the vestibule. Both the loggia and the vestibule are cunningly shortened by the architect, so that they seem to the looker-on as the mere humble servants of the foyer.

The annexes require little explanation; they speak for themselves. The refreshment-room annex is planned for the purpose of free circulation: it is therefore roomy and simple. The Emperor's annex is, on the contrary, more elaborate, being constructed to meet all the exigencies of the court during their visits to the opera.

For the manager's offices and the accommodation of the actors and dancers, a large portion of the building has been set apart in the rear of the stage. The object in view was to secure a quick and easy circulation,—a difficulty masterly solved by the double T passage, along the west side of which are the actresses' retiring-rooms, and along the east side of which are the actors' rooms. A glance at the plan will convince the reader that the compartments of the manager's offices have been most logically adapted to their several purposes.

If the reader, after a general acquaintance with the main divisions of the new opera-house, considers its plan as a whole, he cannot fail being struck with the sequential simplicity, the calm, clear, and practical beauty of its composition. Like Phidias with the Parthenon, M. Garnier, in the plan of his opera-house, has produced the maximum of effect with the minimum of means. Great art not only bids us wonder, but bids us wonder at our wonder. When we consider the masterpieces of painting, sculpture, and architecture, we marvel at being moved by their apparently effortless simplicity. But it cannot be too loudly asserted that in architecture, as in other arts, the grace of simplicity is only vouchsafed to the systematically schooled student; and that taste, like the human heart, wants chastening, in order to prove honest and pure.*

LAWRENCE HARVEY.
École des Beaux Arts, Paris.

* A view of the entrance-front of the building will be found in our volume for 1867, p. 749.

REFERENCE TO PLAN.

I. The Stage.

- A. Vestibule for the general management of the house.
- B. Stairs for working staff.
- C. Dépôt for theatrical implements.
- D. Boxes of male chorists.

II. The Theatre Proper.

- E. Imperial box.
- F. Vestibule of approach.
- G. Courts for ventilation and lighting.
- H. Boxes of Imperial Family.
- I. Dressing-rooms.
- J. Grand staircase.
- K. Minor staircase.

III. Public Promenade.

- L. Open loggia.
- M. Smoking-gallery.
- N. Coffee-gallery.

IV. Manager's House.

- O. Promenade for the singers.
- P. Promenade for the dancers.
- Q. Stairs for manager's working staff.
- R. Boxes for leading female singers.
- S. Boxes for leading male singers.
- T. Dressing-rooms.
- U. Boxes for choreographers.
- V. Connecting gallery.
- W. Hairdressers' room.
- X. Retiring-room of the chorus leaders and trainers.
- Z. Area for ventilation.

V. Emperor's Pavilion.

- a. Grand Imperial saloon.
- b. Grand vestibule of approach.
- c. Imperial staircase.
- d. Empress's saloon.
- e. Emperor's private apartment.
- f. Ice-house vestibule.
- g. Ice restaurant.
- h. Retiring and waiting room.
- i. Restaurant's kitchen.
- k. Stairs for working staff.



SOUTH KENSINGTON MUSEUM : CENTRAL PORTION.—DESIGNED BY THE LATE CAPTAIN POWELL, R.E.

LECTURE THEATRE BUILDINGS AT
SOUTH KENSINGTON.

OUR illustration this week represents the façade of the new Lecture Theatre and Refreshment-rooms, which form the north side of the internal quadrangle of the Museum at South Kensington. The materials employed are mainly red brick with dressings, and enrichments of terra-cotta. The chief feature of the design is a deeply-recessed arcade on the principal floor, the arches being supported on columns of terra-cotta, modelled by the late Godfrey Sykes. The soffits of the arches are filled with white majolica, manufactured by Messrs. Minton & Co., of Stoke-upon-Trent. Figures holding shields of the same material are also introduced in the spandrels on either side of the circular panels in the arched recesses, and in the square panels above the door. The three circular panels just alluded to, are filled with glass mosaics, by Messrs. Salviati, Rust, & Simpson. The figures, which represent History, Poetry, and Alchemy, are executed in coloured tesserae, upon a gold background.

The door, which forms the central feature of the lower story, is in six panels, with figures of Newton, Davy, Bramante, Michelangelo, Watt, and Titian. It may be remembered that this bronze door attracted a great deal of notice in the Paris Exhibition. It has since been richly gilt. The brickwork of the ground-floor is banded with four courses of moulded bricks, the intermediate portions being rubbed and gauged. The arch-heads of the large openings to the right and left of the central building, are filled with lunettes in mosaic-work. These mosaics were executed in the South Kensington Museum by the female students, the materials being supplied by Messrs. Minton, Hollins, & Co. The rectangular panels in the upper portions of the wings, and the large picture which occupies the tympanum of the pediment, were carried out in the same way. The upper story of the theatre building consists of a series of triple arches placed in square-headed recesses, the spandrels above the arches being filled with a diaper of red terra-cotta. The subject of the design in the pediment is the Exhibition of 1851. Four allegorical figures, representing the four quarters of the globe, receive from Queen Victoria wreaths and rewards, while natives of the different countries bring their manufactures and produce to the Exhibition. In the background is the building. The figures are executed in buff tissue, the Exhibition being black, and the groundwork of the whole gold. On the pedestals at the corners of the building will be colossal groups in terra-cotta, designed by Mr. Bale, a student of the Lambeth School of Art. One of these figures, manufactured by Messrs. Doulton, is already on the ground. The summit of the roof is surrounded by a perforated screen of cast iron, supplied by Messrs. Hart & Son. The terra-cotta for the buildings was furnished by Blanchard, of Blackfriars-road, with the exception of the frames of the square panels, which were made by Millicamp, of Lambeth. Mr. Cawte, of Fencham, supplied the bricks; Messrs. Smith & Taylor were the builders; and, since the death of Captain Fowke, Lieut.-Col. Scott, R.E., has been the Director of Works.

ARCHITECTS' RIGHTS AND CHARGES.
THE DRAWINGS OF THE HOUSES OF PARLIAMENT.

SIR,—Mr. E. M. Barry's case is likely to go round the artistic world as one of extreme hardship to Mr. Barry himself, and of reproach to be hereafter attached to Mr. Ayrton's name. It is a constant and, in principle, a reasonable claim set forth by political rulers that they should be allowed to complete their measures before they are judged and turned out. Why not adhere to the same rule with regard to artistic works and men? We, in Canada, had a case of a similar nature to that of Mr. Barry in the matter of the Ottawa Government Departmental Buildings. But the works had then so far progressed as not to suffer much by a change of architects; and this satisfaction was offered the profession in Canada, that a sacrifice was necessary! However, the architects, who were employed under commission, were not asked for any more drawings and details than had already been executed at the actual stage of the works. Would the lordly British Government be less magnanimous than a Colonial?

Englishmen should certainly look to it as a blessing that the chain of tradition was not

broken until the present day in the building of the Houses of Parliament, the son succeeding the father in the carrying out of the works—a boon which was not always offered by Providence in many other national piles which, as artists have often an occasion to regret, lack unity of conception and execution, causing sometimes a puzzle to the archaeologist and a sore to the connoisseur.

If we approach the question of economy which might have actuated Mr. Ayrton, we have here, by induction, another example of people ruining themselves through avarice. Artists will not grow on poor feed; and where is the man of talent who, in this age, would consent to seal his fate by condemning himself to drawing on the board, and selling his productions as articles of commerce?

I herewith inclose a copy of the schedule of charges, &c., followed by architects practising in Montreal, and, I may say, through the whole Dominion. It will go as another piece of evidence that any one entering our profession is made aware of his liabilities, and is expected to meet a certain treatment as a reward for his studies and labour, neither more nor less.

We, on this side of the Atlantic, earnestly hope that the Barry embroglio will be so adjusted as to accord with the rules universally adopted by the profession in England, Germany, France, and America.

Professional Charges of Architects practising in
Montreal.

	Per Cent.
1. Public buildings and private residences, commission on the cost thereof of	5
2. Block of two houses of similar design, commission on the cost thereof of	4
3. Block of three, four, or five houses of similar design, commission on the cost thereof of	3
4. Block of six or more houses of similar design, commission on the cost thereof of	2½
5. Stores and warehouses, commission on the cost thereof of	4
6. Block of two stores or warehouses of similar design, commission on the cost thereof of	3
7. Block of three or more stores or warehouses of similar design, commission on the cost thereof of	2½
8. Items of charge comprised in 5 per cent. commission.—Preliminary sketches, working drawings and specifications sufficient for an estimate or contract	2½
9. Detailed drawings	1
General superintendence (exclusive of clerk of the works), examining and passing the accounts, exclusive of measuring and making out extras and omissions	11
10. N.B.—The foregoing subdivisions of charges to apply proportionately to stores, warehouses, &c.	
11. For works in alteration of premises, the remuneration to be increased according to the time, skill, and trouble involved.	
12. Taking out quantities from plans for a detailed estimate, commission on the amount thereof of	1½
13. Measuring and valuing artificers' work done for any amount under 1,000 dollars	2
Over 1,000 dollars and under 4,000 doles.	1½
Over 4,000 dollars	1½
14. For services by time at per day	10dols.
15. N.B.—All travelling expenses to be charged extra.	
16. No charge to be made for a rough estimate obtained by cubing out the contents. If a detailed estimate be requested by the proprietor, a charge therefor is to be made as above.	
17. An architect is bound, under the full percentage charge, to provide one set of drawings and one set of tracings, with duplicate specifications; it being understood that the architect is paid for the use only of the drawings and specifications, and that, in the event of carrying out the works to completion, are to remain his property.	

The above was agreed on in February, 1865, and from the last clause (16th) it will be seen that Mr. Ayrton's claims as to the ownership of the drawings of the English Houses of Parliament would, in Canada, be resisted by the architect.

A. LÉVÊQUE.
Montreal.THE COLUMNS IN ST. SWITHIN'S,
LINCOLN.

SIR,—I will not attempt to follow the quotation from the *Lincoln Gazette*, which appeared in your last issue, but simply give you a few facts. The pillars of the nave arcades are of Ancaster stone, 2 ft. diameter, of alternately circular and octagonal section, containing an area in the circular ones, the smallest, of 453.009 in. The weight of the cleareatory and roof on each pillar I estimate at 60 tons, or 2,649 cwt. per inch of area. Mr. Huddleston, a local builder of some considerable experience, and a member of the committee, states that there are about 30 tons of walling on each on the north side, and 38 tons on the south side. To this must be added the weight of the roof,—not 20 tons per pillar, certainly,—so that my estimate is in excess of his. Now, if published tests of the quality of stone are worth anything,

and it is upon these only that architects can depend in calculating for weights, &c., I give you the following:—In the experiments made by Messrs. Poole & Son, in October, 1861, on Bath stone, it was shown that a weight of about 80 tons might be considered safe per foot, some not showing damage until upwards of 120 tons per foot. The report of the Royal Commission states the cohesive power of Bath (Baz) stone at 5,313 cwt., and of Ancaster at 8,349 cwt.; and if Bath will carry 80 tons, Ancaster should carry 123 tons; or these pillars, of 3½ ft. area, should carry 405 tons; and a stone of which the cohesive,—not the crushing,—power is 8,349 cwt., ought not to crush with a weight of 2,619 cwt.

In some experiments made by Messrs. Poole, also, on Ancaster stone, the crushing weight for these columns would be 391 tons, 12 cwt. 16 lb.

In some made by Mr. Lindley, the owner of the Mansfield Quarries, the crushing weight of Ancaster stone is given as 18.33 cwt. per inch, or about seven times the weight on each of these pillars, viz., 415 tons.

JAS. FOWLER.

WATERING STREETS.

YOUR correspondent who inquires a better way of watering streets than by horse and cart, such as hose and jet, &c., will find the information he requires in some recent numbers of the *Gardeners' Chronicle*. It is there stated that the Local Board of Health of Reading has used the hose and wheel apparatus for many years, and is quite satisfied with its working. Those in use there are larger than those used in Paris, but are similar in other respects. A somewhat similar plan was followed in Oxford fourteen or fifteen years ago. It is very cheap; and the simplest form is gas-piping in 12-ft. lengths, put upon small cast-iron wheels, and pulled by india-rubber hose. Messrs. C. Hart & Sons, of 13, Gun-street, Reading, would give any further information.

DESTRUCTION OF A MASTERPIECE
OF ART.

MOST of our readers will remember the richly-mounted and jewelled human skull, taken from the summer palace of the Emperor of China, and exhibited, under the department of Goldsmith's Work and Jewellery, in the Chinese Court of the Great Exhibition of 1862. It was then in the possession of Mr. P. M. Tait, and the price put upon it was one thousand guineas. It stood upon a triangular stand of pure gold, resting on three roughly-shaped heads of solid gold. The cover was also of pure gold, richly ornamented with minute patterns in low relief, and studded with small precious stones.* Good judges have spoken of it as the most remarkable specimen of Oriental goldsmith's work ever seen. This extraordinary piece of work has now been melted down for the mere value of the metal, and thus one of the most precious relics of Chinese art and history is irretrievably lost. Nothing remains but the upper part of the naked skull (which has been supposed to be that of Confucius!), and which was left uncared for at the house of a Jewish gold-dealer in Houndsditch!

THE KENSINGTON ROAD.

SIR,—“Quondam,” in his communication to you of last week, says that the slip proposed to be taken from Hyde Park, is in length 500 yards, by a width of 25 yards. He is wrong in the last measure; it should be feet, not yards, and it is only 25 feet in one small part of the length. The average width is very much less: 75 ft. would cause the lodge just erected, in front of the Exhibition-road, and that at Queen's Gate, together with the iron gates and rails there to be removed. The erection at Queen's Gate cost the builder on the Harrington and Alexandra estates nearly 3,000l. The line proposed, however, passes in front of them. The trees might be preserved according to “Quondam's” idea, by putting the road-patn within them. It would almost do everything that was required, to give a good approach to the Hall of Science.

A mistake is made by parties who propose that the statue of the Prince Consort, in the monument, should be turned with its face to the park, in order that it might be towards the site of the Exhibition of 1851. It would be nothing of the kind. The first glass palace stood far away towards Hyde Park-corner; and the statue, if placed in the position proposed, would front towards what has always been vacant land, and have its back to the real valuable creation of the revered Prince Consort, the splendid Museum of Arts and Science, the Hall of Science, and the other buildings devoted to a national purpose, that will undoubtedly in a few years be erected there. C. J. R.

* Readers will find it figured in Mr. Waring's “Masterpieces of Industrial Art,” vol. iii., p. 291.

PIRATING A ROTHERHAM FIRM'S DESIGN.

A CASE of some importance has come before the borough justices at Wakefield. Mr. Samuel Nichol, iron founder, Virarage-street, Wakefield, was charged with infringing a new, original, and patent design for an oven-door, the property of Messrs. Hattersley Brothers & Co., iron-founders, Queen's Road, Rotherham, near Rotherham. An agent to the prosecutor gave evidence as to the purchase of stoves, with an oven-door, identical with the prosecutor's in form. In his opinion the door had been cast from the prosecutor's casting. The prosecutor's trademark, however, did not appear upon the defendant's door. The defendant's son was then called, and he said that since they got the summons they had destroyed all their models, which corresponded with those belonging to the prosecutors. Other evidence having been given, the Bench fined the defendant 5*l.*, and ordered him to pay the costs, which amounted to 2*l.* 10*s.* Mr. Wainwright said he had received instructions to prosecute all offenders.

"AN ARCHITECT'S BILL."

LINCOLNSHIRE AND NOTTINGHAMSHIRE UNION SCHOOLS.

SIR.—Neither Mr. Peck nor his solicitors have mended matters by publishing an explanation of this bill. The main facts, as described in your journal, remain uncontradicted; but as Messrs. Monckton & Co. have given the particulars, it enables even a countryman to criticise it. The first item is—Commission on 13,300*l.*, being estimate of expenditure, 666*l.* 10*s.* There are only two errors in these figures, viz., the estimate procured for carrying out the works amounted to 12,340*l.*, and upon this actual sum (not an assumed estimate of the architect), is the commission payable; and as the works were not ordered by Mr. Peck, neither superintended the works nor made out any builders' accounts, and therefore, by the rules of the Institute of British Architects, and the invariable practice of architects in London, and even in the country, he is only entitled to charge 3 per cent., instead of 5 per cent., or 370*l.*, instead of 666*l.* 10*s.*,—a difference of only 296*l.* 10*s.*

A BUMPKIN.
* * The correspondence must end here.—Ed.

CURIOUS COINCIDENCES FOR OBSERVATION.

SIR.—When I ventured to point out in the *Builder* the expediency of making simultaneous observations upon the physical changes in a systematic form, I anticipated the record of magnetic and electrical effects, or their dynamic manifestations, from different expert scientific observers, so far as related to mundane interests in the various parts of the world, up to this time. However, in a relatively local point of view,—that is to say, in this country, the climate, or weather, during the past three months has been remarkable; and farmers and others who are interested in the climate observe the indications of a very small quantity of rain which has fallen of late, and for which no provision could be made by man to supply artificially.

Now, as I venture to anticipate that the compensation for the deficiency of rain will be, perhaps, suddenly made up, we may expect a kind of tropical supply of water in an inconveniently short space of time, so as to overtax the usual outlets and overflow the drains and sewers. The storm outfalls ought to be looked after at once. The sudden change will be sure to be attended with magnificent electrical phenomena, and impress its effects upon various objects: lightning conductors will be found quite the right thing just now as a salutary provision, if properly conducted into water.

With the exception of the physical commotion which took place on the 15th of March last, at Natal, South Africa, very few records of electrical or magnetic storms have been published.

It takes time to accumulate effects before the results reach the senses, and then mostly in a form to which we are accustomed and to which identity by a popular name.

I still urge the critical examination of the magnetic indications, with the ultimate view to trace the influence of the magnetism of the sun upon the inclination of the axis of the earth to the plane of its orbit, and the consequent influence upon climate during ages, and the simultaneous development by selection of various organised beings, adapted to such period, and fully identified by geologists.

ARTHUR GEARING.

ELECTRICITY IN THE DRAWING-ROOM.

A FRENCH story is told in a London journal, to the effect that the Empress of the French (it would seem to be) had received an electric shock while going to a mantelpiece before which lay a bear-skin on the floor; and that when the Emperor did so, "a fine jet of bluish fire was seen to pass from the marble to his clothes." The story, we confess, looks rather apocryphal in the way it is put; but it reminds us that in some recent electric experiments, Sir C. Wheatstone has ascertained that the mere shuffling of the feet along a carpet will charge the human body with electricity sufficient to indicate itself by means of a delicate electrometer which he used; nay, that the electric charge resulting from a single stamp of a foot is thus recognisable. And this gives some countenance to the strange story from America, that not only do people thus charge themselves electrically, for private amusement, but that they can set fire to gas with the tips of the fingers when so charged. In America, at all events, it is

well known that electricity occasionally manifests itself far more strongly than with us; and this has been attributed to the moisture of our climate on the one hand, and the dryness of the American on the other. Perhaps the continental extent of the ground in America, has something also to do with the state of electricity there; and, it may be, with the gradual and peculiar change in the physical characteristics of the people, as originally immigrants mainly from this country.

GRANTHAM NEW TOWNHALL.

THE new building consists of a porch, spacious entrance-hall, 30 ft. by 19 ft. 6 in.; on the left hand of which is a subscription news-room, 37 ft. by 19 ft. 6 in., with a W.C. and lavatory adjoining; and on the right hand is the borough surveyor's office and muniment-room, behind which is the townhall kitchen. Immediately behind the entrance-hall and staircase is placed the sessions hall, which is 50 ft. by 30 ft. and 26 ft. high. This hall is fitted up with ornamental pierced panelled work, having a raised dais or platform at one end for the magistrates, the centre of which is occupied with a canopy-headed seat for the mayor. Behind this platform is the private entrance for the magistrates, and a private retiring-room, W.C., and lavatory, and also a petty jury retiring-room; the latter is approached from a separate entrance almost immediately from the jury-box. The arrangements for the grand jury, clerk of the peace, the pleaders, witnesses, prisoners, and the public in this hall, appear to have given great satisfaction. On the right hand of the main building, and abutting against it, is placed the borough police station, which consists of the superintendent's residence and four police cells, fitted up with every convenience, and warmed by means of hot water.

The residence of the superintendent, in whose care the buildings are entrusted, has direct communication with the townhall proper.

The prison is placed immediately behind the sessions-hall, and consists of twenty-four cells, eighteen of which are for males, and the remainder for females. The governor's residence is placed at one end of the prison.

The upper floor of the townhall is approached from the entrance-hall by a spacious staircase, 6 ft. 6 in. wide, the height of which is divided into three flights, having spacious landings between each. From the second landing, right and left, are placed the grand jury-room and witness-in-waiting-room. From the former a door leads directly into the grand jury-gallery of the sessions-hall. These rooms are also intended to be used as retiring-rooms to the large assembly-room when required.

The assembly-room occupies the entire front of the main building, is 60 ft. by 30 ft., and 21 ft. high, and is capable of dining with comfort about 200 persons. The ceiling of this room is divided into nine panels, three in length and three in width, the beams dividing them being left perfectly plain, thus giving apparent strength to the constructive features of the ceiling. Ornamental cornices are fixed round the inside of each panel, that portion of it on the ceiling being pierced through for ventilation. The decorations consist of carved plaster work in the Renaissance style of architecture.

The front buildings next St. Peter's-hill are built with Messrs. Platt's patent dry-pressed red bricks, from Oldham, in Lancashire, with Ancaster stone dressings, except the columns of the front entrance porch, which are of red Mansfield stone. The stone arches to the windows, and the archways of the porch, have moulded panels inlaid with Lizard serpentine polished marble. The entrance-hall floor is laid with Maw & Co.'s encaustic tiles.

The cost of the prison and governor's residence was nearly 3,000*l.*; and when we consider that there are in addition thereto separate houses for the chief warder, superintendent of police, and four cottages for policemen, making no less than seven separate houses, likewise police-station, offices for fire-brigade, and sessions hall, it will be seen that from a little over 8,000*l.* a very small sum could have remained for the town-hall proper.

Mr. W. Watkins, of Lincoln, was the architect; and Mr. Wartonby, of Grantham, the contractor.

The India Museum.—In future this museum will be opened on Saturdays until eight o'clock p.m.

CHURCH-BUILDING NEWS.

Tonge.—St. Michael's Church, Tonge, has been renovated in its internal fittings and arrangements, from the designs and under the superintendence of Mr. H. Cockburn, architect, Middleton, near Manchester. The old high-backed pews have been removed, and open benches substituted, with reclining seats and backs, and the walls of the nave have been wainscoted with portions of the old woodwork. The arrangement of the chancel and choir has been materially altered. A portion of the nave floor in front of the chancel has been raised two steps, and will accommodate the clergy and choristers. Above this, the floor of the chancel has been raised three steps. The walls and ceiling of the chancel have been painted and decorated with bands, powdering, diaper, and other designs in colours. These decorations have been executed gratuitously by Mr. John Deane. The wainscot on the east wall of the chancel is, like the other woodwork, of pitch-pine. Other alterations and improvements have been effected. The contractors were Messrs. Welling, Brothers, of Middleton. The ironwork was by Messrs. Thomason & Co., of Birmingham and Manchester.

Thorndon.—The Church of Thorndon, near Eye, is about to be restored. The work contemplated includes refacing the walls, the removal of the carved pulpit and reading-desk near the chancel, rebenching the nave, the removal of the gallery, and throwing open the west window, now for the most part blocked up by it. By lengthening the benches, narrowing the passage, and seating that part under the present gallery, the number of sittings will be increased, and the interior of the church improved. The walls are continued from end to end without a break, the chancel being only distinguished from the rest of the church by the steps which lead to it, and in the roof by a projecting rib springing from carved corbels. Mr. Phipson is the architect employed, and Mr. Grimwood, of Wynebraid, the contractor. The contract is for 377*l.*

Cheadle.—The chancel of the parish church of Caverswall, which is interesting as containing some curious inscriptions on mural monuments, and also Chantry's monument to the late Countess of St. Vincent, has been restored at the expense of the patron of the benefice, the Hon. E. S. Parker Jervis. The work has been carried out by Mr. S. Mear, of Longton, builder. Everything has been done without the aid of an architect.

Omalds.—Balwick Church, Northamptonshire, is undergoing a necessary restoration. The edifice has been placed in the hands of Messrs. Slater & Carpenter, of London, architects, and Messrs. Halliday & Cove, of Greattham, Rail-road, contractors. The provisions made for carrying out the restoration have been agreed upon Mr. T. Tyron, the lord of the manor, offering to heat the church and erect the family seats; the other portion of the expense to be borne by the incumbent, and a rate leviable on the parish.

Great Waltham.—The foundation-stone of a new church has been laid at North-end, near Great Waltham, by Mrs. Tafnell, of Langley's Park. The district assigned to it is the northern portion of the large and scattered parish of Great Waltham. An eligible site of four acres for the church and for a parsonage-house, which is also to be erected, has been given by Mr. J. J. Tafnell, who has likewise contributed towards the building of the fabric and the residence. The new church, which is to be dedicated to St. John the Evangelist, will be built in accordance with plans which have been prepared by Mr. Chancellor, of Chelmsford. It will consist of a nave of about 60 ft. long by 22 ft., a south aisle the same length and about 10 ft. wide, and a chancel with octagonal end 27 ft. 6 in. long by 19 ft. wide, providing accommodation in all for about 235 persons. At the east end of the aisle there will be a vestry, the ground floor of which will serve as a vestry, and the south doorway of the aisle will be protected by a porch. The walls of the building throughout will be faced with red bricks, inside and outside, relieved by bands of pressed bricks and stone. The windows in every part of the church will have moulded brick jambs and arches with plate tracery. The arcade separating the aisle from the nave will have stone columns with moulded brick arches. The roofs of the nave and aisle will be open timbered. The tower will be 50 ft. in height from nave floor to eave of spire, and the spire will be 20 ft. high. The porch will be of oak.

open timbered with arched sides. The church will be fitted internally with open benches, and the gangways will be paved with tiles. It is proposed to heat the church with hot water. The cost of the building will amount to something like 2,500l.

Southborough.—The foundation-stone of a new church has been laid on the New Building Ground, Southborough. The funds at present will only admit of a portion of the church being built. There will be a chancel and two transepts, and the church will be built in the early Gothic style, of local stone, with Bath stone dressings. It will be lined internally with red bricks, and will have an open-timbered roof covered with tiles. The church is to hold about 300 people, and is to be completed, at a cost of about 1,800l., by Messrs. Willicombe & Oakley, the architect being Mr. Theodore H. Green.

Preston (Lancashire).—Emmanuel Church, Preston, has been consecrated by the Bishop of Manchester. It is built of brick, with strings and bands of coloured and moulded bricks and stone dressings. The style of architecture is Geometrical Gothic. The plan is cruciform, and the ground floor accommodates 632 adults, 150 in the west gallery, and 92 in each transept gallery. There are four entrances to the church, viz., the tower doorway, the double doorways at the west end, and one to each transept which answers for the galleries. The entrances are so arranged by double doors that everything in the shape of draught is obviated. The west entrance is approached by a porch projecting about 7 ft., which is surmounted by an ornamental carved stone cornice, and a neat balcony with trefoil and quatrefoil perforations having large carved leaves at the angles. Over the archway in front of each door is a gable, with panels underneath, left for carving some appropriate subject. The organ-chamber and vestry are on the south side, on the north side of the chancel. The tower of the church is at the south-west corner: it is 12 ft. square inside. The nave is lighted by two and three light windows on the north and south sides, filled with plate tracery. The transepts are lighted on the west by two single lights, and at the ends with three single lights, having a large one over. The chancel has a five-light, and the west end of the nave a four-light. The roofs throughout are open timber of pitch pine, and are boarded diagonally. The extreme length from east to west is 125 ft.; breadth over transepts, 86 ft.; breadth of nave, 40 ft.; chancel, 20 ft.; transepts, 25 ft. 6 in.; length of nave, including vestibule, 86 ft. 6 in.; chancel, 27 ft.; organ-chamber, 13 ft. by 11 ft.; height of nave from floor to ridge, 45 ft.; height of tower to top of pinnacles, 100 ft. The architects of the edifice, its furniture, and fittings, were Messrs. Myers, Vevers, & Myers, of Preston. Mr. John Pownall was clerk of works; and Mr. John Bamber, builder. The gasfittings and lectern were provided by Mr. John Whitehead; heating apparatus by Mr. Seward; and the decorations by Messrs. Park & Co., of all this town.

Keele, Staffordshire.—The new Church of St. John the Baptist, built at the sole cost of Mr. Ralph Sneyd, of Keele Hall, the patron of the living and owner of the parish, has been opened for divine service. The church has been erected from the designs of Mr. T. Lewis, of Newcastle, architect, under whose superintendence the works have been carried out to completion. The rebuilding was commenced in the spring of 1868. The new edifice will seat 280 adults and 100 children, and consists of a chancel, 32 ft. by 18 ft., with a vestry on the north side thereof; chancel aisles, each 12 ft. 6 in. by 12 ft. 6 in.; nave, 60 ft. by 21 ft.; north and south aisles, each 47 ft. by 10 ft.; and a tower, 16 ft. square at the west end of the south aisle, with a spire, the total height of which is 128 ft. from the ground level to the top of the metal finial. The principal entrances are by porches at the west end and on the south side. The building is of the Decorated period of Gothic architecture. The external walls are 2 ft. 3 in. thick, built with rock-faced native stone (of a pale red colour), and Hollington stone dressings outside; and inside the walls are lined with Westons stone, part of which formed the outside walling of the old church, the piers, arches, and general dressings being of Hollington stone. The nave has an arched of four arches on each side, with octagonal piers supporting a clear-story, and with a moulded arch between the nave and chancel, with smaller arches to the chancel aisles. In the course of the excavations for the foundations, two recumbent figures in alabaster were found. These were recognised as having

formed the effigies from an altar tomb, which had been in the former church as a monument of the Sneyd family. These and the tomb have been restored, and placed in a recess prepared for them on the north side of the chancel. Against the east wall of the chancel is an arched recess formed of Hollington stone, with columns of griott marble and panels of Minton's mosaic tiles; the floor of the chancel and altar platform are laid with Minton's tiles. The font is of Hollington stone, the upper part having carved panels and appropriate inscription, and supported by an octagonal base with griott marble columns. The roofs are of high pitch, and covered with green Westmoreland slates, those of the nave and aisles being of red deal, stained, and the plaster between the rafters tinted blue. The chancel and chancel aisle roofs are panelled in oak, and the main ribs of the former are supported by carved oak figures supporting shields. All the seats, pulpit, desk, communion-table, and other fittings are in oak. All the windows are glazed with cathedral glass, having a narrow border of clear glass round each light; the glass in the east and west windows is only common glass at present, but is intended shortly to be replaced with stained glass. The church is warmed by Haden & Son, of Trowbridge. The six bells, which were formerly in the old tower, have been tuned, refitted, and rehung in the new tower, by Messrs. Mears & Stainbank, of London, and were rung at the opening services. One of these bells has the inscription, "God save the King, 1647," cast upon it.

DISSENTING CHURCH BUILDING NEWS.

Derby.—The new Congregational chapel, Derwent-street, has been opened. It is planned to seat 350 persons, and is of sufficient height to admit of the addition of side galleries, for the insertion of which and the extension of the end gallery provision is made. By these means the accommodation may be increased to 500. An organ-gallery occupies a recess behind the pulpit, and beneath is a vestry. The site provides ample room for commodious schools, which it is proposed to erect at a future time. The style of architecture adopted is Gothic of the fourteenth century. The front next Derwent-street has a four-light tracery window in the centre gable, and an arched doorway underneath, the arch being moulded and supported on stone shafts with carved capitals. Staircase ways flank the front gable on either side, that on the south side being grouped with an octagon spirelet, 60 ft. high. The work has been executed by Mr. Stoddard, of Derby, the contract price being 1,258l. Mr. Tait, of Leicester, is the architect. The Green-hill Wesleyan Chapel has been re-opened after undergoing extensive alterations. The ceiling has been raised and thrown into moulded panels; the windows, of which there are six on each side, are new; the square windows in the gallery are superseded by circular headed ones. New vestries have been added, the roof has been re-slated, and the old front has been replaced by an elevation in the Italian style. Mr. John Gadsby has carried out the work. The late Mr. Woolhouse was the contractor for the plumbing. The decorations were by Mr. Basford. The alterations and improvements have been made under the superintendence of Messrs. Giles & Brookhouse, architects. The cost of the improvements will be something like 1,000l.

Cambridge.—The memorial stone of a new Wesleyan chapel has been laid in Hills-road, Cambridge. The chapel and minister's house are to cost 4,000l., and the funds still needed to complete the work are 2,000l. The chapel is first being proceeded with. The design is Early Gothic. The chapel is set back some 20 yards from the road. In the basement there are arranged a schoolroom, 42 ft. by 33 ft., three class-rooms, of good sizes, kitchen and heating-apparatus room. On the ground-floor plan there will be inner and outer lobbies to the chapel. The sittings on the ground-floor will accommodate 200 adults and 100 children, and the organ-gallery 15 adults. The gallery will be approached from both sides of the principal entrance by means of a staircase. At the back of the chapel over the kitchen, will be a minister's vestry. On the left-hand of the principal entrance will rise an octagonal bell-turret, relieved at the top by an open octagonal canopy, the arries of which are somewhat obliterated with carving and gurgoyles. The front gable is pierced by a triplet

window, filled in with Geometrical tracery having four lights in the centre and two at the sides. The whole of the windows in the chapel will be glazed with cathedral glass in quarry lights. The principal entrance doorway is in the centre of the front. At the sides of the entrance doorway are double-light windows for the inner lobbies. There are main entrances at the front and side to the staircase wings of the gallery. The building will be constructed of white bricks and Bath stone dressings. The amount of the contract is 2,938l. The architects are Messrs. Hill & Swann, of Leeds and Sheffield; the builder and contractor, Mr. Thoday, of Cambridge; and the clerk of the works, Mr. W. Cooper.

SCHOOL-BUILDING NEWS.

Abingdon.—The new Grammar School here has been opened. The site is in the Albert Park. The new buildings have been erected by Mr. Charles Claridge, of Banbury, the contractor. On the ground floor, so called, which, however, in this case is elevated some 9 ft. above the ground, in order to give an airy basement-story underneath, there are a schoolroom (66 ft. by 20 ft.), having an open-timbered roof; boys' library, class-rooms, dining-hall, and assistant master's sitting-rooms. The first and second floors are devoted to dormitories for forty boys, bath-room, masters' bedrooms, matron's rooms, and other offices. Underneath the schoolroom is a covered playground for the use of the boys in wet weather, the side walls being arched, the floors laid with coloured tiles, and entered from the outside. The infirmaries or sick rooms are detached from the other portions of the building, being approached by a separate staircase, which can only be entered from one of the matron's rooms. The dining-hall is fitted up with dinner-lift oak tables and benches. The master's house, is of ample dimensions, some of the rooms being much beyond the usual size, the drawing-room having an oriel window on that side which overlooks the park. Externally the building is of a simple character, the local material of red brick and tile being the chief material employed, relieved by bands of Bath stone, the windows also being of that material. The grounds surrounding the building are being levelled and laid out as playground, recreation or pleasure grounds, and gardens for the head-master. Boundary-walls, gates, and fences are being erected in accordance with the design of the building by the trustees. The designs for the building were selected in competition, and were prepared by Mr. Edwin Dolby, of Abingdon, who has also superintended the works, assisted by his clerk of the works, Mr. R. F. Bryan. The total cost of the building, fittings, architect's commission, clerk of works' salary, and all other expenses, will be about 7,000l. The stone carving has all been executed by Mr. Samuel Grafton, of Oxford.

Devonport.—The new schools at St. Stephen's, Devonport, have been opened. The site has been given by Sir Edward St. Aubyn, the lord of the manor, and the architect was Mr. J. P. St. Aubyn, London. The builder was Mr. Elliott, of Plymouth. The schools will accommodate over five hundred children. The front does not come out level with the houses, but retreats several yards, and is enclosed with rails. The cost of the new schools is 1,400l.

Oldham.—St. Peter's Branch Schools, Ashton-road, have been opened as a place for the celebration of divine service on Sunday, and "as an easement to St. Peter's Church." The building is in the Gothic style, with open-timbered roof and two light windows with pointed heads. It has a spirelet, containing a bell, upon the apex of the gable. There is a porch to the principal entrance, and a small chancel, with vestry attached, having a cellar underneath, containing boiler for tea parties, &c. The building will seat about 280 persons. It is heated by hot air, and lighted by ornamental wall brackets. The total cost, including fittings and boundary wall, will be about 800l. Mr. John Wild, of Oldham, is the architect; and Mr. Wm. Lees, of Greenacres-hill, the contractor for the whole of the works.

Stanford.—Roman Catholic schools have been erected here. The new building is of stone, and in a style of architecture corresponding with that of the church, i.e., Early Geometrical Pointed. It is 46 ft. long by 20 ft. wide, and 25 ft. high inside. The room is entered by a porch to the front, and opposite to that of the church, being lighted by a characteristic pointed

window in its gable. The floor is laid with tiles. The windows are coupled, pointed-headed, with an inner arch stopping in against splayed jambs; the lower portion of the woodwork being fixed, and that above the stone transoms levels hinged to fall inwards. A traceried, cusped, pointed, and wheeled window fills the gables. The roof is composed of framed principals and curved pieces, carrying chamfered purlins, closer together than generally seen; and these in their turn carry the hoarding which is exposed. Messrs. Goldie & Child, of London, were the architects, under whose superintendence and from whose designs the work was carried out. Messrs. Halliday & Cave, of Greenwich, were the contractors, whose foreman, Mr. Walters, had charge of the work.

Thorpe-le-Soken.—The memorial stone of a new parochial school has been laid here. The site of the proposed school, about three-quarters of an acre, is in the centre of the village, near to the church, and is the gift of the vicar. Mr. James Rolph, of Thorpe Park, has offered to be at the whole expense of erecting the schools, the estimated cost of which is between 700*l.* and 800*l.* The architect is Mr. White, of London, and the work has been undertaken by Messrs. Gifford & Wellham, of Thorpe, builders.

VILLA AND HOTEL BUILDING.

Corshamilton.—The laying of a memorial stone in the walls of the first villa erected by Mr. E. H. Rabbitts, on his Strawberry Farm Estate, has recently taken place. Strawberry Farm lies to the north of the new line of railway, the railway embankment bounding the estate on one side, from the bridge over North-street to a second bridge over the road and the river close to the residence of Mr. G. Brodrick, which forms part of the property. The other sides of the estate present frontages to three roads, one of which skirts Hackbridge Park. The whole is well timbered. The gravelly soil, the close proximity to the railway station, the rural and proverbially healthy nature of the locality, and the attraction of the Wandle, combine to recommend the spot as a site desirable for country villa residences. It is arranged to have but one road through the estate, which, with drains, are being formed and made. First-class houses are to be erected, with from a half to an acre of ground each. The ground is to be let or sold, and houses will be built to the design of those agreeing to take them after completion. The architect is Mr. J. D. Hayton.

Southampton.—An addition to the hotel accommodation at this busy port has been inaugurated by the opening of a building in the Italian style of architecture, which forms a facade to the terminus of the South-Western Railway, and immediately faces the docks from which the mail steamers start. This hotel has more than 100 bedrooms, with reception-rooms, bath-rooms, &c. It is started upon the somewhat indefinite but very requisite principle of a "fixed and moderate" tariff. A feature is a steam laundry of capacity sufficient to start any number of the longest *voyageurs* on their inland journey with clean wardrobes in a few hours.

STAINED GLASS.

Christ Church, North Shields.—The great west window of the tower in this church has just been filled with stained glass, to the memory of the late Rev. Christopher Reed, M.A., thirty-eight years vicar of Tynemouth. The window is circular, 10 ft. in diameter, and is fixed in iron-work with copper fittings. The subject is "Our Lord's Commission to the Apostles," which is surrounded by a border, the figures of our Lord, St. Peter, St. John, and St. James being prominent in the foreground, and life size. The work is painted with due regard to the great height in which it is placed. The cost has been raised by public subscriptions, amounting to above 110*l.*, from the parishioners of Tynemouth; and the work was designed and executed by Mr. Baguley, of Newcastle. The same artist has received a commission to paint two other windows for the same church, which will then be entirely filled with stained glass.

Chichester Cathedral.—Another memorial window, of stained glass, has been completed, and placed in the north aisle of this cathedral, immediately adjoining the north transept entrance. It was executed by Messrs. Clayton & Bell. The window is in memory of George Croke Rowden, D.C.L., Precentor of the Cathedral.

The centre figure represents King David, the "sweet singer of Israel."

St. Saviour's, Lower Walmor, Sic.—The east window of this church has been fitted up with stained glass, in memory of the late Mrs. Barrow. The window is in three lights, and the subjects illustrated are, in the centre, the Crucifixion, and on the sides the Bearing of the Cross and the Descent from the Cross. The tracery is filled with emblems of the Evangelists, surmounted by our Lord in majesty. Mr. W. M. Popper, of London, fitted up the window. He is also at present engaged in restoring the stonework and painted glass of the east window of St. Mary's, Seymour-street, and preparing nine large windows for the cathedral at Sierra Leone.

All Saints', Clifton.—A stained-glass window has been placed in the chancel of this church. It is of large size, and was designed by Powell, and executed by John Hardman, of Birmingham. It is composed of five lancet-headed compartments, and three circles above. The window represents a crowd of saints—some in heaven, and others on the earth. The cost of the window was 500*l.* A new organ has been provided for this church by Mr. Hill, of London, at a cost of 1,100*l.*

St. Catherine's, Gloucester.—At the time of the building of this church, says a Gloucester paper, five windows were placed in the chancel. They were the gift of a sister of Mr. Monk, and represented our Lord and the Evangelists. Soon afterwards a connected design for the whole of the windows was prepared by Messrs. Clayton & Bell, who suggested that in the north transept the figures should be those of Elijah, David, and Moses; in the south, those of St. Peter, John Baptist, and Paul; in the windows on the northern side of the nave, Daniel, Ezekiel, Jeremiah, and Isaiah, prophets; in those of the south side, Stephen, Lawrence, George, Alban, Mary, and Catherine, saints of the early Christian Church; and in the window at the west end, the patriarchs Abraham, Isaac, Joseph, and Jacob. The windows in the south transept have just been erected by Messrs. Clayton & Bell; they are the gift of Mr. Charles Walker. The pierced tracery of the Catherine window has been filled with ornamental glass, the central light containing the sacred monogram. There are figures of St. Peter, John, and Paul. In the trefoil over each is represented an angel bearing the martyr's crown and palm, and under the figures are representations of our Lord's charge to Peter, "Feed my sheep," the martyrdom of St. John in prison, and Paul struck with blindness when on his way to Damascus.

Church of Headless Cross, Redditch.—Two stained glass windows, by Mr. Preedy, of London, have been inserted in this church, to the memory of the late Baroness Windsor. In the first window there is a representation of the Holy Child, His Mother, St. Joseph, and the wondering shepherds, who have come to the stable to see Him; and underneath is the text, "The Word was made flesh, and dwelt among us." On the second light is represented the Virgin Mother holding the Child. Above their heads is the Star of Bethlehem, and kneeling in adoration are the Magi, offering their "sacred gifts of mystic meaning," while below is the text, "The kings of Tarshish and of the Isles shall bring presents." In the first light of the second window is the presentation of Christ in the Temple. On the next light is the baptism of our Lord in the Jordan; above is the holy dove, and below the text, "This is my beloved Son, in whom I am well pleased." Each of these subjects is surmounted by a canopy ornamented with golden crockets and finials, and surrounded by coloured borders. These windows are at the west end of the church.

Doncaster Church.—The Standish window, which is to be placed in the north transept of the parish church, will be from the atelier of Messrs. A. & W. H. O'Connor, London. The whole design will illustrate St. Matthew xvii. In the upper portion of the six lights the spiritual life will appear, depicted by the subject of the Transfiguration, shown in a mass of soft, transparent light. The figures will be of heroic size, and the whole subject will be surrounded by a great aureola of angelic spirits in mystic attendance. Beneath this, and also in the six lights, the subject represented will be that of the father with his lunatic and paralytic son, the disciples being grouped around—thus throwing into striking contrast, with the glory depicted above, the helplessness of humanity, struggling with pain and infirmity. The colouring of this part of the window will be toned down to a

sombre light in order to contrast the more effectively with the radiance above. The motif is the same as Raphael's, but Messrs. O'Connor have designed original pictures, suited to the requirements of painted or stained glass. The cost of the window is to be 500*l.*

Wisbech Church.—A stained-glass memorial window to the late Mr. Wm. Stevens has just been placed in the north side of the chancel of this church. It is the workmanship of Messrs. Clayton & Bell, of London. The window is a two-light Gothic one, and the subject in one compartment is the "Agony in the Garden," and in the other "The Ascension." A quatrefoil above contains an angel holding a label inscribed "Watch and pray."

St. Paul and St. Peter's, Olney, Bucks.—A stained glass memorial window is to be placed in the east end of this church. The window measures 37 ft. high, by 15 ft. wide, and contains, in the three centre compartments, the Ascension of our Lord into Glory, surrounded by the figures of the Apostles, designed life size; underneath the same, the subject of the Last Supper, forming a pedestal for the group above. In the two side openings are the subjects of the Annunciation of the Virgin Mary, the Nativity, Crucifixion, and Resurrection of Our Lord, surmounted by rich canopies in proper keeping with the figures. In the tracery are the emblems of St. Paul and St. Peter, the patron saints, also of the Four Evangelists, the Dove as an emblem of the Holy Ghost, Angels with various kinds of music, incense, &c., and others bearing scrolls. This window is now fixed. Messrs. Holland & Son, of Warwick, are the artists.

Books Received.

The Metropolitan Board of Works: Report on the Economy of Road-maintenance and Horse-draught through Steam Road-rolling, with special reference to the Metrop. Dis. By FREDERICK A. PAGET, C.E., &c. Printers, Judd & Glass, Doctors' Commons. 1870.

THIS Report is greatly in favour of the use of steam rollers of a certain weight. Their reputation of too great weight, Mr. Paget explains, was gained by 30-ton and 36-ton rollers. With the use of steam, he is of opinion, all objections to road-rolling fall away. There is no interruption to the traffic; the roller is easily manœuvred, and ascends inclines; the road rapidly consolidates; no horses throw about loose metalting. The greater weight of the steam roller is its chief advantage over the horse roller. Too heavy rollers do injure the subways, &c.; but it is impossible to have a roller as heavy as the heaviest traffic. The frightening of horses can be prevented by working at night, or by blocking up the thoroughfare for a short distance while repairing the road; but an ingenious and simple way of preventing horses from being frightened by the steam-roller is to harness an old horse in front. The work of the steam-roller is much better than that of the horse-roller, in quality as well as quantity; and in economy the steam-roller is preferable. The saving in metalting can be estimated as at least 50 per cent. per annum, as is the general cost of maintenance by steam rolling by comparison with horse-rolling.

In short, the steam-roller, in the reporter's opinion, saves expenses and time, and does better work than the horse-roller. The work diminishes the horse draught, and saves wear and tear in horse flesh, vehicles, and harness, as well as in the time and energy of men and animals.

The Report enters fully into the subject, and is very valuable.

VARIORUM.

"The Annual of Scientific Discovery; or, Year-Book of Facts in Science and Art for 1870. Edited by John Townbridge, S.B., aided by S. Kneeland, M.D., and W. B. Nichols. Boston: Gould & Lincoln. London: Trübner & Co." This useful American Year-book of Science and Art sustains the favourable opinion of it which we have repeatedly expressed. The present volume gives a vivid portrait of Professor Peirce, and the usual notes of the editor on the progress of Science for the year 1869.—"Russian Metallurgical Works, Iron, Copper, and Gold. By Herbert Barry, late Director of the Estates and Ironworks of Vukica. London: Effingham Wilson. 1870." In this small volume, a plain and brief account is given of

Russian metallurgical works, at the conclusion of which the author says,—

"I think the facts I have given will show that the territory which Russia possesses, susceptible of mineralogical enterprise, is enormous; that that country is as yet undeveloped in an infinitesimal proportion only of its real power; and that it is only awaiting energy and enterprise to make its production astound the world."

—**Handbook of English Coins.** By Llewellyn Jewitt. London: Tegg. A concise description is given in this little volume of the various denominations of English coin from the Norman Conquest to the present reign. It is illustrated by metal-coloured plates of a good many of the coins described.—Hogg's "Secret Code for Letters or Telegrams." Hogg & Co., Fleet-street. To prevent the easy decipherment of secret correspondence, based on the interchange of alphabetical letters, this card has been published, with instructions for the introduction of key-words, which will sadly puzzle the would-be decipherers, and render all their attempts, on the old principles, useless, unless they can guess the key word, which may be any single word whatever, so as it be known to the correspondents beforehand.

Miscellaneous.

The Public Baths and Washhouses, King-street, Camden Town.—The annual report of the commissioners for these baths to the Vestry of St. Pancras has been printed. It states that the progress made the first year the institution was opened has been fully maintained during the past year. The total receipts for the year amounted to 2,552l. 11s. 9d., against 2,331l. 1s. 6d. for the forty-four weeks the baths were opened, 1868-9. From the opening of the establishment on the 19th May, 1868, to the 20th March, 1869, 145,735 bathers availed themselves of its advantages; and for the year ending the 19th March, 1870, 149,474 persons have enjoyed the luxury of a bath. The classification is as follows:—First class, 48,364; second class, 101,110. The number of washers in the wash-houses has gradually increased, and this portion of the establishment has been very beneficial to many poor families. In 1869 payment was made on 9,425 separate occasions, and the receipts were 218l. 14s. 5d.; but for the year ending the 19th of March, 1870, payment was made on 19,620 separate occasions, the receipts being 450l. 14s. 6d. The balance-sheet shows that 2,552l. 11s. 9d. have been received, and 2,110l. 11s. expended in working expenses and repairs.

The Building Trade in Paris.—The following petition has been laid before the Corps Législatif:—

"Gentlemen,—We, the undersigned, have the honour of calling your attention to the consequences of the suspension of public works in Paris. Numerous constructions, contracted for and commenced some years since, are exposed to a probable decay, which will lead to heavy expenses for repairs. The various bodies of craftsmen connected with the building, who in the capital and its suburbs employ more than 20,000 men, are very sorely tried. Certain heads of establishments who used to employ on an average a thousand men, can now scarcely find work for a hundred, and the nine-tenths who remain idle of course suffer and complain bitterly. Our stock and trade materials are deteriorating, and the standstill brought on by the public administration has necessarily led to a scarcity of private enterprise. As a crowning misfortune, we cannot obtain payment of the large sums due to us from the city. This state of things places us all, both masters and men, in a state of embarrassment which cannot be continued without serious danger. We therefore pray you, gentlemen, to take some immediate steps for saving us from the calamities which threaten us, since all hereafter depends on you."

New Store for Castleford Co-operative Society.—The corner-stone of a new store in connexion with this society has been laid at Castleford. The society was formed by about a dozen persons in 1865, when operations were commenced in a small shop. In addition to extensive shops to be used as drapery and grocery stores, there will be a secretary's office, a library, and a reading-room, and other apartments, the chief of which will be an assembly-room capable of containing 450 persons. The building has been designed by Messrs. Maxwell & Tuke, of Bury. The cost of the new store will be about 1,586l. The land involved an outlay of 365l. 15s. The contractors for the erection of the building are Messrs. Kassell, Brothers, masons, and excavators, Castleford; Messrs. Shuttleworth, Brothers, joiners, Keighley; Mr. J. Binn, plasterer, Castleford; Mr. T. Laister, painter, Castleford; Mr. Doyle, plumber, Leeds; and Mr. Pycock, slater, Leeds.

Society for the Encouragement of the Fine Arts.—On the 2nd Dr. Westland Marston delivered a lecture to the members of this society on the "Tragic Element in the Drama and Fiction;" Dr. Doran in the chair. The lecturer, promising that his address would be confined to a few hints connected with the present condition of tragic art, declared that at no previous period in the history of literature was there so much distaste for tragedy. Pleasure and deep spiritual emotion at the present day were incompatible terms, the popular taste being in favour of perilous adventures and miraculous escapes. One cause of this was the passion for realism which seized upon the photographic appearances of life, and neglected the essential parts; another the monotony of modern society that made it bad taste to feel, and reduced everything to a dead level of indifference. It was the fashion now to be ashamed of showing spirit. In some degree all art takes notice of externals, but it should not be bounded by them. At its close a short discussion ensued, in which Dr. Doran attributed much of the falling off in the tragic art to the want of appreciation on the part of actors. Dr. Doran drew a comparison between the methods employed by celebrated English and foreign actors, in order to raise their feelings to the proper pitch of tragic excitement, insisting that our actors had managed this more naturally than the French.

The British Association Committee on Sewage.—There seems to be a hitch in the working of this committee. It consisted of six members, nominated by the association; but at the suggestion of Mr. W. Hope, three professors, Williamson, Marshall, and Corfield, were nominated, as a sort of colleagues, or extra committee men; and these three, with Mr. Hope, have outvoted the other gentlemen present and voting, on a question of payment of personal expenses. The only voters in the minority, Professor Wanklyn and Dr. Paul, have accordingly written to the corporations, &c., subscribing the fund, and they state that the replies are to the effect that the very fact of a subscription to the committee implies that the personal expenses of the committee, as well as other expenses, are to be met by means of it. Mr. Hope and his nominees are not likely, therefore, after all, to be able to shoulder out the original committee and have it all their own way as to the disposal of the fund and the resultant disposal of the question of sewage treatment and utilisation. The minority question the right of the three professors to vote at all on the committee nominated by the association.

Summer Garden Society.—The inauguration of the pleasure-grounds of this society, situated within about a quarter of a mile of the Willesden Junction Station on the North London Railway, was celebrated on Sunday. These gardens have been established by a body of working men under the title of the Summer Garden Society, and will be conducted on a principle popular on the Continent, under the management of Mr. Henry Bolleter. The admission is by season ticket only, at the price of 1s., and admitting until September next, the children of members under twelve years of age being admitted free with their parents, it being the object of the society that the gardens should become a summer resort for families. On weekdays, among the other amusements provided are cricket, bowls, quoits, athletic sports, and dancing, on a large platform, with special amusements for children. On Sundays the gardens will be opened in the afternoon for promenade, with instrumental band, which will play from four until eight in the evening. No persons but those holding season tickets will be admitted into the grounds.

Clifton, Beds.—In an outlying portion of this parish, called Clifton Fields, an infant-school has been erected, at the sole expense of the rector; and the village church has been provided with additional bells, for chiming. The original peal consisted of five bells, the tenor, or largest bell, weighing about 11½ cwt.; to these ten have been added by the rector, chiefly with a view to the contemplated chimes. Messrs. Mears & Stainbank supplied the new bells. The chiming machine was manufactured and designed by Messrs. Gillett & Bland, at their steam clock factory, Croydon, Surrey. It is fixed in the same chamber (below the bells) as the clock with which it is connected by means of a lever, which sets the machinery in motion every three hours.

A New Motive Power in Aid of Steam. How to generate steam quickly, and at the same time inexpensively, has remained one of the problems left to engineers to solve. Mr. Galway has invented an apparatus which, whilst it does not claim to supersede all steam boilers at present in use, yet claims that it can be affixed to them readily, and, once applied, save 50 per cent. in the cost of fuel, and pay for itself within one year. These are bold assertions, and well worthy of the consideration of those who use steam power. The invention, as we understand it, consists in the application of atmospheric air, which is first of all pumped down a pipe passing through the flue, the air being heated on its passage; the pipe is continued under the furnace, and passing through returns on the back under the fire bars; and the temperature of the air having thus become raised by the waste heat is driven into the boiler, and helps to generate steam in the chamber, the action of the piston rod assisting the process.

Royal Horticultural Society.—On Wednesday last the great show of the season at the gardens of the Royal Horticultural Society took place. The display of plants, flowers, and fruit was excellent, and may be regarded as in every respect successful. The attendance of visitors was very numerous. An important feature of the show was the exhibition of rhododendrons by Mr. Waterer, of Knaphill Nursery, under the marquees. Several thousands of trees were set in groups upon undulating land, and the masses of bloom of various tints, well arranged and divided by walks to the spectator on an elevated spot, were very effective. In the general exhibition the orchids were a remarkable collection, and the fine foliage plants were numerous and of great merit. The azaleas were not quite so good as usual.

Oxford Architectural Society.—The members and their friends, to the number of twenty, have visited Ryecote and Thame. The remains of the mansion at Ryecote were first examined. They are but a small portion of the original mansion, which was almost a palace. Indeed, it was the residence for a time of two crowned heads. An account of the leading features of the church was read by Mr. Bruton. The members then continued their journey to Thame, when the chief points of interest in the church were described and pointed out by Mr. Payne, of Charley's Hall. The Prebendal house was next visited; as also the grammar-school of Thame. The next excursion included Smerton, North Aston, Sleepy Aston, Lower Heyford, Heyford Warren, and, if time permitted, Rousham. Warwick was next to be visited.

Broughton Footbridge, Manchester.—The ceremony of opening the new suspension footbridge which has been erected at the foot of Hough-lane, between Broughton and Peel Park, took place on Saturday afternoon. The centre opening is 135 ft. in length, but the entire length of the structure is 240 ft. The footway is 6 ft. wide, and the ironwork, of which there are some 20 tons, rests upon two stone piers, while the chains are attached to anchors of considerable weight on each bank of the river. The total cost of the bridge, which has been defrayed wholly out of the Broughton rates, is about 1,000l. The engineers are Messrs. Cawley & Newton, and the contractors for the ironwork, Messrs. W. Mabon & Co., Ardwick; and for the masonwork, Mr. E. Johnson, builder.

Hammersmith Bridge.—The annual general meeting of this company was held at the Freemasons' Tavern. The report stated that the tolls collected from the 25th of April, 1869, to 30th of April, 1870, amounted to 6,143l., making the total receipts from all quarters, including a previous balance, 6,793l., while the total expenditure had been 2,152l. A dividend of 2l. 2s. per share was recommended, which would absorb 3,313l. 16s.; and after increasing the reserve to 2,000l., there remained a balance of 84l. in hand.

Royal Gallery of Illustration.—*Ages Ago* and *Dejar my Neighbour* are advertised for the last performance on June 18th. On the following Monday a novelty, from the pen of Mr. W. S. Gilbert, entitled *Our Island Home*, will be produced. For this Mr. German Reed has composed the music.

Cause and Effect.—A telegram from Madras says,—"Cholera is assuming an epidemic form. The effluvia from the river is frightful."

Northern Architectural Students' Society.—On the 31st ult., the winter season of this society was brought to a close. The members met in the ante-room of the Literary and Philosophical Society, and the report of the committee and the treasurer's statement were submitted and approved. The president (Mr. W. L. Newcombe) then delivered an address appropriate to the occasion, after which the election of officers for the ensuing year, took place with the following result:—President, Mr. W. L. Newcombe; vice-president, Mr. J. Morton; honorary secretary and treasurer, Mr. J. Oswald; committee, Messrs. Bedlington, Oliver, Spence, and Thorhill. During the summer the society will hold meetings occasionally at some of the most interesting buildings in the district.

Discoveries.—At Wigmore Castle, Herefordshire, the other day, some workmen, digging, found a dungeon communicating with another, of equal size, each about 15 ft. square, and covered with arched stone roofs. They were approached by means of stone staircases, which have been buried in the rubbish of the ruins for many years. In the stonework of the side-walls were embedded large, strong iron staples, supposed to have been used for securing prisoners during the civil wars.—A Gallo-Roman cemetery has just been discovered at Givères (Loir-et-Cher). A considerable number of urns and funeral vases of very curious workmanship have been found.

Christ Church Cathedral, Oxford.—The restoration of Christ Church Cathedral has been decided on, and will be commenced in the ensuing vacation. Much labour and cost will be involved in the restoration of the nave, principally the windows. These windows were first of all Norman, and that next, for the most part, was altered to the Perpendicular, and finally, all the traceries were taken out to make room for the stained glass now to be observed therein. Such of the windows as were thus altered will be restored to the Perpendicular. The two in the south side will not be included in the list. These will remain Norman, in conformity with the chancel window, as it is to be.

Islington Workhouse.—A curious scene occurred at the meeting of the Islington guardians on the 3rd, the builder, Mr. Nutt, imploring the architect, Mr. Burden, to go round the building with him and point out what was not to his satisfaction; and the architect resolutely refusing to do anything of the sort until Mr. Nutt had written him a letter saying that the works had been carried out in accordance with the specification. The Guardians begged and prayed, but all in vain. Ultimately, however, the architect agreed to go over the works with a sub-committee of the Board, the builder and clerk of the works being present.

The New Market, Madeley.—Arrangements having been made with the lord of the manor for holding a market here, and for the erection of a suitable building, a contract has been entered into with Messrs. Nevitt Brothers, of Ironbridge, for its erection, and the work is now being proceeded with. The building will be 50 ft. by 70 ft. in the interior, and will consist of red and white brick, with iron roof. The front will have a parapet, also two entrances, and the interior will be well supplied with stalls, classified to suit dealers in various kinds of goods.

Enormous Conflagration at Constantinople.—A fearful fire has occurred in Pera. In consequence of a strong wind the flames spread with alarming rapidity, and the English Embassy, the American and Portuguese Consulates, the Naum Theatre, the Palace of the Armenian Patriarch, many churches, mosques, and several thousand houses and shops in the finest part of Pera, were completely destroyed. Several persons were killed and others wounded. The loss is immense. Thousands of families are rendered homeless.

Theatrical Scaffolding.—A sad accident has occurred in the Alhambra Music-hall, Leicester-square, through carelessness in the fixture of a scaffolding on which fourteen or fifteen young girls were placed. No less than eleven of them were injured, some of them very seriously, the arm of one being broken, the ankle of another dislocated, a rib of a third broken, and others bruised. Nothing, probably, but fear of the manager's personal inspection of such scaffolding can prevent such carelessness and such "accidents." Official inspection is, we suppose, out of the question.

Value of Land in Walsworth.—At a sale of fifty-one building plots, fronting or abutting upon a new street, lately let by auction, large prices were obtained. The lots cover about an acre and a quarter of land, and the ground-rents reached a total of 494l. 10s. per annum. This is at the rate of 395l. 12s. per acre, which, capitalised at twenty-five years' purchase, gives 9,890l. per acre as the value of the fee simple.

The Thames Embankment.—The Board of Works has decided that the name Victoria Embankment shall be applied to the Northern and Embankment, and Albert Embankment to that on the south side of the river.

TENDERS.

For enlargement of house for Mr. J. H. Clarke, at Castle-hill, Maidenhead. Mr. J. H. Rusforth, architect:—

Rogers	22,580 0 0
Dunn	3,495 0 0
Shapton	1,863 0 0
Silver & Son (accepted)	2,450 0 0

For house and shop, High street, Kensington, for Mr. Joseph Toms. Mr. John Cox, architect. Quantities supplied by Mr. Sidney Young:—

Roberts	21,940 0 0
Roberts	4,760 0 0
Cunder	4,517 0 0
Manley & Rogers	4,398 0 0
Servicor & Waite	1,845 0 0
Cooke & Green	4,367 0 0
Longmire & Burge	4,285 0 0
Goodman	4,195 0 0

For a detached villa at Croydon, for Mr. Heslop. Messrs. Hine & Sons, architects:—

	1st.	2nd.
Pollard	21,810	21,902
Shuttle	1,525	1,589
Roberts	1,470	1,485
Gaskett	1,368	1,488
Nightingale	1,350	1,440
Jarrett	1,339	1,399
Sharrington & Cole	1,313	1,384
Halsidge	1,310	1,380
W. daard	1,280	1,355
Peckett & Taylor	1,274	1,354
Bowler & Co.	1,248	1,377
J. & A. Wright	1,247	1,317
Laurie	1,240	1,316
Wood & Co.	1,229	1,299
Willingby & Mead	1,182	1,213
Thomas	1,143	1,208
Hutchinson (accepted)	1,103	1,169
M. S. & Brisbey	1,073	1,119

For St. Paul's Village House, Peterborough. Mr. E. Browning, architect:—

	House.	Stable, &c.
Perkins & Sons	21,407 0 0	4,110 0 0
Richardson & Roberts	1,513 0 0	104 0 0
Halliday & Cave	1,280 0 0	103 0 0
Hobson & Taylor	1,287 0 0	100 0 0
Thompson (accepted)	1,287 10 0	108 0 0

For new schools for district of St. Mary, Kilburn. Mr. William Smith, architect:—

	House.	Stables.
Brown	21,404 0 0	4,110 0 0
Fryley	1,386 0 0	185 0 0
Verbury	1,367 0 0	185 0 0
Estman & Fotheringham	1,283 0 0	185 0 0
Keyes & Head	1,282 0 0	185 0 0
Sawyer	1,244 0 0	185 0 0
Newman & Mann	1,210 0 0	185 0 0
Manley & Rogers (accepted)	1,187 0 0	185 0 0

For repairing twenty-four houses at 11 per Svedham, for British Empire Life Assurance Company. Mr. McDougall, architect:—

	House.	Stables.
Williams & Son	2,777 0 0	4,110 0 0
Pierpoint	739 0 0	185 0 0
Sayer	728 0 0	185 0 0
Davies	578 0 0	185 0 0
Stoner	575 0 0	185 0 0
Roy	535 0 0	185 0 0

For repairs to four houses, Acacia-road, Sydenham, for the above Company:—

	House.	Stables.
Sayer	2,491 0 0	4,110 0 0
Pierpoint	380 0 0	185 0 0
Williams & Son	325 0 0	185 0 0
Roy	275 0 0	185 0 0
Stoner	243 0 0	185 0 0

For repairing thirty houses, Chapelin-street, Forest-hill, for the same Company:—

	House.	Stables.
Roy	2,983 0 0	4,110 0 0
Pierpoint	788 0 0	185 0 0
Stoner	788 0 0	185 0 0
Davies	775 0 0	185 0 0
Sayer	673 0 0	185 0 0

For enlargement of Countess of Huntingdon's College, Chestnut, First portion. Messrs. Lander & Bedells, architects. Quantities supplied:—

	House.	Stables.
Pyman & Co.	25,070 0 0	4,110 0 0
Williams & Sons	35,500 0 0	4,110 0 0
Manley & Rogers	1,500 0 0	185 0 0
Servell & Son	1,474 0 0	185 0 0
Mann	1,431 0 0	185 0 0
Brass	1,428 0 0	185 0 0
Browne & Robinson	1,423 0 0	185 0 0
Graver	1,423 0 0	185 0 0
Henshaw	1,423 0 0	185 0 0
Bayn	1,423 0 0	185 0 0
Dove, Brothers (accepted)	4,475 0 0	4,110 0 0

For two proposed houses in Wyane-road, Briston. Mr. E. G. Colman, architect:—

Kent	23,360 0 0
Dunn	1,883 0 0
Maxwell	1,950 0 0
Brashier, jun. (accepted)	1,815 0 0

For two houses at Hendon, for Mr. P. Rouse. Mr. S. J. Nicholl, architect:—

Anscomb	24,475 0 0
Dunn	4,395 0 0
Longmire & Burge	4,395 0 0
Kilby	4,187 0 0
Manley & Rogers	4,152 0 0

For rebuilding No. 3, King-street, Chesapeake. Mr. H. Christian, architect:—

Cook	21,388 0 0
Fish	1,951 0 0
Abby & Horner	1,670 0 0
Abby & Son	1,633 0 0
Jackson & Shaw	1,605 0 0
Brass	1,597 0 0
Sharrington & Cole	1,497 0 0

For the erection of seed stores, Reading, for Messrs. Sutton & Sons. Messrs. Win. & J. T. Brown, architects. Quantities supplied:—

	House.	Stables.
Dunn	2,710 0 0	4,110 0 0
Wheeler, Brothers	700 0 0	185 0 0
Sheppard	690 0 0	185 0 0
Strong	693 0 0	185 0 0
Barnett	677 10 0	185 0 0
Woodroffe (accepted)	677 10 0	185 0 0

For making certain alterations and additions to Huntercombe House, near Maidenhead, Berks. Mr. C. E. Davis, architect. Quantities supplied by Mr. G. W. Rawwell:—

Silver & Son	21,541 0 0
Webb	1,475 0 0
Reall	1,470 0 0
Almond & Webb	1,372 0 0
Woodroffe	1,370 0 0
N. Hingwood	1,343 0 0
Taylor	1,248 7 0
Gibson, Brothers (accepted)	1,241 0 0

For new brewery and stables, for Messrs. W. & R. Richards, Shepherd-bush. Messrs. Davison & Scamell, architects. Quantities by Messrs. Curtis & Son:—

Myers	23,850 0 0
Hockley	3,686 0 0
Brass	3,689 0 0
Hall & Co.	3,549 0 0
Abby & Co.	3,510 0 0
Servicor & White	3,417 0 0
Hart (accepted)	3,250 0 0

For alterations and repairs at the Home Farm, Halesstead, Kent, for Mr. J. F. Atkins. Mr. John Jenkins, architect:—

Yates	2,850 0 0
Banks	534 0 0
Grover (accepted)	481 0 0

For alterations and repairs to eight cottages, called Yew Tree-row, Halesstead, Kent, for Mr. J. P. Atkins. Mr. John Jenkins, architect:—

Blundell	2,196 10 0
Grover (accepted)	131 0 0

For a pair of semi-detached villas, for Dr. Hirschfield. Mr. W. K. Knapp, architect:—

Capps & Ritao (accepted)	23,470 0 0
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For house at Sevenoaks, for Mr. A. Wilson. Mr. J. M. Hooker, architect. Quantities supplied:—

	House.	Stables.
Myers & Sons	23,176	4,254
Hart	2,900	185
Dore	2,595	185
Dove, Brothers	2,585	185
Wallis & Clements	2,551	200
Sharrington & Cole	2,533	200
Henshaw	2,543	185
Jackson & Shaw	2,542	185
Longmire & Burge	2,511	185
Anscomb	1,913	185
Turner & Sons	2,387	215

For house at Sevenoaks, for Mr. Lyall. Mr. J. M. Hooker, architect. Quantities supplied:—

Anscomb (accepted)	24,075 0 0
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For new lecture-hall, Hare-court Chapel, Mr. Thomas Chubb, architect:—

Abby & Son	21,305 0 0
Dove Brothers	1,295 0 0
Cunder	1,202 0 0
Williams & Son	1,260 0 0
Higgs	1,234 0 0
Browne & Robinson	1,191 0 0
Servicor & White	1,153 0 0

TO CORRESPONDENTS.

W. H. K. Head—A. D. D.—S. & S.—M. & L.—R. R. Y.—P. & C. N.—H. W.—J. P.—A. H.—J. G.—D. C.—A. G.—W. S.—R. P.—A. R. H.—L. J.—Y. B.—G. W.—W. R.—D. L. & C.—W. E.—A. G. N.—G. R.—W. J.—C. H.—J. M.—R.—R.—H. H. R.—W. P. (omitted on more than one occasion). H. H. C. (sent yesterday). R. W. (sent 10 days ago). H. H. C. (sent 10 days ago). We are compelled to decline printing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

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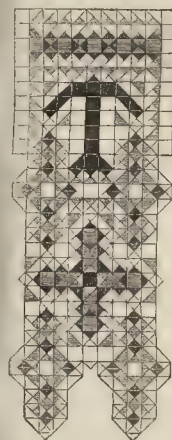
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The Builder.

VOL. XXVIII.—No. 1428.

Architecture and Legislation.

THE juxtaposition on our table of several forms of Building Act, proposed or in force, suggests some observation as to the manner and degree in which legislation of this nature affects architecture as an art, and whether prejudicially or otherwise. In the main, of course, such Acts have a practical object only, that of insuring sanitary and constructive safety and completeness in the street buildings of large towns, and are for the most part negative rather



than positive in their provisions, and scarcely affect general architectural construction, as they are only designed to insure a certain minimum of provision for stability, quite below what in most cases would be deemed a necessary foundation for anything like an effective architectural design. Where the provisions of the Building Acts infringe at all upon the province of the architectural designer, it is commonly in the "preventive service,"—in forbidding as contraband nearly everything which goes to make a building picturesque and effective. What would have become of those picturesque bits of old street architecture in some of our own as well as in Continental towns, which painter and architect alike delight to sketch, had those who were to erect them been clogged by such a sentence as this, enforced by official warrant:—

"No projection shall be built or made from or before any building in any street within 10 ft. above the level of the foot-pavement of such street, so as to extend beyond the general line of the walls of the building, except architectural decorations attached to, or forming part of, an external wall, and projecting not more than 3 in. therefrom; and no cornice, coping, or balcony above the level of 10 ft. from the foot-pavement of such street, shall project more than 18 in. in streets not exceeding 30 ft. wide, and no other architectural decoration above the level of 10 ft. above the street shall project more than 6 in." &c.

This is from Section XXIV. of a proposed new Building Act for Liverpool, originally intended to have been brought before Parliament this session, but which is at present in abeyance. We do not say at once that some such clause may not be absolutely necessary in relation to buildings which are to flank crowded thoroughfares, and where provision must be made to obviate unnecessary drip in wet weather, as well as possible danger from imperfectly-constructed overhanging features. But under such regulations, what would become either of such buildings as those in the Florentine palatial style, with its grand projecting cornice, or of the aforesaid picturesque oriels and corbelled upper stories of Mediaeval Germany? It should seem, according to this, that we must choose between safety and commodiousness on the one hand, and architectural effect on the other hand, as regards street architecture. Must we really accept this fate? Is there no safe steering between Scylla and Charybdis, no compromise possible between the requirements of the architect and of borough officials? At all events, this species of restriction has been of pretty

long date in Liverpool, for we find, under the Section LXXVII. of the existing Building Act for that borough a similar provision in even more stringent terms:—

"And be it enacted that no projection of any kind shall be made in front of any building over or upon the pavement of any street, except for shop fronts or for doorways, and no part of such shop front or doorway in streets under 10 yards wide . . . shall project more than 6 inches, except the cornice, which may project 18 inches, &c. Provided always, that it shall be lawful for any person, with the consent in writing of the Council, testified by a copy of some resolution in writing of the Council, certified under the hand of the Town Clerk, and also with the consent of the Commissioners for the better paving and sewerage of the town of Liverpool, testified by a copy, &c. (as before)—to build with or add to, or cause to be built with or added to, any building fronting any street, any projecting pilaster which shall not project more than 6 inches, or, in streets more than 10 yards wide, more than 12 inches from the perpendicular line of the front brick or stone work of the building where it fronts such street."

This solemn and elaborate preparation for the legalising of the regulation shop-front pilasters, the most thorough specimen of bastard architecture in existence, is amusing enough in its way, but it is difficult to know why the framers of Building Acts should show such a special delicacy of feeling with regard to shop-fronts. The fact is that the prevailing style of shop-front architecture is the curse of our towns, architecturally; and so far from seeing clauses made specially to facilitate this sort of production, we would rather see it negated by some doctily-framed prohibitory clause, that no one shall dress up his shop front in wooden pilasters and sham architraves, but erect it in an honest and solid manner on sufficient brick or stone piers, &c. The proposed Metropolitan Building Act does offer some slight check upon over-much of cradling and bracketing architecture, in the provision (clause 69), that,—

"No part of the woodwork of a shop-front shall be fixed higher than eighteen feet above the level of the nearest public way, or nearer than four inches and a half to the line of junction of any adjoining building; and a pier or corbel of brick, or other fire-resisting material, at least four inches and a half thick, shall be built or fixed next to such adjoining building, as high as any such woodwork is fixed, and projecting, at least, to the extent of such woodwork."

This is a provision in favour of actual, though not of apparent, solidity of construction; but it is to be regretted that a Bill, formed partly under architectural direction, should, while putting a veto (by the clause demanding that all walls be "of brick or stone") upon any kind of genuine timber construction even for shop-fronts, make special encouragement or provision for a conventional screen of wood used in a non-constructive manner. In this point, the old and proposed Liverpool Building Acts also coincide; and we fully concur, as our readers are aware, in the prohibition or discouragement of timber construction in large towns; but it is a pity to see a false use of woodwork encouraged, at the expense of a genuine and true use thereof. The proposed new Liverpool Building Act, it may be observed, ignores wooden bresssummers altogether, decreeing iron in all cases; a decree scarcely necessary, since a good wooden beam may be as durable as an iron one; certainly, there are wooden bresssummers in existence and in good bearing condition, which have stood a longer test of time than we have been able to put iron beams to as yet.

In the matter of roofing, it is worth notice that none of the Acts before us recognise, or at all events encourage in their wording, the portentously high Mansard roofs, which are at present such a feature in all exhibitions of architectural drawings. The existing Liverpool Act, in scheduling thicknesses of walls and other matters with reference to height, makes no account of stories in the roof; and the proposed Metropolitan Act specially provides that "in a building used wholly or in part as a dwelling-house, there shall not be more than one story of rooms constructed wholly or partly in the roof, except with the permission of the Board;" and further that "in a building used wholly or in part as a warehouse, or for purposes of business, and not used in any part as a dwelling-house,

there shall not be any story of rooms constructed wholly in the roof." Such a regulation would probably be equally desirable on constructive and architectural grounds; but some of our warehouse and hotel designers will be shorn of the strength residing, not "in their hair," but in their roofs, by this Delilah of legislation. As to the constructive material of decorative adjuncts, the Metropolitan Bill provides, in general terms, like the existing Act, that "any cornice, coping, facing, window-dressing, portico, porch, balcony, verandah, and balustrade, and every projection or architectural decoration whatever, and also the cornices of any overhanging roof shall, except with the approval of the Board, be of stone brick, tile, artificial stone, vitrified stoneware, slate, cement, or other fire-resisting material."

This, of course, precludes wooden ornament, and may deliver us from we know not what possible fantastic tricks of barge-boards and finials; but then we have a parenthetical clause excepting from this dictum not only dwelling-houses "distant at least 15 ft. from any other building," but also "cornices and dressings of window fronts of shops;" and why, we again ask, this exceptional permission to shops to adorn themselves with combustible adjuncts not permitted, in the same situation, to any other class of building? Is it impossible for tradesmen to sell goods without hanging a wooden cornice over their inevitable sheet of plate-glass? It is satisfactory to find there is a limit beyond which masonry piers must be introduced. "When a building, enclosed with walls, is constructed so as to leave on the ground story, or on that story and another story or stories, an extent of opening greater than one-half of the whole area of the vertical face, or elevation of the wall or story or stories in which such opening is left, there shall be sufficient piers of brickwork or other fire-resisting material so disposed as to carry the superstructure." This would put an end to the erection of some marvellous webs of iron and glass which in the streets of certain towns we have seen towering from pavement to cornice; but we cannot help thinking such stipulations might be carried further, and shop-fronts be compelled to rest in all cases on adequate brick or stone piers. As to the gain in architectural appearance we need say nothing; possibly such a regulation might be accompanied in time by the further advantage of checking the system of competition in mere showiness and ostentation of goods between tradesmen, and suggest a habit of depending for success more on actual excellence and less on show. If the present aspect of shop architecture reflects (as we think it does only too truly) the falsity and flimsiness of much of our trade materials and trade principles, is it impossible that there should be a converse action, and that a better style of shop architecture, thrust upon them whether they will or no, should exercise a beneficial effect upon the tradesmen of England?

The proposed Act for Liverpool deals a blow at stone lintel construction in the provision that "every opening above 2 ft. 6 in. in width which is not arched over throughout the thickness of the wall, or which has not an iron lintel, shall have a discharging arch of brick or stone." The rule does not define whether a window with a stone head and one or more stone mullions is to be classed as one opening without regard to the mullions, or not. It may be pointed out that in certain positions (i.e., near the angle of a building) the "relieving arch" might have a tendency to disturb rather than assist the stability of the structure, by bearing horizontally on the angle pier. When we come to the roofs of our buildings, we find Building Act directions in general a good deal at variance with architecture. The present Liverpool Act, after some definitions and restrictions as to party walls, provides always "that nothing in this Act shall prevent any person from carrying up any wall above the

slates of the roof to form a parapet," &c. Not unfrequently it has been found that when a parapet wall has been built over the cornice line, there has been "nothing to prevent" it coming down into the street as it very short notice; but the Metropolitan Act is to provide that every building adjoining a street shall have a parapet at least 1 ft. above the gutter. Why the parapet wall, which practically affords the opportunity for distributing an overflow of rain-water within the building instead of outside it, and which architecturally gives the roof the appearance of sinking into the building instead of covering it, should be a feature so favoured by the framers of Building Acts we do not very well understand. The suggested development of party walls generally above the roof is, indeed, rather alarming to contemplate, and sometimes not a little puzzling. Thus the new Liverpool Act directs not only that "every party wall shall be carried up above the roof, flat, or gutter of the highest building adjoining thereto, and also above any part of such roof as shall be within the distance of 3 feet opposite thereto;" but also that "every party wall shall be carried up above any turret, dormer, lantern, or other erection of combustible material on the roof or flat of any building within 4 feet of such party wall." &c. The general impression conveyed by this, after two or three perusals, is, that something on every roof shall be higher than something else on another roof; at all events, the system of "slighting or overcrowing" (as Dr. Dalgetty would say) all erections on your neighbour's roof by a brick wall on your own, would be difficult to carry out in some cases, and leads to some painful considerations as to possible appearances resulting from the rigid enforcement of the principle. The Metropolitan Act gives the same directions in rather more perspicuous wording. We question whether the evident object, the prevention of the spread of fire, would really be attained in any marked degree by these provisions; and the amount of otherwise useless brickwork with which our roofs must be cumbered in accordance with such directions is a matter not to be (and which, indeed, in a literal sense, we fear cannot be) left entirely out of sight.

So far as the examples of architectural legislation before us are to be taken as specimens, it would appear that the tendency of such legislation is to steer clear of any precise reference to architectural features, except with regard to those which, whether rightly or wrongly, are most universally employed, and to make exceptions in favour of these only, placing all others under rigid restrictions. The result is to make the Building Act, in the main, an engine for the favouring and evoking of architectural commonplace, and throwing obstacles in the way of architectural invention. And, of course, it is impossible to legislate definitely, except upon practical matters. But it seems a pity that the framers of such Acts should not have more before their minds the interests of architecture, and provide for judicious deviation from the rules so rigidly laid down by more general provisions.

OLD STAINED GLASS IN ENGLISH CHURCHES.*

Glass of the Fifteenth Century.

THE existing remains of English glass of the fifteenth century appear to be about as numerous as are the examples of the previous period.

Cambridge possesses some glass of this date, in the chantry of Provost Brassey, removed in 1857 from one of the vestries, and restored by Mr. Constable, representing prophets and apostles.

Canterbury Cathedral, in the north transept, has a painted window, the gift of Edward IV. and his Queen; their own figures, those of their two sons (the princes murdered in the Tower), and those of their daughters, still remaining in it. In the Church of Dorchester (Oxon) is a window of four lights, representing the Stem of Jesse, which affords a unique example of the combination of stonework and stained glass in one mystic design.

In Durham Cathedral, the west window represents the tree of Jesse. The window of the south transept illustrates the *Te Deum*. The date is 1450.

The windows of the north aisle of the Church of Eaton-Socum, Bedfordshire, represent the

legends of St. Nicholas and St. Ethelthreda. The costumes are of the period of Edward IV.

The stained glass in the east window of the Chapel of St. Gabriel, in *Easter* Cathedral, dates in the first half of the fifteenth century.

The series of five windows representing Scriptural subjects, apostles, prophets, Roman emperors, &c., of *Fairford* Parish Church (Gloucestershire), were taken in the year 1492 on board a Flemish vessel. Some have attributed the workmanship to Albert Dürer. Copies of these windows are now in course of completion for the South Kensington Museum.

The painted windows of the Church of *Gatton*, Surrey, filled with sacred subjects, were removed from the Cathedral of Aerschot, near Louvain. They are Flemish fifteenth-century work.

In the Lady Chapel of *Gloucester* Cathedral the headings of the window lights retain their original glass. The east window is also filled with fifteenth-century glass, white and yellow being much employed.

At *Levington*, Cambridgeshire, the early Perpendicular east window contains a tree of Jesse. The east window of the north aisle represents, in the five larger lights, ten Jewish kings, each attended by a prophet or a saint, with a motto on a scroll. In the smaller compartments are figures of the Virgin Mary, the Evangelists, and other personages, interlaced by a pattern of vine branches. On the south side of the chancel is our Lady of Pity, with a knight and a lady kneeling on either side.

The remains of glass in the north and south choir aisles of *Lincoln* Cathedral are of a Perpendicular character.

In the *Wenlock* Chapel, in the *Luton* Church, the upper compartments of the windows are painted with small figures of saints and angels, on a ground of plain glass, charged with various small devices, the arms of John, Lord Wenlock, the founder, within the garter, and several other escutcheons, being scattered about beneath the figures.

The patterned glass windows of the *Bede House* Hall, at *Lyddington*, Rutlandshire, are of the latter part of the fifteenth century.

The west window of the south side of the choir of the Priory Church of *Great Malvern* was presented by Richard III. It contains twelve full-sized figures. Six windows on either side of the choir, and the east window of the church, contain much stained glass of the same date. There are illustrations of the Life of Christ, the Last Supper, and heads of saints, surrounded with glories, in the latter. The foundation of the priory, by Saint Werstan, King Edward the Confessor, Bishop Wolstan, and other bishops and priors, the marriage of Jehoiakim and Anna, the Crucifixion, and the Annunciation, are among the subjects illustrated in the side windows. In the *Jesus* Chapel the north window contains four gospel scenes, and the portraits of Arthur Prince of Wales, son of Henry VII., and of Sir Reginald Bray, privy councillor to that sovereign, which are the only perfect remains of a series described by Habington, *temp.* Charles I.

There is painted glass, in the Perpendicular style, in the church of *Mells*, Somersetshire; one window containing a figure of Mary Magdalene.

The glass in the windows of the chancel and nave of *Nettlestead* Church, Kent, is in good condition. The date is 1465.

The hall windows of *Ockwells' House*, Berkshire, are filled with heraldic glass of the middle of the fifteenth century.

In the series of illuminated windows in churches and chapels at *Oxford*, glass of the fifteenth century is to be found in the west window of Christchurch Cathedral, in the Church of St. Peter-in-the-East, in St. John's Chapel, Merton College, and in the hall, New College.

Windows of the fifteenth century exist in the Church of St. *Rev*, Cornwall.

The Church of St. Thomas, *Salisbury*, contains in the windows of the south aisles painted glass of the time of Henry VI. In the banquetting-hall of John Hall, in the same city, is glass of the same, or of the succeeding reign.

In the south aisle of *Titchfield* Church, Cornwall, is a "Creed window," in which each of the apostles is represented, accompanied with the article in the apostles' creed traditionally ascribed to his authorship.

The glass in the east and side windows of the Beauchamp Chapel, *Warwick*, was executed by John Prudde of Westminster, A.D. 1447.

The arms of Bishop Babwith (three chaplets of holly) in the window of the chapel of the Vicar's Close, *Wells*, date 1407 A.D.

Winchester contains windows in the refectory

of the hospital of St. Cross representing the arms of Cardinal Beaufort, of the latter half of the fifteenth century. Fragments of the time of Edward IV. and Henry VII. are in the library window of the college, in those of St. John's Church, and in the east window of the cathedral.

York is rich in stained glass of the fifteenth century. The west window of the cathedral is by John of Coventry, date about 1404. The east window of the choir is by the same artist, containing 115 Scriptural subjects, each about 2 ft. 2 in. high. In the window of the north choir aisle Archbishop Bowet is represented on his knees before an altar, surrounded by shields charged with the arms of his family. In the south transept eastern aisle is glass of the reign of Henry IV. Glass of the same century is to be found in the windows of All Saints' Church, and in those of St. Martin's Church in the same city.

Glass of the Sixteenth Century.

Some Flemish and German glass of the sixteenth century, A.D. 1537 to A.D. 1543, is in the windows of the Mayor's Chapel of St. Mark, *Bristol*.

Twenty-six large stained-glass windows, forming a complete history of Our Lord, beginning from the birth of the Virgin Mary, are in King's College Chapel, *Cambridge*. The date is 1527-1531. In the chantry of Provost Brassey, in the same town, is some glass of the same age, restored by Mr. Constable.

Durham Cathedral has a marigold window, with fragments of sixteenth-century glass, in the Chapel of the Nine Altars.

Lichfield Cathedral contains some Flemish glass, from the Cistercian Abbey of Herkenrode, near Liège, dating 1530-1540 A.D. In the aisle of the south transept is to be seen Mary Magdalen at the foot of the Cross, together with the figures of benefactors to the Abbey. In the south choir aisle, we have the Holy Trinity in the centre, a knight supported by St. Hubert on one side, and a shield of arms on the other. In the Lady Chapel are five windows representing subjects from the New Testament, and two containing kneeling portraits of patrons and benefactors of Herkenrode.

The east window of St. Margaret's Church, *Westminster*, is said to be the finest specimen of stained glass in London. It is in the early cinque-cento style, and was executed for Henry VII. at Gouda.

A glass window of this period, from the Cathedral of Basle, is in the possession of Mr. William Smith, Upper Southwick-street, *London*.

Oxford contains glass of the sixteenth century in the Church of St. Peter-in-the-East, in the hall of New College, and in the Bodleian Library.

In the Church of St. Neot's, Cornwall, are six windows, containing Old Testament subjects, of the early part of the sixteenth century. There are also portraits of benefactors, patron saints, labels, the history of St. George, and the legend of St. Neot, each adorned with inscriptions.

The west window of *Salisbury* Cathedral contains the shield of arms of Bishop Jewel. Date, A.D. 1562.

Southwell Minster has the four lower east windows of the choir filled with French cinque-cento glass paintings, presented by Mr. Gally Knight in 1818, representing the Baptism of Christ, the Raising of Lazarus, the Triumphant Entry into Jerusalem, and the Mocking of Christ by the Jews.

In the west window of *Wells* Cathedral is cinque-cento glass, brought partly from Eouen, and partly from Cologne, by Dean Creighton, illustrating the life of John the Baptist. The date, 1607, is traceable on one of the lights.

Winchester Cathedral has the east window filled with Perpendicular painted glass of a date a little earlier than 1525, the work of Bishop Fox, whose arms and motto, "*Est Deo Gratia*," are introduced. In point of execution it is said to be as nearly perfect as painted glass can be. In both aisles of the choir, and in the clear-story windows, as well as in the east window of the south transept, are also remains of cinque-cento glass.

There is glass in *York* Cathedral referred to the sixteenth century; but the description of its date and character is contradictory.

The famous windows which the Constable Anne de Montmorency commissioned Bernard Palissy to paint for the Château of *Ecouen*, representing the history of Psyche, have been removed to the residence of M. le Duc d'Aumale, at *Twickenham*.

* See p. 459, ante.

Glass of the Seventeenth Century.

The windows of the aisles of the choir in Bristol Cathedral are filled with enamelled glass of the seventeenth century. The subjects are, on the north side, Jonah escaping from the whale, the Ascension, the Agony in the Garden, the Ascension of Elijah, and the Sacrifice of Abraham; those on the south are the Expulsion of the Money-changers, Jacob's Dream, the Tribute Money, Melchisedec and Abraham, and Gideon and the Fleece. Much of the original glass has been replaced by "pot glass." The jumble of subjects is unprecedented.

The stained-glass windows of Archbishop Abbot's Hospital Chapel, *Guildford*, date in the seventeenth century.

The Flemish painted glass in Lincoln's-inn Chapel, *London*, is by Abraham Van Linde. Date, A.D. 1640.

The glass in the six-light window of the north transept of Malvern Priory Church, containing full-sized figures of St. Paul, St. John Evangelist, and St. John Baptist, and passages in the life of Christ, divided by labels, is German, of the seventeenth century.

The windows of the Church of St. Stephen, *Norwich*, date A.D. 1601. Those of the Church of St. Michael Coslany, in the same city, date in 1610.

In *Oxford*, the window of the south aisle, the north transept, and the transept aisle, of Christ Church Cathedral, were executed by Abraham Van Linde, A.D. 1630-1640. St. Peter's Deliverance from Prison, in the north aisle, is by Isaac Oliver, A.D. 1700. There is also glass by Van Linde in Balliol College Chapel, in Lincoln College Chapel, in Queen's College Chapel, in University College Chapel, as well as glass of the same date in the Chapel of Magdalene College.

Glass of the Eighteenth Century.

Bristol Cathedral exhibits in its west window inferior stained glass, dating 1710, A.D.

The blazonry in the upper part of the east window of Exeter Cathedral is dated A.D. 1766.

The great west window of the nave of Lichfield Cathedral is by Brookes, A.D. 1776.

In *London*, the Resurrection and the Last Supper, by Joshua Price, are represented in the Church of St. Andrew, Holborn, date A.D. 1718. There is some late Flemish glass in the Church of St. George, Hanover-square.

Oxford has glass painted by Joshua Price, circa A.D. 1702, in the chapels of Magdalene and of Merton Colleges; and eighteenth-century glass in the Church of St. Peter in the East, and New College Chapel.

The east window of St. Asaph Cathedral was glazed by Eggington after a picture by Albano. Date, A.D. 1780.

The Elevation of the Brazen Serpent, designed by Mortimer and executed by Pearson, the gift of the Earl of Radnor, fills the east window of the choir of Salisbury Cathedral. Date, A.D. 1781.

The west window of Worcester Cathedral dates A.D. 1792.

The rose-window in the north transept of Westminster Abbey was filled with stained glass in A.D. 1722. The great west window was executed in 1735. Neither of these windows is mentioned in the "Universal Art Inventory."

In the chapel of Heriot's Hospital, *Edinburgh*; in the cathedral churches of *Ely*, *Peterborough*, and *Ripon*; and in the churches of *Morley*, *Derbyshire*; *Rivenhall*, *Essex*; and *West Wickham*, are painted windows, cited in the Inventory, the dates of which are not stated.

We thought it due to our readers, as before hinted, to verify the references which are so freely made in Mr. Cole's Inventory, to the late Mr. C. Winston's valuable work on ancient glass. As far as the general index of this work is concerned, the churches named therein are all duly to be found in the Art Inventory. But in the woodcuts, the coloured plates, the preface, and the appendix, to this volume, occur the following additions to the information given in the Art Inventory. They will be found to be neither few nor unimportant.

Early English glass is figured from a lancet window in the Church of *Stockbury*, *Kent*, of the latter part of the thirteenth century.

A lancet window of pattern glass, in the Church of *Stanton Harcourt*, *Oxfordshire*, dates in the third quarter of this century.

Decorated glass, of the first quarter of the fourteenth century, is to be found in the cinquefoil tracery lights of two windows in *Newark Church*, *Sussex*.

The same date is attributed to a patterned panel and figure, in brown enamel, in *Snodland Church*, *Kent*. A St. Matthew in a tracery light dates some fifty years later.

In a tracery light at *Westonbirt*, is a shield, with the arms of *Berkely*, in brown enamel, dating soon after 1361.

At *Southfleet*, *Kent*, exists a patterned window of coloured glass, of the third quarter of the fourteenth century.

At *Worfield*, *Kent*, a head in brown enamel dates before the middle of the fourteenth century.

From *Urchfont*, *Wilts*, we have a patterned quarry, painted with a leaf in brown enamel, of the same date; and a fleur-de-lis from *Great Dunmow Church*, *Essex*, is an example of an heraldic bearing of the period.

Perpendicular glass of great beauty is figured by Mr. Winston from *Wanlip Church*, *Leicestershire*, containing a complicated emblem of the Trinity, and the arms of John of Gaunt and of Thomas of Woodstock, cir. 1393.

Woodmansterne Church, *Surrey*, has a credo figure, or apostle, in brown enamel, of the third quarter of the fourteenth century.

From *Much Hadham Church*, *Herts*, we have a circle containing the monogram I.H.S., surrounded with the motto, *hoc est nomen super omne nomen*.

Stotting Church contains two portraits of members of the Stotque family, of the early part of the reign of Edward IV. Two female heads, of the same date, in yellow and brown, are to be found in *Thaxted Church*, *Essex*; and tracery lights in the Church of *Temple Rothley*, *Leicestershire*, are of the same date.

At *Reynold's-place*, *Horton Kirby*, *Kent*, are the arms and crest of John Bowes, who died 1595 A.D. At *Franks*, *Kent*, are the Bathurst arms, dating 1591. From *Lambeth Palace* is figured a lily, in stained glass, forming part of a border round the arms of King Henry VII.

Mr. Winston further cites, as instances of false heraldry in glass, arising rather from the exigencies of the material than from the ignorance of the artist, the Royal arms of Edward II, in the Church of *Fawkham*, *Kent*; the arms of the family of *Brockhall*, temp. Edward III, in *Lukingstone Church*, *Kent*; those of Bowes, in *North Cray Church*, in the same county; and those of Philip II. of Spain, in *Wilton House*, *Wilts*.

Monumental inscriptions, in most instances accompanying portraits, in stained glass, are cited as existing in painted windows at St. Michael's *Basishaw*, *Kediton*, *Chart Magna*, *Wellborough*, *Tunbridge*, *Holywell Priory*, *Great Thorndon*, *Cotes Church*, *Danthorp*, *Barley*, *Great Malvern*, *Afford*, and *Wanlip*. Thus the illustrations of Mr. Winston's book alone supply some thirty-five additions to the Art Inventory.

A still larger number of churches containing old stained glass is referred to, in topographical order, in Mr. Franks's "Book of Ornamental Glazing Quarries," published in 1849. This valuable monograph contains numerous drawings of panes or quarries of old stained, painted, or enamelled glass, each of which contains a perfect pattern, and not a mere portion of a general design. These are distributed as follows:—

Berkshire.—Choley, Moreton, Wantage.

Bucks.—Ickford, Kimble Power.

Cambridgeshire.—Bourne; King's, Queen's, and Emmanuel Colleges, Cambridge; Chesterton, Ely Cathedral, Fulbourne, Girton, Hardwick, Hildersham, Melbourne, Milton, Waterbeach, Wimpole.

Devon.—Exeter Cathedral.

Essex.—Bromley, Chignal, Swesly, Good Easter, Marks Toy, Febmarsh, Takely, Thaxted.

Hants.—Winchester, St. Cross and St. John.

Hereford.—Mansley.

Herts.—Great Berkhamstead, Walton.

Kent.—Bethersden, Fawkham, Hardres (Upper), Kemsing, Penshurst, Southfleet, Westwell.

Lincolnshire.—Lincoln Minster.

Middlesex.—Greenford.

Norfolk.—Boxwell, Bressingham, Holm Hall, Southacre.

Oxfordshire.—Chakendon, Headington, Marston; Merton College, Oxford; Stanton Harcourt, Warborough, Watlington.

Somersetshire.—Taunton.

Suffolk.—Brandeston, Kenton, Gasley.

Surrey.—Challington, Newdigate, Ockham, Okewood Chapel.

Wales.—Penmachno, Carnarvonshire.

Wilts.—Sherington.

Worcestershire.—Birta Merton.

Thus the work of Mr. Franks cites sixty-six churches containing old stained glass, only two

or three of which have been mentioned by Mr. Winton, or included in the Art Inventory. Descriptions of each of these windows are desirable, as Mr. Franks merely draws single panes. It is evident that the remarks which we made as to the large body of information which has to be added to that collected by Mr. Cole, are more than justified, a hundred distinct additions being thus collected from two well-known books alone. As illustrating the history of stained glass, the table we have formed possesses undeniable value. As an exhaustive list of the old stained-glass windows to be found in this country, the information thus arranged from the Art Inventory can only be regarded as rudimentary; but it is a rudiment from which may be hereafter developed a full topographical catalogue of English painted windows; and in that hope we commend it, not only to the perusal, but to the collaboration, of our readers.

It is remarkable that the valuable work of Mr. Franks, referring to so many churches not mentioned by Mr. Winton, appears not to have been consulted by Mr. Cole. It is not included in the "List of Works in Art Library containing Information upon Painted or Stained Glass," which is given in the "Universal Art Inventory," although it is entered in the "Universal Catalogue of Books of Art," with the added letters, "S. K.," denoting that a copy is to be found in the Art Library at South Kensington.

COMPLETION AND PRESERVATION OF ST. PAUL'S.

It is not to the credit of England, in the matter of æsthetic education, that the metropolitan cathedral should have been allowed to remain unfinished for nearly two hundred years. Still less creditable is the fact that such a statement will be received, by nine persons out of ten, with surprise, if not with incredulity. That such is, however, the plain unvarnished truth, there is no doubt. Grand as is the outline, and careful or even elaborate the external finish, of the exterior of the finest modern Roman building, except one, in the world, the interior yet remains in the state, with few exceptions, at which it arrived when the builder proper had nearly completed his work, and the architectural decorator was about to begin his. Wind-tight and weather-tight, externally not only completed by the architect, but fringed with a stone balustrade, erected in addition to the design, and against the will, of Sir Christopher, the interior of St. Paul's is yet in the essentially temporary state of an unfinished building. The lovely carvings with which the unrivalled skill of Grinling Gibbons enriched the choir contrast with the unrelieved hue of the monotonous stone and plaster. Still more bald,—nay, positively offensive to the eye,—are the square, thickly-leaded panes of the mean glass windows, which, till very recently, have been the sole lights of the place. It is true that this defect is now, to some extent, in the course of rectification. We wish that we could speak with enthusiasm as to the success of the attempt.

An old engraving exists which shows the interior of St. Paul's richly decorated, according, as it is stated, to the design of Sir Christopher Wren. However that may be, there is no doubt that a certain and, indeed, a large amount of decoration is demanded by the very nature of the structure. We cannot compare St. Paul's, classic although we may term its Roman architecture, to those ancient hypæthral temples which owed their grandeur to severity of form and depth of unrelieved shadow. The *basilica*, not the colonnaded *cella*, is the primitive form of a Christian church. Vast, high springing arches, or lofty inclined roofs, have been always required to shelter the thronging worshippers of the northern climates. It has been the habit of the pious, certainly for fourteen centuries, to enrich the interior of churches of Romanesque and Roman design with colour and with gold; and that with a splendour proportionate to the structural importance of the work. In many cases the gleam of coloured marbles, the glitter of gilded bosses, and the rich warmth of painted medallions, burst on the eye of the visitor who enters the church, with a beauty for which the modest severity of the external architecture had not prepared the imagination. Who can forget the splendour of such interiors as that of the Church of the Annunziata at Genoa? The enrichment which in Gothic art is produced by the chisel of the sculptor, in moulding, and foliated capital, and delicately canopied

shrine, is supplied, in Roman structures, by marble, by gold, and by colour. The "dim religious light" of the painted window is essential to the character of each.

It need not be added that the movement on foot for completing the interior decoration of St. Paul's Cathedral is one to which we shall be most happy to contribute as far as all such support as lies in our power. We might have supposed, indeed, that it was only necessary for the great almsgiving public,—which has been stated to subscribe an annual sum so large that we hesitate to write it, to the various religious and benevolent objects of the metropolis,—to be made aware of the want, to find the means for supplying it, but for the failure which attended the first appeal. When, after so secular a slumber, the dignitaries of the Cathedral, and the worshipful authorities of the City, have awakened to the fact that, as regards this well-known Church, they are in fact "poor, and blind, and naked," we cannot believe that it will be long before they remove the stigma from the City.

We wish good speed to those who have taken in hand the completion and adornment of the Cathedral; and, referring to what we have previously said concerning the effect of the operations for the subterranean Metropolitan Railway, we appeal to them, in so doing, to keep—by day and night—a sure watch on the yet more important point of its permanent stability.

PHOTOGRAPHS ILLUSTRATIVE OF THE ARCHÆOLOGY OF ROME.

A selection from the large number of photographs that have been made in Rome, under the direction of Mr. J. H. Parker, is now on view at the German Gallery, Bond-street, and catalogues of the whole are published. Mr. Parker has come to the conviction that the city of Rome was built upon the great earthworks of the primitive fortifications, which have governed the plan of the city, and have had great influence on the sites and plans of the principal buildings. These gigantic earthworks consisted, like other primitive fortifications of escarped cliffs, of terraces and trenches. They are very much obliterated by having been built over for many centuries, but the demolition of these buildings has brought the original work to light in many places, as on the Palatine, where parts of the wall of Romulus, of Etruscan character, and the foundations of his towers, are visible at the north end, opposite to the Capitol. These towers have evidently been left unfinished, and have been built over in the time of the Republic and of the Empire, and in the Middle Ages; but all these buildings being now destroyed, the foundations of the towers are visible, and photographs of them will be found in his series. The wall of Servius Tullius is visible in many places.

The great wall of Aurelian, thirteen miles long and 50 ft. high, with a corridor for the sentinels along the inside of it, is also copiously illustrated in another series of photographs. And the gateways which occur, many turned into fortresses by Honorius, A.D. 400, are also illustrated. The aqueducts for about a mile from part of the wall, and were incorporated in it by Aurelian, as were other buildings, such as the Pæstorian Camp, the Sessorium with its amphitheatre, and the Lateran; the remains of the great wall are traced also in the Tiber, and in the Trastevere going up to the Janiculum. These form another series.

The aqueducts have been traced from their sources to their sources, and there is in the room a remarkable plan of them from the sources to Rome. There are photographs of the numerous bridges, sometimes more than 100 ft. high, across the valleys and gorges in the mountains; then, descending to the "Campagna" round Rome, we have the "Piscine" and the arcades, till we arrive again at the walls of Rome. It is shown that one of the finest of the aqueducts, which has been called for the last century or more "Aqua Alexandrina," because it was supposed by Fabretti to have been built by Alexander Severus, is really of the time of Trajan and Hadrian, two centuries earlier. This is proved by the construction of the arcade, and of the walls of the *castella aquæ*, or reservoirs, by the side of it. It is also confirmed by an inscription of Hadrian found on the first reservoir near Gabii, by Visconti, in the last century, since the time of Fabretti.

As a chronological series, the photographs are intended to supply a type for each half-century,

from the time of the foundation of Rome to the sixteenth century; and they apply to the buildings over the greater part of Europe, as the history of architecture shows that the art of building in stone came from Rome, or through Rome to all the provinces of the Roman empire, and the construction of walls in each century is everywhere the same. This series affords important help towards a real history of architecture, such as no drawings can supply. Few drawings can be relied on as to the absolute proportion of the stones or bricks, or of the mortar in the joints between them; yet these are details which are often the best guide to the age of the building, or at least of the original parts of it, and which enable us also to see the changes that have been made.

The tombs and cemetery chapels, the fresco paintings in the Catacombs (taken with magnesian light), the mosaic pictures in the churches from the fourth century to the fourteenth, are extremely valuable for the history of drawing.

The mosaic pictures with which the churches are decorated date from the time of Constantine, and a large proportion of them are before the tenth century, a period when we have no churches or other buildings in the West. At a later period, the beautiful church furniture of the Cosmati family, their altars and amboes, and Paschal candlesticks and tombs, enriched with their admirable ribbon mosaics, are not to be found out of Italy. Of these there is a fine series of photographs.

Concerning the constructions of walls, Mr. Parker has elsewhere said,—

"For the construction of walls, the brick-work of the time of Nero is the finest in the world. The bricks with which the walls are faced are so thin that we can count ten to the foot, including the mortar. This perfection did not continue long. In the second century there are eight to the foot, in the third century six, and in the fourth century four only, as in modern brick walls. This is a useful general guide to the age of a building in Rome, because the walls frequently remain when all the ornament has been destroyed. The Roman temples of the first century were better than at any other period, but their marble temples were never equal to those of Greece, and some of the largest and finest buildings in Rome belong to the second and third centuries, although their details do not equal, in purity, those of the first. The magnificent temples of the Antonines, called after Caracalla, are not equal in the construction of the walls, or in the architectural details, to the temples of Titus and the House of Nero; but there can hardly be said to be any perceptible falling off in the buildings of the time of Trajan and Hadrian. Many of the temples were rebuilt by Septimius Severus in the beginning of the third century, and their old names retained, as we are expressly told by the historian of his life; and this is a point always to be considered in examining the Roman temples."

Public bodies,—the British Museum, for example,—ought certainly to become possessed of a set of these photographs, and so aid in an important undertaking. Individuals would find selections of great interest might be made from them. The photographs that have been taken by artificial light in the Catacombs may serve to dispel some illusions as to dates.

LECTURE BY MR. SCOTT ON CHESTER CATHEDRAL.

A CROWDED and enthusiastic meeting in promotion of the restoration of Chester Cathedral, which was held in Liverpool in St. George's-hall, on Tuesday in last week, was followed up, in Chester itself, by a lecture from Mr. G. G. Scott, the architect for the restorations. The lecture was delivered in the fine room which is now called the King's School, and which was formerly the Refectory of the Benedictine Abbey connected with this church. The Dean was in the chair, and made a few prefatory remarks, dwelling especially on the importance of ultimately including the great south transept with the nave and the space under the tower, in one general restoration, so that the whole interior might be seen in its ancient dignity.

Mr. Scott, in opening his lecture, said that unlike the majority of the great Medieval churches, the origin and date of the foundation of this cathedral were unknown. Chester having been a Roman city, it followed that it must, during the last century of the Roman occupation,—when the empire was Christian—have pos-

essed churches, and one might have stood upon this site. The same might be said of the interval between the departure of the Roman legions and the Anglo-Saxon conquest—a period prolonged in this instance through the district which included Chester having been held much longer by the Britons than most parts of England. They were Christians, and must have had churches, and one might have stood here. Whenever founded, the original church was said to have been dedicated to St. Peter and St. Paul; and Mr. Parker conjectured it to have been Romano-British. During the Anglo-Saxon period, however, the dedication of the church was changed from St. Peter and St. Paul to St. Werburga and St. Oswald. This was at least as early as the reign of Athelstan, as he and several later kings are recorded as having paid their devotions at St. Werburga's Church. The lecturer then referred at some length to the personal histories of the Princess, St. Werburga, and St. Oswald, King of Northumbria, as a reason for the change of dedication. A century and a half later we find the church to have become ruined, probably during the second great Danish invasion, and restored or rebuilt during the reign of King Edward the Confessor, by Leofric, the wise and great Earl of Mercia, and the pious Countess Godwina, or Godiva, of famous memory,—the restored English rule thus again doing homage to the memory of their royal English saints; nor, when our country fell once more under foreign domination, was their memory dishonoured; for the first Norman Earl, Hugh Lupus, sister's son to the Conqueror, and his countess, Ermentrude, refounded the church on a far grander scale, converting it from a church of secular canons (just such a collegiate body as now exists) into a Benedictine monastery; and that not at the instigation of the English alone, but of the great foreign ecclesiastic, St. Anselm, then Abbot of Bee, but soon to become Archbishop of Canterbury. Thus we have had in review a long series of kings, princes, and rulers, as well as of royal and noble ladies—century after century—promoting the interests of this church; and we find that this only shared with many others their pious and princely munificence. Yet it is now as much as we can do to get funds to keep the few great churches which remain to us of their great foundations in a state of decent repair!

Not only was it customary with the Normans while dealing with the ecclesiastical structures of their predecessors, to make a clean sweep and reconstruct them on a greatly enlarged scale, but the change from a comparatively small collegiate institution to a great monastery of necessity involved this. It is, therefore, not to be wondered at that no vestige of the older buildings remain. Our architectural investigation must consequently commence with the new foundation begun by Hugh Lupus about 1155. The previous church, if only a restoration of the older Saxon church, was probably of no great dimensions. The surviving portions of Norman work, especially in the north transept, were next described. About 1195 the eastern parts of the building appear to have been much dilapidated, and appear to have been made by the monks in a haphazard tone. An interesting period followed, marked by the frequent presence of King Edward I. in Chester, when grants of venison from the forests of Wirral and Delamere were made to the workmen who were carrying on the work of construction, under the vigorous rule of the Abbot Simon of Whitchurch. One of the most attractive parts of the lecture consisted in the description given of the methods by which the true forms of buttresses and cornices, and especially of the singular terminations of the south aisle of the choir, had been discovered by the help of fragments disinterred in the process of reconstruction.

Towards the close, Mr. Scott said,—You will have gathered, from what I have narrated, that your cathedral, though its beauty is now so sadly dimmed by decay and barbarous repairs, is a building of great architectural merit, and of great antiquarian value. I will add, that few of our cathedrals exhibit a more complete consecutive series of specimens of the different varieties and chronological phases of our Medieval architecture, from the Norman conquest to the Reformation. Of the earliest Norman we have a specimen in the north transept. Of the middle Norman we have the remains in the north-western tower and the substructure of the abbot's hall, with, perhaps, the recesses for tombs in the north wall towards the cloister; of yet later Norman, we have the passage from the

abbot's house to the cloister, with the chapel above it; and later still the doorway from the eastern cloister into the nave. Of the transitional style from Norman to early English, we have the eastern chapel of the north transept, now the vestry; also some beautiful fragments lately discovered. Of the fully-developed early English, we have the chapter-house, with its vestibule, as beautiful works as could well be produced. We have also the beautiful refectory of the monks in which we are now assembled, and which contains one of those exquisite pulpits—such as we find at Beaulieu, at Shrewsbury, at St. Martin aux Champs at Paris, and in many other monasteries. Of the transition from early English to the Middle Pointed or Decorated style, we have the Lady Chapel; of the somewhat more advanced decorated, we have the two eastern bays of the choir aisles, with a further advance in their western bays and the clearstory. Of the later decorated, we have a truly magnificent example in the south transept, and smaller ones in the substratum of St. Werburg's shrine, the sedilia, and the choir-screen. Of the early Perpendicular, I should have thought that we had specimens in the clearstories of the south transept of the eastern bay of the nave; of the more advanced style, in the central tower, and in the stallwork of the choir; of the latest phase, in the west end, and probably in the clearstory of the nave. The cloisters also belong to one of these two last phases. Thus we should have the whole series of changes which the middle ages produced represented in this one cathedral—all alike, however, clouded by decay, and all crying equally loudly for restoration. It is for you to respond to that cry, and to render this, the great central temple of God in your diocese, worthy at once of its sacred uses, of its rank, as the great diocesan church, and of the importance of the diocese, including, as it does, some of the most princely residences of the nobility, and the greatest mercantile emporium of the greatest commercial country in the world. The church has come down to our day—what with decay and barbarous repairs—a mere wreck of what it once was—a melancholy relic of former ages, and a reproach to our own. It is for you to do honour at once to the past and the present, by liberally aiding your most excellent and zealous dean in effecting its proper restoration.

After a vote of thanks had been given to the lecturer, the company followed him from the King's School to the Chapter-house, where he commenced to point out in detail those features in the cathedral to which he had referred in his lecture. The Chapter-house he regarded as one of the most beautiful rooms of the thirteenth century. Its exact age was not known; probably it might be placed in the latter quarter of that century. In its predecessor many of the abbots, including the famous Whitchurch, were buried, but what became of their tombs he could not say. He thought it probable that the light of the western window was borrowed, and that at one time the monks' dormitory came up to it. Passing to the north transept, he called attention to the veritable work of Hugh Lupus, which was to be seen in the arcade over the head of the arch. From the eastern side, up to the end of the twelfth century, projected an apsidal chapel, and the outline of the arch by which that was entered has been disclosed by the taking off of the plaster. The piscina was not earlier than 1190 or 1200. Passing through the vestry, where the details of the Norman arch were more clearly disclosed, Mr. Scott then led the way to the outside of the north aisle, where he called attention to the base of one of the enormous buttresses, then to the corner of the Lady Chapel, where the lighter buttresses were found which gave the true position of the windows and the direction of the mullions. On the south side of the Lady Chapel he called attention to the pierced parapet and toothed ornament, discovered when the roof was removed, and also pointed out the arch above the end of the south aisle, which bore a spire, and the aisle, about being constructed in an apsidal form. Farther on he noticed the sloping form of the buttresses, and a doorway which the Dean said was used as an entrance to the choir at one time by the Benedictine monks, the tomb of the author of the "Polychronicon" being near it. The Lecturer passed on to the south transept, then into St. Oswald's Church, where he spoke of the chapels of St. Nicholas and Mary Magdalen, and pointed to the sedilia of the former. From thence the route was into the south aisle, through the choir, to the end of the north aisle, but not into the

Lady Chapel, then back to the choir, and through the nave to the westward, and into the Norman tower; but here, we believe, the perambulation ended, as it was near five o'clock, the time for evening prayers.

ART-UNION OF LONDON.

THE following is a list of the principal works selected by prizeholders to this date:—

From the Royal Academy.—"Move Eastward, happy Earth," &c., C. J. Lewis, 150*l*.; Henry II. and Diana of Poitiers, A. H. Tourner, 150*l*.; The Village Violinist, E. Opie, 50*l*.; A Mountain Stream, Aber, North Wales, J. Taylor, 50*l*.; Near Bethesda, North Wales, F. Williamson, 50*l*.

From the Society of British Artists.—The Sidle, W. Bromley, 60*l*.; River Rance, Dinan, Brittany, F. T. Lott, 50*l*.; Ennui, T. Davidson, 45*l*.; A Jersey Interior, W. A. Atkinson, 40*l*.; The Forsaken Nest, J. C. Waite, 40*l*.; The Lizard, J. Peel, 35*l*.; Temple Weir on the Thames, A. A. Glendening, 30*l*.; Rhysayr Du Falls, Dolgely, H. P. Powell, 30*l*.; Fishing Village, Coast of Normandy, J. J. Wilson, 30*l*.; Life and Still Life, C. T. Bale, 25*l*.; A Mountain Stream, North Wales, A. Barland, 25*l*.; The Thames at Wargrave, G. S. Walters, 25*l*.; Scarborough, A. Cunt, 25*l*.; Pirling, C. Armitage, 25*l*.; The Path by the Loch, A. A. Glendening, 20*l*.; Evening on the Wyre, F. Muschamp, 20*l*.; Evening, C. J. Coppard, 17*l*.; Waterfall at Loch Eck, on the Clyde, J. Burbridge, 15*l*.; Tired from the Glean, Mrs. Backhouse, 15*l*.; The Resting Place, E. Holmes, 15*l*.

From the Royal Scottish Academy.—Shiehallion—Sabbath Morning, S. Edmonstone, 30*l*.; a Fortune in a Teacup, J. C. Waite, 27*l*.; 10*l*.

From the N. British Institution.—The Jungfrau, from the Road to Mürren, S. Hodges, 100*l*.; Blue Bells, H. Wallis, 70*l*.; Ophebia, H. Selous, 42*l*.; Glen Etive, near Glencoe, J. Docherly, 41*l*.; "Not Enough," A. T. V. Ball, 30*l*.; Girl and Threshing, A. F. Easton, 30*l*.; Moonlight on the Coast, A. Gilbert, 20*l*.

From the Society of Painters in Water Colours.—The Rialto, Venice, W. Callow, 50*l*.; Isola Bella, &c., C. Smith, 45*l*.; Bay of Naples, E. A. Goodall, 31*l*.; 10*l*.; Amongst the Apple Trees, J. J. Jenkins, 30*l*.; Primrose-gathering, P. J. Nafel, 25*l*.

From the Institute of Painters in Water Colours.—Limburg, with the Cathedral of St. George on the Lebu, E. Richardson, 94*l*.; 10*l*.; On the Avon, at South Brent, Devon, J. H. Mole, 50*l*.; From the Capodi-Monte, Naples, T. L. Rowbottom, 25*l*.; At Clulston, near Torquay, John Chase, 15*l*.; 10*l*.

From the General Exhibition of Water Colour Drawings.—The Awakened Conscience, J. Hyslop, 40*l*.; Moelgead, Portmadoc, North Wales, J. Needham, 15*l*.; 15*l*.; "Waiting, Waiting, Hoping still," J. C. Russell, 15*l*.; The Winner Won, Ellen Thornycroft, 15*l*.

From the Old Bond-street Gallery.—Flashing Boats racing—Boats running into Harbour, T. S. Robins, 31*l*.; 10*l*.; On the Moor above Clidich—Loch Awe, J. J. Bannatyne, 25*l*.

ON THE CHEMISTRY OF POTABLE WATERS.*

It is not my intention to give an account of the functions performed by water as a physical agent; of the wonderful changes it has worked and is working upon the face of the globe; of its power as a transporting agent; nor, indeed, of the manifold purposes to which it is turned into usefulness by the ingenuity of human intellect. Yet, as a reservoir, as a store, as a source of power, I may just mention that we possess an immensity in our tidal rivers and around our coasts, which as yet is almost undreamed of in our philosophy; its magnitude is such that when viewed side by side with all the combined steam power of Britain, the latter appears insignificant and microscopic; and in the hands of a Wellington in science greater changes by far may be effected from this source than from the steam of Watt and of Stephenson. But I will lay before you some of the leading characteristics of water as employed for sanitary purposes, such as they occur to me; will point out their impurities, their source and mode of detection, examination, and possible estimation.

Passing over the modes in which chemists formerly examined water, I come to the

Nitrogen, Carbon, and Ammonia Methods.

In the present day, I believe, there are only two methods of approximately determining the value of domestic water. The first is known as Frankland & Armstrong's gasometric system, and the second as Wanklyn, Chapman, & Miles Smith's ammonia system. Between each set of inventors there exists great rivalry, each insisting upon the accuracy of their system to the detriment of the other. Of this rivalry I will merely note my belief that, theoretically, Frankland's process is as perfect as any process is ever likely to approach; while, in practice, Wanklyn's ammonia method is much to be preferred. This being so, I shall give you a brief outline of the gasometric mode of Frankland, and then proceed to a more detailed and illustrated account of that of Wanklyn, premising that the results are such as I have myself personally obtained.

* By Mr. Richard Weaver, C.E.

Frankland & Armstrong's Gasometric Process for the Analysis of Organic Matter in Water.

These chemists endeavour to show, not the actual weight of organic matter present in a given bulk of water, but that of some of its constituents, and also some of the products of decomposed organic matter, which latter is termed by Frankland "the skeleton of sewage." First, the organic carbon and the organic nitrogen. These are converted into gas, and measured as carbonic acid and as nitric oxide. Second, the nitrates and nitrites; and, lastly, the ammonia. By this means the whole of the nitrogen contained in the water is valued, and a distinct estimate is made of the nitrogen rendered harmless by oxidation, and of that which yet exists as putrescible organic matter.

The first operation is to evaporate a known bulk of water to dryness with a prior addition of sulphurous acid, to expel all carbonic acid from carbonates, and also to destroy the nitrates and nitrites; the residue now contains the whole of the nitrogen of the organic matter and the nitrogen of the ammoniacal salts; and by making a separate estimation of the latter,—through the Nessler test, to be hereafter described,—and subtracting this from the total nitrogen obtained, we arrive at that corresponding to the organic nitrogen.

The process by which these determinations are made somewhat resemble the combustions in organic analyses, but are much more complicated, and require greater delicacy of manipulation.

As an indication to the limits of this test, it is stated by Frankland that the $\frac{1}{1000}$ part of a grain of nitrogen and the $\frac{1}{100000}$ part of a grain of carbon can with certainty be determined.

I shall not enlarge upon their mode of estimating the quantity of nitric acid; I have already indicated it is done as nitric oxide and the volume of gas measured off.

But I must draw your attention to a characteristic point in all the analyses of waters by Frankland, and notably indicated in the recent report of the Royal Commission for Rivers Pollution, and in the examination of the metropolitan waters.

I refer to "the previous sewage contamination" column of such analyses. This question is a moot point with chemists, some considering it almost a worthless indication, and others insisting upon its great value in deciding the relative goodness or badness of potable water.

For my own part, I incline to think it as a somewhat vague term, and calculated to mislead the public, not as being worthless in its indications, but as really showing too little.

By the term "previous sewage contamination" would generally be implied the actual quantity of sewage with which a water was, or had been, contaminated at the period of its examination; but such is not the case, as I read Frankland's definition of the term, which, expressed in a few words, means the actual present amount of the skeletons of sewage,—of that which was, and has no reference to that which is at the present moment active and living sewage!

From which it follows that, probably, a water may contain variable quantities of sewage, and yet, according to the "sewage contamination" column of Frankland, no return would be made, and, by inference, that no sewage was present. That this is so, I may mention, a certain water was examined repeatedly by me, at intervals,—which said water shall be nameless—and I always found indications of sewage matter; and, on turning for verification to Frankland's sewage contamination column, in his analysis of the same water, I found that no previous sewage was present. Now, this may be considered as either discouraging or encouraging, as viewed from opposite motives; and yet it is easily explained from the fact of my showing active and putrescent sewage, or analogous matter, whereas Frankland's column merely shows that which was ancient sewage, but is now no longer sewage. And for this, as one ground of objection, I must protest against the term, "previous sewage contamination," as being vague and delusive.

We now arrive at the method devised by Professors Wanklyn, Chapman, and Smith for determining the organic matter in water by

The Ammonia System.

Coupled with this, I shall introduce you, somewhat briefly, to a general system of water analysis, as suggested by these gentlemen, premising that much of it is obtained from older methods, now broken up and partly re-absorbed

in modern systems. I divide the course into six divisions, as follow:—

- 1st. Hardness.
- 2nd. Chlorine.
- 3rd. Total residue and loss on ignition.
- 4th. Nitrates and nitrites.
- 5th. Ammonia.
- 6th. Organic matter.

Hardness.

The hardness of water has reference to its soap-destroying powers, and is caused by the oxides of calcium, magnesium, and iron, combining with the fatty acids of the soap forming insoluble salts; and, so long as any of the earths remain in solution, the soap cannot exercise a detergent action: hence the value of soft water for cleansing purposes. This which I now hold before you is a solution of soap in aqueous spirits of wine, and is standardised by a somewhat tedious process to an equivalent of 16 grains of calcic carbonate per gallon of water; or, in other words, corresponds to 16 degrees of hardness, and with 1,000 grains of water of such hardness, 32 test measures, or 320 grains of soap solution, will just neutralise, and cause a lather to form, on thoroughly agitating, and will last about five minutes.

Upon such a water I now operate, and note the result.

Chlorine.

The reason is for determining chlorine in a potable water that it points to a possible origin in sewage, for no sewage can exist in water without chlorides being present, sewage being rich in chlorine, especially from the urine. Yet, on the other hand, chlorine may very probably be present without any sewage, and it becomes a problem whether its source is due to sewage or to the geological character of the strata through which the water may have flowed.

The determination of the quantity of chlorine is very simple, and yet wonderfully accurate.

We first prepare a solution of argentic nitrate in pure distilled water, and to a known strength. To the water under examination we add a few drops of neutral potassic chromate, and then the silver nitrate,—as in the experiment now before you,—until a faint tinge of reddish coloured silver chromate denotes the end of the chlorine reaction; and from the amount of silver solution employed we estimate the chlorine.

Total Solid Residue, &c.

For this experiment it is essential that the quantity of water employed shall be very accurately measured, and that a delicate balance is at command, because each milligram—about $\frac{1}{1000}$ part of a grain—of residue is equivalent to 1 grain per gallon of water.

The apparatus which is usually employed for the purpose of estimating the total solid matter contained in a water consists of a small copper or tinned vessel for generating steam. Through the mouth of the vessel passes a perforated cork, and again a large glass funnel; into this latter is arranged an accurately weighed platinum dish. We now take 70 cubic centimeters of the water under examination, and place it in the platinum dish; steam, being generated in the lower apparatus, rises through the funnel, and, acting upon the platinum dish, the water contained therein is quickly evaporated—in fact, in practice, I find that about forty-five minutes are amply sufficient time for the purpose. The dish and its contents being now well dried and weighed, the excess of weight over the first weighing represents the amount of solid residue. If it is further desirable to ascertain the amount of loss on ignition, we carefully burn off all carbonaceous matter, at a faint red heat. Moistened with ammonia carbonate, well dry, re-weigh, and the difference represents the volatile matter. This process, as previously stated, is of very little value in estimating the character of water.

Nitrates and Nitrites.

These are the skeletons of Frankland's sewage, and the mode by which their quantity is determined is exceedingly elegant.

We take a retort, and introduce 100 c. c. of water, to this add 60 c. c. of caustic soda solution free from nitrates, &c. The contents are now distilled until about 100 c. c. remain within the retort, and until the Nessler test is incapable of showing ammonia. Into the retort on cooling is added a small piece of the metal aluminium; it is closed with a cork, through which passes a small tube in the manner I now show you; it is filled with pieces of broken-up tobacco-pipe, or analogous matter,

and moistened with dilute chlorhydric acid. On standing for a few hours, the action is complete; the whole of the nitrates have been resolved into ammonia, and the ammonia, being distilled off, its quantity is determined by the Nessler test.

The process is so exceedingly delicate that it may be termed microscopic; indeed, a very small fraction of a grain of nitrates per gallon being readily ascertained. As to the relative value of the nitrates in a water in determining its quality, there is much difference of opinion, some chemists allowing that considerable quantities may be permitted without detriment, whereas Frankland would probably condemn a water if even a gallon contained but half a grain of nitrates!

Ammonia.

The estimation of ammonia in water may fairly be considered to belong to the domain of microscopic chemistry when the Nessler test is employed.

I will first describe this test. We dissolve 50 grammes of potassic iodide in a little hot distilled water, placing the dish in a water-bath, and adding a strong solution of bi-chloride of mercury. We continue the mercury solution until a point is reached at which the red precipitate formed no longer dissolves on agitation. We then filter, and to the filtrate add 150 grammes of solid caustic soda in aqueous solution, and then dilute the whole to the volume of 1 litre. A further addition of about 5 c. c. of mercuric chloride imparts sensitiveness. Allowing all sediment to settle, and pouring off the clear fluid, we have the Nessler reagent such as I now show to you.

If we take a water containing a trace of ammonia, and add the test, we obtain a yellowish brown colouration; and according to the intensity of this colour we calculate the amount of ammonia present.

We have now arrived at a stage in water analysis when we determine the presence of matters that are of prime importance in judging of quality; that is, the ammonia and the urea, and it is astonishing the minute difference in quantity which marks the point between waters that are foul and stinking, and waters that are good and wholesome.

The Albuminous Substances.

The most important of all the substances to be sought for in water intended for domestic purposes, is undoubtedly the nitrogenous organic or albuminous matter, and it is primarily by this test we judge of the antecedents of water, and the character and source of its contamination. It is simple and elegant.

To the remnants of the last experiment we add a strongly alkaline solution of potassic permanganate, and distil off not less than 200 c. c., and until Nessler ceases to show the presence of ammonia; for you must understand that the action of the permanganate is to cause most of the nitrogen from the organic nitrogenous matter—not nitrates—to be evolved as ammonia, and by estimating the quantity of this we have a fair idea of the quantity of organic matter on multiplying the result by ten.

The delicacy of these tests is truly wonderful, for we can directly estimate ammonia in water when its weight does not exceed the ~~weight~~ part of the water in which it is dissolved; and when we concentrate by evaporation or distillation, we increase its delicacy at least ten fold. We have now arrived at the end of our chemical examination of potable waters, and I will just add a few words as the characteristics of really good water.

It should be clear, colourless, and transparent when viewed through a considerable stratum; it should be perfectly free from smell, both at the ordinary temperature and when heated to about 90° Fahr. It is well also if a little lime or baryta water be added previously to warming; its hardness must not be excessive, and, above all other considerations, it must be free from sewage matter. This is of vital importance, for we have it on record for years past, and, in fact, there is not a summer or an autumn comes without hundreds of human beings that are carried away to an early grave from the use of water polluted with sewage; and excepting in the very vilest of waters, its presence cannot be detected [excepting by competent chemical examination, for it is an ascertained fact that waters which are clear and fair to look upon, that are beautiful and sparkling to the eye, may, nevertheless, be veritable poison-cups.

Before closing, something will possibly be expected upon the second phase of water—that is, sewage. Much has been said and written

upon this subject of late years; but very little has been accomplished towards solving the problem of what shall we do with our towns' sewage, as you are aware there are at this present moment three systems in vogue; viz.:

Deodorisation with disinfection, of which the ferric chloride process is a type.

Secondly, the precipitation process, by which a portion of the mechanically-suspended matter in sewage is thrown down, of which the lime, the alum, the clay, and Sillar's processes may be given as types. In this class are attempted to be accomplished the objects of the first, and also to derive a profitable manure; and I scarcely need remind you that they generally fail in the first object, and some of them in the second.

Thirdly, deodorisation disinfection, and a profit is endeavoured to be attained by the irrigation of land with sewage. This is a very ancient mode; indeed, it appears to be coeval with man. Like everything else, chemists and others differ as to whether this system of treatment is really efficient, some contending that the effluent water flowing from off the land, after its functions are here ended, is not in a much better condition than when it was turned on. Now, this objection seems to me, after some years' consideration of the subject, observation in various parts of the world, and a trifle of experiment, to be a very futile objection; for it is evident, upon reflection, that a sufficiency of filtration through, and not over, porous soil has not been attained; for, I take it, the absorbent power of soil will not be called in question, or what is the use of manure?—it must needs be washed away by the first smart shower. There are others—for example, the Rivers Pollution Commissioners—who contend, and I go with them a long way, that the water, as a rule, flows away remarkably pure, deprived of 90 per cent. of its impurities—the amount I give from memory—and this, you will understand, is in practice; but I go further, and contend that 99 per cent. should be removed, being, however, fully aware that greater filtration is requisite,—not ordinary filtration, but that through land, nature's grand disinfectant.

There is, however, another objection to irrigation, viz., that a nuisance and probable danger are created by putting sewage upon land in the first instance; that is, the sewage being in an active stage of decomposition on arriving at the place of absorption by the soil, the gases of decomposition are diffused through the air at all points between the places of absorption and first contact with the open air. This I conceive to be a feasible objection, within certain limits, upon these grounds:—It is a condition of all matter to undergo decay and change through decomposition; it is thus with sewage, especially animal sewage,—a medium between that which was and that which will become life. Under certain conditions, especially of temperature, this decomposition is actively promoted; and I concede that from some causes,—either of distance or of time,—a sufficiency of decomposition may have been attained to create a nuisance and a danger at the points of distribution of the sewage in question. Now, this is a condition I have long foreseen may probably arise, and have from some attention and a little experiment endeavoured to contribute my mite towards the knowledge tending to a solution of the problem.

I need not give you any details of all the schemes that entered my mind and were developed by experiment: suffice it that that which I found the most successful was chlorine, another was oxygen, but I will now only trouble you with the former. This from limited experiment I find to answer the required purpose; it acts instantly upon the organic matter of sewage; upon that in a putrescent state, the gases are fixed or decomposed, ammoniacal salts are secured in the water, deodorisation and disinfection are so effected that after a lapse of even weeks not a trace of unpleasant odour is perceived, and when this sewage is freed from suspended matter you cannot from mere external evidence tell it from the finest potable water.

The process I propose is something after this manner: chlorine to be generated by the perpetual regeneration scheme of Walter Weldon, in which chlorine is obtained from chlorhydric acid through the agency of manganic oxide, the same oxide being used over and over again for hundreds of times; so that the expense is reduced to that of the chlorhydric acid, the labour, and wear and tear of plant; and you are aware this acid is cheap enough, being a waste product of the alkali works, and can be purchased in a concentrated state at 40s. or 50s. per ton,—

a sufficiency, I believe, to treat millions of gallons of sewage.

I shall now conclude this exhaustive lecture,—that is, exhaustive of your patience and good-nature—not the subjects, for of these it is a mere outline,—and give you some idea of the value of sewage, from a calculation I made recently, based upon an average of fifty samples of Leicester sewage. The value of the ammonia alone in a year's flow, if placed upon the market and sold at current rates, would realise very nearly 40,000*l.*; and this substance, although by far the most valuable constituent, is not the only one, for we have the phosphates, and the alkalies; and others; and you will agree with me that there could be no honour too great for the State to confer upon that man who shall effectually solve this problem of utilisation of waste, although I do not believe it will ever fall to the lot of any individual to achieve undivided success, but will rather burst forth spontaneously from many minds, and will attain success, as have all the great events of modern days,—like our railways, our steamers, and our electricity.

FILTRATION OF TOWN SEWAGE.

The new Royal Commission, appointed in 1868 to inquire into the best means of preventing the pollution of rivers, took up the subject where the former Commission had left it,—that is, after the Thames, the Lea, and the Aire and Calder basins had been reported upon, and have now issued their report on the Mersey and Ribble basins. They come to the same conclusions as the former Commission did in respect of the irrigation of land with town sewage being the best means of preventing the pollution of rivers with it, as well as being the most profitable in application; but they state the case in a different way to that in which the former Commission put it. They say that sewage may be sufficiently purified to be allowed to flow into any river or other watercourse, from which it is not intended to take water for domestic use, by filtration through sand or porous soil, as distinguished from the view that some persons take of irrigation, which is, that the sewage is purified by running over the surface of the land in a thin sheet, parting with some of its manurial elements to the plants, and storing the remainder in the top soil for the use of the next crop, or rather for the use of the crop first sown after re-ploughing the land; whereas the present Commissioners say that it is the filtration through a sufficient thickness of sand or porous soil that constitutes the efficiency of this method of utilising sewage; and that, therefore, its purification is insured by passing it through constructed filter-beds equally well as by passing it through the natural soil of the land. This they have ascertained by experiments with several kinds of soil, with sand, and with sand mixed with coarsely powdered chalk. The difference between filtration through constructed filter-beds and through the soil of the land is one not of efficiency of purification, but of the profitable application of the sewage, the former method being unremunerative, while the latter is remunerative. But it is consolatory to know that in places where land cannot be had for irrigation, the sewage may yet be sufficiently purified to be allowed to flow into rivers, although the value of the solid part of the sewage which is retained may not be of much value. The value of it will evidently depend on the quickness with which it can be extracted in respect of the length of the time elapsing from its entry into the sewers to its extraction at the outfall. Where the gradients are considerable, and the mean distance of the outfall from the town is not very great, it may be arrested in a fresh state; and, mixed with street sweepings and other town refuse, may become of considerable value; while, where the gradients are slight, and the outfall at a greater mean distance from the town, it may become so far decomposed in its transit as to be of no value as a manure.

The Commissioners estimate that for a town where water-closets are in general use (therefore requiring a larger area than would be required where they are not so numerous), 5 acres of filtering surface, and a depth of material of 6 ft., are sufficient for a population of 10,000. According to their experiments, something of this depends upon the nature of the soil or other material used for the filter-bed, the qualities of various soils for this purpose differing; for while soil procured from Dursley, in Gloucestershire, purified sewage at the rate

of 9.9 gallons per cubic yard per day, soil from Hambrook, near Bristol, did not satisfactorily purify more than 4.4 gallons per day per cubic yard. Again, soil from Beddington purified sewage of the same strength at the rate of 7.6 gallons per day, while that from Barking did not purify it at a greater rate than 3.8 gallons, or peat from Leyland Moss, near Preston, at a greater rate than 4 gallons per day per cubic yard of material.

Considering that "filtration" has already often been employed to purify sewage, and has always hitherto failed, it is rather startling to see it so confidently recommended, until we remember that both the methods of filtration that have failed for sewage also failed for water many years ago; that is to say, the horizontal method and the upward method, while, as soon as the late Mr. James Simpson rearranged the filter-beds of the Chelsea Waterworks at Thames Bank many years ago, and made the water to descend instead of ascend through the filtering medium, the question was then and thereafter settled as to whether water should be filtered upwards or downwards. Every engineer since that time,—every engineer, that is to say, who has had the knowledge to perceive the difference between a true and scientific and a false and empirical method, or who has had the honesty to acknowledge that he was not the inventor of the practice he has adopted,—all these men have adopted the downward system of filtration of water. And so we find the Commissioners—or, shall we rather say, Dr. Frankland, one of them?—condemning the system of upward filtration now in practice at Ealing, and giving the reason why downward filtration is so effective in purifying sewage. The system at Ealing is to force the sewage upwards through a filtering medium constantly, thereby effecting no proper purification at all; but by making the sewage to descend for six or twelve hours through one bed, then shutting it off from that bed, or compartment, and turning it on to another for a like space of time, and so alternately, the descent of the sewage through the interstices of the material on either bed is followed by atmospheric air; the air, that is to say, that occupied these interstices before the sewage began to descend, and has been used up in oxidising and transforming, and therefore purifying, the former quantum of sewage, is replenished after the descent of each quantum of sewage through each bed, and so by continual periodical renewals of the proper aëration of the filtering medium it becomes a constant purifier of the sewage; for, although this method of filtration in the case of water has mostly been called a mechanical one only, yet in the case of sewage filtration, the same method is said by the Commissioners to be both mechanical and chemical.

In order that there should be no ambiguity about what they recommend, and its attainment, they give a standard of impurity beyond which they think the water of sewage ought not to be admitted into rivers or other watercourses. They suggest that the following liquids be deemed polluting and inadmissible into any stream:—

"Any liquid containing, *in suspension*, more than 3 parts by weight of dry mineral matter, or 1 part by weight of dry organic matter in 100,000 parts by weight of the liquid.

"Any liquid containing, *in solution*, more than 2 parts by weight of organic carbon, or .3 part by weight of organic nitrogen, in 100,000 parts by weight.

"Any liquid which shall exhibit by daylight a distinct colour when a stratum of it, 1 in. deep, is placed in a white porcelain or earthenware vessel."

So far the standard is applicable to any town. But the Commissioners, having before them the question primarily of the pollution of the rivers Mersey and Ribble, which traverse the manufacturing part of the county of Lancaster, found it necessary for that district to prohibit,—suggest, rather, that they should be prohibited,—many kinds of pollution peculiar to the manufactures of those parts, *e.g.*—

"Any liquid which contains, *in solution*, in 100,000 parts by weight, more than 2 parts by weight of any metal except calcium, magnesium, potassium, and sodium.

"Any liquid which contains, whether *in solution* or *suspension*, in chemical combination or otherwise, more than .05 part by weight of arsenic.

"Any liquid which, after acidification with sulphuric acid, contains, in 100,000 parts by weight, more than 1 part by weight of free chlorine.

"Any liquid which contains, in 100,000 parts by weight, more than 1 part by weight of sul-

phur, in the condition either of sulphuretted hydrogen or of a soluble sulphuret.

Any liquid possessing an acidity greater than that which is produced by adding 2 parts by weight of real muriatic acid to 1,000 parts by weight of distilled water.

Any liquid possessing an alkalinity greater than that produced by adding one part by weight of dry caustic soda to 1,000 parts by weight of distilled water."

The opinion of the former Commission was that sewage could not be filtered. "As applied to sewage, disinfectants do not disinfect, and filter-beds do not filter," they said. Sewage applied constantly to a filter-bed on the upward system does not purify sewage continually, certainly; and if that was the system meant to be understood, the former Commission were clearly right in their statement, but on the downward system the case is different. Any one who remembers the condition of the Thames when the Lambeth Company took their water from a point of the river near Hungerford Bridge, and when the Chelsea Company took their supply from Thames Bank, may well compare the water then taken from the river for the supply of a large part of London with the town sewage of to-day. The reports of the engineers were constantly that the water was "turbid;" but that word, as now used sometimes to define the condition of the Thames water, conveys no idea of the state of the water at that time. In comparison with the turbidity now sometimes said to exist, it might be called pea-soup, or sludge, and yet this very foul water was passed through filter-beds on the banks of the river, after subsidence in reservoirs, and transformed into the brightest and most pellucid water, as drawn from the filtered water-well. No doubt the surface of the filter-beds often required cleaning; the mud deposited soon stopped up the pores of the sand so that no more water would pass, and this necessity of frequent shutting off and turning on of the water may have been the cause, as illustrated by the view the present Commission take of the subject, why these filter-beds were so perfect in action under such difficult circumstances; the air filling the interstices of the filtering medium—sand and gravel—after the mud was scraped from the surface of the sand, was replenished at short intervals, and so kept the filter-bed continually perfect.

Manchester being within the watershed of the river basin inquired into by the Commission, it became necessary for them to institute an inquiry into the merits of the privy and ash-pit system, as against the water-closet system, especially as that city is the great stronghold of this first-named system.

Agreeing with every other impartial inquiry into this subject, the present Commission condemn it. They illustrate the case in a remarkable way. They suppose all dwelling-houses, warehouses, &c., to be removed, and only the privies left—nearly 60,000 of them in Manchester and Salford—rows and streets, and crowds of them—scattered about almost as thickly in places as the heaps of manure upon a field that has just received a dressing from the dung-cart—each heap here, however, no mere barrow-load once a year, but a constant collection and continual soaking of filth, which has for years been polluting every corner to which air or water could have access. *Is this the site on which to build a healthy town?* Would it not be the first desire of every sensible man to sweep this filth away, to drain and aerate, and, if possible, to sweeten this land before a single dwelling-house should be built?

On the great question of establishing a River Conservancy Board, the present Commissioners agree with the recommendations of the former Commission, to the effect that it is highly desirable that such a Board should be established for every river basin; but on the secondary question of how and of whom it should be constituted, the chairman, Sir W. Denison, does not agree with his colleagues, Dr. Frankland and Mr. John Chalmers Morton, and on that subject they give separate reports. The chairman advises a parochial system; that the officers of such parishes as the stream flows through should be the persons responsible for the state of the river flowing through their respective districts, but, anticipating abuse of the powers placed in their hands, he recommends that they be made sufficiently responsible to the general government to enable the latter to check or prevent any such abuse, or to notice and reprove, and even to punish, all negligence or unfairness in the mode of action of the former. The initiation

of action is to be the complaint of neighbour against the conduct of neighbour.

Let us take a supposititious case, and inquire how this would be likely to work in practice. Suppose two of the uppermost mills or towns on a stream to use the water that comes to them with satisfaction to themselves, but that one or both of them foul it so as to be unsatisfactory to the third person or town, the one below them. Of whom is the third party to complain? And of course, the difficulty is increased if three or more parties are satisfied, and the fourth or fifth complains. The boundary of the district over which each parochial Board is to have jurisdiction being common to the parish injured to determine how are the officers of the parish to determine who has caused the injury? If all are complained against, who shall determine the degree in which each has contributed to the pollution of the river?

Dr. Frankland and Mr. Morton recommend that, inasmuch as there exist at present no local bodies competent to deal with questions connected with efficient river conservancy, capable of detecting pollutions and enforcing remedies, it will be necessary to call into action an authority possessing greater capacities and powers than those of the existing corporate bodies or local boards. The duties of this authority would be of two distinct kinds: the one would be those of a river police, employed in the detection of offences, and in obtaining the conviction of offenders; the other would include the investigation of and decision upon various works connected with rivers, proposed by either towns or individuals, such as schemes for water supply and for the defecation, filtration, or utilisation of sewage and other polluting matters, while local boards could obtain information on these points only from persons capable of investigating them. Nevertheless, under the second division of the duties of the central authority, the co-operation of the local corporations would be required for the efficient discharge of them. Indeed, if guided and assisted by a properly qualified central court, the present local boards would be quite competent to meet all local difficulties and to supply all local wants. A central authority would not extinguish the corporations and local boards at present existing in the river basins. It would, the Commissioners believe, materially promote the energy of local action by removing the obstacles which at present hamper it, and by giving a prompt decision to the questions which it has to solve.

SOMETHING ABOUT HIGHGATE.

MR. WILLIAM HOWITT, the author of many delightful works, has given, in his recent book, reviewed in these columns when it first appeared, particulars respecting Highgate.* From the top of the house he occupied there he could see the vast mass of all-devouring London spreading itself and ever increasing on all sides. Long after the Norman Conquest all this was the quiet Forest of Middlesex; for Fitz Stephen (c. 1175) thus describes its suburbs:—

"There are cornfields, pastures, and delightful meadows, intermixed with pleasant streams, on which stands many a mill, whose clack is grateful to the ear. Beyond them a forest extends itself, beautiful with woods and groves, and full of the lairs and coverts of beasts and game, stags, hawks, boars, and wild bulls. These wild bulls were probably buffaloes, or like the beasts of Andalusia, in Spain, which, I presume, are small."

They were more probably like the celebrated cattle at Chartley and Chillingham (Northumberland). The forest was full of yews, which supplied the bows for the warriors of Cressy and Agincourt. It was disafforested in 1218, in the reign of Henry III. At this time, we must remember, that the whole population of England was only about 2,150,000. In 1377 London only had 35,000 people. Henry VIII. made a proclamation that as he was "desirous to have the game of hare, partridge, pheasant, and heron preserved in and about his honor, at his Palace of Westminster, for his own disport and pastime; that is to say, from his said Palace of Westminster to St. Giles-in-the-Fields, and from thence to Islington, to our Lady of the Oke, to Highgate, to Hornsey Park, to Hampstead Heath, and from thence to the said Palace of Westminster, to be preserved for his own disport, pleasure, and recreation," &c.

* "The Northern Heights of London; or, Historical Association of Hampstead, Highgate, &c." By William Howitt. London: Longmans, 1869.

Queen Elizabeth hunted in this preserve, and took up her quarters in Canonbury Tower. The residence of Sir Walter Raleigh still remains as the "Pied Bull" public house, Islington, not far from this Tower. At the latter end of the reign of Elizabeth the population of England was only about 5,000,000, and of London about 140,000. The Queen was so afraid of its increase that she ordered no more houses to be built. The Stuarts did the same, but all to no purpose. In 1625 there were only twenty hackney coaches in London; but Charles I. disliked them "because they obstructed the streets, and rendered them dangerous to his Majesty, his beloved consort, and the nobility." Very soon we shall see London increasing at the rate of 500,000 every ten years, an amount of population which it did not reach from the Conquest till the end of the seventeenth century.

Highgate is situated on a hill 400 ft. above the level of the sea, and for a long time was a mere hamlet of houses scattered here and there amid the forests. It was not till the fourteenth century that the Bishop of London allowed a highway to be cut through his park and woods of Harringhay (the hare-ingo-hay, or meadow and wood of hares). A gate was erected and toll taken, and the place is said to have been called Highgate from this gate; but what was the name of the place before that time is not known. The bishopric of London had extensive woods and demesnes beyond this gate reaching to the gate of Hampstead Heath, now the Spaniards Tavern, to Finchley, where the bishop had a palace.

The chapel of Highgate which occupied the site of a hermit's cell, was granted by Bishop Grindal, afterwards Archbishop of Canterbury, in 1565, to a new grammar-school, erected and endowed the year before by Sir Roger Cholmeley, late lord chief justice. This was pulled down many years ago, and the church built in another part of the village. Among the tombs, however, was that of Coleridge, the poet and philosopher. The church was built in 1832, at a cost of 10,000*l.*, in the parish of St. Pancras; but Highgate was soon afterwards made a district of itself.

The unfortunate Richard II. was conveyed through Highgate, in 1398, on his way from the North, by his haughty rival, Bolingbroke, hooted by the rabble. In 1461, Thomas Scrope, baron of the Exchequer, was beheaded by the insurgents in Highgate. In 1745 the London train-bands marched through Highgate to encamp on Finchley Common, to defend the metropolis against Prince Charles and the Scots. Mr. Howitt remarks that he has seen a man, then 112 years old, who, as a boy, witnessed the battles of Preston Pans and Culloden. On West Hill is the Fox and Crown Tavern. Sixteen days after our Queen came to the throne, she was descending the hill with her mother, the Duchess of Kent, when the horses took fright, and dashed down the hill. The landlord, Mr. Turner, succeeded in stopping them; and if he had not done so, there would probably have been a change in the succession to the throne. Turner was allowed to place the royal arms over his door, and received a handsome present.

Coleridge settled at Highgate, in the house of Mr. James Gillman, surgeon, about 1800. At an early period he had used opium, and could not shake off that unhappy bondage. His physical strength gave way, and his mind was unstrung. "Here," as Carlyle says, "he sat looking down on London and its smoke-tumult, like a sage escaped from the insanity of life's battle, attracting towards him the thoughts of innumerable brave souls still engaged there,—heavy-laden, high aspiring, and surely much-suffering man." During this time he continued his literary work, and was visited by many of the chief literary men of the day. He died July 25, 1834, aged 61.

Mr. Mac Dowell, the sculptor of the "Reading Girl," resides at Highgate. His sculptures of "Love Triumphant," and "Death of Virginia," executed for Mr. Wentworth Beaumont, place him in a high rank in the artistic world. His son is a young sculptor of promise. In the old coaching days, travellers for the north stopped at Highgate, and at whichever of the nineteen public-houses it might be, "out came the horns, fixed on a pole, and the passengers were sworn to eat no brown bread when they could get white, unless they liked it better, and not to kiss the maid when they could kiss the mistress, unless they liked her better;" and a lot of other nonsense. This probably relates to the old passage-toll levied on horned cattle, and gathered

by some park-keeper, who carried a staff with horns to show his authority.

At Fitzroy Park, an outskirt of Highgate, Dr. Southwood Smith lived, a very modest and clever man of science. He was physician to the London Fever Hospital, and wrote a valuable "Treatise on Fever," and "Animal Physiology," for the Society for the Diffusion of Useful Knowledge. In 1837, he was appointed by Government to inquire into the state of the poor, and many sanitary reforms resulted from his investigations. Dr. Smith died at Florence in 1861, and was buried in the Protestant cemetery there.

Highgate has retained more of its rural character than any other village in the suburbs of London. It has its old buildings, elm and lime tree avenue, and around stretch fields and hills. The house and estate of Caen Wood are the finest feature of the immediate vicinity of the village. The house is large and massive, of yellow stone, and was erected in the style of the reign of George III.; Robert Adam was the architect, and he also built Luton House and Gosford House. The rooms in Caen Wood House are lofty and convenient. The park and grounds are so arranged, that one has all the sylvan exclusion of a remote country mansion. Walks, two miles in extent, conduct you round the park, which contains fine beeches and cedars of Lebanon. Mr. Howitt says a custom is kept up here which smacks of the old feudal times. Every morning, when the night watchman goes off duty, at six o'clock, he fires a gun, and immediately three long whistles are given on a horn to call the servants, gardeners, and labourers to their employment. The horn is blown again at breakfast and dinner hours, and at six in the evening for their dismissal.

The confederates of Guy Fawkes fled into Caen Wood, on the failure of the Gunpowder Plot. The hill at some distance from it is still called Traitors'-hill, and here it is supposed they stood waiting for the explosion, to assure them that the plot was successful. William Paterson, the founder of the Bank of England, lived near here: he was a Scotchman, and very clever. He collected the springs of Caen Wood into reservoirs, and supplied Hampstead and Kenilworth Town, till the New River Company was established.

Caen Wood House (or Kenwood House, as it is now generally called), in 1661, was the property of a Mr. John Bill, who married a Lady Pelham, supposed to be the widow of Sir Thomas Pelham, and a daughter of Sir Henry Vane. It afterwards became the property of the Earl of Bute, who married the only daughter of the celebrated Lady Mary Wortley Montagu. The earl sold the estate in 1755 to Lord Mansfield, who, on his death, devised it to go with the title to his nephew, Lord Stormont, whose descendants now possess it. Mr. Howitt gives a capital sketch of the life of William Murray, fourth son of Viscount Stormont, afterwards Lord Mansfield. His father had fourteen children, and was very poor, so that they lived chiefly on oatmeal, porridge, and salmon. Willie was sent to the grammar-school of Perth. He rode on his pony from Scoon to London, being then fourteen years of age, with a bag of oatmeal hung from his neck. He entered Westminster school, and gained a good deal of learning. He pleaded at the bar, and a silvery-toned voice won him many admirers. In 1742 he became Solicitor-general, and eventually Lord Chief Justice of the King's Bench, and Chancellor of the Exchequer, with the title of Earl of Mansfield. He first decided that no slave can remain a slave in England. He was, however, against the liberty of the press, and supported the practice of pressing seamen. Lord Campbell tells us he had no heart; all he did might have been done from a refined calculating selfishness, with a view to his own credit. He had no warmth of affection; he formed no friendships; and he neither made exertions nor submitted to sacrifices purely for the good of others. ("Lives of the Chief Justices," ii, 576).

Oliver Cromwell built Cromwell House, a solid red-brick mansion, about the year 1630; but he is thought never to have made more than an occasional visit to it. Pickett, in his "History of Highgate," says, "Cromwell's House was evidently built and internally ornamented in accordance with the taste of its military occupant. The staircase, which is of handsome proportions, is richly decorated with oaken carved figures, supposed to be of persons in the general's army, in their costume; and the balustrade filled in with devices emblematical of warfare. On the ceiling of the drawing-room are the arms of General Ireton: this and the other ceilings of

the principal apartments are enriched in conformity with the fashion of those days. The proportions of the noble rooms, as well as the brickwork in front, well deserve the notice and study of the antiquary and the architect." The figures here mentioned stand on the posts of the staircase.

Andrew Marvell, the patriot, had a house at Highgate. He was the son of a clergyman at Hull. He became secretary of Earl Carlisle and assistant Latin secretary, with Milton, to Cromwell; and in 1659 became Member of Parliament for Hull. He mercilessly exposed kings and bishops. Charles II. issued a proclamation offering a high reward for his apprehension; and he retired to Hull, where he died soon afterwards, in his fifty-eighth year. Marvell was the first to discern and proclaim the magnificent genius of "Paradise Lost."

Not far from Cromwell House once stood Arundel House, the suburban residence of the Earls of Arundel. Norden mentions it in his "Survey of Middlesex," in 1596. The King slept here in 1624. Two interesting historical events took place here—the flight from it of Arabella Stuart, in the reign of James I., and the death of the Chancellor Bacon, about fifteen years afterwards. Arabella Stuart was descended from Henry VII. Had James I. had no children, she would have been the next heir to the English throne. Elizabeth put her in prison to prevent her marrying; and, of course, James was not more favourably disposed towards her. William Seymour, second son of Lord Beauchamp, eldest son of the Earl of Hertford, fell in love with Arabella, and they were secretly married. James was furious when he heard of it, and sent the husband to the Tower and the wife to Lambeth. He then ordered her to be sent to the Bishop of Durham, and was only prevented by a fever coming on during the journey, and was brought back to Highgate, to Arundel House. Here she planned an escape for herself and husband, who was in the Tower, and she succeeded in getting away disguised in men's clothes, and got on board a French boat, which was waiting for her. Seymour escaped from the Tower disguised as a physician, but the boat containing his wife had put to sea, and he engaged with a captain of a collier to carry him to Flanders. His escape was soon discovered, and Arabella was taken, but Seymour escaped. She was taken to the Tower, and soon went out of her mind, and died about four years afterwards. Her husband was permitted to return after his wife's death, became Marquis of Hertford, and fought for the Crown in the civil war, though he had married the sister of the Earl of Essex, the Parliamentary general, and Charles II. restored to him the title of the Duke of Somerset, which had been forfeited by his great-grandfather, the Protector.

In 1626 the man who revolutionized philosophy and laid the foundation of all our modern progress in science, died here. For five years he had been a fallen and disgraced man, banished from court, and living in retirement. We owe him our gratitude for his "Novum Organum," but he certainly took bribes as a judge, which does not give us a very high idea of his morality. He kept great state, and his ostentation of liberality was somewhat pitiful. On his trial he delivered in a list of bribes taken by him on twenty-eight cases, and these amounted to 10,860*l.*, equal to 60,000*l.* of our money. He got chilled when trying an experiment respecting preserving bodies in snow, and then slept in a damp bed, and died at Arundel House, in the sixty-sixth year of his age.

On descending the hill not far from the Archway Tavern, is a massive stone, bearing this inscription:—

"WHITTINGTON STONE.

SIR RICHARD WHITTINGTON, LORD MAYOR OF LONDON.
1397 Richard II.
1409 Henry IV.
1419 Henry V."

This stone takes the place of one at which Sir Richard, when riding here, having dismounted and walked up the hill, mounted again. It is not our intention to venture to disprove the cast story, but, at any rate, Whittington was a great man in his day. In the reign of Edward III. he made the king a present of 10,000*l.*—a vast sum in those days—towards the expenses of the war with France. Stowe says that he dealt in wool, leather, and pearls. He entertained Henry V. and his queen at Guildhall; and the king having praised the fire made of choice woods and spices, said he would make it still more agreeable to his Majesty. He then threw into it the king's bonds

for 10,000 marks due to the Mercers' Company, 12,500 to the Chamber of London, 12,000 to the Grocers; to the Staplers, Goldsmiths, Haberdashers, Vintners, Brewers, and Bakers, 3,000 marks each,—of course an immense sum. Whittington built a church in Vintry Ward, almshouses, and a college; rebuilt Newgate, repaired Guildhall, and did many other useful works.

Mr. David Williams, founder of the Literary Fund, and minister of the Presbyterian Chapel, lived at Highgate. He was born near Cardigan in 1738, and was educated at a college of Dissenters at Carmarthen. He became minister of a small congregation at Frome, in Somersetshire, but soon removed to a more important charge at Exeter. The elder members of his congregation objected to his entering into social pleasures, but, as he happened to know something of their own private character, they agreed that if he left Exeter he should take the office of pastor at Highgate. In 1770 he appeared as the defender of Mossop against Garrick, and wrote the actor a letter, which resulted in Mossop being liberated. Williams detested anything like intolerance or bigotry. He retired to Chelsea after a time, and during his residence there he gave an asylum to Dr. Franklin at a period when there was great excitement against him. Mr. Williams proposed a scheme for universal uniformity of worship, and delivered a set of lectures illustrating this principle in the chapel in Margaret-street, Cavendish-square. In 1782 he published a work called "Lectures on Political Liberty," which was translated into French, and procured him an invitation to Paris to assist in drawing up a constitution for France, but his advice was not taken, and the Revolution followed.

J. P., Jun.

GREAT PRIZES FOR ART WORKMANSHIP.

THE Council of the Society of Arts having in view the International Exhibitions about to take place under the management of the Royal Commissioners for the Exhibition of 1851, think it well to suspend for a time the form hitherto adopted in offering prizes for art-workmanship, believing that the change is likely to be beneficial to the object the council have at heart, viz., to see the art-workmen of the United Kingdom occupying a good position in the coming International Exhibition in comparison with those of other countries.

With this view, the council have decided upon offering a series of rewards for special excellence on the part of all concerning in the satisfactory production of works of industry of the highest character. They consider that they can most effectually ensure their object by offering to manufacturers the highest distinctions they have in their power to confer, and to workmen liberal money premiums. They desire to obtain, from those who may be willing to compete for the prizes they offer, specimens of art-manufacture, which will have to be sent to the Society's rooms by the 14th of January, 1871.

These will be immediately judged upon their merits, and the premiums enumerated below will be awarded. An endeavour will be made to effect arrangements by means of which every object receiving a premium, or selected for the distinction of being exhibited, will be placed in the coming International Exhibition as a contribution on the part of the Society of Arts, showing the results of recent efforts made to improve art-workmanship in this country.

The specimens of manufacture sent in, in competition for the above rewards and premiums, will have affixed to them the name of the designer and of the workmen, in each special branch of industry involved in the execution of the work. Every workman will be eligible to receive money premiums proportionate to his merits, and to the degree in which he may have contributed to the successful results of the whole; while the manufacturer may receive the gold or silver medals of the Society.

The Society hopes that they may receive objects enabling the judges to award the Society's gold medal to manufacturers; and the Society's silver medal to manufacturers or designers—accompanied in the latter case, if the circumstances appear to call for it, with money premiums; and to the art-workmen, money premiums from 3*l.* to 20*l.*, and to the extent in the whole of 500*l.*

These works may obviously include specimens not only of the taste of the designer, but of the skill of the carver, inlayer, metal-worker, chaser, bronzist, engraver, china-painter, die-sinker,

cameo-cutter, glass-worker, enameller, mosaicist, and other art-workmen, either separately or in any arranged combination.

It is thought better not to define too closely the objects of manufacture likely to result from any such combination; but, by way of illustration of what the Society hopes to receive, may be mentioned the following:—

A cabinet with glazed doors, for the exhibition of articles of *verru* of the highest character.

A toilet-glass suited for the boudoir of a lady of rank.

Any combination of goldsmiths' and silversmiths' work, with elaborate glass fittings, for the centre of a dining-table.

A chamber-organ, piano, or other musical instrument, combining enamels, inlays, marquetry, and metal work.

A casket or other personal jewel, executed with enamels, chasing, &c.

A case for a Bible, presentation volume, or any rare book, involving carving, inlaying, marquetry, and precious metal work.

No object involving combined labour for its production will be eligible for reward, unless accompanied with the names of all those engaged in its production, to the most meritorious of whom—whether their works may be exhibited in the rooms of the Society, or in the International Exhibition—every effort will be made by the Council to give publicity, and attract attention.

Such combinations between the manufacturer, designer, and various workmen, will not preclude the award of premiums to individual workmen producing any object single-handed.

By way of illustration of the class of objects likely to be so produced, and to be highly regarded by the Society, the following may be mentioned:—

A drinking-cup.

A centre-piece for flowers in blown or twisted glass, decorated with filigree, or enamel colours, or by combination with metal-work.

A candelabrum in wrought iron, brass, bronze, or other metal, with inlays, enamelling, damascening, &c.

A flower-box in modelled and painted china or earthenware.

A carved or modelled clock-case.

A carved or modelled chimney-piece.

The Council will far more highly esteem grandeur and beauty of style, invention, or elegant simplicity, than they will richness or minute elaboration.

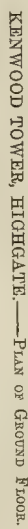
We earnestly commend these proposals alike to manufacturers, designers, and workmen.

KENWOOD TOWER, HIGHGATE.

KENWOOD TOWER, now being erected for Mr. Edward Brooke, will have the external walls faced with Loughborough red bricks and rubbed Reading red brick quoins, all the dressings of the windows and other stonework [being of Donkton freestone. The chimney-shafts will be of various patterns, and built up in small moulded bricks, supplied by Gumlin, of Cassy. The roofs are to be covered with ornamental red and dark grey tiles. The dining-room will have a moulded and carved ceiling in wainscot; also dado doors and window jambs, all of wainscot framing, moulded on the solid. The door parquetry; the chimney-piece will be modelled and carved, with various woods and marbles: it will be the whole height of the room, and worked into the cove of the ceiling. The principal staircase is to be of wainscot, carved, of Elizabethan design, with an open-timbered ornamental roof, coloured. The billiard-room, ante-hall, and principal hall will be fitted up with pitch pine, of similar design to the dining-room. The upper portion of the windows in the ground-floor rooms is to be filled with stained glass, supplied by Heaton, Butler, & Bayne, the subjects to be suitable to each room. There will be a stained-glass window, too, on the principal staircase, filled in with the armorial bearings of the Brooke family; in the hall, large stained windows, with subjects from well-known fables. Polished marble columns and carved capitals are used inside, both in staircase, hall, and drawing-room. The conservatory and vineries will have an entrance from the dining-room.

Mr. E. M. Ward's picture, "Judge Jeffreys," and Mr. Frith's portrait of Mrs. Rensby, both in the present Royal Academy Exhibition, will hang in the dining-room here.

The contract is taken by Messrs. Jackson & Shaw for 10,126*l.*, exclusive of the conservatories, chimneypieces, and stones. The foundations have been put in by Messrs. Sharpington & Cole, who have also erected various decorative structures in various parts of the grounds. The clerk of works is Mr. G. Simonds. The whole of the works are being carried out from the designs and under the superintendence of Messrs. E. Salomons & J. P. Jones, architects.





KENWOOD TOWER, HIGHGATE.—MESSRS. SALOMONS & JONES, ARCHITECTS.

RICHMOND, SURREY.

A commodious chapel for the Baptist Congregation has just been completed and opened in Richmond. The building stands on a prominent freehold site near the railway station, and is constructed of corrugated iron, resting on a base of brickwork about 6 ft. above the ground level. It is approached in front by a flight of Portland steps, through an open deal porch, over which is a circular stained glass window. The pewing is also in deal. The pulpit and reading-desk are of oak, on a raised platform, at the rear of which is the open baptistery, with a vestry on each side. The size of the main building is about 80 ft. by 50 ft., and accommodates 700 persons. The height from level of floor or top of brickwork to the apex is 35 ft., with a bell-turret in the south-east corner 60 ft. high. The roof is boarded diagonally, and secured by perforated T-iron principals supported on iron columns, which divide the space into nave and aisles. It is lighted, artificially, by three crown pendants. The ironwork throughout has been painted with Galley's Torbary iron paint, which is said not to be liable to be affected by the action of the weather. The contract was taken by Mr. Giles Bennett. Total cost, 1,700*l*. The work has been carried out under the personal superintendence of Mr. Albert Bridgman, architect. Sufficient space has also been secured for Sunday and day schools, which will shortly be erected.

AN ARCHITECT'S ACCOUNT OF THE GIANT'S CAUSEWAY.

The curious and wonderful assemblage of basaltic pillars on the coast of the county of Antrim, Ireland, known as the "Giant's Causeway," has been a thousand times described by artist, essayist, journalist, traveller, and poet. It has been a most subject for the whole artistic and literary phalanx of Europe and America. Topographers have rounded it, geologists hammered it, and Vandal excursionists bid fair, if not stopped for the next generation, to trample it down to the sea level, or pick it to pieces, to satisfy an uncontrollable and unwholesome passion of carrying home "a bit of the Giant's Causeway" to ornament their chimney-boards. Amongst all the sightseers who visited the Causeway, we have never known but one architect who visited it that described it. As this architect's account has not met the eyes of many, and as it is to our thinking one of the most interesting descriptions that have been given, we will present it to the readers of the *Builder*. Though written many years ago, it has lost nothing of its interest. The writer was an architect of eminence in the sister kingdom, who held during his lifetime a conspicuous place in his profession, and lived to find a successful rival in the person of his own son. R. Morrison, architect, for he was the writer, enjoyed good practice in Ireland. One of the name in the sister island has impressed his character, as our readers know, upon his works.

Our architect thus describes the Giant's Causeway:—"The sea cliffs contiguous to the Causeway are particularly high. You approach it by a narrow path, or a long dreary precipice almost impassable. Every image which presents itself has something uncommonly grand and magnificent. Above you, the impending rocks to a timorous fancy threaten instant ruin; around you the sea presents immensity, unless where the shore of Scotland gives the idea of a world set at a proper distance for contemplation; and below you, the dreadful precipice produces an effect of inexpressible solemnity.

The Causeway is a low head, extending from the head of the cliffs into the sea like a mole, consisting of a great number of polygonal cylinders or pillars, so closely united that the edge of a knife cannot be inserted between their adjacent sides. At the first view this head did not appear to me so grand as I expected from the drawings I had seen of it; but when I came to walk on it, and to consider its plan and situation more attentively, it appeared a stupendous production of nature, extending from the bottom of the cliffs into the sea, but to what distance has never been ascertained. At low water the length of it appears to be 600 ft.; its breadth, in one place, 240 ft., in the narrowest, 120 ft.; it is very unequal likewise in its height. In some places it is 36 ft. high from the level of the strand, and only 15 ft. in other places. The pillars of which the causeway is formed stand most of them per-

pendicular to the plane of the horizon, yet the contour of them is so adapted that there is no vacancy between them. I could not discern whether they run underground like a quarry or not. Some of them are very long, others short, and some for a large space are broken off an equal height, so that their tops make an even plane surface. Many of them are imperfect, crooked, and irregular; others entire, uniform, and handsome, and these of different shapes and sizes.

I found them almost pentagonal or hexagonal, a few excepted, of seven sides, and many more pentagons than hexagons, but they were all irregular, for none that I could observe had their sides of equal breadth. These pillars are some of them 15 in. and some 18 in., and some of them 2 ft. diameter. None of them are one entire stone, but every pillar consists of several joints or pieces, as I may call them, and the whole are joined as close as it is possible for one stone to lie upon another, not jointing with plain flat surfaces. The upper ends of most of the pieces are concave, the lower ends convex, the prominences of which are nearly quarters of spheres, with rims round them. The length of each of these pieces which compose the pillars is 6 in., some 12 in., 18 in., and 2 ft., and easily separated, though so united in all appearance. When I parted them asunder, both the concave and convex superficies appeared very smooth, as are also the sides of the pillars which touch one another, being of a whitish freestone colour, but a much finer and closer grit. When I broke some pieces of them, the inside appeared like blackish iron grey, somewhat like the best limestone marble before it is polished, but of an extraordinary hard, close, and compact texture; their grit or grain so very even and fine that it hardly appears, but, where the stone is nearly broken, there it shows itself on its surface like a very minute, small glistening sand, thickly interspersed with the rest of the solid, and this (by reason of its parts being so closely combined together) has more specific gravity than most other kinds of stone. I must observe that, in my opinion, the curiosity of this place is much increased by the stones of which the pillars are composed being the irregular rather than the regular figures of geometry, as it is much more difficult to suit the sides of polygons together than squares and triangles, the latter being done easily by putting together two triangles equal to the square. I perceive in some of the stones the scheme of the 11th, 12th, 13th, 14th, and 15th propositions of the Fourth Book of Euclid, wherein an ordinate pentagon was inscribed; about it was circumscribed a circle; in another I observed a cylinder circumscribed about a cone. There is nothing more surprising than the piles of rocks here composed of a vast number of polygons; the external angles of each exactly suiting that made by the adjacent figures, and some rising like a flight of stairs to a considerable height.

At a small distance from the Causeway you discover in the impending cliff to the south-east, one large pile of those polygonal figures, so situated and united as to appear really to be what it is commonly called the Giant's Loom or Organ, as in perspective it resembles either. Another on the summit of the precipice has so much the resemblance of the chimneys of a house that the *Laia*, some ship of the Invincible Armada, mistaking it for a town, in the approach to it split on the rocks.

From observing at low water the rocks stretching a great length into the sea, and that there are similar ones on the opposite coast of Scotland, some have been led absurdly to imagine that there was formerly a design of uniting the kingdom by means of this Causeway!—a notion pregnant with folly. Others, from observing rocks in the precipice or cliff similar to those of the Causeway, have imagined that the sea, by undermining, has brought down these; but there is really no foundation for the remark, there not being any great similarity between the stone in the Causeway and precipice; and the pavement of the Causeway extends along the shore, where it could not have fallen from the precipice; nor can we, with any degree of reason, attribute to a chance fall a phenomenon so regular, so perfectly connected, and so extensive. Others, again, with a superior display of penetration, endeavour to account for the figures of the stone from the crystallisation of salts. This they found, I suppose, on the doctrine of l'Abbé Nollet, who, in his lectures on experimental philosophy, says that 'every salt when crystallised generally affects a figure which is proper to itself, and

which probably depends on the figures belonging to its smallest part. Sea salt, for example, forms amber, saltpetre needles, sugar globules, &c.

For my own part, I think it most reasonable to imagine that nature, which pursues infinite diversity of plans, forming some things for the use, others for the pleasure, of mankind, has left this and such like curiosities as perpetual subjects for our admiration, that, from observing the wonders of the visible creation, we might be led to sublime contemplation of the invisible Creator, and, as Democritus philosophised amongst the rocks of Abdera, were a man of reflection to confine his whole observation to this Causeway, and attentively to consider it, he would find himself surrounded by pregnant proofs of the divine wisdom and power. Indeed, all the works of human art must cease to attract if compared with this. Not the army of Xerxes, with an Archimedes to direct them, could form anything so wonderfully great, so uniformly various.

The usual attempts to explain this phenomenon appear to me very absurd. It had its name from the ignorant credulity of the unlettered, and superstitious vulgar causes, often of more absurd errors."

So ends the description given by an architect of a visit to the Giant's Causeway.

ON LIGHTNING RODS.

In a lecture printed in the *American Gaslight Journal*, an attempt is made by Dr. Bushee, of Worcester, Mass., to show that lightning-rods constructed and erected according to the principles in vogue, tend at least as often as otherwise (the author says, often), to increase the danger.

The lecturer said, while observing effects of atmospheric electricity with reference to the construction of the lightning rod, my attention was called to the fact that a large majority of buildings struck by lightning had rods. Sometimes houses with rods were severely damaged, while others, in close proximity, without rods, escaped. In some instances buildings have stood half a century unharmed, but immediately after the application of rods, were struck by lightning. Such facts have done much to destroy confidence in rods, while on the other hand they call on us to answer to the question,—Are lightning-rods a total failure? If not, what are their defects, causing so many accidents? My decided convictions prompt the answer: they are not a failure in principle, but have become so to a great extent by defective application.

Passing over points of minor importance, the leading defects of rods in general, and the chief cause of disaster, appear to be due to imperfect connexion with the ground. The rod is usually run into the ground from 4 ft. to 6 ft., or until it is supposed to reach moist earth. This is a great mistake.

It is well known that clay, sand, and gravel are comparatively poor conductors, and the very limited surface which a common rod presents to them affords very inadequate means of relieving the rod.

In such cases the tip of the rod is often burned or fused, the glass insulators (if such are used), broken and thrown from their places, and frequently the ground where the rod enters more or less torn up.

When the rod is subjected to all the pressure it can bear, some slight causes often turn the balance of forces in favour of a lateral discharge; and this is often ascribed to the insufficient size of the rod, or to the form, or material, or mode of insulation, while the main cause of the failure of rods to perform their proper functions appears to be due, in nine cases out of ten, to an over-charge of the rod caused by the resistance of the earth.

In Worcester county over eighty cases have been reported in the use of a patent copper rod, in which evidence was left that the rod had been too severely charged. In a large majority the electricity leaves the rod at or very near the earth. Often the effect is shown merely in tearing up the ground. Moreover, in the most severe cases I have observed, the rod is invariably found imperfectly connected with the ground; usually much oxidized, and sometimes extending not more than 2 ft. or 3 ft. into the earth.

Dr. Bushee's recommendation (by no means a new one) is, that in all cases the rod should be connected with the water-pipes and gas-pipes with which our large towns and cities are furnished; which, being good conductors and pre-

sending large surface, promptly diffuse the heaviest charge to the earth. Such pipes have, nevertheless, been struck by lightning and the joints destroyed, and persons have been injured by electricity from gas-burners, but when a proper connexion is made with a good pointed rod, and hence the charge gradually received, no possible harm can occur.

He also recommends another mode which is not uncommon; that is, connexion with a well, spring, or permanent stream, this being in general a safe and reliable means. The rod should extend to some considerable depth into the water.

It is thought by some, he said, that metallic roofs possess some power of protecting buildings from lightning, but experience shows that buildings with such roofing are sometimes struck, and probably as often as other buildings under similar circumstances, and therefore require the same means of protection. Good points should be attached to the chimneys or highest part of the house, and connected with the metallic roofing. It is not necessary for the rods to be extended over the roof, and they may run simply from the eaves or lower edge of the roof to the earth.

HOW IS THE DEATH-RATE KEPT UP?

SIR,—The *Builder* is full of lamentations on the subject of defective sanitary arrangements, polluted rivers, and such-like sanitary abominations, and look at the result of this state of things. It appears the weekly returns of the Registrar-General for the future are to include several large towns not hitherto inserted in that official report, and on examining statistically the effect of past sanitary arrangements, I drew the following deductions therefrom. If we are to judge of the health of towns by the death-rate, it is clear very little progress, if any, has been made in effective sanitary improvements, and I think her Majesty will have to appoint another Commission to examine into the cause, as in 1844: although it is rather early for the moral effect of the last searching inquiry to be lost already, and for history to repeat itself so soon:—

	Estimated population.	For Ten years, 1869, 1871 to 1870.	Health of Towns Report, 1849, '51, and '52, Per 1,000.
Hull	25 37	24 1	30
Bradford	25 53	26 6	31
Liverpool	29 00	30 0	35
Sheffield	27 58	27 0	27
Birmingham	21 61	24 9	27
Leeds	28 25	26 3	27
Newcastle-on-Tyne	36 10	27 4	27
Bristol	24 22	25 2	31
Manchester	28 97	29 1	32
Salford	26 75	26 2	28

Thus it appears in the above list there is a slight increase in the death-rate of two towns (marked *) from 1840 to 1869, and in the other towns there is little, if any, change; so our labours for the last thirty years have produced very little effect. The new year has opened more disastrously. It is very self-evident, and well understood, that sanitary works, if efficiently and properly carried out, do materially reduce the death-rate, as we have many towns that are cases in point; but it appears from some inexplicable causes our large towns do not profit by them to that extent that we ought to expect, and I think the excess of deaths should not be attributed to but should be quite irrespective of, the increase of population.

I am one of those sanguine enough to believe that it is possible, with proper sanitary works, and sanitary measures strictly enforced in towns, to reduce the death-rate to a minimum,—say not exceeding 2 per cent. of the population, and it is therefore perfectly clear that our provincial town authorities have now had more than a quarter of a century's fair and indulgent trial, and they have proved themselves wanting. The action of the Royal Commission now sitting might very well be directed to this important subject, so as to stimulate our slumbering town authorities as a temporary measure; and for a permanent improvement a Minister of Public Health should be at once appointed, with a skilful and energetic staff, who would frequently and periodically survey our dirty towns and the plague spots in them, and thus by these means remove the foul blot that now defaces our national escutcheon.

B. B.

St. Mary's, Exeter.—It is proposed to add a tower to St. Mary's Church, as a memorial of the late Bishop.

CHURCH-BUILDING NEWS.

Goudhurst.—The old church of this parish has, for some time past, been undergoing internal restoration, which will soon be finished. The proprietors of Bedbury and Combwell, Mr. A. J. B. Beresford Hope and Mr. H. J. Campion, are restoring the south chantry, at an expense of some 400l., and there only remain the south aisle, as wide as the nave, and the north chapel, to complete the internal restoration. The church was filled with the highest of pews, and had the usual western gallery with small organ. Nearly all these have been removed. All the windows except one had been depolished of their mullions and tracery. Three of these have been restored at the expense of Mr. R. Oakden, and three others by Mrs. Cramer Roberts, Mrs. S. W. Newington, and Miss Miller. A new pulpit, of oak, on a stone base, carved by Forsyth, was the gift of the late Mrs. Henry Lake, of Highgate. The restoration of the north aisle has cost about 1,000l. The chancel has been restored by the Ecclesiastical Commissioners, two entirely new windows being inserted in the east and north walls. The east window is of coloured glass, executed by Messrs. Clayton & Bell. It consists of three lights and represents the subject of the "Crucifixion," treated triplet-wise. In the northern light are the "Three Marys standing by the Cross," and in the southern light, "Joseph of Arimathea, Nicodemus, and the Centurion." The north window represents the "Supper at Bethany."

Loppington.—The re-opening of Loppington Church, near Wem, after its thorough restoration, has been celebrated. The greater portion of the edifice has been rebuilt, with the exception of the tower, the circular arches of which point to its Norman origin. It is a stone building, with freestone facings; and the high pews have been replaced by low-backed seats. It is also fitted up with a heating apparatus. The work has been carried out by Messrs. Bowdler & Darlington, Shrewsbury, from plans by Mr. E. Randall, of the same place. The work of restoration required the sum of 1,600l., which has been raised, or nearly so, by public subscription. The restoration of the chancel has been done by Mr. Vaughan and Captain Dicken, at a cost of 300l.

Wombridge.—The parish church here has been re-opened for divine service, after rebuilding, except a portion of the tower, which has been refaced. The new church is built on the old foundations, with the exception of the chancel, which has been extended. The church is cruciform in plan, and provides sitting accommodation for 350 persons. The walls are faced with Cefn stone, and the dressings are of the same material. The cost has been 2,000l., and the work has been carried out by Messrs. Millington & Son, of Oakengates, builders, from the design of Mr. George Bidlake, of Wolverhampton, architect. The whole of the windows, except one, are filled with rolled cathedral-leaded quarry-glass, of a light warm tint, with a margin of a greenish hue, by Messrs. Done & Davies, of Shrewsbury, who have also filled the other window with stained glass. The subjects in the last window were specially chosen by the vicar, on account of the late Mr. Oliver's kindness to children, it being to the memory of that gentleman that the window has been erected. The subjects which the memorial window contains are, "Christ with the Doctors in the Temple," and "Our Saviour blessing Little Children," with a canopy over each. Underneath the subjects is a base, which also forms a small canopy for the lily which is introduced at the bottom of the window. The church will be warmed by an apparatus supplied by Mr. Dodwell, plumber, Shrewsbury. In excavating for a road around the church, the workmen met with some walling belonging to the original fabric. It was 2 yards thick, and appears to be of the date of 1215.

Wantage.—West Hanney Church, after restoration, has been formally re-opened by the Bishop of Oxford. Mr. Jas. Brooks, of London, provided the plans. The total estimate was 1,700l., in which was included the porch over the principal entrance on the north side, where there is a Norman arch, and also the chancel. Sufficient funds not having been raised, the vicar was compelled to limit the work to about 1,100l. The church is fitted with stained deal seats, all unappropriated, and will seat 300 persons. Under the seats the floor is boarded, and the aisles are laid with Staffordshire tiles. An open-timbered roof, stained, covers the nave. The plans have been carried out by Messrs. Longmire & Burge, of London.

Radwinter.—The parish church of Radwinter has been re-consecrated, under its former dedication to St. Mary the Virgin, after having undergone a restoration in every part except the tower. The church has been enlarged by adding one bay to the nave, and therefore the chancel has been thrown forward. The architect was Mr. W. Nesfield. The old square pews are replaced by plain deal benches. The chancel is elevated three steps above the nave, and is paved with tiles. The chancel stalls are of carved oak.

Elmsted Market.—At a meeting of the building committee appointed to carry out the erection of a new church at Elmsted Market, the plans of Messrs. James Stannard & Co., of Leicester, were submitted for inspection, and accepted, the estimated cost of the church being something over 2,000l.

Barnsley.—The restoration of St. Mary's Church has been commenced. The designs for the alterations are furnished by Mr. Bodley, of London, architect; and the work, which is of an extensive character, including the entire re-modelling of the interior of the church, and the opening out of the west window, which is to be filled with stained glass, in memory of the late Mr. J. S. Beckett, will occupy some time.

Kidderminster.—We hear that a new church is to be erected at Franche. Plans for a small structure have been prepared by Messrs. Martin & Chamberlain, of Birmingham, and the contract for the building has been taken by Mr. Thompson, of Park-lane.

Nether Denton.—The new church at Nether Denton has been consecrated by the Bishop of Carlisle. This church has been erected to supply the place of an old structure dedicated to St. Cuthbert. The new building is in the Early English style of the thirteenth century, and is calculated to accommodate 140 persons. It consists of a nave 45 ft. 6 in. in length, and 21 ft. broad; and a chancel, 26 ft. 3 in. by 17 ft. 6 in., on the north side of which is an arch containing a harmonium, separated from the vestry by an oak traceried screen supporting a grille of ironwork glazed. The entrance is by a covered porch on the south side. The chancel is lighted by a triple lancet window, filled with stained glass, by Messrs. Gibbs, of London, representing the Crucifixion and other Scriptural incidents. The tracery is plain and unadorned. The south and north sides are perforated with a continuous arcade of single lancet windows, one or two of which are filled with stained glass. The west end is lighted by two large lancet windows. The walls are double, with a space between them, the inner part being of chiselled and square stonework, without plaster, by which means the church will always be dry; and the exterior of the church being of white stone, of a description which abounds in the neighbourhood, and contrasting with the red sandstone from Wetheral, of which, in lieu of slates, the roof is composed. There is a double bell colume at the west end of the edifice. Messrs. Cory & Ferguson were the architects, and under their superintendence the building was erected. Mr. W. Armstrong, of Gilsland, contracted for the masonry; Mr. Court, of Carlisle, supplied the woodwork; Mr. Norman, of Carlisle, contracted for the roofing; Mr. Thompson, of Carlisle, for the plumbing; and Mr. Bell, of Wigan, for the painting and glazing. The cost of the church was about 1,000l., part of which is not yet subscribed.

Bestwood Park.—A new church has been erected here, and opened for divine service, according to the *Notes Guardian*. The church is built of stone. The edifice is without aisles, and consists simply of an entrance up the centre, with seats on each side. The chancel is an apsidal one, and on the north side this part of the building opens, by means of a couple of small arches, into a vestry and organ (or rather harmonium) aisle. The windows are small, but numerous and deeply recessed. The porch is a feature in the building. The west end of the church is surmounted by a bell, hung in an open turret. There is a coloured window over the communion altar, and in the arrangements for this part of the church, the Duchess of St. Alban's worked the communion cloth. The seats consist of low chairs. The Duke of St. Alban's has aided in the cost of the edifice, and at the opening. The Duchess played the harmonium and started the singing.

Kettering.—The new church of St. Andrew the Apostle, at Kettering, has been consecrated by the bishop of the diocese. The church, which is

built at the north end of the town, is of the Early English character, and is capable of accommodating 550 persons. It consists of a nave, south aisle, vestry, and chancel, and has been built at a cost of about 5,000*l.*, by Messrs. Barlow & Butlin, of Rothwell, from the designs and under the superintendence of Mr. Street, of London, architect. Mr. Godfrey was clerk of the works. The roofs, both of the chancel and of the nave, are high-pitched, and the pavement is of encaustic tiles. There is a small bell turret, with spire. Chairs are used in the church, to be replaced as soon as means are obtained by open seats. The lectern is of brass, and the altar cloth is of maroon-coloured velvet. The frontal was worked by Mrs. W. Lindsay, sister-in-law of the rector, and the super-frontal by other ladies. Previous to the service, a crozier was presented to the Bishop. The crozier was designed by the Rev. F. H. Sutton, vicar of Theddington, and executed by Messrs. Skidmore & Co., of Coventry. It is in the style of the middle of the fourteenth century; the staff is of ebony, with ivory bosses, and the head is ivory and silver-gilt, jewelled with carbuncles, topaz, and lapis-lazuli. It is the gift of certain laymen in the Archdeaconries of Northampton and Leicester.

Walworth Common.—The foundation-stone of a church, to be called St. Stephen's, Walworth Common, has been laid. The temporary iron structure at present in use is too small. The site of the church is in Villa-street, between Albany-road and Westmoreland-road. The architects are Messrs. Jarvis & Son.

Middle Claydon.—The church here, having been restored, has been re-opened by the Bishop of Oxford. Care has been taken, where practicable, to maintain the original fabric intact. The exterior has been restored, Dalton stone being used in the repairs. The tower and the chancel are of the perpendicular style of architecture, the latter having been built in 1519, by the Giffard family. The tower has three bells, which have been rearranged, new-framed, and re-hung. In restoring the porch, the old oak front has been stained and made the main feature, the new parts being in keeping. A new vestry and lobby have been built on the south side of the chancel, like the tower and chancel, in the Perpendicular style. In the interior, the old gallery has been taken down, and also the ringing-floor, a new one having been put up over the western arch. The old roof of the nave has been taken down, and a new oak panel one has taken its place, one beam being left to show the reproduction of the ancient work. The seats, the lectern, and the prayer-desk are all new, and are of oak. The old pulpit (also of oak), having been re-adapted, and fitted with new base, stairs, &c., has been retained. In the sill of a window in the nave a piscina was found, and has been repaired. The carved oak screen has been restored. In the chancel, the wagon-headed oak roof is embellished with red and gold devices, and the bosses are gilt; Messrs. Clayton & Bell, London, being the decorators. The communion-steps are of superior Devonshire marble, and the remainder of the church is paved with encaustic tiles, by Mr. Godwin, of Hereford. The alabaster monument of the Giffard family has been taken from the mural position it formerly occupied, and placed in the chancel. The monument by Chantry of the late Sir Harry Calvert, Adjutant-General of the Forces, has been restored and decorated, as have also all the other monuments. The reredos, occupying the whole of the stand of the chancel, is of alabaster, executed by Messrs. Farmer & Brindley, of London. The centre portion is divided into three subjects—the middle one being the Ascension, that on the left the Resurrection, and that on the right the Day of Pentecost, carved in alabaster, and surrounded by carved canopies. The total cost of the restoration will be very nearly 3,000*l.*, the chief portion of which will be borne by Mr. Frederick Calvert and Lady Lucy Calvert. A short time since the inhabitants of Steeple Claydon were indebted to this same source for the spire of their church. The work has been superintended by Mr. G. Hannaford, under the directions and from the designs of Mr. George Gilbert Scott. The builders were Messrs. Franklin, of Deddington.

Fyerning.—St. Mary's Church, Fyerning, has been re-opened, after having been closed about twelve months for restoration and repairs. The works have been carried out by Messrs. Brown & Son, under the direction of Mr. Chancellor, of Chelmsford, architect. Judging from the extreme plainness of the stonework of the north

and south doorways of the nave, and of the nave windows, the walls of the nave and chancel of this church are believed to be Norman work, probably of a very early date. The walls are constructed principally of the conglomerate, commonly known as "plum pudding stone," mixed with the thin Roman bricks, septaria, and large pebbles. Very little (if any) alteration appears to have been made in the walls, which are very substantial, beyond the insertion in both nave and chancel of windows of a later period. The wall at the west end of the nave appears to have been cut away, and a brick archway formed, opening into a fine specimen of a brick tower, erected very late in the fifteenth century. Previous to the present restorations the roofs of both nave and chancel were comparatively of a modern date, with the exception of two massively-constructed principals at the west end of the nave, which were, no doubt, the remains of an original roof, and which evidently supported one of the ordinary wooden steeples of the county, thus proving that the present brick tower, when erected, was altogether an addition to the church, and not built upon the site of a more ancient tower. The restorations that have been carried out include the stripping off the plastering from the outside walls all round (thus exposing again to view the old conglomerate walls of the Norman period), the restoration of the stonework of the Norman and other windows and doors, and the construction of entirely new open roofs of oak timber, tiled. Internally the chancel arch has been rebuilt in stone, the west gallery removed, and the brick archway of the tower opened up, the whole of the old pews and sittings taken out and replaced with oak benches of simple design, with oak pulpit, reading desk, and lectern, in character with the benches, the gangways being paved with tiles. In order to preserve the church from damp the surface all round has been sunk below the level of the floor and paved, and the church itself is heated by hot water. The organ has been rebuilt, and removed from the west gallery to the north side of the nave, at the west end, by Mr. Rust, of Chelmsford. The total cost of these restorations amounts to about 1,400*l.*

WEEKS'S DUPLEX BOILER.

THE upright tubular boiler which has been patented by Messrs. Weeks & Co. appears to possess considerable merit. It is so arranged that it is impossible for the whole boiler to fail, as, being made in two halves, the contraction and expansion are entirely neutralised; and should any unforeseen accident occur to one half, that portion can be detached and removed without in any way interfering with the working of the other half. The shutting off of either half of the boiler is accomplished by means of gun-metal valves and chambers. The arrangements for removal of sediment seem so simple that any ordinary labourer may clean out the boiler at any time without withdrawing the water from the apparatus or removing a single brick in the furnace. The patentees claim that the boilers being made of cast iron, their durability is far greater than those made of wrought iron, and they show their own confidence in their durability by insuring them for fifteen years.

SEWAGE IRRIGATION AT ABERDEEN.

AN experiment in sewage irrigation, the first, probably, so far north, is being made on land belonging to Lieut.-Col. Henry Knight Erskine, of Pittodrie, on his Spittal lands, a little to the north of the city of Aberdeen, between King-street-road and the sea. An agreement was entered into between the Commissioners and Colonel Erskine on the footing of the sewage being sold to him at the rate of 5*l.* per acre to the extent of the land cultivated, he being restricted to a maximum of 5,000 tons per acre per annum. The price of the sewage is thus about a farthing per ton. The whole extent of the land intended to be irrigated ultimately is from fifty to sixty acres, and the sewage is leased for nineteen years. The land lies immediately inland from the Old Town Links, is of fair quality, and has been under ordinary cultivation. The ground in great part has a pretty uniform slope, the primary requirement for sewage irrigation. The whole supply is diverted, when not required, down the main sewers to the ordinary outlet at the harbour. The catch-water drains run off the water to the main spill-water channel, which takes the exhausted sewage away into a burn in the neigh-

bourhood of the Links, and thence into the river Don. The cost of two sewers and tank was about 550*l.*, which will be defrayed partly by Colonel Erskine and partly by the Police Board. The land was prepared in February last. The system of supply and distribution has been found to work well, the sewage flowing easily and uniformly over the land. The exhausted sewage is remarkably clear, while there is no perceptible smell from the operations. These are carried on upon the same principle as at Edinburgh, Barking, Croydon, and other places. The engineering works have been planned and superintended by Mr. R. Anderson, C.E., the Police Board's surveyor. The Lord Provost of Aberdeen has lately visited Hastings, to examine the A B C process of utilising sewage; and the Police Commissioners have put into the hands of Professor Brazier the matter of an analysis of the liquid used in this process, with the view of testing it in connexion with Aberdeen sewage.

THE INSTITUTE OF ARCHITECTS AND THE 1871 EXHIBITION.

No disposition being shown, although certain fresh commissioners have been nominated, to place the president of this Institute, *ex officio*, in the same position as the presidents of other like scientific and artistic bodies, the Hon. Secretary states that the Institute, representing the profession of architecture, feel themselves precluded, on account of this marked omission, from taking part, as a body, in the International Exhibition of 1871.

IS DISTORTION IN ARCHITECTURE THE STYLE OF THE PERIOD?

MANY modern instances of wryness in design seem to show an effort to repudiate the adage of the days of Ben Jonson, which says "By line and rule lives many a fool." If there is any wisdom in adopting a tag-rag style by reproducing broken outline and unfinished or decayed design, we are wise in our generation. Is it the freedom of Freemasonry, or for moonshine effect, that would be baronial villas, and even streets, have so many nondescript towers and turrets so helplessly copied in detail, and stuck to, with tumble-down effect, as if some after-thought or blunder, which puzzles us now to make out what the taste and style of the period is? So future antiquaries may well say (from Marmion):

"The towers in different ages rose;
Their various architecture shows
The builders' various hands."

Since Scott built his "romance in stone" and lime at Abbotsford, my conscience! what a host there has been of retrogressive imitators of the romantic in building, often without much regard to present fitness; such as the reproduction in costly stone of the tottering lath and plaster features of old Edinburgh, now excluding dwellers there from plain substantial houses so much required by workmen, and also, by way of contrast, to the broken outline of the ridgy back, piled deep and high, of the old town.

The old times have left much that is good to imitate: why should the beauty and taste of Mediæval design be generally so poorly grasped at in modern church-building?

Although the vast proportions of the perfect cathedral church may not be required, perfect, true, and harmonious construction should adorn all churches and chapels dedicated to the worship of an all-perfect Creator. Ancient Pagan temples and idol shrines had true and beautiful proportions, as also had the finished Christian places of worship of the Dark Ages. Why, in these enlightened times, perpetrate such distortion in erecting so many lop-sided churches, with "the taper spire that points to heaven," put up as chance or whim may dictate? Many churches built to please the priest, remind one of the hunchback who, after hearing a friar preaching on God's works being all perfect, asked what could be said of him? "Why," said the friar, "you are a perfect hunchback."

Surely imperfect copies of the fervent art of the builders in past ages need not be set up all over the land in hotch-potch style, as without being able to read sermons in stone we but play the fool's part, in pursuit of mere empty shadow, following the Jack-o'-Lantern of an absurd taste for retrogressive imitations in detail, without the true spirit of the old builders, "whose works have not followed them."

J. K.

CEYLON.

THE foundation-stone of the new Public Markets and Municipal Offices, Colombo, was laid on the 22nd of April last by his Royal Highness the Duke of Edinburgh, in the presence of a large number of spectators, for whom temporary sitting accommodation was provided in an octagonal structure, 70 ft. in diameter. A guard of honour of the 73rd regiment presented arms as the ducal party drove up, the band playing the national anthem, and on alighting under the triumphal arch at the entrance, the Prince and the Governor were received by the chairman and members of the council. The Duke, on advancing to the centre of the octagon, was greeted with loud cheers, and took up a position to the left of the stone. A suitable address was then read by the chairman, and the Prince proceeded to lay the stone in the usual form, assisted by the architect, who had been previously presented to his Royal Highness. The trowel was of chased silver, bearing an appropriate inscription, and the arms of the Municipality, with a ducal coronet at the extremity of the ivory handle. The stone having been declared by the Prince "well and truly laid," the proceedings terminated.

The buildings will consist of two detached blocks, one 200 ft. by 60 ft., running parallel with the face of the site; and the other 170 ft. by 80 ft., at right angles to it in the rear. The central portion of the former will contain the offices of the municipality, with a double row of shops on each side, covered with iron roofs. The rear block, which is to be used as a public market, will be entirely of iron. The buildings generally will be of an ornamental character, and a lofty clock tower is to form a prominent feature. The buildings have been designed by Mr. James G. Smither, Government architect, under whose directions the work is to be carried out.

THE CONDITION OF LINCOLN.

OUR correspondent, "Gargoyle," has sent a reply to "A Lincoln Householder," in which he maintains the correctness of his former statements, and concludes with the observation,—"I still think that at Lincoln the arts are sacrificed at the shrine of Mammon, and that, in their efforts to avoid Scylla, the powers that be are falling fastly into Charybdis."

We do not think it necessary to print the whole. The correspondence will doubtless serve to lead enlightened inhabitants of Lincoln to look about them, and probably result in advantage to the city,—a place of unsurpassed natural beauty, with an unrivalled cathedral, and rich in associations.

SWANSEA WATERWORKS.

SIR,—On the 21st of May (p. 410), and the 4th of June (p. 453), there are some remarks relative to the Swansea Waterworks. Will you allow me briefly to say that Mr. Williams, the contractor, received 500*l.* as a bonus for completing the line of conduit before the time specified in his contract, as Swansea was suffering a water famine. The completion of this conduit enabled Swansea to receive, subsequently, in three years, not less than 3,000 million gallons of water, which, at 2*d.* per 1,000 gallons, would represent 25,000*l.* This, in my opinion, is a liberal return for the bonus of 500*l.*, and also warrants some expenditure in present repairs. Mr. Williams had, in his contract, a large work to execute, in and over a most difficult country: in my opinion, he did this work well and honestly, and earned all the money paid to him. Works of all kinds require supervision and repairs,—waterworks more, probably, than ordinary works, as water is unceasingly active; and, when confined by an embankment or in a conduit, active for mischief. The conduit at Swansea is some 7 miles 300 yards in length, laid, in part of its course, over a coalfield in work. There are also trees on part of the line, and rootlets have entered at joints not more than 1-16th of an inch wide, which have forced such joints, and caused leakage.

The conduit is, however, now in course of repair, and I hope the cost may not be very large. But, large or small, Mr. Williams, the contractor is not answerable for it. In my opinion, the editor of the *Cambrian* is wrong in stating the cost of the Swansea Waterworks at "160,500*l.*" and the income at "3,500*l.* a year." The cost, including town service-pipes to the

extent of nearly 16,000*l.*, as given in my final report, is 70,355*l.* 13*s.* 8*d.* This report, with all its details, has been at the service of the editor of the *Cambrian*, but he does not appear to have used it. As to the income of the waterworks, if my recollection be correct, this, in 1868, amounted to upwards of 6,000*l.* per annum, and was increasing. As a rule, I do not notice these local statements, and I now only ask you, Mr. Editor, to give a place to these remarks and explanations to enable me to say that in my opinion the public of Swansea never expended 500*l.* to better purpose than in giving it as a bonus to Mr. Williams, the contractor, for the work done. I wish also to say that Mr. Cousins, the borough engineer, is only responsible for the due maintenance of the works as handed over to him. Personally, I feel under a deep obligation to Mr. Cousins for his untiring courtesy to me during my connexion with Swansea. He has carried out the sewerage and drainage within the town in the best manner, and with good sanitary results.

ROBERT RAWLINSON.

RAFFAELLE AND MICHELANGELO.

BURLINGTON FINE ARTS CLUB.

Few persons ascending the narrow stairs of 177, Piccadilly, to rooms over a shop, would suppose they were entering the premises of a club that includes a considerable number of well-known lovers of the fine arts, and where, from time to time, very remarkable collections of works of art of past ages are exhibited. Such, however, is the case. A change in this respect, is looming in the distance. The number of members is to be increased from 250 to 500, when the committee will be in a position to recommend removal to a larger house, and to take such other measures as shall increase the advantages of the club. The honorary secretaries are Messrs. Ralph N. Wornum and J. Bevington Atkinson.

The exhibitions, to which we have alluded, have for their object the thorough elucidation of some school, master, or specific art. On the present occasion it consists of a collection of drawings and other illustrations of the works of Raffaele and Michelangelo of rare merit and interest. Her Majesty the Queen lent for a few days, in aid of the collection, a number of original drawings from the Windsor Castle collection. These have been removed, but what remain will afford ample enjoyment to those who, through knowledge of a member of the club, obtain the privilege of examining them.

"NEW BRITISH INSTITUTION."

A COLLECTION of pictures by old masters and deceased British artists is now on view in the gallery, 39, Old Bond-street. We should like our convictions if we said that we expect this Institution, as at present constituted, to supply the place of the defunct British Institution, *quoad* an exhibition of "Old Masters." Putting this idea quite on one side, we may fairly say that an interesting collection has been brought together on the present occasion, and will well justify the expenditure of a shilling. Some of the pictures are avowedly the property of dealers, and are for sale; the remainder are lent by owners. In the whole there are 140 pictures, many of them good.

A NOVEL COMPETITION.

THE French Society of Architects of the Department of the North have instituted a competition with the view of making known works of modest merit. They invite the transmission of two photographs of an entrance-door to a private residence, including the door-frame and surroundings, such as the balcony above, should such occur. The selection of the best will be made by the architectural societies with which this society is in connexion. The photographs must be sent by the 30th of September next, and must be from the executed work, not from drawings. Reputation is the chief prize offered, but medals will also be given, besides one complete set of the photographs to the competitor whose work is selected as the best.

As Mr. Vandenberghe, the secretary, who dates from Lille, requests us to make the competition widely known, we conclude it is international. The programme issued by the society may be seen at our Office.

DRAINAGE OF LIVERPOOL.

SIR,—Some two years ago I was permitted, by your favour, to make some observations on the then bad sanitary condition of Liverpool, with its resulting high death-rate, which stood at 36 per thousand. Since that time a vigorous policy of conversion has prevailed; that is, great numbers of privies have, on the certificate of the medical officer of health, been forcibly converted into water-closets, the effect of which, coupled with the late mild spring, has been to reduce the death-rate to 23 per thousand, a rate nearly rivaling the proverbially healthy towns of Salford and Bristol.

Lately, however, a feeling seems to have sprung up among some members of the health committee that their medical officer was doing too much; not exceeding his duty, but straining a point towards the pursuit of health greater than the pockets of the landlords or owners of house property were disposed to bear; and although they have spent already a million of money in sewerage the town down to the tideway of the Mersey, yet they are displaying a willing ear to each and every one of the systems lately proposed, from the dry-earth system to disinfection, &c., plainly intimating at the same time, though not in a direct manner, that they desire the medical officer to stay his hand; while he, being responsible to the public, is distracted, and does not know how to proceed.

One would think, in face of the facts, and remembering that Liverpool is mainly built on the slopes and top of a high hill forming a rocky bay, with the river at its base, that it would be better to wait a little and see the effects of the various trials now being made in several inland towns, where no such facilities as exist here for the disposal of the sewage are available,—let well alone, in fact, until it is shown that something better is applicable; but no: some evil influence is working, and this public body, the health committee, hold private meetings, from which the reporters are excluded, for the avowed purpose of changing, if possible, the disposal of the sewage of the town. Having in view the large amount of money already spent upon the sewerage, and the present depressed state of trade, the people look upon these private meetings with some alarm, because it is evident that the creation of a perfectly healthy town is not the primary object of the health committee, or they have only to pursue the policy of conversion to obtain it, and any other object we, the public, hold to be beside their duty. How is it, we ask, that the committee, instead of pursuing a vigorous and definite policy, do not order and compel, as they have the power, owners and others to alter and convert privies into water-closets by a given date? Each owner would then be treated like his neighbour, and no favour could be shown or dissatisfaction arise. Life and health are at any time and in any place of vastly greater value than any mere sewage, and the people of Liverpool would be glad of your help towards that object.

R. G.

CAMBERWELL CHARITY ESTATE COMPETITION.

SIR,—For the information of your subscribers who may have been misled by the letter of your correspondent, Mr. Gough, inserted in your issue of the 4th inst., I beg to state that the design sent in by the local surveyor to the charity has been accepted as the best, &c., by the committee. That it has not been determined to refer the decision on the plans to the Vestry Surveyor, that the terms "surveyor" to the charity and "vestry surveyor" are not synonymous; therefore no competitor has to adjudicate upon the designs. That it has been proposed by the General Purposes Committee that the vestry appoint some disinterested member of the profession to report upon the plans, and leave the award in his hands; and that the matter only awaits such a recommendation to be ratified by the vestry.

Geo. W. MARSDEN, Vestry Clerk.

STAINED GLASS.

MESSRS. CLAYTON & BELL completed two important windows for Whit Sunday. One is in *Doncaster Parish Church*, the great window in its south transept, and has been raised in memory of the late Dr. Schofield. The subjects chosen for the work are Scriptural incidents recorded only in the Gospel of "the beloved physician," St. Luke, who, with his emblematic winged bull, is prominently represented in the upper tier of the window. In the middle tier is shown, in a series of subjects, the parable of the Good Samaritan, as especially suited for the memorial of a physician, and additionally so as being a parable recorded by St. Luke only. In the tracery are four angels,—two bearing respectively open books, inscribed "Evangelium" and "Actus Apostolorum"; the other two bearing, in allusion to the medical calling, a skull and a branch of herbs. The work is designed and executed, as to style in close conformity with the architecture of the building. The second window is a memorial of Colston, the philanthropist, in the north transept of *Redcliffe Church, Bristol*, a notice of which we may find another opportunity to give. The cost of it was raised by subscription.

Holy Trinity Church, Preston.—Memorial windows have been put up in the north and south transepts of this church, in stained glass of a grisaille geometrical character. The tracery surrounding each of the openings is filled with foliated work. The windows are in memory of the Rev. C. Robinson, LL.D., for nineteen years incumbent of this church. The cost was 150*l.* They have been supplied by Messrs. Edmundson & Son, of Manchester.

Bath Abbey.—The last addition to the series of painted windows in the abbey is one erected in

the north aisle by the Rev. Prebendary Kemble, to the memory of his son, who died at sea. The idea prevailing throughout the greater part of the design is that of early piety. The family arms occupy the upper compartment in the tracery, and the four small compartments beneath are filled by representations of Isaac, David, Joseph, and Josiah. Each of the lancet lights in the body of the window contains two designs, a larger one and a smaller one, the latter being placed at the bottom. The main subject in the central light is "The Good Shepherd." The two other leading subjects occupy the upper portion of the remaining four lights, "Eli and Samuel" being inserted in the first and second compartments, while in the third and fourth the scene illustrated is Timothy being instructed in the Scriptures by his mother and grandmother. In the lower portion of the window is placed a series of minor designs, three in number. The central one is "Angels raising the Dead from the Deep," which is flanked on the right by a representation of "Elijah raising the Son of the Shunamite Woman," and on the left by the scene of "Our Lord raising the Widow of Nain's Son." The window was designed and executed by Messrs. Clayton & Bell.

Salisbury Cathedral.—A painted glass window has been recently placed in the south transept of this cathedral by Mrs. George Marsh, in memory of her father, the Ven. William Macdonald. The window is the work of Messrs. Clayton & Bell, and in its execution they have observed the characteristics of the various specimens of ancient glass which are to be found in the cathedral, believing that to be the most suitable way of treating the work. The window is divided into five compartments. In the top is the subject, "Noli me tangere." The centre part represents "The Angels and Marys at the Tomb," and at the bottom of the window is "The Burial of the Saviour."

St. Mary's, Oxford.—The workmen of Messrs. Clayton & Bell, of London, have just inserted, near the principal entrance to this church, a stained-glass window to the memory of the Rev. Isaac Williams, once curate to Dr. Newman, and for many years connected with St. Mary's Church. The design comprises a four-light window, divided with mullions, and the figures in the lights are the four Evangelists, and above them St. Augustine, St. Gregory, St. Jerome, and St. Ambrose. These are surrounded in the scrolls with figures of angels.

DISSENTING CHURCH BUILDING NEWS.

Doncaster.—The Wesleyans of Doncaster are about to build, at a cost of some 7,000*l.*, a new chapel, in St. James's-street, Doncaster, upon a site recently purchased of the corporation for that purpose, and of which Mr. Watson, of Wakefield, is the selected architect. The new chapel will be built in consequence of the existing place of worship in Priory-place having become inadequate to the requirements of the society. The somewhat novel ceremony, so far as a chapel is concerned, of turning the first sod was performed by the Mayor of Doncaster, in the presence of an immense concourse of people. The mayor, who is a churchman, invited the members of the corporation, the ministers of the society, and the building committee, to luncheon at the Mansion House, in honour of the occasion; the Mayor of Leeds being also present. A procession was formed at the Mansion House, headed by the band of the Third West York Militia, the mayors of Doncaster and Leeds, the mace-bearers and police leading, and followed by the corporation, some of the officials of the borough, members and ministers of the Wesleyan society, and about 900 Sunday-school children. A silver spade was presented to the Mayor of Doncaster, with which he performed the ceremony of the day. The chapel is to be built by Mr. Harold Arnold, of Doncaster, and when completed will accommodate 1,000 people. According to Mr. Watson's design, the building will be in the Italian style. It will be erected at the top of the new street now forming in Crowther's-garden, and will face St. James's-street. At each side will be a space of 46 ft. wide. On the right-hand side will be built the boys' school, and on the left the school for the girls and infants. The front elevation and also external staircase wings, will be of stone, having circular-headed doorways and windows on the ground floor; and above, in the centre, there will be a large traceried circular-headed window, which, in all probability, will be filled with stained glass. The extreme size of the chapel

building will be 57 ft. 4 in. wide by 107 ft. long. This will include large band-room, ministers' vestry, and other offices on the ground floor at the rear. A gallery will run round both sides and one end. The chapel will be built with a clearstory, which will have seven circular lights on each side, and the clearstory walls will be supported by cast-iron columns and wrought-iron girders, the former also supporting the side galleries. The ground floor and gallery will be filled with stalls; and all the woodwork will be executed in red deal, stained and varnished. The schools on each side are designed to accord with the chapel. The front facings right and left will be of white bricks, with red arches, bands, and other ornamental features. Each school will present a frontage of 85 ft., and each will afford accommodation for 250 children. The tender supplied by Mr. Arnold, of Carr-lane, was for 5,262*l.* Though not the lowest, the committee took into consideration the fact that Mr. Arnold was the owner of the land adjoining their site, and as he was anxious to serve them by erecting near their new chapel houses of first-class appearance, the committee entrusted to him the contract for the building. The total cost of land and building will be a little short of 6,500*l.*

Lightcliffe.—The general committee of the proposed new Congregational chapel has had a meeting, Sir Titus Salt presiding, when the plans for the new church were submitted, after having undergone several alterations. The tower and spire will be 130 ft. high, and the design is Gothic. In the rear of the church a minister's house will be built, in a suitable style to the other building. The total cost, including everything, is about 4,800*l.* The plans were adopted, and Messrs. Lookwood & Mawson, of Bradford, will commence the work as early as possible.

Wokingham.—The foundation-stone of a new Wesleyan chapel has been laid in this town, on the site of an old building. The new chapel will be built by Mr. Whiting, of Reading, from plans prepared by Mr. T. S. Landowne, architect, Swindon. The shape of the building is a parallelogram, and it will be composed of red brick, with Bath stone dressings. The roof will be open timber, built diagonally, boarded, stained, and varnished. The seats will be open, stained, and varnished. The style is the fourteenth century Gothic, and the street front will contain three gables, with centre porch, and the roof will be supported on stone corbels. The dimensions are 51 ft. by 33 ft., and there will be accommodation for 350 persons. The cost is about 1,000*l.* It is intended to erect a schoolroom, which will increase the cost to 1,400*l.* The late Mrs. Heelas had given 400*l.* to the building fund, and Sir Francis Lycett, who has contributed to various other Wesleyan chapels in different parts of the country, has given 25*l.* A coloured drawing of the new chapel, by the architect, was exhibited in the Town Hall.

FROM SCOTLAND.

Bonnyrigg.—At a special meeting of Commissioners of Police for the burgh of Bonnyrigg a previous resolution was confirmed "to lease or rent a piece of ground near the burgh, to be used as a pleasure-ground, or place of resort or recreation, in terms of the General Police and Improvement (Scotland) Act, 1862." The park, which is situated on the farm of Polton East Mains, and in close proximity to the burgh, measures 527 imperial acres. A lease of ten years, from Martinmas, 1869, is proposed, at the yearly value of 14*l.* 10*s.*; the estimated cost of inclosing the park and effecting other improvements is 72*l.* 10*s.* The total outlay is computed to amount to 100*l.*, and it is proposed to be paid in yearly instalments by an assessment of 1*d.* per pound, which would liquidate the cost in six years.

Glasgow.—The foundation-stone of a new bridge, to be called the Albert-bridge, has been laid at Hutchesontown, Glasgow, by the Earl of Dalhousie, as Grand Master of Freemasons.

Stirling.—The late Mr. Thomas Smith, of Glassingall, who died lately at Avignon, has bequeathed 5,000*l.* for building a museum, picture and sculpture gallery, and artisans' reading-room and library, in Stirling, for the district, with nearly 500 oil paintings, water-colour drawings, and articles of vertu, valued at 6,000*l.*, and 14,000*l.* to endow the institution.

Paisley.—The new scheme for an additional supply of water to the town of Paisley has been inaugurated. A number of gentle-

men proceeded to the new filters at Stanely, which is situated immediately below the Braes of Gleniffer, and the provost there formally turned on the water. This extra supply is secured from a large reservoir at Nethertrees, about seven or eight miles from Paisley, and the water is conveyed by gravitation to the filters at Stanely, about three miles from the town. The top of the receiving-tank at the Stanely filters is placed about 10 ft. higher than the top of the High Church steeple, which is erected on the most elevated part of Paisley. The reservoir, when full, will contain 77,000,000 cubic feet, extends over an area of 109 acres, and the maximum depth is 35 ft. The whole scheme is estimated to cost 77,000*l.* The Water Commissioners will be able to pay the interest of the money without increasing the public rates.

Nairn.—Extensive alterations and additions to the Nairn Sheriff Court-house and County Buildings have just been completed. A range of buildings has been added in the rear of the original edifice, which comprises debtors' rooms, prison store-room, new cell accommodation, and the prison governor's house. The exterior of the building has also been improved. A new clock has been placed in a spire.

Dundee.—Recently a movement was commenced by Provost Yeaman, with the view of getting the Old Steeple repaired and renovated; and a numerous meeting of gentlemen, who had been requested by the Town Council to aid in the matter, has been held in the Town Hall. The Town Clerk read letters which he had received from the Earl of Airlie, the Earl of Strathmore, the Earl of Southesk, Lord Wharmcliffe, Lord Kinaird, Sir John Ogilvy, M.P., Mr. Armitstead, M.P., and others, expressing their readiness to have their names placed on the committee, and to assist in defraying the expense of the work of restoration. Resolutions approving of the efforts now being made for the purpose of repairing and restoring the steeple in accordance with its original style of architecture, and agreeing to take the advice of Mr. Robert Mathieson, Assistant Surveyor of Woods and Forests, as to what is necessary to be done, were unanimously agreed to. The Old Steeple is supposed to have been erected during the fourteenth century.

Perth.—The foundation-stone of the new church in Tay-street, for the Free West congregation, Perth, has been laid by the Earl of Dalhousie. The design for the new structure was prepared by Mr. J. Honeyman, jun., architect, Glasgow. The building was commenced in the autumn of last year, and considerable progress has since been made. The site is about midway between the Post Office and the County Buildings, on the line of Tay-street. The structure will be in the style of church architecture which prevailed in the middle of the thirteenth century in France and other Continental countries. The length of the building, exclusive of the vestry and the proposed Presbytery Hall, is 114 ft., and the width 63 ft. The main entrance to the church will be in the base of the tower, fronting Tay-street and the river, the lower part of the tower forming a porch. The tower will measure 30 ft. over the buttresses, and the height from the pavement to the top of the spire will be 212 ft. The church will be divided into three aisles by iron columns supporting the sides, galleries, and roof. The ceilings will be plastered, but the principal couples, which are very ornamental, and the purlins will be exposed to view. The height of the centre aisle from floor to ceiling will be 43 ft. Provision will be made for ventilating the church by drawing the vitiated air into the tower. The pews will be 33 in. wide, affording a space of 20 in. to each sinner. Accommodation will be provided for upwards of 1,000 persons; and it is understood that the total cost, exclusive of the site, will be about 8,000*l.*—The opening of a new Roman Catholic church, dedicated to Our Lady of Perpetual Succour, in connexion with St. Mary's Redemptorist College, Kinnoull, Perth, has taken place. The new church is immediately to the north of the collegiate buildings, which, together with the church, were designed by Mr. Heiton, architect, Perth. The church is in the Early English style.

Inverness.—The new public markets have been formally opened by the magistrates and town council. The building has been about a year in course of construction, and is erected on the open space where the markets were formerly held. The site is central, the main front being in Academy-street, directly opposite the railway station, while at the extreme end there is a entrance from Church-street, and there is also a

side gateway into Union-street. The whole building is easy of access. The cost of erection was about 3,000l. The architects were Messrs. Matthews & Lawrie, of Inverness and Aberdeen.

Roths.—The foundation stone of a spire, which will be furnished with a clock, has been laid in Roth's. The ceremony was performed with Masonic honours. The carpenters' society, and the children attending the various schools in the town, took part in the procession, and the Volunteers acted as guard of honour. The work has been instituted by the Rev. George Gray, of the parish church, on which building the spire will be erected. The cost is estimated at 300l.

Greenock.—Serious damage has been done to the new works of the Greenock Water Trustees at the Gryfe, the repairing of which it is estimated will cost fully 2,000l. It is stated that the masonry of the wall was not sufficient to withstand the weight of the embankment behind it, and was forced in, and that the embankment will have to be cut out, and the tunnel rebuilt.

Books Received.

A Guide to the Construction and Management of Workhouses: together with the Consolidated Order as amended by subsequent Orders of the Poor-law Board. By EDWARD SMITH, F.R.S., &c., Medical Officer of the Poor-law Board, and Poor-law Inspector. Knight & Co., Fleet-street, 1870.

DR. SMITH has here prepared a Guide which, in a compendious form, includes sanitary, legal, and general observations, and supplies the requirements of the local executive on all the duties which devolve upon them.

The Consolidated Order has been printed as the third part of the work, and those clauses which have been amended or superseded by subsequent orders of the Poor-law Board have been indicated and altered.

The increased attention which has recently been given to this subject has led to improved administration, with an expenditure of very large sums of money, and has induced the Poor-law Board to express their views on certain subjects more definitely than heretofore, by the issue of "Instructions" and "Suggestions," all of which are printed in this work, and will be at hand for reference.

Architects have long desired such "Instructions" when preparing plans; and we may expect that those officially issued, with the remarks upon the selection of sites, and the arrangement of the different blocks of buildings constituting the workhouse, which are given in this book, will lead to the saving of time and expense in the performance of that duty.

The instructions on the site, drainage, and water supply, construction, and arrangements of workhouses, are full and detailed, and constitute a chapter of the book in themselves.

The Mystery of Edwin Drood. By CHARLES DICKENS. Parts I., II., and III. London: Chapman & Hall.

THE last chapter of this tale published closes with the sentence,—"And thus, as everything comes to an end, the unaccountable expedition comes to an end—for the time." Little thought the thousands who read it that the expedition of the great novelist himself had come to an end—here; that the busy brain that was evolving the mystery about which were clustering new acquaintances, and through which fresh insights to man's heart were to be gained, would work no more,—that a dear friend, though possibly unknown in the flesh, had passed away, and that Charles Dickens would write no more. The universal opinion as to the value of his works has been shown by a wide burst of sympathy, and it is not too much to say that England and America feelingly weep his loss. More than one strange coincidence with reference to his death has been mentioned, notably the circumstance that dying, as he did, on the 9th of June, 1870, on the 9th of June, 1865, he most narrowly escaped death on the South-Eastern Railway. It is a small circumstance, still it is cogent, the first advertisement in each of the published numbers of "Edwin Drood" is one of "mourning," surrounded with a wide black border.

Concerning the remainder of the work, the publishers have in type something more than enough for three numbers, in the whole rather more than half the work. It was at first thought that Mr. Dickens had left a rough scheme of the

complete work behind him, but at present this has not been found, and we believe we may state that no attempt will be made by another hand to finish it. It may interest some to know that more than 50,000 copies were sold of No. 1, and that the steady sale, judging from that of the latter numbers, promised to be 40,000.

All our readers, doubtless, by this time, have heard that on Tuesday morning last, early, and quite privately, the remains of our great novelist were buried in Westminster Abbey. The grave is in Poets' Corner, at the foot of Handel's, the head of Sheridan's, and between Lord Macaulay and Cumberland, the dramatic poet. A few feet removed, and near to the side of Dickens, and towards his feet, lie Johnson and Garrick, while near them repose the remains of Campbell. The statue of Addison and the bust of Thackeray overlook the grave at its head: Shakspeare's monument is not far from its foot, and Goldsmith's monument is on the left.

VARIORUM.

We are glad to learn that the "Photographic Art Journal" is about to give up its second-hand title, to which we objected on its first appearance, and is about to appear with a new one in a fresh form. No. 4 includes a clever reproduction by the Woodbury process, of a painting called "Le Favori du Roi," by a rising Spanish artist, M. Zanaviva, and one of a beautiful study of heads and hands by Raffaele. —Mr. Bailey Denton has published in a separate form (through Messrs. Spon, Charing-cross), his paper on "Sewage Farming," with remarks on the position of sewer authorities in relation to lands to which sewage is applied, first read before the Central Farmers' Club in March last. —"Report to the Tottenham Local Board of Health on the Disposal of the Sewage of their District, May, 1870. London: Spon." The Committee who so report have, after considerable investigation and trouble, come to the conclusion that irrigation is the best mode of disposing of sewage. They deprecate the idea that sewage farms are "miasmatic fields," "putrid quagmires," or anything of the sort; and assert, on the contrary, that as a rule the mere visitor would not know that he was on a sewage farm at all. They have had no difficulty in finding land wherewith to commence sewage farming at Tottenham. —The Tenth Annual Report of the Amalgamated Society of Carpenters and Joiners, from December, 1868, to December, 1869. Kenny, Printer, Camden-road. From the remarks of Mr. Applegarth, the general secretary, it appears that, notwithstanding the continued depression of trade, the operations and progress of the society have been highly satisfactory. The increase made in members and funds, however, is not equal to that of 1868; but the increase made, the suffering and distress relieved and prevented, and the quiet useful work done, are said to furnish cause for congratulation. After meeting an exceptionally heavy expenditure, there is a balance of 446l. 18s. 5½d. out of the year's income. The society has admitted 569 new members, and opened seventeen new branches, five of them in the London district, four of which were old-established local societies. —"The Nineteenth Annual Report of the Amalgamated Society of Engineers, Machinists, Smiths, &c., for 1869. Kenny, Camden-road, Printer." The general secretary, Mr. W. Allen, states that he has to record a very large diminution in the funds; indeed, so much so that, notwithstanding the fact of their income having amounted to no less a sum than 82,467l. 13s. 2½d., their expenditure has exceeded that amount by 22,521l. 14s. 4½d., the total expenditure for 1869 having been 104,988l. 7s. 6d., or 4,881l. 11s. 5d. less than in 1868. This large expenditure has entirely resulted from the lengthened depression of trade experienced not only in the United Kingdom, but in our Colonies and the United States of America—such a depression as the society have never encountered before, and which is attributed to the unsettled state of commerce in the country, and want of confidence generally in the trading community. However, although they have had three years of unprecedented bad trade, the society has been enabled to meet all its engagements, and still be in possession of a large reserve fund at the close of 1869. On the last meeting night in 1868 the balance in hand amounted to 98,699l. 2s. 1½d., to which must be added the income for 1869, namely 82,467l. 13s. 2½d., making in all 181,167l. 15s. 4d., from which sum is required to be deducted

104,989l. 7s. 6d., the total expenditure, leaving a net balance of 76,176l. 7s. 10d. During the twelve months the society have paid as donation to unemployed members the sum of 59,980l. 7s. 1½d.; to sick members, 17,777l. 18s. 10½d.; to superannuated members, 8,055l. 17s. 8d.; in sixteen cases of accident, as per 23rd rule, 1,600l.; and for funeral benefit, 5,600l. 8s. 2d.; being in all 93,014l. 11s. 10d. paid in support of the five principal benefits of the society, or 2l. 15s. 5½d. per member.—

"Notes to accompany a Series of Photographs designed to illustrate the Ancient Architecture of Southern India. Taken for Government, and described by Captain LYON. Edited by JAMES FERGUSON, F.R.S. London: Marion & Co."—In these Notes are described, according to the Preface, nearly all the temples worthy of a visit in the South of India. The Notes are given gratis to the purchaser of ten of the photographs. The text has been revised and corrected by Mr. Fergusson. —"Plan for conveying Railway Trains across the Straits of Dover; showing the Origin of the Idea. By Evan Leigh, F.S.A. London: Longmans & Co." The author of this pamphlet says, in the outset,—

"In the year 1861, I first conceived the idea of conveying railway trains across the Straits of Dover, and took out a patent for it, connected with some other nautical matters. In the following year I exhibited my patent ship in London to the Lords of the Admiralty and a number of other scientific gentlemen, including Mr. Scott Russell, having been introduced to most of them by Rear-Admiral Denham. After this I sent my models to the Great Exhibition of London in that year, and distributed hundreds of lithographs, with a printed description of my new ship, showing how railway trains might be conveyed across the Straits of Dover or other narrow seas. A great amount of curiosity was excited at the novelty of the idea, this being the first that was proposed."

Mr. Leigh appears to have since improved his scheme. The paddles are protected, by being inserted amidships and not at the sides, and the form of paddle is like that of water-wheels. There are no chains for the trains to be dependent on; and as the boat will not draw more than 7 ft. or 8 ft. of water at most, with train and coal on board, if made without pontoons, and only about 12 ft. with them, it would be unnecessary to change the present route, *via* Calais, Boulogne, or any other port.

Miscellaneous.

Moving a Windmill Entire, for Sixteen Miles.—A novel experiment, though not quite so sensational as the moving of a hotel at Chicago, has been the removal of a wind flour-mill, with all its fittings, from Westacre to Clechurch, Norfolk. The mill is a wooden structure, and with its machinery, of enormous weight. It stood upon wheels, and having been purchased by a man living at Clechurch, he determined to endeavour to draw it along the road by a traction-engine, but all efforts to find one strong enough proved ineffectual; the application, however, of a powerful steam cultivation engine proved more successful. In passing along the route various expedients had to be tried, such as in ascending a hill the engine proceeded to the summit, and then pulled the mill up with a chain, and so carefully had the task to be performed, that it occupied three days to make the journey. In crossing the Ouse, it was feared the celebrated long bridge would not be strong enough, but the engine having first passed over, the mill itself was drawn over, the bridge timbers creaking.

Projected Improvements at the County Gaol, Chelmsford.—The Committee of Justices appointed to carry out the enlargement of the cells in the two old wings of the county gaol at Springfield, and to alter them so as to correspond with the cells occupied by the female prisoners in the other wing, have met to examine the tenders sent in for carrying out the works. The following tenders were accepted—Adamson, 5,726l.; Mun-ay, 5,800l.; Capon, Manningtree, 5,300l.; J. Grimes, 5,039l.; Wells, 4,700l.; J. Brown, 4,650l.; Rannicles, 4,547l.; Parmenter, 4,515l.; Saunders, Dedham, 4,430l. (accepted).

The Architectural Association.—At the ordinary meeting, on the 3rd of June, Mr. T. Blashill read what was entitled "A Paper on Papers," the principal purpose of which appeared to be to urge young men to work rather than to read, and to acquire knowledge practically instead of taking it up second-hand.

To See Down a Well.—The New Hampshire *Journal of Agriculture* suggests an excellent plan for exploring the bottom of a well:—"It is not generally known how easy a matter it is to examine the bottom of a well, cistern, or pond of water by the use of a common mirror. When the sun is shining brightly hold a mirror so that the reflected rays of light will fall into the water. A bright spot will be seen at the bottom, so light as to show the smallest object very plainly. By this means we have examined the bottoms of wells 50 ft. deep, when half full or more of water. The smallest straw or other small object can be perfectly seen from the surface. In the same way one can examine the bottom of ponds and rivers, if the water be somewhat clear, and not agitated by winds or rapid motion. If a well or cistern be under cover, or shaded by buildings, so that the sunlight will not fall near the opening, it is only necessary to employ two mirrors, using one to reflect the light to the opening, and another to send it down perpendicularly into the water. Light may be thrown fifty or a hundred yards to the precise spot desired, and then reflected downward. We have used the mirror with success to reflect the light around a field to a shaded spot, and also to carry it from a south window through two rooms, and then into a cistern under the side of a house. Half a dozen reflections may be made, though each mirror diminishes the brilliancy of the light. Let any one not familiar with this method try it, and he will find it not only useful, but a pleasing experiment. It will, perhaps, reveal a mass of sediment at the bottom of a well, that has been little thought of, but which may have been a fruitful source of disease, by its decay in the water."

The "Clameur de Haro."—The States of Jersey gave the English railway company that is forming a line between the towns of St. Heliers and St. Aubin the site of the slaughter-houses at the head of St. Heliers Harbour for the erection of a railway station. The grant, however, was attended with certain conditions respecting the providing of suitable accommodation for slaughtering. The contractor had proceeded to abolish the buildings without complying with the necessary conditions, when Mr. David de Quetteville, one of the judges of the Royal Court, proceeded to the spot, and raised the *Clameur de Haro*, which consists in the person raising it falling on his knees and crying out, "*Haro! Haro! A Païde, men grince, on me fait tort!*" The workmen immediately desisted, as they were bound to do under a heavy penalty, and the work was stopped. A special meeting of the States (the Island Parliament), was convened, and it was resolved, after a stormy discussion, to prevent any further proceeding with the work until a satisfactory agreement had been made with the company for the erection of new slaughter-houses.

The Prehistoric Remains at Dartmoor.—At a recent meeting of the Ethnological Society, Mr. C. Spence Bate presented a "Report on the Prehistoric Antiquities of Dartmoor," forming one of the series of reports being now collected by the society with a view to obtaining accurate information on the present condition of the megalithic monuments of this country. After noticing the physical features of the district, the author described in detail the numerous stone circles, avenues, menhirs, cromlechs, cairns, and other prehistoric monuments of Dartmoor. He suggests the idea that the stones in some of the avenues may have been erected in commemoration of the death of persons of distinction, one being added for each burial. The depressions on the summits of some of the cairns were regarded rather as indications of unfinished work than of subsequent disturbance by treasure-seekers. Evidence was adduced of the wanton destruction of the granite blocks in some of the cromlechs; and both in the paper and in the subsequent discussion attention was directed to the importance of extending legislative protection for these prehistoric monuments.

Telegraphic Communication.—It is understood that application has been made for letters patent for constructing a cylindrical iron kerb for reception, repairing, and maintaining telegraph wires, to be of the same external form and size as the stone kerb now in use. Should this, in the opinion of practical men, be available, it must be a means of extending telegraphic communication, and prove of great public utility and economy, by preventing the constant necessity of taking up the roadways and pavements.

Palmyra and Tadmor.—The wife of Capt. Burton, the traveller, writes to the *Morning Post*, from Damascus a pleasant letter about the East. She states that the road to Palmyra and Tadmor is now open to European travellers. She has visited them, and says that Palmyra is only worth visiting if some days can be given to it, especially to examine the old Palmyrene tombs-towers which there represent the pyramids. Old Tadmor and its vicinity it would not be difficult, she thinks, to revive and cultivate when there is protection for life. Speaking of the tombs-towers, Mrs. Burton says:—"There are three tomb-towers which still may yield results; the people call them Kasr el Zayneh (pretty palace), Kasr el Azba (palace of the maiden), and Kasr el Arns (palace of the bride). Explorers, however, must bring ropes and hooks, ladders which will reach to 80 ft., planks to bridge over broken staircases, and a stout crowbar. We had none of these things. I have little doubt that the upper stories still contain mummies, tesserae, and other curiosities. We made sundry excavations, but we lacked implements, and our stay was not long enough for good results. The march from Damascus to Palmyra may be done in four days by strong people well mounted, as we did on return."

The Derby Memorial.—The Grocers' Company will subscribe 100l. to the fund now being raised for erecting a statue of the late Earl of Derby. A general meeting of the subscribers to the memorial in the former parliamentary division of North Lancashire was recently held at Preston. The amount promised is 1,560l. 13s. The sum actually received in subscriptions is 1,183l. 16s. The chairman said he had received the consent of the Duke of Devonshire to form a committee. He also stated that he had seen Mr. Foley, the sculptor, who said that the cost of the statue would be about 1,200l. It was resolved unanimously to adopt the recommendation of the general committee that the testimonial should take the form of a statue. The statue committee is to consist of the Duke of Devonshire, Colonel Patten, Colonel Greene, Lieut.-Colonel Croose, and Messrs. Holt, Harkie, Sharp, and Parker. It was resolved that the statue should be placed either in Lancaster or Preston.

Opening of the Darlington Polytechnic Exhibition.—The collection of the productions of art and science, now being exhibited in the Mechanics' hall, Darlington, is valuable and extensive. The objects which claim and receive chief attention are the paintings, which, though not properly a legitimate element in the collection, are additions and attractions which the committee secured. Among the results of the labours of skilled mechanics are an oak and elm Gothic sideboard, and other articles of furniture worth exhibition; specimens of graining and panelling; an electro-magnetic apparatus for working the block system on a railway; a model of a revolving fort; McDermid's patent paper-hanging machine; &c. The opening ceremony took place under the presidency of the Mayor of Darlington.

Fire at Westminster Bridge Station.—On Monday night a fire broke out at the booking-office of the Metropolitan District Railway Company, at their Westminster Bridge Station. The cause is at present unknown, but the fire spread very rapidly, until the whole of the wooden building was in flames. The booking clerks were able to leave the place without injury. The fire was fortunately confined to the office in which it originated, and which was almost destroyed. The exemption from the provisions of the Building Act at present enjoyed by railway companies is opposed to the public safety.

The Mansion-House Terminus.—"A Citizen" suggests as a compromise that the Metropolitan District Railway Company should be allowed to bring their line up to the Cannon-street end of New Earl-street, making their station on the angular piece of land on the east side thereof, and bounded by Bow-lane, thus absorbing the block of buildings (a great portion of which is at present unoccupied), and which presents such an awkward break of the line of the new street. The suggestion is worth consideration.

Permanent Photographs.—Mr. Woodbury's patent for printing photographs by a permanent process, has been purchased by Mr. Vincent Brooks, of Gate-street, Lincoln's-inn-fields.

Eastbourne.—The president of the college, the Duke of Devonshire, has determined to take steps for the immediate erection of the permanent buildings. The site selected is Larkfield, on the slope of the Southdowns and near the sea. The land immediately surrounding it has been assigned to the college for cricket-fields, &c. The position and soil are all that could be desired. Mr. Henry Currey, architect to the Duke of Devonshire, will have the management of the buildings.—The opening of the pier by Lord Edward Cavendish has taken place. The ceremony was marked by considerable pageantry, including a procession. A banquet took place in the evening, at which Lord Edward was present.

Manufacture of White Lead in America.—It is estimated that at least 40,000 tons of white lead were produced in the United States last year, and of this fully one-third by four establishments in Brooklyn. The largest corroding works in the country are in this city. It is further estimated that about 700 tons of lead in oil were imported in 1869, and about 1,500 tons dry. The amount of pig lead consumed in the United States the same year was over 30,000 tons, nearly all of which, as we have stated, is imported. The actual capital invested in the corroding business alone cannot be much less than 30,000,000 dollars, and fully 5,000 hands are regularly employed. If we look at the business incidental thereto, such as graining, colour-making, and selling, the proportions of this industry are vastly enlarged.

His Royal Highness the Prince Consort's Prize of Twenty-five Guineas.—This prize has been awarded by the Society of Arts to Edward Turner Sims, jun., aged twenty-two, of the Southampton Athenæum, clerk, who has obtained the following first-class certificates:—

- 1867. Arithmetic—First-class Certificate.
- " Political and Social Economy—First-class Certificate.
- " Geography—First-class Certificate.
- " English History—First-class Certificate.
- 1868. Book-keeping—First-class Certificate.
- 1869. English Literature—First-class Certificate.
- " Logic and Mental Science—First-class Certificate.
- 1870. Metric System—First-class Certificate.

Worcester Cathedral Restoration.—Mr. Scott (the architect) having examined the plans and revised the estimates, finds that 15,000l. further expenditure will be required to complete the restoration of the cathedral. Towards this sum Lord Dudley offers 5,000l., conditionally on 10,000l. being raised by the city and county of Worcester. The dean and chapter, in their official capacity, will contribute 2,000l., so that there will still be left 8,000l. to be provided by the public, in order to be in a position to accept Lord Dudley's offer. Lord Lytleton and Sir J. Fakington have made suggestions as to raising the required amount.

Another Discovery in Palestine.—An important discovery is said, by the *North German Correspondent*, to have been made at Jerusalem. It is an old stone, bearing the figure of a god sitting on a throne, with priests on both sides, and a Hunyartish inscription two lines in length. It was brought from Yeman, and was offered for sale. Dr. Oscar Meyer, the Chancellor of the North German Confederate Consulate, obtained an impression, which is at present in the hands of the Confederate Consul, Dr. Blau, who is residing for a time at Berlin. The inscription is said to contain the name of "Athtar," or Astarte.

Suffocation in a Well.—A labourer has been killed by foul air while being lowered into a new well in course of being sunk at the new asylum, Longdales, Bothwell. Water had been found at a depth of 57 ft., and for two or three days the well remained closed. The man was lowered with his foot on a rope attached to a windlass wrought by two labourers. As the apparatus neared the bottom, these two men heard him shouting, and asked what he wanted. No answer being returned, they raised the rope, and were shocked to discover his dead body hanging head downwards.

Cordova International Exhibition, 1870-71.—An exhibition of works of art, manufactures, produce, &c., will take place at Cordova, from October 15th, 1870, to January 15th, 1871, under the management of a board of directors appointed by decree of the national government, dated December 9th, 1868. In addition to the contributions of native exhibitors, certain manufactures are specially invited from foreign countries.

The Bath and West of England Show.—The Exhibition of the Bath and West of England Society has been held at Taunton. The arts department comprises some illustrations of metal work, with reproductive copies of the more remarkable specimens from both public and private collections in this country, and other parts of Europe. The Kensington Museum contributes, as it did last year, some specimens in majolica. Several classes of pottery are included in the contribution. A portion of a case is set apart to illustrate the application of the fine arts to the chief manufactures of France. Patent Roman tiles for roofing, patent ridge tiles, and patent eave tiles are exhibited in the open grounds; and Messrs. Searle & Son, builders, Bridgwater, have erected for the exhibitors, in red and grey moulded bricks, covered with tiles, an ornamental model cattle-shed.

The Oxford Architectural Society.—An excursion to Somerton, North Aston, Steeple Aston, and Lower Heyford, has taken place. The party were received at Somerton, by Mr. Wing, of Steeple Aston, who assisted in pointing out the principal objects of interest there, and at North and Steeple Aston, where the party were received by the Rev. J. H. Brookes, the rector, who hospitably entertained them at the Rectory, and exhibited the well-known examples of the fourteenth-century needlework belonging to this church. Rousham was next visited, though the time remaining was so short as to allow of little more than a glance at the church, though the party were kindly invited to pass through the grounds of Rousham, on their way to the station.

Longhope Church.—The spire and upper part of the tower of this church have for some time past been in a dilapidated condition; the belfry floors were decayed, the bell carriages unsafe, and the bells for a long time have preserved an enforced silence. The vicar and churchwardens therefore took the matter in hand, and have placed the edifice in safety. The spire has been taken down, together with the tower to the ringing-floor; the stonework has been rebuilt, and the tower furnished with crocketed pinnacles. The work has been executed by Mr. Organ, of Mitcheldean, under the superintendence of Mr. Maberley, architect, Gloucester.

Electricity in Threshing.—"R. T." says,—Electricity will open and expand loose fibrous substances. The beautiful rose will partly unfold itself. Why not the husk of corn which envelops each grain be made to open? I presume a slight application of a brush or stick would drop every grain; steam-threshing would then be an operation of the past. I was led to form this idea by the appearance of a Blue-coat school-boy partaking of a long and strong dose of electricity; his short hair stood upright,—he resembled a young porcupine astonished at a bugbear!

A New Gate.—A novel invention in the shape of a self-acting gate has been introduced, the construction of which is simple and ingenious. In driving up to the entrance the carriage-wheel passes over an iron, so connected by an underground rod with the hinges of the gate, that the latch end is elevated, and the top so inclined that the gate swings open by its own weight. The carriage in passing runs over a second wheel-iron, which causes the gate to close and securely latch. The movement is attended with no delay.

Electricity Utilised.—At the last exhibition of the American Institute, there was seen an elliptic lock-stitch sewing-machine, driven by a small electric engine, which might easily be put into a common hat-box. A series of eight magnets are set on the periphery of a circle, and around these revolves an armature of steel, which is continuously propelled by the magnetic action, and thus operates the machinery that moves the needle. The current may be cut off entirely, or the speed of the needle graduated as may be desired. The inventor is one Charles Gaume.

The Cost of Ink for the Public Service.—Mr. Stanfeld informed Mr. Crawford that the cost of ink annually purchased for the public service was 79,616 gallons of liquid ink, and 169,392 lb. of powder ink, and the cost was 3,212l. 6s. 6d., of which amount upwards of 1,500l. worth was purchased for and paid for by India. The whole amount was supplied by a private contract.

Contemplated New Church at Elmstead, near Colchester.—On Wednesday, the 8th, a meeting of the Building Committee appointed to carry out the contemplated erection of a new church at Elmstead Market, was held at the Bowling Green Inn, in that parish. The plans of Mr. James Stannard, of Leicester, were submitted for inspection, and accepted, the estimated cost of the church being something over 2,000l.

TENDERS.

For the erection of nursery, &c., at St. Marylebone Schools, Southall. Mr. H. Saxon Sueli, architect. Quantities supplied:—
Nightingale £1,363 0 0
Bamford & Son 1,320 0 0
Manley & Rogers 1,320 0 0
Hudson 1,319 0 0
Gibson, Bros. 1,274 0 0
Crabb & Vaughan 1,213 0 0
Howard (accepted) 1,189 0 0

For the erection of a house at Putney, for Mr. John Vaughan. Mr. Charles H. Goode, architect:—
Adamson & Sons (accepted) £1,565 0 0

For a house and office at Tulse Hill, for Messrs. Rickett, Smith, & Co. Mr. Gill, Croydon, architect. Quantities not supplied:—
Garrett £737 0 0
Bysh 679 0 0
Cressel (accepted) 658 0 0

For the erection of a farmhouse and homestead at Kensal Green, for Mr. Hutchinson. Mr. Robert Hutchinson, architect:—
Nutt & Co. £3,050 0 0
Bunting & Saint 2,994 0 0
Meville 2,928 0 0
Wicks 2,850 0 0
Dowel 2,745 0 0
Harrison & Sons 2,710 0 0
Blease 2,695 0 0
J. & R. Whitaker 2,635 10 0
Wills 2,550 0 0
Thackray 2,500 0 0
Dover & Co. 2,499 0 0
Parsons & Telling 2,499 0 0
Snowball 2,495 0 0
Wicks, Bangs, & Co. 2,430 0 0
Salter 2,375 0 0
Thompson & Smith 2,277 0 0
Bowler & Baxter 2,139 0 0

For the erection of a farmhouse and outbuildings at The Hyde, Kingsbury, for Mr. Atkins. Mr. Robert Hutchinson, architect:—
Blease £1,700 0 0
Wicks, Bangs, & Co. 1,631 0 0
Wills 1,599 0 0
Wicks 1,548 0 0
Nutt & Co. 1,500 0 0
Dowel 1,489 0 0
Harrison & Sons 1,478 0 0
Meville 1,470 0 0
Salter 1,457 0 0
Dowling 1,398 10 0
Thackray 1,395 0 0
Dover & Co. 1,383 0 0
Willett 1,362 0 0
Thompson & Smith 1,327 0 0
Snowball 1,292 0 0
Parsons & Telling 1,249 0 0
Bowler & Baxter 1,155 0 0

For house at Sevenoaks, for Mr. A. Wilson. Mr. J. M. Hooker, architect. Quantities supplied:—
Anscumb (accepted) £2,448 0 0

For proposed Union-house at Winchbold, Horat, Hants, Mr. Edmund Woodthorp, architect. Quantities supplied by Messrs. Welch & Atkinson:—
Brass £11,414 0 0
Hibbard 11,380 0 0
Nightingale 11,111 0 0
Birch 10,908 0 0
Henshaw 10,855 0 0
Perry, Bros. 10,880 0 0
Hill & Sons 10,980 0 0
Smith 10,600 14 0
Wood 10,000 0 0
Martin, Wells, & Co. 9,378 0 0
Sanders, W. 9,799 0 0
Sanders, F. (accepted) 9,497 0 0
Bull & Sons (accepted) 9,497 0 0

For offices for the Clerk of the Peace for Kent, at Maidstone. Mr. Martin Buimer, architect. Quantities by Mr. Geo. Ruck:—
Schofield £1,540 6 3
Smith 1,231 14 0
Naylor 1,187 0 0
Anscumb 1,045 0 0
Vaughan 1,422 0 0
Ayard & Abnett 1,015 0 0
Bridge 998 0 0
Sollet 990 0 0
Walls & Clements (accepted) 990 0 0

For schools at Belle Isle, Camden-road. Mr. E. M. Whitaker, architect. Quantities supplied by Mr. L. O. Radlett:—
Roberts £1,494 0 0
Williams 1,465 0 0
Higgs 1,463 0 0
Bridgman & Nuthall 1,361 0 0
Servenier & White 1,333 0 0

For additions to infirmary, at the workhouse, Bethnal-green, for the Guardians of Bethnal-green. Mr. Wm. Mundy, architect:—
Brown & Sons (accepted) 2,653 8 0

For repairs to thirty-seven houses, in Jefferson-street, Bromley-by-Bow, for the British Empire Life Assurance Company. Mr. McDougall, architect:—

Charman £1,510 0 0
Sayer 1,308 0 0
Sharp 1,265 0 0
Perpet 1,086 0 0
Stoner 965 0 0
Morley 991 12 6

For surface (pipe) drainage, Teddington. Mr. Thomas Goodchild, architect. Quantities supplied:—

Agas £599 7 4
Cole 528 2 0
Brown 519 3 0
Shanda 510 0 0
Pizzey 465 0 0
Voss 457 10 0
Blackmore 445 0 0
Keeble 419 0 0
Young 401 10 0
Goodair 350 10 0
Bloomfield (accepted) 398 0 0

For house, Lansdown-road, Tottenham. Mr. T. B. Munday, architect:—

Clayton £885 8 0
Chapman 710 0 0
Luzel 719 0 0
Hamlin 684 0 0
Sher 695 0 0
Vech 675 0 0
Nightingale 672 0 0
Mayers 668 0 0
Hamphreys & Son 640 0 0
Bowler & Baxter 630 0 0
Wicks, Bangs, & Co. 637 0 0
Harrison & Edwards 620 0 0
Bowler & Baxter 599 10 0
Reat & Brown 577 0 0
Neblett & Son 550 0 0
Whitaker 549 10 0
Hoare & Cleland (late) 535 0 0

For chapel at March, Cambridge. Mr. John Usher, architect:—

Curven £2,839 0 0
Nightingale 2,620 0 0
Broadhurst 2,471 10 0
Hutchinson 2,225 0 0

For Cambridge Corn Exchange. Mr. W. J. Bowyer, architect:—

Bardell & Son £8,300 0 0
Bast & Waters 5,395 0 0
Thorndy 5,200 0 0
Hailey 5,073 0 0
Nightingale 4,729 0 0
Bell & Sons 4,415 0 0
Loveday 4,375 0 0
Elworthy 4,325 0 0

For residence and stables, at Bendicote, near Barbory, Oxfordshire. Mr. Thos. M. Lookwood, architect:—

Dover & Co. £2,781 0 0
Nightingale 5,678 0 0
Franklin & Sons 5,255 0 0
Munday 5,194 0 0
Claridge 4,930 0 0
Davis 4,572 0 0
Kimberley 4,498 0 0
F. & S. Orchard (accepted) 4,490 0 0
Palmer 3,973 0 0

For works, Grand Junction-street, Blackfriars. Mr. A. Peebles, architect:—

Hill & Sons £2,576 0 0
Myers & Sons 2,415 0 0
Barnett 2,240 0 0
Adamson & Sons 2,226 0 0
Ramsey 2,215 0 0
Fish 2,199 0 0
Manley & Rogers 2,168 0 0
Sawyer 2,100 0 0
Nightingale 2,063 0 0
Pattman & Potheringham 1,959 0 0
Foster 1,942 0 0
Ennor 1,990 0 0

For rebuilding house and shop, No. 29, High-street, Hampstead, for Mr. Barnes. Mrs. F. C. Dyer, architect:—

Hill & Sons £1,424 0 0
Servenier & White 1,268 0 0
Manley & Rogers 1,277 0 0

For alterations and additions to Bromley Workhouse, at Ladbroke, Bromley, Kent, for the Guardians of Bromley Union. Mr. W. Lee, architect. Quantities supplied by Messrs. Lunsell & Giffard:—

Marsden £2,800 0 0
Emmett 2,499 0 0
Garrett 2,845 0 0
Paine & Co. 2,838 0 0
Crabb & Vaughan 2,199 0 0
Arnold 2,096 0 0
Gill 2,729 0 0
Henshaw 2,683 0 0
Hill, Kedwell, & Waldram* 2,510 0 0
Idclett 4,377 0 0

* Accepted.

For St. Michael and All Angels' Mission Schools and residence, Woolwich. Mr. J. W. Walter, architect:—

Quantities supplied by Mr. W. F. Neighbour:—
Myers £2,763 0 0
Woodford 2,613 10 8
Dove, Bros. 2,475 0 0
Manley & Rogers 2,465 0 0
Winship 2,230 0 0
Shepherd 2,150 0 0

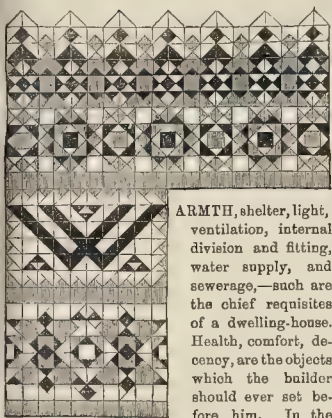
For stabling, coach-house, &c., at St. Alban's, Hertford. Mr. Thos. Paget. Messrs. Henry Jarvis & Son, architects:—

Tarrant £1,651 0 0
Misin 1,487 0 0
Thompson 1,480 0 0
Henshaw 1,447 0 0
Shepherd 1,443 0 0
Gammon & Son 1,385 0 0
Richardson 1,159 0 0

The Builder.

VOL. XXVIII.—No. 1429.

Bad Building.



ARMTH, shelter, light, ventilation, internal division and fitting, water supply, and sewerage,—such are the chief requisites of a dwelling-house. Health, comfort, decency, are the objects which the builder should ever set before him. In the

absence of intelligent care for these things the cot of the labourer degenerates to the level of the wigwam of the savage, or the lair of the wild beast. It can bear no comparison, as an architectural product, with the pendent nest of the weaver-bird.

Beyond these, which may be the result of mere building, we want æsthetic propriety. A dwelling-house, architecturally designed, should not only fail to offend the eye by its ungraceful lines, or its unredeemed poverty of surface, but it should give a sense of pleasure to the intelligent observer. It should afford evidence of thought, of skill, and of good taste. It should act as an educational element in the life of its occupants. It should, by silent contrast, condemn all that is sordid, squalid, and makeshift. It should be such a building as it would be impossible to mistake for a magnified pig-stye.

It is possible that a more steady and successful attention might have been given to these great requirements of domestic architecture, but for the weight of another consideration, which few can safely neglect. Cheapness is unfortunately a most important desideratum. So much is this the case that, like Aaron's rod, its voracious energy too often devours all the rival elements. "Learn to build cheap: all earthly graces will follow in their proper places," or, if they do not follow, so much the worse for them. Such might be the motto inscribed (it is inscribed for those who know how to read it), on many of our modern groups of houses.

We speak, on the present occasion, almost exclusively of the dwellings of the poor. For them, necessarily, economy of construction is a leading element. Luxury of ornamentation would be out of place. It could only be at the expense of some more valuable requisite. And yet it is in this very class of buildings that the moral teaching of architectural propriety is most important. If we regard, as we should do, the architect as a silent but yet eloquent moral teacher, it is precisely his very poorest clients who have the most need of his ennobling lessons.

In old time the architect spoke to the poor man with a voice louder and more melodious than any that echoed from the pulpit. He reared before his eyes the House of God. He pointed his thoughts towards heaven, by a graceful and lofty

spire. He hung in the air above him towers rich in clustered tabernacle-work, or pierced with luminous tracery. He arched over head a miniature resemblance of the firmament, which seemed to be a solid crystal vault, spangled with shining stars. He clustered his shafts, and shot out his fan-shaped groins, in emulation of the natural net-work of the forest. He pierced his solid walls with slenderly-mullioned windows, till the white transmitted light became intolerable to the worshippers. Then, in defence of his art, he called on the glass-worker to emulate the craft of the painter. He subdued the unwelcome glare by *grisaille*, by yellow stain, by all the heraldic pomp and historic glory of purple, and crimson, and green, and azure. And thus, in stone and in glass, he wrought out many a noble poem, which stirred the hearts of those who were altogether unable to spell out the language in which it was made immortal.

In considering the past and the present position of architecture, it should not be forgotten that we are unable to distinguish how much of the effect of ancient architecture is due to the very element of age. There can be no doubt that antiquity, as such, has its distinct effect upon the imagination. In reading the poems, in studying the art, in admiring the architecture, of our predecessors, we revert to the cradle of our own thoughts. The voice of the past is always poetic, even when it no longer is considered to be musical. It is so because it is always more general, more allusive, more allegorical, than contemporary speech. With the descent of mankind, and with the increase of knowledge, language becomes more precise, more scientific, and less poetical, generation after generation. What is the case with language is the case with all the expressions of human thought. And thus a cathedral of the fourteenth century, or a castle of yet earlier date is surrounded by a mythical halo which no contemporary building can wear to our eyes, although it may, long hereafter, to those of our descendants.

While, then, we feel bound to acknowledge with some satisfaction the change which the last quarter of a century has seen effected with regard to our views as to contemporary ecclesiastical architecture, and even as to taste in buildings in general, whether in streets or in country localities, we anticipate but little educational advantage from this influence. With but few illustrious exceptions, our architects themselves are too uninterested in the history and in the capabilities of their art to make it a vehicle of elevated moral culture. For the most part they are paralysed by the spells of the demon of cheapness. A pernicious substitute for the golden rule has been introduced in our time. It has not yet been inscribed in copy-books, or stuck up in our houses in spider-legged little oak frames, blazoned in ill-conditioned church text; but it is made by many the rule of life, notwithstanding. It is the gospel of some men in high places; or, at least, it is the formula by aid of which they clomb to the seats which they so long and so bitterly envied. It is the maxim to buy cheap and sell dear. That is the golden rule. Much good it has wrought us.

But, leaving aside the question of the æsthetic proper, let us look at that which lies before us at the present day. If economy banishes ornamentation, there is yet left for us the beauty of well-adapted structures. Everything that is well done has a beauty of its own. The cheap is not necessarily the nasty. On the contrary, by the time that the play is played out, it will appear that the nasty is never really cheap.

It should be observed, in passing, that, under our present social condition, economy is as it were double-distilled. It is raised far above proof; its effect is intensified and aggravated by the different steps which intervene between the desire, on the part of a landholder, to build a

house, and the completion of the house on which he decides. But the future proprietor has to count his own cost. He has to decide on how much he can spend,—to reckon what return he may fairly hope to receive for his outlay. So far we hear nothing but the voice of prudence. The unwisdom of the man who began to build, and had not wherewithal to finish, is matter of moral statics from the time when people were accustomed to dwell very contentedly in tents. So far, then, so good.

For the next step comes in one of the improvements, if such they are, of later times. Our friend has decided to build—let us say—a dozen cottages for his farm labourers or his factory-men. He is prepared to lay out so much money for the purpose. Will that be enough? he asks. Quite enough, is the reply.—How shall I be sure of that? Nothing more simple. Contract with a builder, and the thing is done.—So far, again, so good. There is no doubt that a practised builder will tender, for a given sum, to erect a much more substantial and ornamental set of buildings than the capitalist would obtain if he had to go himself into the market for materials and to superintend the activity of his workmen. Thus far, again, we hear nothing but the voice of prudence.

But the next step goes rather aside from the straight path. The capitalist is not content with getting value for his money; he wants to get the outside value,—the uttermost farthing: therefore, instead of selecting a tradesman of unimpeachable character, and quietly arraigning with him the terms of an equal and just contract, he advertises for tenders. In they come, by the dozen. The best man stands aside in disgust; the second-best man tenders a trifle cheaper than he fairly ought to do, for the sake of obtaining employment. How about the third-best and the fourth-best, and those following after him? How about the thoroughly reckless scamp? Why, in sober fairness, unless the advertiser gives notice that he will not hold himself bound to accept the lowest tender, the scamp, if he can produce the security of other scamps like himself, will have a *right* to the contract. The proprietor saves 15 or 20 per cent. on paper. He becomes the unenviable owner of buildings that are worth nothing. Economy peeps out of every hole and every crevice, and laughs at him to his face. The foundations are on the slip; the bricks are misshapen; the timber is sappy and unseasoned; the paint blotches and blisters; the glass distorts the external prospect into a worse than Chinese perspective. An army of rats ascends from the untrapped drain-pipes. The slater's footmarks leave dribble-holes for the rain, always in that part of the roof against which the wind beats most fiercely. The chimneys are so roughly finished as at once to smoke, to draw downwards instead of upwards, and to collect volumes of soot for discharge into the rooms at inappropriate times. No door closes; no bell rings; no lock shoots. Water-pipes are afflicted with dropsy, and exude unwholesome damps; ill-made plaster comes off in patches; gas, if gas be laid on, pervades and permeates every room. Conversation in the kitchen, varied to a sharper key than is pleasant by some of those agreeable incidents, becomes distinctly audible in the sitting-room, or wakes the baby, to add to the din, and the inhabitant bewails the day on which he was beguiled, by an offered economy of a few pounds of annual rent, to inhabit a cheap house.

We have spoken of but one out of the many sources of wretched work in building. We have referred to the master-scamp alone, to the cutting contractor,—needy or unprincipled, as the case may be. But we must remember that like takes to like. The master-scamp has an unfailing tendency to surround himself with other scamps, each more hungry, more inefficient, more cutting than himself. The timber mer-

chant must live, so must the brickmaker, so the painter, the plumber, and the glazier, the ironmonger, and so on. Hear what a working man, or at least a representative and good friend of the working man, says on this point. Says Mr. G. Shipton, the secretary to the Amalgamated Society of House Decorators, "From these combined elements of evil there arises another most deadly and pernicious in the extreme, I mean the class of needy unprincipled employers who have sprung into existence and infest our trade, simply because to an employer it is excessively remunerative. Thus any person having a few pounds to start business commences in obtaining, by peculiar means, and underhand methods well known in the trade, the influence of the servants to some gentleman, and in the first place by cleaning the windows, slopping out basements, washing paint, doing one-coat work, &c., and by making themselves generally useful for any purpose, finally obtain the work to be done in the grand staircase, dining-halls, and even drawing-rooms. . . . At last the honourable and respectable firms, by further reducing the required skill, education, and judgment to conduct good works down to a base level within the scope of the meanest intellect, give fresh opportunities to the needy employers to compete against them, and by their underhanded influences of course more successfully, and still further demoralise the taste of the public.

Against a state of things thus eloquently described in the language of truth, it is, indeed, time to make a stand. And the one feature of the case which tends to give most confidence as to the results of effort in the right direction is the utter wastefulness of inferior work. That waste, indeed, is of things more precious than gold or silver. Health, comfort, brain power,—the great elements at once of individual well-being and of national wealth—are squandered by that neglect of the laws of honesty and of common sense which is so evident in the greater number of our low-rented houses.

In this, as in all other cases which demand reform, the first thing is to obtain full, accurate, and appropriate information. To compel the builder to erect houses fit for human habitation, we must teach the occupants what careful skill can really place within their grasp. Something has been done, and is doing, in this respect among ourselves. But it is to our French neighbours that we owe the most valuable and most accessible information on the subject of the elements of industrial building that shall be at once reasonably cheap and reasonably good. Attention has been turned to the subject in Paris far more systematically than in London. The Emperor of the French, not content with the transformation of picturesque, old, unsavoury Paris, into its present costly magnificence, has tried his own hand as a poor man's architect. The taste, however, of one rank of life is rarely that of another. Habits differ with the difference of habitual occupation, and the requirements of the wage class, the small tradesman, and the more freely-spending folk of the lower and middle classes differ as much as do those of men of different nationalities. Thus the Emperor's home for the poor man is not altogether to the poor man's taste. He will be his own architect. He thinks that he knows far better what will suit him than the most anxious thought of the considerate occupant of the Tuilleries can enable H. I. M. to arrive at. With universal good sense and good taste the Imperial architect has endeavoured to accommodate his poor brother. If the latter has a plan to suggest, it shall, at all events, be tried. We have not space at the present moment to enter into the details of this most honourable and interesting competition, but we propose to give full information to our readers on a future occasion.

Reverting, then, to the considerations with which we commenced, let us summarise those qualities which are demanded for the seven requisites of even the humblest human dwelling.

First, as to shelter. It is requisite that walls and roof, doors and windows, should be not only weather-tight, proof against pouring or drifting rain and violent gusts of wind, but further that they should be bad conductors of heat, so as to avoid chill and save fuel in winter, and keep out the undue heat in summer. Further, they should be non-absorbent and washable, both within and without. The sanitary importance of this requisite is of the very utmost degree.

For light, it is necessary for health, and especially necessary for the successful rearing

of children (unless the poor creatures are to be given the key of the streets), that the windows should be of proportionate size, glazed with fair glass, and that the house should be so arranged with regard to them as to avoid dark nooks and corners, which are too apt to become the seed-plots of disease. Nor can we hesitate to deplore the economy which fails to complete the window, especially in the sleeping-room, with a solid wooden shutter.

Warmth and ventilation are intimately connected, although, in our present style of building, they are regarded as antagonistic. In even the best sort of English houses ventilation is for the most part only effected in virtue of the scamping and non-fitting of doors and windows. The subject is of the utmost sanitary importance. The introduction of fines for the admission of air, which may, by a proper arrangement, be warmed in its passage, enter the rooms at an adequate temperature, and escape laden with the products of respiration as well as of combustion, ought to be made legally imperative. Our wasteful open fires, our ill-built chimneys, and our ill-constructed grates and stoves, are all so many premiums for dirt, waste, and discomfort. Intelligent precaution would entirely alter this portion of our domestic disarrangement.

The internal divisions and fittings of a house exercise as much influence on social welfare and happiness. Due separation of the sleeping from the living apartments, and of both from the accommodations for cooking and for cleanliness, are essential. Nothing can tend more to break down the instinct of modesty, and to lower and degrade the daily life, than the want of such decent accommodation. Again, proper cupboards or closets, distinctly fitted for the well-known and universal requirements of cottage life, are requisite for tidiness, cleanliness, and comfort. At the same time they must be so constructed as to be readily thrown open to the light. Dark, crooked, un-get-at-able nooks must be avoided, as haunts of dirt and of vermin. The washable character of every fitting must be borne in mind. All absorbent matters, in small or densely-packed houses, more especially, have a special faculty for imbibing miasma, evil odours, and the seeds of disease of all kinds, and for giving them freely forth without losing the power of continued reproduction. Much discomfort, or much cost in furniture, may be saved by due provision being made by the builder for the universal wants of the occupants.

As to water-supply and sewerage, the conditions of the town and country cottage may widely differ. For the latter, the main point may be to regard the purity of the well, and to consider how far the earth-closet system can be satisfactorily applied. For the former it is important to avoid lead pipes, cisterns, or fittings. The principle of constant supply, with a protection against waste by the use of pipes of a very small bore, should be regarded as essential. And for the sewerage the importance of depending upon the regular action of a fixed supply of water, which is under the control of the engineer, and of carrying off by surface or other proper drains the irregular floods caused by the uncontrollable rainfall, and avoiding the undue dilution of unavoidable manure, should never be lost sight of. The more fact of realising the importance of these seven elements of health and comfort, and of keeping their attainment constantly in view, would tend, more than almost anything else, to the improvement of the future dwellings of our industrial classes.

HOMERIC ARCHITECTURE: THE PALACE OF ULYSSES.*

THE position of a *thalamos* of Penelope on a level with and just beyond the *megaron*, explains how she overhears all the treacherous talk of the suitors over their cups in the "*megara* [here plural] of the men." It seems to be in this same lower *thalamos* that while she is in private discourse with Eumæus and her maidservants (xvii, 541) she hears from the *megaron* the well-omened echoing news of her son. It is not inconsistent with this that in the first book she hears the song of the harping Phemius perfectly from her upper apartment (i, 328).

In the twenty-first book it is certainly from the *thalamos* where she has been within earshot of the suitors (xx, 387) that she proceeds by

the lofty stair (*clíman*) of her *domos* (xvi, 5) to ascend to her "most secluded chamber [*thalamos eschatos*] with the oaken threshold" (*dominos oudos*), a muniment-room and treasury, and brings away the bow of her absent lord,—the power to bond which she proposes to her suitors,—so will she yet once again play with and deceive them, as qualifying test of her future husband.

The father and son, in anticipation of their desperate enterprise, have already, after the departure of the suitors for the night, removed all arms from the walls of the *megaron*, where they have been hanging ever since the departure of Ulysses for Troy. The nurse, or now rather housekeeper, Euryclia, by their order keeps the women who have to clear up in the hall, in the *megara*,—here equivalent to the women's apartments beyond the stone threshold,—she shuts (locks) the doors of the "*megara*, well inhabited," while the pair carry in—it does not at present appear distinctly where, but clearly into some apartment accessible from the *megaron*—the helmets, shields, and swords. Athene herself gives light to the work, carrying a golden lamp and lightens all the place—(xix, 37)—"the walls of the *megara*, the beautiful *merodmai* [frames of the panels?] the pine beams and lofty columns;" and this is the most detailed statement we have of the constructional members of the apartments. A store-room almost as important as a treasury, but in constant charge of Euryclia is mentioned in the second book, where Telemachus descends into the broad, high-roofed *thalamos* of his father—a cellar, therefore—from what part of the house does not appear; but doubtless and naturally beyond the *megaron*, as he has to await his mother's retirement to rest before removing stores (ii, 358). Wine and oil are here stored away, with chests of raiment (*nyctos*), gold, and brass. Then we have notice of the mills where the women ground the corn, not remote from the *megaron*.

The test of the bow is to consist, not merely in power to string it, but also in using it with such dexterity as to shoot an arrow through a series of twelve iron instruments—they are called axes (*akatai*)—set upright in the ground. What might be the form of these otherwise—the female attendant's of the Queen bring them down in a case (*kyrtov*), (xvi, 61)—it is not easy to guess, and at present does not matter. As regards their arrangement, Telemachus plants them duly upright, in one accurately straight trench, and presses down the earth about them (xxi, 122). He then stands upon the threshold and attempts, or pretends to attempt, to bend the bow. We learn afterwards that they were set up within the limits of the palace (xxi, 262)—the *megaron* of Ulysses. The *aula*, as an open courtyard, is the place that would admit of the trench required; and it would seem that it must have been the threshold of communication between this and the *megaron*—the *melinos oudos*—upon which the attempting archer took his stand. Otherwise, from the *launos oudos*, he would have a longer shot by length of *megaron*, but to shoot through the opposite door.

At a sign from his father, he lays it aside, just as he could have succeeded. The suitors all try in vain, proceeding (*iridísta*) from the position of the *crater*, or mixing vessel; and as the wine circulates—not from right to left, as passed from one to another by moderns, but from left to right, as carried round by the wine-bearer of the ancient feast. In vain they endeavour to render the weapon more flexible by anointing it with fat melted at a fire they have lighted on the spot (*iri myyapara*). While they are thus futilely employed, the oxherd Philoitus and swineherd Eumæus quit the *oikos*; Ulysses also goes out of the *domos* (the equivalent use of the phrases is noticeable), and as soon as they are outside the portals of the *aula* he reveals himself to them—tested before,—certifies his identity by a roar, and claims their loyal and zealous aid. Eumæus is instructed, in case of any objection on the part of the suitors, to place the bow in the hands of its master; then to order the women to fasten the doors of the *megaron*, cutting off so the connection between the *megaron* and the *thalamos* behind by closing the doors on the threshold where Penelope so often had appeared, and by closing which Euryclia had already before excluded the women, and to keep within and quiet, whatever disturbance they might bear in the enclosures of the men (*akípaon ipirípaon* by *ipípaon*=*andronitis*). Philoitus, at the same time, is to lock and secure the main outer portal of the *aula*, which he does, as we have

* See p. 438, ante.

seen, with a ship's spar. All this is accurately performed. Penelope, in the mean time, having retired, on the injunction of her son, at the height of altercation with the suitors, who are indignant at the suggestion which she favours, as well as Telemachus, that they should be brought into competition with a beggar, albeit he would be excluded from the prize. The queen retires to her upper chamber, to be speedily sent to sleep by Athena. Throughout this scene, as previously, Homer adjusts her conduct and expressions with such dainty delicacy that all is perfectly natural; yet the reader knows as little as Ulysses can know, whether (περίπου) Penelope suspects or believes the beggar to be her husband, knows not whether to believe or suspect it, or has no thought whatever on the point.

Ulysses strings the bow with ease, twangs it as a lyrist a new string, and, seated as he is, sends an arrow through the steels unerringly. The position of his seat, we have been told (xx, 258), Telemachus had now assigned him, a proper, but modest seat, within the megaron, and by the *laivos ovdos*, thus opposite the door between the megaron and aule. Telemachus, at a signal, seizes sword and spear, and takes his place beside the *thronos* of his father, who, stripping off his rags, leaps to the great threshold (μέγανυθρον) (xxi, 1), which implies,—as this threshold is certainly the *melthos*,—that he traverses the megaron; he shakes out the arrows from the quiver before his feet, and launches the next into the throat of the chief offender among the suitors, Antinous. The slaughter so commenced proceeds apace. The victims turn to the walls for arms, only to find them stripped and bare, draw their swords, seize the tables as shields, and encourage each other to force by a rush their ruthless enemy from "the threshold and the doors." Every arrow carries a life; and in anticipation of their exhaustion Telemachus seeks arms for themselves and the pair of servants in the *thalamos*, where his weapons were deposited (xxii, 109), and so the four stood armed with helmet, spear, and shield. This *thalamos* must either be the same as his sleeping-apartment, or, at least, like that connected with a set that could be entered from the *aule* (i, 425), and therefore at the command of those who held the threshold intermediate between *aule* and *megaron*; it appears, indeed, by what follows, to be the same to which the night before they had transferred the arms from the megaron.

From the megaron there was one other exit only, an *orothyre*, or sallyport, "in the well-built wall" (xxii, 126), the sequel shows, at the suitors' end of the apartment; and by "the extremity of the threshold of the well-based megaron," the threshold occupied by Ulysses, there was a way or passage into a lane (*ὁδὸς ἐς λαύρην*) apparently external to the palace, secured by well-fitted folding-doors (*καύρη*). One suitor proposes to ascend by this sallyport (Why ascend? we ask,—was the megaron on lower level than the *aule*? This could scarcely be), and give the alarm to the people without; but the attempt is renounced because "the fair portals—*thyreæ*—of the *aule* are very conspicuous, and the mouth of the passage (*ὀρὶς λαύρης*) so confined, that one resolute man could there obstruct any number." Ulysses, indeed, has placed the swineherd on the spot to watch the passage—*ὁδὸς* (xxii, 129).

The passage to which this *orothyre* admits will be consistently interpreted as a service passage between the wall of the megaron and external wall, issuing into the *aule* by a passage, and into an outer lane, by a door near the end of it.

Melanthius, the ill-conditioned and disloyal goatherd, who is with the suitors, as he has abetted their worst courses all along, ascends by the *orothyre* to the *thalamos*, where he has divined that Ulysses and Telemachus had deposited the arms, and thence brings supply to the still surviving suitors. This *thalamos* was thus on an upper story reached from the service passage mentioned. It is described as ἀνὰ ὤψας πυράδος (xxii, 143).

This disaster is a consequence of the negligence of Telemachus; he owns that he had left the door ajar,—we presume when he brought the arms thence very shortly before. He now bids Eumeus "to close the door of the *thalamos*, and observe who is the traitor, Melanthius or one of the women."

This suggestion that the women who have been excluded by the closed doors at the stone threshold may still have supplied the arms implies that the service passage had, as is

reasonable, communication with the women's department beyond the megaron. This, in fact, gave the indispensable access not only to the *aule* and its main door, without traversing the megaron, but also admitted the household, when necessary, to such a *thalamos* as that where the arms were deposited, and also to others on this side. Thus it was that Ulysses, sleeping in the prodromus, had an opportunity of seeing with indignation the women-servants going out to join the suitors, their paramours. In the first book the bedchamber of Telemachus is described as "a *thalamos* of the very beautiful *aule*, built lofty, in a position conspicuous, or rather affording a general overlook." The description implies that it is accessible from the *aule*; and the attendance of Euryclia, that it is so also from the women's side. The instruction to fasten the *thalamos* has to be deferred; but Eumeus catches sight of Melanthius, which he possibly might from the further end of the passage, and reports. Ulysses undertakes with his son to confine the suitors to the megaron, while Eumeus and Philoioles proceed to the *thalamos*. Melanthius is already searching the recesses,—the *muchos*,—of the *thalamos* for arms, when the two herds take post, one on either side of the entrance by the *stathmoi* or door-posts: as he comes out laden they start forth, seize, and drag him by the hair into the *thalamos*, throw him down, draw back feet and hands, and strap them together; then, looping him with a rope, draw him to the top of a high column close to the rafters or beams. The rope seems to be thrown over a beam that extends from one column to another, or from wall to column.

The herdsmen then arm themselves,—had they for this merely gymnastic exploit taken off the arms in which we have seen them already equipped?—"close the shining door,"—(the same phrase 201, as at v. 156),—and rejoin the princes.

The fight recommences. Athena, for a few moments in the form of Mentor, stimulates Ulysses, and then flies upwards in form of a swallow, and perches on the *melathron* (αἶσα λαένρος πυράδος) (xxii, 239),—properly the beam blackened by smoke of the hall fire,—and hence sometimes used like hearth, as equivalent of hospitable house, and here at least implying a covered roof, with escape for the smoke.

The suitors in vain discharge spears,—six of them together,—at Ulysses alone, in position at "the first doors" (πρὸ πύλων ἑρῶν) (xxii, 250), a new title for the doors between megaron and *aule*. Minerva made all effectless and futile,—one struck the door-post, another the door, another the wall. Every spear returned by the party of Ulysses is fatal, and the rest retire to the recess or extremity,—the *muchos* of the megaron (270). The same interchange is repeated, and with the same marvellous and unequal results. Then Ulysses and his son close with their opponents; the goddess on high from the roof (*ὑψόθεν ἐξ ὀροφῆς*) (298), the roof that we inferred, displays, the maddening *αἶς*,—they scatter and fly like a herd maddened by the brise, and are slaughtered in all directions (*κατὰ ὅπας*) about the hall.

Pheonius, the minstrel and Medon, the herald, both guiltless, and only consorting with the suitors under compulsion, are spared. Pheonius had stood still holding his lyre, close by the *orothyre*, hesitating whether he should fly from the megaron,—evidently by the *orothyre*,—and sit by the altar of Great Jove Herceia,—that is in the *aule*,—or embrace the knees of Ulysses. He decides for the last, and setting down,—still carefully,—his lyre between the crater,—that this is one in a certain position at the extremity of the megaron we learn from xxi. 146, and a *thronos*,—he sues to be spared as guiltless. Telemachus intercedes for him, and also for Medon, if still unslain. Medon creeps out from his hiding-place under the *raw* (*ρῶα*) hide of an ox. Ulysses laughs—a little, we suppose, at the figure he makes,—and bids both go forth from the *megaroi*,—now in the plural, *Sûpaç*,—through the door, and sit in the *aule*; there, accordingly, they take seat by the altar of Great Jove, glancing every way, expecting death every moment (xxii, 378).

The chamber searched through and every suitor found to be slain, Telemachus shakes the door of the megaron to signal Euryclia (394), who opens it and sees Ulysses, bloody from head to foot among the slain, like a lion after feasting on an ox.

At command, she summons the female servants,—twelve out of a total of fifty,—who have intrigued with the suitors and disgraced and insulted her authority and Penelope. These

first, under compulsion, carry forth the dead and place them under the *aithousa* of the well-fenced *aule*, "pressing on one another" to relieve the weight of their burdens (v. 387), by the doors of the *aule* (xxiii, 49), and then with water and sponges cleanse the seats and tables. Telemachus, with the two herdsmen, scrape the floor (*dapeδον*) of the well-wrought room (*πύλα προῖταις ὀφύας*) with hoes (*ἀστράταις*);—there is no decisive hint whether the floor was paved or of wood,—and the women carried away the dirt and deposited it without (*Sûpaç*). When all has been set in order, the wretched girls are taken out of the megaron and confined in a narrow space whence there was no escape, between the *tholos* and the fence of the *aule*; there Telemachus, varying from his father's instruction to slaughter them with the sword, declares that it is by no clean death that the lives shall be taken who have insulted his dignity—his mother—and comforted the suitors, and with the cable of a ship—fitting it to a lofty column of the *tholos*—he drew them up and hanged them all. "Nooses were round the necks of all of them that they might most miserably die, and they quivered their feet for a time—a very short time indeed" (xxiii, 470). We may probably be justified in inferring from the reference to an unclean death,—or if this means no more than privation of what semblance of honour there is in death by the sword, from the name and position of the *tholos*,—that it represents the place of accommodation necessary even to palaces.

Lastly, Melanthius is brought forth by the *prothyron* and *aule* (474)—by the prothyron and then to the *aule*—that is, by that portion of the *aithousa* of the *aule* that formed the prothyron of the megaron. There he suffers the cruel mutilations that too much resemble modern vengeance of kings—the execution of Babington, or of Colonel Harrison, or even of rebels of the '45 on Kennington common (*τετίεστο δὲ ἔργον*) (479). The work is complete, and the work done; sulphur, "of ill the remedy" (481),—sulphur and fire are brought to purify "the megaron and domos and *aule*" (494); and so all is prepared for general recognition by his household,—the other women admitted at once are at once effused in confiding joy and congratulation—and above all by Penelope, who, more collected, more wary, more wise, withholds her full recognition from the basely-clothed and, indeed, metamorphosed husband, is not convinced by the sign of the scar, which she only knows by hearsay from Euryclia, and then only flies into his arms when, fresh from the bath, re-clothed, restored to proper majesty by Athena, he responds to her challenge, and reveals his knowledge of their common secret, the concealed construction of the bed which he himself, in building his *thalamos*, had made an absolute fixture, working it into and about an olive-stem that was growing and rooted in the earth when he commenced, and that he left so until he had entirely closed and covered in his chamber.

CONCERNING LUNATIC ASYLUMS.

In conformity with the general custom of the heads of the various structural departments of the public service to outline the chief requisites in the classes of buildings over which they preside, the Commissioners in Lunacy now distribute a pamphlet of suggestions and instructions likely to be useful to those about to build or remodel lunatic asylums. Besides their own long list of recommendations concerning sites, construction, arrangement, and plans, they make an accompanying gift of a second pamphlet of suggestions relating to the sewerage, drainage, and water supply, drawn up for them by Mr. Rawlinson. Persons in quest of information as to what a lunatic asylum should be like in its structural arrangements, have now, consequently, official general guidance on many points; and those in charge of such establishments may find many items of instruction that they can make of good account.

And what are the official requisites in a lunatic asylum in the year 1870? Several of them are merely sanitary precautions that every architect would take on building a gentleman's house. In the choice of site, for instance, the suggestions are those that an architect would advise for any considerable residence. But, on the other hand, there are instructions with which it is imperative to be specially acquainted. Every four patients should have, the Commissioners stipulate, not less than an acre of land,

if practicable, to afford them means for agricultural employment, exercise, and recreation; these acres should lie to the south of the asylum, that they may be in the sun and not in the shade of it. Again, the locality should be within easy access by railway or other public conveyance, for the convenience of friends visiting the patients, and for the supply of stores; and not more than three miles from a town, so as to be able to take advantage of the water and gas supplied to it, taking care, however, that the grounds are not overlooked, or intersected, or even surrounded by public walks. Forty gallons of water per patient per diem, are considered sufficient; but the quality must be good, and ascertained by analysis, and the materials used for pipes and cisterns determined by the information yielded by it.

In considering the accommodation required indoors, architects may reckon that, out of every hundred patients, fifteen will be sick, twenty will be recent and acute cases, requiring also special provision, and sixty-five ordinary-working, quiet, and chronic cases. There must be infirmaries for the sick; small reception-wards for newly-admitted patients, whilst their cases are under scrutiny for classification; dormitories, with single rooms adjoining for special care of suicidal and epileptic patients; and accommodation for at least three classes of ordinary male and female patients, with their attendants. Three stories in the building are not objected to, provided the uppermost story be set apart for sleeping accommodation, and the living-rooms, as far as possible, kept on the ground floor, in the southern aspect; and all offices, store-rooms, committee-room, visitors' rooms, and porter's room and entrance kept on the northern side. Cottages or other simple buildings are considered desirable for working patients of both sexes; these for women to be erected near the laundry, and those for men near the workshops and farm buildings. The chief buildings destined for general use, such as the chapel, dining-hall, kitchen, scullery, laundry, workshops, and store-rooms, should be made at the first large enough to meet a possible increase in the number of patients. The chapel may be isolated—indeed, should be so; but the dining-hall must be near the kitchen, and, at the same time, available for amusements.

Coming to the actual arrangements for the every-day life of general patients, the Commissioners suggest that every ward should have a day-room on the ground floor for aged, infirm, and excited patients especially, of not less than 40 ft. superficial dimensions for each patient, unless there be wide corridors, of more than 10 ft. in width, when the 40 superficial feet may be made up between the two. The associated dormitories must contain 56 ft. superficial for each patient, and the separate sleeping-rooms 63 superficial feet. The rooms intended for the sick should allow rather more breathing-space; and rooms intended for the sick to sleep in should have one-third more cubical contents than others. Each infirmary must be provided with a small kitchen, with a cooking-stove; and there is yet one more requisite for the unfortunate sick. Each division of the establishment must have a mortuary, consisting of two rooms, easily accessible from the infirmaries.

The officers' residences are duly cared for. The medical superintendent must have good accommodation either in a central part of the asylum, or near enough to it to be connected by a covered way, with a kitchen and other domestic offices for his sole use. The assistant medical officer, the steward, matron, and chief attendants must have suitable apartments of moderate extent placed near the chief scenes of their duties, without, however, private kitchens. The domestic servants are associated with such patients who work in the kitchen.

The staircases are recommended to be so placed that the medical officers and attendants need not retrace their steps to get from one ward to another. There should be no winders to the stairs, or long flights, or well, or other facilities for suicides or accidents.

Horizontal and lateral fire-proof construction, the Commissioners say, should be adopted wherever practicable; but they insist that the floors next below the roof in those parts of an asylum occupied by the patients should be made of incombustible materials; the floors of other sleeping-rooms, day-rooms, and corridors to be of oak, or yellow deal, that they may be cleaned by dry rubbing. The walls can be plastered, or lined with pressed bricks, at option.

Lavatories, with a bath, and water-closets in

proportion of one to every ten patients, are required for every ward.

The precautions officially preferred for effecting ventilation are flues taken from the rooms and corridors into horizontal channels, communicating with a perpendicular shaft, where the foul air is to be carried away by the aid of rarefaction, contrived in a fireproof chamber. The official mind contemplates the possibility of building the ventilating flues of inflammable materials, and stipulates that when they are constructed of such,—for instance, quartering lathed and plastered,—they should be kept at least 20 ft. from any furnace, smoke-flue, or shaft; this intermediate distance to be of fire-proof materials. Smoke-flues carried up through any of the main walls are required to have a hollow space round them, to prevent the transmission of heat from them.

In the matter of the disposal of the sewage, it is suggested that it should be distributed by gravitation in a fresh state over the land. And for the best mode of doing this, the Commissioners refer inquirers to Mr. Rawlinson's instructions, which, as we have indicated, they issue with their own. On turning to these, we find a complete treatise on sewage, drainage, and water supply, abridged, to meet only the necessity of its application to institutions similar to those under consideration, into about fifty short canons; moreover, illustrated with nearly as many diagrams, showing sections of brick sewers, filter-beds, manholes, ventilating-shafts, and the like. Mr. Rawlinson not only details every step that should be taken to ensure the thorough working of his system, but points out imperfect ways of carrying it out that would utterly frustrate its simple mode of action, and the dangers that are possible to be met with in its execution, with the best means of guarding against them. The pith of his instructions concerning sewerage, however, comes to the familiar this:—

Main sewers, of commensurate size, should be laid out in straight lines and true gradients from and to well-considered points, without the use of right angles, with ventilated manholes, and flushing and ventilating arrangements at each principal change of line and gradient. Where earthenware pipes are used it is well to line the trench in which they are laid with clay puddle, and to see that the joints are water-tight, and in sandy soils impervious to sand. When brick sewers are used they should be made of bricks moulded to the radii, and set in hydraulic mortar, or in cement. Sewers and drains, whether of equal or unequal dimensions, at all junctions and curves should have extra falls. Drains should not enter buildings, nor be ventilated into flues within buildings. Surface inlets to all pipe drains should be protected; and sewer outlets should have the same care taken to prevent wind blowing in, and so driving sewage gases back. The form of sewer outlet recommended as efficient to remove solids, sediment, and floating matter is among the objects figured. Manholes should be made easy of access from the surface to admit of inspection. The most approved form for these, with ventilating chamber and charcoal basket, is also figured. Danger, in deep trenches, must be looked for from quicksands, loose earth, bog, or made ground; and guarded against by close timbering and packing up, and either by leaving the timbers in the trench, or removing them with the greatest care.

For water-pipes, Mr. Rawlinson recommends cast iron, and for cisterns boiler plate, or cast iron. Wrought-iron service pipes, and earthenware pipes, where not liable to pressure, are preferable to lead. The care required for forming conduits, tanks, and wells, is dilated upon minutely. An opinion respecting the value of sewage is thus positively given:—

"Sewage contains the elements of every field or garden crop which is grown, and, compared with solid manure, there are advantages in using fluid sewage. The water of sewage in dry weather is alone of great value, 224 gallons (1 ton) of sewage, in summer, worth about (twopence compared with Peruvian guano at 11l. per ton.

Sewage may be applied to common grass, to Italian ryegrass, and also to root and vegetable crops.

The earth possesses the power of extracting and absorbing from sewage all the manure it contains, if the dressings, in volume, are proportioned to the area, to the depth broken up, and to the quality of the land. Sewage-grown herbage increases the volume of milk cows will give, and improves the quality of the butter. Sewage may be applied to land throughout the year."

Lunatic asylums are just now in rather unfavourable repute, owing to several cases of broken ribs that have been produced in the carrying out of processes in vogue for quieting restless, paralytic, pauper patients. At a meeting

of the Pathological Society, Dr. Thompson Dickson recently presented some bones from a paralytic patient, of forty years of age, which were remarkably soft and fragile, to show how easily they could be broken. An impression of too much roughness, or too little regard for soft and fragile bones, however, still remains. Many will be, doubtless, surprised to find that the commissioners have considered so many points in the housing of unfortunates, whose bones meet with so little tenderness. A little more breathing space and elbow-room, and more provision for amusements, beyond that occasionally to be had by the transformation of the dining-room into a hall of entertainments, would place an asylum, constructed according to their suggestions and instructions, almost upon a level with any hygienic establishment. Where return to health, mental and physical, is the general aim, a detached hospital for any epidemic that may break out among the patients should, as well as these items, be stipulated for in more stringent terms in the next edition of the instructions, and then well-wishers of the afflicted would have but few more constructional improvements to urge.

NEW TRAVERSE STREET FROM THE STRAND AND HOLBORN TO THE NORTH-WESTERN RAILWAY.

FROM east to west, extending eight miles, our city is permeated by streets and roads, which, although winding, give scope for its enormous population; Oxford-street and Holborn being the widest, the most central, and direct; Piccadilly and the Strand the more devious; both lines converging in a sweep round St. Paul's,—not because there is no open for their direct junction, but that a heavy iron railing meanders round the cathedral, and a wooden barrier stops the way. Oxford-street presents a direct line of suitable width, about three miles in extent, from Uxbridge-road to Farnival's-inn. Along this route the greatest improvement has been effected—first, by pulling down the block of insulated houses called Holborn Bars, but most by bridging over the Fleet valley, as effected by the corporation, in an unequalled style of liberality. In strong contrast, however, with this, the Temple Bar is allowed to stand in ruin, and obstruct the still more important highway of commerce, the last of the corporate barriers of free intercourse; but so soon as the long-pending question of the Courts of Law is decided, that too must give way (like Cripple-gate) in the march of improvement.

What the public really wants is a line of inter-communication between the Strand and Holborn—one struck out so as to alignate with the best north-western route, through the W.C. district, and leading to a railway station, by a wide, long, and distinguished thoroughfare.

In the plans of the new Law Courts some allusion has been made to the necessity of enlarging Serle-street into Lincoln's-inn-fields, and thence perhaps to widen Great Turnstile, so as to give a one-sided approach. It is difficult, however to see how this line could be drawn, of sufficient latitude to the Strand, southward, without impinging on the site already secured, which is little enough for a building that ought to be national, and creditable to the skill and taste of the day.

On the other side of the plot selected a line of street might be drawn through the worst slums of our great centre, that could be effected with as little cost, and that would form the most convenient causeway from north to south, whilst it would reclaim squalid shambles, and transform them into an ornament to the whole vicinage.

Lincoln's-inn-fields, with their fine array of vigorous plants and shrubs, will quadruple with the proposed new elevation of the Law Courts, at less than 160 ft. distance. The spacious roadway on the west side is but 110 yards distant from Holborn, through Little Turnstile, one half of that passage being already of sufficient width. Then continue the street from the south-west angle of the fields in a straight line southward to the Strand, just opposite Norfolk-street—the distance is but 170 yards; thus there will be only 225 yards of demolition to permeate the New Inn, part of Newcastle-street, Houghton-street, and Holles-street, Clare-market, Gilbert-street, and Portsmouth-street, the vilest of costermongers' quarters. Upon such grounds, the works of reconstruction and the formation of a new street would be comparatively inexpensive, and, at the same time, give health to a region which has hitherto been the dark retro of law-

yers. The line of chambers on the west side of the old inn would, by these means, be saved the din of traffic, while the Elysian character of the fields would be preserved; and, so far as concerns the Law Courts, it would suffice for their necessities.

The thoroughfare entering Holborn at New Turnstile, 100 ft. eastward of Kingsgate-street, should cross that street diagonally in the direction of Upper King-street, necessitating the demolition, in part, as far as the north corner of Lower King-street, a distance of 150 yards (but this only in case an extension of the line may be thought expedient), so as to form an opening and vista of the noblest line of the N.W. district as far as Camden-town, for a further distance of two miles. Its course would be Southampton-row, Russell-square, Woburn-place, Tavistock-square, then by St. Pancras Church, by the great North-Western Railway, and so onward. This would form at least one happy issue for the construction of traffic, leading to an important, well-built, and quadrilaterally arranged portion of the metropolis.

On the south of the Strand, Norfolk-street, which is 49 ft. wide, leads direct to the Metropolitan-station and Temple Pier; and this, like the three miles of north-west extension, is complete and ready to hand, access to the embankment being provided at an easy gradient for a driftway.

It will be seen that by opening the new street for only 170 yards, the thoroughfares of Norfolk-street and Lincoln's-inn-square (west side), will be utilised, and, as it were, revealed for public traffic, between the Embankment and Holborn; and that by a continuation across Holborn of only 55 yards more to Upper King-street, the straight two-mile range will be brought into play as far as Camden-town. As to the value conferred on the slums of Clare-market and the whole vicinal reticulation of zigzag lanes, there can be no doubt of the remunerative prospects of the change and transformation; no more than of the easement it would give to traffic, together with the respectability, if not dignity, which it must confer upon the Temple and the new Law Courts.

5 per cent. on all public buildings; he did the work in a public office; his clerks were paid by Government; the Government made a change, and called upon him to confine himself to the duties of the office with an increased salary; he resigned his office, but refused to give up any drawings he had prepared while holding office, and succeeded in retaining his plans.

Mr. Oliver said that, having succeeded in a competition for the North Riding Infirmary, after carrying out the works and upon rendering up the building to the corporation, he was asked by the town clerk to deliver up the drawings. He maintained that the drawings were his property; the town clerk said the corporation would go to law. He (Mr. Oliver) said that if they would not make it expensive he would join them in a friendly lawsuit, for the purpose of settling the principle. The committee, however, dropped the matter, and he retained his drawings.

Mr. Drew said a similar case was that of Mr. Rogers, against whom proceedings were commenced by the town council of Chelmsford, because he retained his plans. He consulted counsel, who very strongly advised him not to give up a single paper. It was to be presumed that the town council also consulted, and received similar advice, for the matter was dropped. He knew of other similar cases.

Mr. Hine said it was his practice to bind up the plans, bills of quantities, contract, and every paper connected with it, into one book, the custody of which he always retained with him as the umpire between builder and client, without dispute by either.

After a lengthened discussion, the following resolution was agreed to unanimously:—"That, in the presence of the delegates present, the custom of the architect retaining his plans of the buildings which he has carried out has been universally adhered to, and that it is desirable it should be maintained in the provinces."

The following resolution was also carried unanimously:—"That in the opinion of this alliance it is very desirable that the Royal Institute of British Architects institute examinations in the provinces."

The following officers were then elected in place of those retiring:—Mr. Hine as President; Mr. Rickman as Vice-President; and Mr. Douglass Mathews as Secretary.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

On Wednesday evening last, the President and Fellows of the Institute, gave their annual *conversazione*, at the House in Conduit-street. Mr. T. H. Wyatt received the visitors. The rooms were filled with objects of art, including many capital drawings, and a military band in the lower galleries discoursed excellent music. The attendance was numerous, and the whole passed off agreeably.

DRAINING WITHOUT SCIENCE.

How differently a face looks, painted by two different men. One will make a moderately dirty little boy look "as clean as new paint;" another will make him as dirty as it is possible, by a liberal supply of oil and muddy colour. The processes are always in operation. One runs foul of the other; for either the clean little boy is allowed to trot forth first, with a certainty of a dirty little boy banging into him head foremost; or the dirty little boy is let loose, with a certainty of coming to fisticuffs with some clean little boy. I am not one of those who like to see an old woman step up, separate, and admonish the combatants. I prefer to keep a clearing witness a fair fight, admiring pluck as much in the washed as in the begrimed. I have been led into this line of thought by "Gargyles," "Stagnant Lincoln," and the reply of "A Lincoln Householder." The former makes Lincoln a moderately dirty little boy. I call this a fact. The "Lincoln Householder" makes it a wonderfully clean little boy. I call this a —. However, I am not going to do the muddy colouring; in fact, my present communication has little or nothing to do with Lincoln or its minister. Upon looking over my notes, jotted down some few months since,—I had never been in Lincoln before,—I find this: "The drainage does not seem so very good." Now, I may remark, that I have become so accustomed to filth in close proximity to noble architectural works, that I question whether I should have troubled to note any fact about drainage unless something worse than usual had struck me or my olfactory nerves. "A Lincoln Householder" puts any excuse for such a state of affairs under his feet by denying the existence of stagnant water. I can quite sympathise with him as a householder and tax-payer, and can easily imagine that another rather heavy tax for a thorough system of drainage, in addition to those which he already has to bear, fills him with a wholesome terror. But, who on earth is wild enough to suggest a system of thorough drainage for a place like Lincoln? A hill like that upon which it is built drains itself naturally. This is easily demonstrated; at least, it was to me; for during my ascent of the steep hill (no wrong name, I can assure the infirm) I witnessed some of the good housewives emptying domestic utensils into the

surface gutters. The contents of such vessels commenced rapidly finding their own levels by making frothy head for the lower portions of the town. Should the drainage below be no better than higher up, the peculiarly black and greasy appearance of the streets is easily accounted for.

This matter of drainage brings me to my subject. Drain your towns, by all means, but utilise the sewage. Those who are practically acquainted with farming need not be told the vast amount of food thrown into the sea, or, worse still, thrown where it becomes our deadly enemy, poisoning our rivers, plague-smiting all people; evils intensified by another sort of drainage,—the drainage of the country. We have been doing worse than the individual did who killed the goose that laid the golden egg. We have gone madly,—well, say unscientifically,—into drainage. We have found verdant vales not verdant enough; they have borne us crops, but the crops have been all too little for our cravings. We have sought for the place of the lichen and the willow; we have noted the resort of the woodcock and snipe; and in our wisdom we have said, "This is all wrong: bogs do not fill pockets, and will not grow corn well. Improve them off the face of the earth. Search ye out rushes: ay, here is neglect: drain them away." The times of good Queen Bess, with the rush-bestrewn floors and rush-bottomed chairs, are of the past: they may not cumber the ground any longer: away with them and their memories. Drain the land, "reclaim" it, and make it valuable. We have done this with a vengeance. Farm after farm, county after county, has been drained. Swamps bloom; morasses have become gardens; mountain-sides vie with the valleys in fruitfulness,—and will not continue to do so. We have no water; drought has assumed a dreadful and gigantic aspect. Each summer as it comes brings its increasing terrors; each winter its fearful inundations. We have figuratively, almost in fact, laid a coat of impenetrable armour between the clouds and our poor land. The rains of heaven descend; they are hardly allowed to kiss, leave alone embrace, it. Can we hope for fruitfulness? The generous streams fall but to be hurriedly driven into the nearest channel; from the channel to the brook, from the brook to the river, and then—for a flood. The river overflows its banks, and floods a district, bridges are swept away, cattle destroyed, and a small amount of human loss may add slightly to the evils; but we enlarge our bridges, increase our waterway, straighten our rivers, if we can, and pitch into drainage with fresh vigour; and then summer comes again. Wheat gets into ear, with no straw worth speaking of; the hay is "light in the bottom," and seeds before its time; potatoes are as big as marbles, when they ought to weigh half-a-pound apiece; and the town waterworks cut off the supply, and there is no water to boil them.

This water question, so far as we in England are concerned, is assuming a most serious aspect. The architect, as well as the engineer and landowner, is involved in the question. Sites are fixed upon for houses, and houses built, the water supply duly thought of—sometimes; but eventually the river, which has worked a ram, fails in giving a head of water sufficient for the purpose. If a well has been sunk, matters may be almost as bad; the height of the water decreases year by year, until it is looked upon with doubt, is proved unequal to the requirements, and eventually abandoned for a covered "catch" tank.

In out-of-the-way places, where the pipes of waterworks have not yet penetrated, the architect has often been driven to his wits' end in meeting and overcoming the difficulty of a regular and sufficient water-supply; and unless the subject receive a great amount of attention, his difficulties in this respect will increase. However, he is far from being the most interested party: the question concerns the nation at large.

I said that the thorough drainage of a town, and the thorough drainage of a county jointly caused a great evil, and were directly the cause of epidemics. Our cities are drained as a rule into the nearest rivers; these cities have organised water-supplies; the water falling in the winter is collected into tanks, and the surplus of the rainfall is carried to the sea. Now a natural result follows; we have so drained our country that springs, which have hitherto been unknown to fail, fail now when the dry season arrives,—the rivers become low, and often, were it not for the sewage water flowing into them, almost dry: the result is, that when we want

THE FRENCH GALLERY, PAUL MALL.

THREE or four pictures by a young Spanish artist, Mariano Fortuny, now exhibited here, have from Paris a high reputation. The principal of them are called,—the "Spanish Wedding," "the Snake Charmer," and "the Carpet Merchant;" and we learn that the "Wedding" picture has been sold for 2,800*l.*, and the "Snake Charmer" for 1,700*l.* That they are works of peculiar merit, few who examine them will deny. The expression given to each figure, the powerful and harmonious colouring, viewed from the proper point of view, are very striking; but the style is not such as we should wish to see imitated: it borders closely on the extravagant, and would speedily degenerate to the outrageous. The pictures actually before us, however, are very interesting, and well deserve a visit.

THE ARCHITECTURAL ALLIANCE.

THE ninth annual meeting of this body was held on Wednesday last, at 9, Conduit-street; Mr. T. R. Smith in the chair. The following delegates were present:—Mr. Rickman (Hon. Sec. of the Alliance), Mr. J. D. Mathews, and Mr. R. P. Spiers, as representatives of the London Architectural Association; Mr. J. R. Botham, of the Birmingham Architectural Society; Mr. H. H. Statham, jun., of the Liverpool Architectural Society; Mr. Thomas Oliver, of the Northern Architectural Association; and Mr. T. C. Hine (Vice-President of the Alliance), representing the Nottingham Architectural Association. Mr. Drew, of the Institute of Architects of Ireland, was also present, as a visitor.

After some discussion, the following resolution was agreed to,—“That the Royal Institute of British Architects be invited to meet the delegates of the Architectural Alliance, consisting of the following allied societies (mentioning their names) once a year, at their annual meetings.”

The next subject brought under discussion was the custom, law, and expediency of an architect retaining his plans.

Mr. Hine said his experience supported the universal practice of retention.

Mr. Drew cited a case which occurred forty years ago in Ireland, and which was identical with Mr. Barry's case. The architect of the public Board of Works in Ireland, Mr. Murray, was paid 500*l.* a year, and a percentage of

this sewage washed immediately into the sea, the river is least capable of doing it; the filth accumulates, channels become shallow, currents sluggish, and thus one evil produces another.

In speaking to different farmers upon the matter, I have not unfrequently been told that the springs in certain fields have failed in an extraordinary manner; upon questioning them as to drainage, and pointing out the impossibility of springs supplying water if their supply is cut off by drainage, they have told me that they were thinking of taking up the drainage pipes that had been laid down. This, in some instances, must be done, unless each farm is furnished with water-tanks. Drainage in some counties has proved but poor economy. We have turned our bogs into gardens, and our gardens into deserts. We have been unscientific in the matter. Had we, before draining to the extent we have, calculated the rainfall to each acre, found what each acre required, the necessities of the population, the flow of the rivers, the strength of the current required to retain the proper depth in the channel, and the collateral questions involved, we should have provided artificial springs before destroying the natural. We should then have heard less frequently of floods, of falling bridges, of floating hay-stacks and cradles with babies and cats, of stagnant pools instead of silvery rivers, of fish destruction and poisoning, of dying cattle, of bankrupt farmers, of fever and death.

M. U.

PARLIAMENTARY.

Unemployed Labour.—On going into Committee of Supply, Mr. McCullagh Torrens called attention to the continued want of employment in many of the great towns, with the view of inducing the Government to do something for the promotion of emigration to the colonies, and for the cultivation of waste lands at home. He would have, for example, as he said, third-class ships, like third class or like Parliamentary trains; and to every workman paying down 3*l.*, he would give a passage by these ships to Canada. Other members took part in the debate, and Mr. Goschen, in a very able speech, showed, from a host of documents, that trade and employment are reviving at almost all the centres of industry, and that the unemployed are being rapidly absorbed. The revenue returns, he said, show that the working classes are consuming more sugar, more tea, more beer, more spirits, and more tobacco than ever. Those classes are depositing more in the savings-banks and contributing more to the Imperial Exchequer; and there is scarcely an indication on which we can rely that does not point to increasing prosperity throughout the length and breadth of the land. "All the facts," he added, "to which I have referred, leave me no doubt of this—that the distress is not greater than it was a year ago, that it is not greater than it was two years ago, and that it is decreasing. Unquestionably, there is great misery in parts of the metropolis, and local misery elsewhere. The question, then, is—are we to legislate on this subject; are we to go back from the great principle we have always acted upon of leaving the labour market free, of letting labour take care of itself? I contend that we ought not to do so unless a very strong case is made out." He did not deny that there still remained enough distress and want of employment to deserve the attention of the Government; but he asserted that the remedy was to be found, not in reversing all our past legislation, or resorting to extravagant schemes of education, but in removing from our workmen the disadvantages which hampered them in their competition with foreigners, and encouraging the self-reliance and self-dependence for which they were distinguished. Members afterwards spoke both against and in favour of Mr. Goschen's statistics and conclusions, and the debate was adjourned.

Cavalry Barracks.—In reply to Sir C. Dilke, Mr. Cardwell said that no proposal had been made to the Government with respect to the purchase of land in Chelsea for the purpose of cavalry barracks, and he had not thought it necessary to interfere in the matter. This scarcely agrees with what has been stated elsewhere.

The New Law Courts.—Mr. Ayrton informed Lord E. Cecil that questions had arisen of a very complicated character, which would take some time to solve, in relation to the new courts of law, which it was desirable to solve before the plans could be agreed on and produced.

Accommodation for Reporters in the House.—

Mr. Ayrton informed Mr. Taylor and the House that his attention had been directed to the character of the accommodation provided in the House for reporters, and he was about to submit the results to her Majesty's Government; and if the plan which he had prepared should be approved, it would be submitted to the House in the special service estimates.

The Kensington-road Improvement Bill.—The First Commissioner of Works has informed the House that he shall postpone this Bill till next session. The matter has not been very well managed, and opposition to a desirable improvement was unnecessarily raised.

The Embassy House at Constantinople.—In reply to Mr. Rylands, the Secretary to the Treasury, Mr. Stansfeld, said that in the event of resolving to rebuild, no contract would be entered into before it had been laid on the table. Should the estimate be laid before the House this session, it would necessarily be a rough one; but in that case he should do his best to make it as accurate as possible.

OPENING OF ARDINGLY SCHOOLS.

The opening of Ardingly Lower Middle-Class School, of which we gave a view and plan in our volume for 1867, pp. 836, 837, has just taken place.

This educational establishment, which bears the name of St. Saviour's College, is situate on the slope of a hill overlooking the valley of the Ouse, and is visible from the great viaduct on the Brighton Railway, between Hayward's Heath and Balcombe stations. The college is designed to hold 1,000 boys of the superior artisan, or small tradesman class; and, for the small sum of 1*l.* per annum, each boy is boarded and thoroughly educated, the education being based on Church teaching. The institution will be self-supporting. The first stone of the buildings was laid by Earl Granville, on the 12th of July, 1864, and since that time the works have been pushed steadily forward, and are now far advanced. The plan consists of two large quadrangles, the lower one being open on the southern side. The two wings of the lower quadrangle have accommodation for 400 boys in eight dormitories for 50 boys each, the ground-floors being occupied by class-rooms, with masters' rooms at the end. The head-master's house adjoins on to the south end of the east wing. The cross buildings between the two quadrangles comprise the upper and under dining-halls, and the two great school-rooms, which occupy the whole space under the chapel. A tower stands between the hall and the chapel, which is reached by a staircase communicating with the ante-chapel. The upper quadrangle has on its three sides double dormitories for 600 boys, with class and master's rooms, and separate school-rooms for the very young boys. The kitchens and offices stand westward of the dining-hall, and form a distinct quadrangle. The ground falls rapidly towards the south-east; a terrace wall, therefore, be carried along the southern front, and the quadrangles kept on one level; below the terrace is a steep slope with a lake at the bottom. The River Ouse forms the south-east boundary of the estate. The style adopted is simple Early Pointed, with alternate two, three, and four light cusped windows in the wings, and three-light traceried windows in the upper dining-hall. The materials are red brick for the walling, and for the windows, arches, dormers, bands, and other architectural features, the local sandstone, which is of a light brown colour. The roofs are covered with brown tiles from St. John's Common. The fittings are of a very simple description; the window-frames and casements are of iron. The sum of 6,538*l.* has been paid for the site, and the estimated cost of the buildings is about 35,000*l.* The architects are Messrs. Slater & Carpenter, of London. The clerk of the works is Mr. Knight, of Shoreham, builder to St. Nicholas College.

The buildings at present erected comprise the two wings of the lower quadrangle, including a portion of the head-master's house, half the cross building, the kitchen, and the offices. These will give accommodation for the head-master and his family, fourteen other masters, a staff of servants, and 450 boys—in all, about 500 persons. The portion of the cross buildings erected consists of the upper and lower dining-halls, but till the chapel is built the lower hall has been fitted up for divine service. This building is 120 ft. long and 62 ft. high. The upper hall has an open roof of Memel timber, stained and var-

nished. The two wings of the quadrangle completed are each 162 ft. long, 47 ft. high, and 37 ft. in width. The space across the quadrangle, which is covered with turf, is 182 ft. The buildings will occupy about three acres.

The school, which already numbers 250 boys, has hitherto been carried on at Shoreham, houses being hired for the purpose, but the boys will now very shortly take up their residence at Ardingly.

ON THE UTILISATION OF THE HEAT THAT USUALLY PASSES AWAY IN CHIMNEYS.

SIR,—Economy in fuel has been justly for some time a matter of scientific investigation.

It has been well known that heat is given off from the outer surface of pipes, shafts, and chimneys whilst transmitting heat that has been produced in stoves or furnaces, but the quantity of heat in such cases is too inconsiderable to answer the end of warming any apartment through which they may pass. The power of arresting the heat usually lost by passing into the open air, may be greatly augmented (as will be clear to any mind on reflection) by causing the air of an apartment to pass through tubes transfixing such flues or pipes, but in no way communicating with the interior.

For some years past I have thrown my thoughts into this subject, and have conducted experiments, the results of which have shown me that a vast economy of fuel, with other advantages, may be derived through means used for the carrying out of the principle above stated.

I am not aware of the exact proportion of heat that is afforded by fires in ordinary stoves, grates, &c., to the apartment in which they are placed, but I have understood and believe that the proportion is small compared with that which passes away into the open air. It has been stated to be as three to seven. To utilise that heat which would usually pass away is the great desideratum, and I am convinced that this is within our reach to a great extent.

The following are the plans I would recommend, and the objects to be obtained:—

First. Where there is a narrow chimney or shaft passing through an apartment connected with a fire in the same room, or in a lower room, warmth may be communicated by transfixing such chimney with tubes obliquely, so that the air of the apartment passing through from their lower to their upper extremities shall be heated, and passing into the room will of necessity warm the whole air.

On taking possession of a cottage which I had purchased, I found just such a narrow chimney in one of the bedrooms, and for two years by such means this room has been kept warm whenever a fire has been lighted in the room below. This is, however, an imperfect instance of the advantage to be derived from the plan. It will be found that the surplus heat produced by a fire, and which would ordinarily pass away by the chimney, may with great facility, in many cases, be given to adjoining rooms on the same or upper floors, and thus may be accomplished.

Secondly, as follows:—Where a chimney runs upwards, through a wall which divides the room in which the fire-place is placed (connected with such chimney) from another, the superabundant heat may easily be conveyed, instead of going off by the chimney, to the apartment behind the wall. An opening for this purpose may be made at the back of the stove above the fire, and through the wall, into which an earthen pipe may be introduced, of sufficient length to allow an elbow of a metallic pipe to be fixed, in which a valve or damper should be inserted. From this elbow a flue may be carried upwards, or in any other direction, through which have been inserted small tubes, from 2 in. to 3 in. in diameter, in an oblique direction. This pipe may be carried through the floor to the apartment above and beyond, according to the quantity of heat that may be usually transmitted from the fire beneath.

The size of the pipe may be varied; but that which I have employed is about 7½ in. in diameter. This plan I have put into operation in two instances, and have kept warmed six rooms, during the last two winters, by two fires. The temperature varying, of course, according to the size of the fire, and the external temperature of the air, it may be said that proper pro-

* I have tried a variety of metals, and at present give preference to tinued iron.

vision must be made for the safe transmission through the flooring, although the heat never rises to a dangerous degree; and also the pipe at its further extremity must bend by a slanting elbow into a chimney (in its case it is the same chimney). It must be further observed, that the stoves above alluded to are Romford, or "register," stoves, and that the heat requires to be shut out from the chimney by the register-flap, or by a damper above the fireplace, so as to send it backwards into the pipe.*

Thirdly. The same effect may be produced by building a narrow shaft of brickwork at the back of an interior wall, having a fireplace on the opposite side, through which shaft small metallic tubes, the same as those above mentioned, varying from 2 in. to 3 in. in diameter, are introduced obliquely, the shaft itself communicating with the fireplace as before described, and furnished with a damper. This plan I have carried out by building a brick shaft behind my kitchen fire, which for two years has communicated sufficient warmth to a room behind and to a bedroom above it, the shaft terminating in the upper part of the kitchen chimney.

Fourthly. The object aimed at may be obtained by substituting for the pipe a box of the necessary size transversed by small tubes either obliquely or perpendicularly, according to convenience, the box having two openings, one for the admission, and the other for the exit of the products of the fire.

A small church, with a high-pitched roof, 65 ft. in length, by 24 ft. in breadth, has been conveniently warmed by this contrivance for the last three years. The stove, which is 15 in. by 17 in. in dimensions, stands out of sight in a small shallow well at the end of the building, surrounded with brickwork; the box through which the products of the fire pass is in length 43 in. by 10 in. in breadth, and 36 in. in depth, and is transversed by 16 tubes, some nearly horizontal, and some perpendicular. The draught from the stove is made to pass from one corner at the bottom of the box across to an opening at the opposite corner at the top, where it passes into the chimney.

On experimenting with this limited apparatus, I found that the box and tubing did not sufficiently economise the heat produced by the stove, and I thereupon attached a second box, 36 in. by 10 in. by 36 in. in dimensions, and have thereby fairly accomplished the desired end. In the stove coke is exclusively burned, and each day costs only from 6d. to 8d.

The temperature of the church can be usually sufficiently raised in about four hours. The only observation that I would further add is that this principle, viz., of warming the air of apartments by the surplus heat, which ordinarily passes away by communicating it to the air, by its passing through small tubes, as above described, may be carried out in a variety of ways, as I have proved by making other experiments, and that with proper adjustment it may be made to conduce also to the ventilation of apartments by the external air so warmed in its passage.

As my object is simply to communicate a means of comfort and economy procured at small expense, from which I myself and some of my friends have derived benefit, allow me to make use of your widely-spread journal for this purpose.

JOHN WHITING, M.D.

(Member of the Royal College of Physicians, London).

STEAM CULTURE.

At a meeting of the Wenlock Farmers' Club, reported in the *Shrewsbury Chronicle*, a paper was read by Mr. Stables "On the Advantages of Steam Culture," &c., from which the following is condensed.

What is the relative cost of steam and horse tackle? . . . As a principle, allowing a 12-horse-power set to cost 600l., including all accouters, that amount involves a sum, for interest, of 30l. per annum; that is, for the power of 15 horses, with the implements of culture. Suppose that 18 horses of ordinary stamp, should be bought for 30l. each, and the implements required in

using their powers on the land cost 10l. more, we have the amount of 540l. for horses, and 110l. for implements, making a total of 650l., which commands interest to the amount of 32l. 10s. Were the extent of land sufficient, and the circumstances of the farm or farms conducive, so that this 18-horse-power could displace the same number of horses, then it follows that no more capital is required to farm with steam than with horses. . . . The fact must be palpable to the most uninitiated that steam tackle should, with proper care, and if adapted to the work to which it is applied, be worked at a much less rate of deterioration than horses. The steam-horse is heedless of those atmospheric influences which prove so deleterious to the varied members of the animal world. Alike a stranger to attacks of colic and inflammation, and ignorant of all vicious propensities, it uses its wondrous power at the bidding of intelligence, knowing no other will but that of its attendant; and in the development of its strength, it is alike a stranger to galled shoulders and wearied limbs.

The introduction of steam-cultivating tackle into any neighbourhood is a matter of importance not only to the occupier, but to the proprietor. The land is permanently improved by steam cultivation. How is this? Depth of culture tends to increase the depth of the soil. Depth of culture in facilitating the action of the drains; and, making the land more constantly and permanently dry, tends to improve the quality of the soil. While these facts point to increased annual value, the possession of tackle enables a tenant, by increase of crops and by saving of expenditure, to combat with seasons, circumstances, and times; and tends to ensure rent punctually and fully paid. There are many enterprising, industrious, persevering tenants who would be glad of steam power, and whose farms are well adapted, and with such power would make a good profit, but now can but manage to live and pay their way. Maybe their landlord is looking out for money investment, and is glad to get 3 per cent. for his surplus income. Why not invest in the steam-cultivating tackle for the benefit of his tenants? Why not lend them part of the purchase-money of the tackle on the security of the tackle itself? True, there are some occupiers who have little mechanical genius, and who would make little profitable use of a set of tackle. But this is not the case with all, and the principle is the same.

CATHEDRAL RESTORATIONS.

Rockester.—The appointment of the Rev. Dr. Scott to the deanery of Rochester will, it is believed, lead to the restoration and renovation of this cathedral at no distant date. For many years past the funds from the suppressed canonries of the cathedral have been accumulating in the hands of the Ecclesiastical Commissioners, and these now amount to between 30,000l. and 40,000l. A strong hope is now expressed that the accumulated funds will be expended in improving the cathedral, both internally and externally. The removal of the old block of houses on the south side of High-street has opened up a fine new view of the north-eastern portion of the cathedral. A further improvement might be carried out by still further throwing open this partially inclosed space, and making a road to the eastern end of the cathedral from High-street.

Ely.—Between two and three years ago, Mrs. John Thomas Waddington, of Troyford Lodge, near Winchester, undertook the restoration of the great western portal of this cathedral, renewing the richly foliated tracery of the arches and replacing the entire series of marble pillars. This work was executed by the firm of Messrs. Rattee & Kett, of Cambridge, under the direction of Mr. G. G. Scott. Mrs. Waddington was anxious, at the time, to present a pair of new oak doors to be ornamented with richly-wrought metal work. An objection was, however, raised to the displacement of the old doors, which had been erected by Bishop Eustacius, in the thirteenth century, and an attempt was therefore made to repair them by cutting away all the decayed portions, and inserting new wood. The result, however, was very unsatisfactory and patchy. Experiments were tried of staining the doors, but no uniform colouring could be obtained, whilst the effect of the ironwork on the darkly stained doors was altogether lost. Other experiments were made of painting and gilding the ironwork, which were equally unsatisfactory. The door has been cased with new oak, and the ironwork replaced.

Lincoln.—An interesting experiment has recently been made, with a view of ascertaining whether it is not possible to add to the beauty of the interior of this edifice without the enormous expenditure of restoring certain portions of the fabric, which have suffered from the ravages of time. The pillars which support the arches of the triforium, or angels' choir, have been at some period covered with whitewash, in order to conceal the decay of the stonework. In one portion, above the presbytery, the whitewash has been removed, and the surface of the columns, first smoothed and then rubbed with oil, and varnished. The effect of this, it is said, closely resembles that of polished Parbeck marble, and serves to throw into relief the foliage and tracery with which the arches are so elaborately decorated.

THE GRANITE CHURCH IN ABERDEEN

THE Roman Catholic church of St. Mary of the Assumption, Aberdeen, which was opened on December 20th, 1869, is the largest in the city of Aberdeen, the dimensions being,—nave, internal length, 150 ft.; breadth, 30 ft. 6 in.; breadth of aisles, each 16 ft. 9 in.; total width internally, 69 ft. The aisle walls are 20 ft. high, the walls of the nave 43 ft., and the height from the floor of the nave to the apex of the roof is 70 ft. The nave is divided on each side into seven bays by piers and arches of polished Glasgow freestone, and the church is lighted from the clearstory only by triple lancets above each of the nave arches. Two traceried lancet windows on each side give light to the sanctuary, and there is a large traceried window in the west end of the nave, 15 ft. wide and 30 ft. high, divided into six lights, and having three large circles in the arch. Externally the church is built of the light white granite, from the Kemnay Quarries, Aberdeenshire. The entrance to the church is by a moulded doorway, with polished shafts of grey and red granite.

The tower is at present carried up to the bottom of the belfry-stage, and stands 60 ft. It is now proposed to complete the spire, the height of which, from the ground to the top of the cross, will be 200 ft.; and as the whole structure is to be of granite, to correspond with the present work of the church, it will be peculiar, if not unique. In the lower part of the tower, and opening into the north aisle, there is a small chapel. There are besides three altars at the east end of the church, and one in the west end of the south aisle; large vestries on each side of the sanctuary; and the windows of the sanctuary are filled with stained glass, by Mr. Lyon, of London. There is a large presbytery on the north-east of the church for the resident clergyman; and more recently there has been added a conventual establishment, of very plain description. The church is seated for 1,400 persons. In the nave between the arches, and supported on large moulded corbels above the piers, are figures of the twelve apostles, colossal size, the work of the late Mr. Alexander Brodie, of Aberdeen. The architect of the church was Mr. Alexander Ellis.

NEW BANKING HOUSE, NEWCASTLE-UPON-TYNE.

OWING to the great want of accommodation in the premises occupied by the National and Provincial Bank, in Newcastle, it was a short time ago decided to erect a new building, with architectural pretensions. An expensive site was purchased at the corner of Dean-street and Mosley-street, and the preliminary work having already been accomplished, the foundation-stone has been laid in the presence of a numerous body of gentlemen connected with the company. The new building, which is expected to cost from 14,000l. to 15,000l., will be erected from designs prepared by Mr. John Gibson, of Westminster, and will have carved fronts of 86 ft. in Mosley-street and 39 ft. in Dean-street, the entire premises extending to St. Nicholas' churchyard in the rear. Both the fronts are to be constructed of Kenton stone. The building will rise to three stories above the ground-level, the lower story being rusticated. The windows will be semicircular headed, and the doorway will be ornamented with polished red shafts, the arms of the company surmounting the entrance. The windows of the first story will have Ionic columns and enriched pediments; while the two upper stories will be entered by pilasters and cornice, the frieze inscribed with the title of the company, date of its establishment, and date of

* The register flap or damper in the chimney may be so arranged as to regulate the quantity of heat communicated to the pipe.

† The damper should be kept open above the fire when there is smoke, and that within the pipe should be closed. I find it best in all cases to employ coke, as it communicates no foulness to the pipes. Heat from gas-burners may in the same manner be utilised as well as purified by an appropriate apparatus.

its erection, with blocking, which completes the building. The entrance to the bank will be in the centre of the Mosley-street front. The internal arrangements comprise a banking-room of over 70 ft. long, 30 ft. wide, and 22 ft. in height, being spacious enough for thirty-five clerks. The ceiling of this apartment will be flat in the centre, divided into lozenge-shaped panels, with a groined cove all round. The treasury will be constructed of brickwork, with hardened iron lining, and contrivances for insuring perfect security, the iron safes being of Messrs. Chubb's manufacture.

The contractor for the edifice is Mr. Joseph Elliott, of North Shields; and the work will be carried on under the supervision of Mr. W. Glover, the clerk of the works.

LIFE BY THE LIFFEY.

AN important case, in a sanitary point of view, has just been decided in the Dublin Law-courts, in which a woman claimed and got damages from the corporation for the loss she sustained by the death of her husband, who was employed by the corporation, and who met his death by the foul gases in the Dublin sewers. The culpability of the corporation was fully proved, and the sheer neglect they had from time to time exhibited in not remedying that hideous scandal and disgrace of Dublin, the Liffey and its feculent tributaries.

The case of Anne Loughman v. The Corporation of Dublin is really a most important one, and we hope the verdict obtained against the municipal authorities of Dublin will shame them into action in abolishing at once an acknowledged nuisance, by the adoption of one of the methods so often pointed out by us for the purification of the river Liffey.

The Dublin press, some of whose proprietors are aldermen or town councillors, have acted with a suspicious silence in not noticing this law case, because of the example it makes. But enough for the day, as we shall probably next week afford our readers some additional evidence of the sanitary condition of Dublin, and life by the Liffey.

EASTBOURNE PIER.

THIS favourite and prosperous watering-place was on Monday, 13th, the scene of gay festivities in connexion with the opening of the new pier by Lord Edward Cavendish, one of the county members, and son of the Duke of Devonshire. This pier, the opening of which we mentioned last week, was designed by Mr. E. Birch, by whom the first pier of the kind was erected at Margate about sixteen years ago, and who has been the designer and constructor of those at Brighton, Scarborough, Blackpool, and other watering-places.

The new pier when completed will be about 1,000 ft. in length, with a minimum width of 22 ft., increasing to a width of 135 ft. at the head, which is of a triangular form, and provided with all necessary facilities for landing and embarking passengers from steam-vessels and pleasure-boats. The arrangement of weather screens made of glass, as on the Brighton Pier, has been adopted here.

The entire superstructure rests on iron columns fixed into the ground by means of screw piles; and has been executed by Messrs. Head, Wrightson, & Co., of the Teesdale Ironworks.

HULL WORKING MEN'S ART AND INDUSTRIAL EXHIBITION.

THE building, situate in the Corporation Field, is a wooden erection, designed by Mr. R. G. Smith, architect. It has been constructed by Messrs. W. & J. Hall, contractors, of this town. The building, with its enclosures, stretches across the north end of the Corporation field—a distance of more than 300 ft., and it has a frontage to Park-street. Between the building and the street the ground is laid out attractively. In the centre of the ground, opposite the porch, is a large artistic fountain. On each side of the path is an enclosure, with a flower-bed in the centre, and two large stone eagles are also placed in front of the building. The front is stained, and the other portions of the exterior have been painted a stone colour. The central and main portion of the building is 150 ft. long by 50 ft. wide, and 45 ft. high to the apex of the roof. The annexes on each side are 158 ft. long by 30 ft. wide, and 24 ft. high. In the centre of

the hall there has been constructed a fountain, and around it have been placed seats for the accommodation of visitors. The fine-art department is at the west end of the north aisle, and is 90 ft. long by 30 ft. wide, and lighted in the daytime, the same as the other portions of the exhibition, from the roof.

THE SMALL BEGINNINGS OF GREAT ENDINGS.

A poor woman in Constantinople, the other day, was about to go to the upper floor of her living-place to bring down the *mangal*, or pan of lighted charcoal, for cooking; but, feeling lazy—the day was warm—sent her child for it. The child let the pan fall on the stairs, near a window-curtain; and the result of the woman's change of mind was that terrible fire we have all heard of, which has reduced 30,000 persons to destitution, utterly destroying many hundreds of them, and some thousands of houses. If a neighbour had given the poor woman 10,000*l.* not to send the child, it would have been a good bargain.

LAYING THE FOUNDATION-STONE OF THE STANLEY HOSPITAL, LIVERPOOL.

THE Earl of Derby, in company with about 200 gentlemen, has laid the foundation-stone of the Stanley Hospital.

The ground for the hospital has been given by the Earl, and the cost of the entire scheme, which includes a trial of the cottage plan of hospitals, will be not less than 15,000*l.*

In aid of the hospital funds there has been a *fête* of four days at Stanley Park, and the extraordinary sum of 10,000*l.*, free of costs, has been thereby realised.

The principal building is to have a frontage of 300 ft. to the Stanley-road, and will consist of a central building of 50 ft., and two wings of 60 ft. The northern wing will contain a small chapel for the use of the patients, and the southern the waiting-room and dispensaries for out-door patients. The buildings allotted to the in-patients are to be placed at the rear of the main building, and will be erected on what has been referred to as the cottage plan. They are to comprise four wings, each wing consisting of four wards, and each ward will contain five beds, giving to each patient 1,100 or 1,200 cubic feet of air. All surgical cases will be treated on the ground floor, the medical cases being dealt with on the second story. Every accommodation in the shape of bath-rooms and ventilating apparatus has been provided for; and when the plan is complete, it is calculated that there will be space for 176 beds, although at the commencement it is expected only to provide for a portion of these at an expense of 8,000*l.* to 10,000*l.*, and to finish the design as funds may accrue. The part to be first proceeded with will be the main building fronting Stanley-road, which will give accommodation to about fifty in-patients, in addition to the dispensaries for out-door patients. The plans are by Messrs. Wainwright & Son, of Liverpool.

JOHN OF LEYDEN'S CARD-TABLE, MUNSTER.

THIS interesting relic of antiquity, of which we give an illustration, now serves a purpose much at variance with the object for which it is said to have been made. It is now the "Credence-table," for the high altar of the cathedral at Munster. It seems to be of rather an earlier style than that in vogue at the time of the notorious fanatic, who styled himself "King of Munster and Jerusalem," and who took possession of the town of Munster in the year 1534. However, it must be remembered that Gothic architecture continued to be in use in this part of Germany, and remained very pure and free from classicism, down to a very late date. This table is made of pine wood, and is in an excellent state of preservation.

ST. JOHN'S CHURCH, SCHWÄBISCH-GMÜND, GERMANY.

RECENTLY we gave some particulars of the interesting town Schwäbisch-Gmünd, near Stuttgart, with a view of the doorway of Holy Cross Church there.* Although the town contains

now only about 5,000 inhabitants it has as many as twelve churches, ten of which are still used for religious purposes. There are also remains of two others, so that before the period of the French Revolution, when all the religious orders were suppressed here, there must have been at least fourteen churches. Six of these are outside the walls, which would lead one to suppose that originally the town had very extensive suburbs, that have ceased to exist.

We will begin our renewed description of the churches with those that are extra-mural, and the first which will occupy our attention is St. Saviour's. This building is one of the most singular in Europe; it is a small church of two stories, both of which are cut out of the rock; at the south-west angle is a lofty octagonal tower, now crowned by a dome; and at the east end is a kind of open gallery. These are the only portions of this singular building (if it can be called a building) which are not cut out of the solid rock. The lower church is evidently of a much earlier date than the upper one; it is a kind of crypt of very irregular plan. Near the east end is a large crucifix, with attendant figures, about life-size, of the very rudest workmanship; this is probably as old as the tenth or eleventh century. The upper church is probably not earlier than the fifteenth century; it is a simple parallelogram about 50 ft. long by 20 ft., and, like the lower church, is entirely cut out of the rock; it is adorned with a great deal of rude, though late, sculpture; a good old picture of the "Seven Dolours," very much in the style of A. Dürer; and some very bad modern glass. There is an external pulpit, and a series of "Calvary chapels" are placed at intervals along the flights of steps leading to this church.

Two of the other churches outside the walls are quite similar in plan. They each consist of a lofty octagonal chancel, and a low vaulted nave of three bays; the chancel arch is in both cases filled with a metal grill, which in one case is ancient.

Of the churches within the walls three are worthy of notice, St. John's, the Franciscan Church, and the superb Church of the Holy Cross, which we previously described.

The Church of St. John is the most ancient ecclesiastical edifice in Gmünd (with the exception of the lower Church of St. Saviour). It consists of a nave and aisles of moderate dimensions, a tower at the east end of the north aisle, and an apsidal chancel. The nave, aisles, and tower are of a very rich and singular Romanesque character; the chancel is Third Pointed. This church is said to have been in existence in the year 1102, but very little of the present building can date from that period. The remarkable Pseudo-Classical detail of the tower and portions of the nave, the use of the pointed arch, and the great richness of the ornamentation, lead us to believe that the greater portion of the building does not date from an earlier period than the last quarter of the twelfth century or the commencement of the thirteenth.

The tower (of which we now give a view) is a beautiful specimen of the latest Romanesque style. The spire with which it is crowned is covered with green and yellow glazed tiles, which are not older than the fifteenth century. It is probable, however, that the form of the spire is original.

This church is being thoroughly well restored, and all the plaster abominations and trumpery altars and furniture with which it was disfigured during the last century, are being removed, and will be replaced by others more in harmony with the style of the church. The plaster vaulting of the nave is also being removed, and will be replaced by a flat boarded ceiling, restored from portions of the ancient one which have been brought to light. Very interesting remains of ancient decorative painting have also been found under the thick coating of stucco which disfigured the walls of the nave. When the restoration is completed this church will be a gem of late Romanesque architecture. We should not omit to mention the doorways of this church, which are very rich and beautiful. They are adorned with carved shafts resting upon the backs of lions, and all the *tympans* are filled with sculpture.

REFERENCES.

- A. Cornice under spire.
- B. Cornice above broach.
- C. Cornice under broach.
- D. Base table.
- E. Arch-mould of windows of lower story.

* See pp. 365-367, ante.



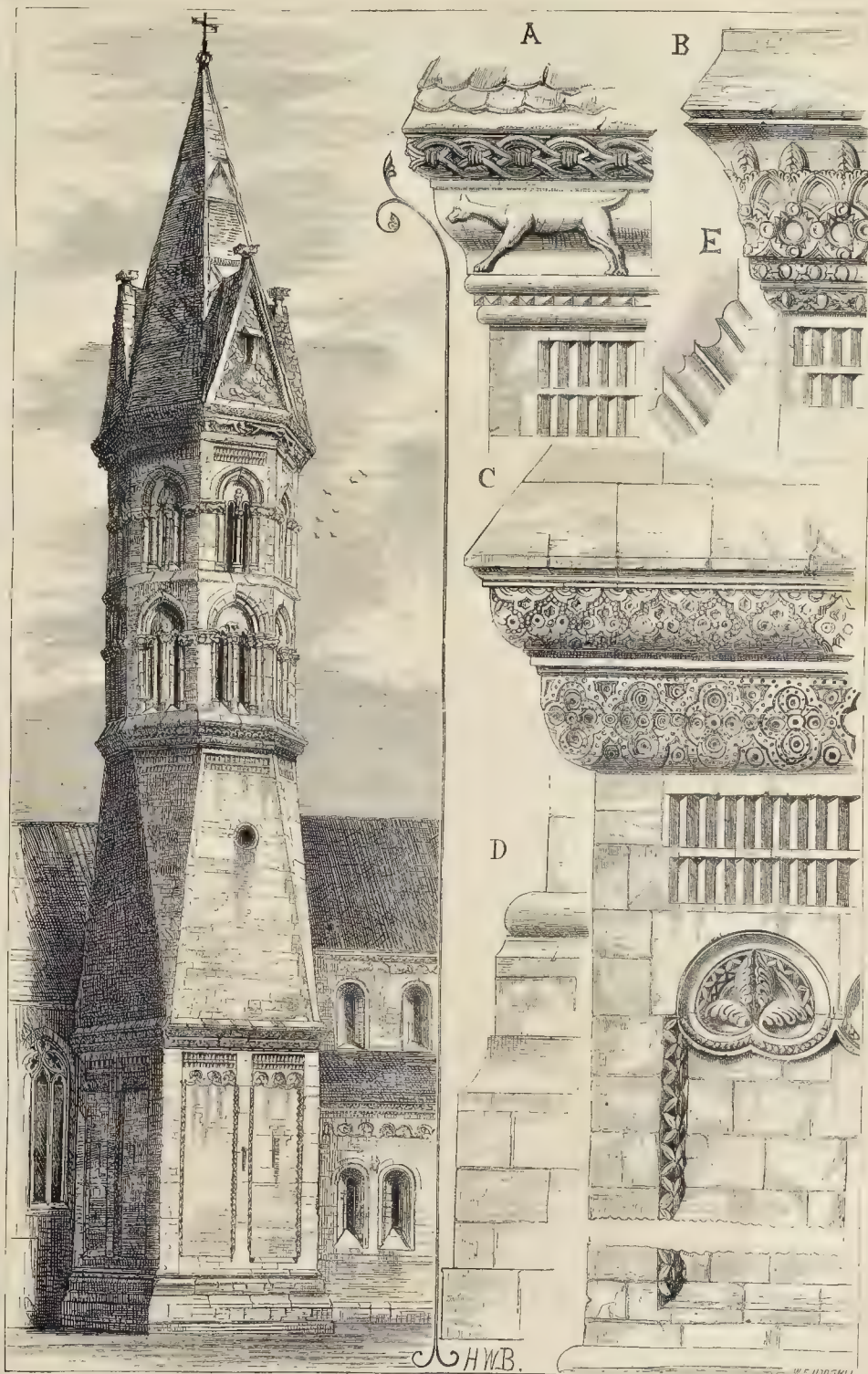


MR. HENRY CURREY, *Arch'tect of St. Thomas's Hospital.*



H.W.B.

MEDIEVAL FURNITURE: JOHN OF LEYDEN'S CARD-TABLE.



ROMANESQUE TOWER OF ST. JOHN'S CHURCH, SCHWÄBISCH-GMÜND, GERMANY.

THE NORTHERN ARCHITECTURAL STUDENTS' SOCIETY.

The first annual report of this little body (the members at present only number fourteen), reviewing progress, says,—

"On the 14th of December the inaugural address was delivered by the president (W. L. Newcombe), and since then seven papers have been read and discussed, namely: "The Studies of a Young Architect," by W. S. Hicks; "Landscape Gardening," by W. Reddington; "Decoration," by G. Hall; "Villa Architecture," by J. H. Morton; "Domestic Architecture," by J. Oswald; "Foundations," by G. D. Oliver; and "Timber used for Building Purposes," by E. Thornhill. Besides the in-door meetings of the society, at which these papers formed the principal business, two out-door meetings have been held,—the first at Seaton Delaval Hall, and the second at St. Nicholas's steeple, and the Mining Institute, Newcastle.

The committee remind the members that one of the principal objects of this society is the encouragement of the study of ancient architecture, from the buildings that remain around them; and that the rules require the members to contribute original drawings of such examples.

A WORKMAN ON THE FREE LIBRARIES QUESTION.

SIR,—The recent paper in the *Builder* on the subject of Public Free Libraries will, I hope, be the means of calling the attention of your readers to the present position of that important and national question. The reflection on its perusal must have a depressing effect on those who are anxious for the progress and well-being of the working classes; and it shows that, in relation to the library question, and the intelligence of vestrymen and the masses, in spite of all the boasting of England's greatness, she must, when compared on this question with the smallest Continental state, be called Little Britain. It is to be hoped that no intelligent foreigner reads the reports announcing the failures in different parts of the country to put the Act in operation, or the arguments used against the Act by her free and enlightened citizens, or he will, no doubt, think that England is fast drifting into the senile state, and that in the transition period public spirit is dead, and the people have lost all interest in mundane concerns. The report of Mr. Ewart's committee showed how deficient this country was in free libraries, and how far behind we were twenty years ago in comparison with other countries. At that period every great Continental town had collections of books accessible to all classes. In France, there were 107 free libraries; in Tuscany, nine; in Great Britain and Ireland, one. Thus, in the matter of promoting the intellectual condition of the people by reading, England was then eight times behind what was at that time considered despotism and benighted Tuscany. Turning from countries to capitals, the results are the same. At that time Paris had seven free public libraries; Copenhagen, three. The whole population of Denmark is not much beyond half the inhabitants of London; and yet the chief city,—not larger than a middle-sized English town,—had three public libraries; while London the Great, the mart of the world, with a population more in number than eight capital cities which at that time had twenty-four free libraries, had none; and to-day, there is but one, and that of so little importance as not to be mentioned in the late return. I believe the little institution in Smith-street, Westminster, is not known to one in fifty of the working men in London. Such a condition of things is, among all the disgraces of England, the greatest; and, for her honour, it is ardently desired by a few that it will not remain any longer.

During the last month I read most of the reports of what are called the May Meetings, and, wonderful to relate, this London, which is so far behind in providing intellectual food for the people, but which has more drunkeries and more drunkards than the capitals of all nations, is looked upon as the civiliser of the world. The failure of one mission or the success of another was recounted by a variety of speakers, and yet there were some important social and moral failures within a short distance of Exeter Hall which were not enumerated; and perhaps if the same sort of thing had happened in China or Madagascar, it would have found a place in some mission report, to show the dark condition of the inhabitants. Some time back, a few working men in Islington thought it would be a great advantage to the parishioners if the

Free Libraries Act were in force in the parish; and a requisition was presented to the vestry, for that body to convene a meeting of the rate-payers on the 5th of last January. The meeting was held at the parochial school-rooms, Liverpool-road, Islington, and the next morning's papers stated the resolution, "That the Public Libraries Act be adopted," was carried, the working men voting for the Act, the vestrymen and shopkeepers against. So far the ignorance of the workmen had gained a victory over the refined culture of the shopkeepers and vestrymen.

On the 22nd of January, the second part of the business relating to the Act commenced in the vestry, by one of its members moving that the vestry appoint commissioners to carry out the Act of Parliament. The result of the motion created a commotion among the opposers; and, if the account of the meeting in the local press is to be credited, it created a screaming farce, which had not its equal in the days of unreformed Bumbledom. After the farce had been played out, the last part finished with the motion being rejected by 52 to 4; and so up to the present stands the question, in the great and very highly-civilised parish of Islington. Another failure was in Shoreditch. It has often been lamented that the workmen in England are behind the workmen in other countries, in so far as education is concerned. It is said,—and the "Reports from her Majesty's representatives respecting the condition of the labouring classes abroad," confirm it,—that our tastes are low, our pleasures degrading, and that our earnings are largely wasted in debasing gratification; and when it is considered how much is provided to debase, and how little to raise, the intellectual condition of the people, there is nothing to surprise any but those who are strangers to the country. Among the many evils caused by the want of free libraries, there is none perhaps greater than the narrow views partial reading fosters. Most of the small tradesmen have their daily pennyworth of paper. It may be Liberal or Conservative. The penny daily paper is too often the whole extent of their reading. Its opinions they take for their guide in public affairs; and thus it is there is so much party-rancour and so little independent thought among the shop-keeping class. My employment takes me a great deal among that class, and I find they are not book-readers. Being somewhat fond of books myself, on going to a house I in general take a passing glance to see if the bookcase is well stocked, and I find that is but rarely the case; and therefore we cannot wonder at the opposition which exists to the establishment of free libraries; for of all distorted visions perhaps mental blindness is the worst and most hurtful to the community. Were a free library established in every parish, that class would be largely benefited, as there are times in the day when they are almost disengaged, and then they could visit the library and reading-rooms, and study the various questions of politics and trades from different points of view, and thus form their ideas on a broad basis, to the benefit of themselves and society. There is another class which might be benefited, for it is to be remembered that the institution would be open to all, and that is, those who are in the habit of borrowing the *Times* at a penny for an hour. Looking at it only from a pecuniary point of view, they would receive a great advantage, as there are 313 working days in the year, and that alone would be 26s., and as the rate is limited to a penny in the pound, it would in most cases be but from 2s. to 3s. They would save in papers alone a good sum, and have the advantage of a free library into the bargain. If one-sided reading is an evil in the class which is a step or two removed from the working classes, it is a still greater injury to the working men, as the leading articles of most of the cheap weeklies give distorted ideas of the habits of the upper classes. The writers in most cases are levellers, who would unbinge and raze the foundations of society, and although they are great at pulling down, it is evident their wisdom would not build up again. It is strange the dupes who believe it is all gospel these men preach do not make a few inquiries to see if their idols are of common clay. If they did it would be found that the proprietors of their favourite papers ape, as far as possible, the manners of those they are always writing down. The want of books and free libraries is felt among the class of workmen who are called intelligent. In high-class journals and reviews the great questions of the day are discussed in

all their bearings, and yet not one workman in a hundred reads them, or knows of their existence, although the articles are often on working men's questions, and are of greater importance to them than to any other class. In the last issue of the *Contemporary Review* a working man,—some, perhaps, might demur to the title,—contributed a paper "On Trade-Unions from the Workman's Point of View." There is no doubt many workmen would like to read it, but, unfortunately, the price of the *Review* is more than they can afford. It is not lent at the stationers' libraries; and I believe it is not to be found in a reading-room in London; so it is with the *Fortnightly*, the *Quarterly*, *Edinburgh*, and *Westminster Reviews*. They are unknown to the earnest workmen, and it is a sad fact they are kept in the dark because their class are too ignorant to appreciate a high-class literature and the pleasure and advantages of knowledge. There are, it is true, some few bright spots in the intellectual desert of England. And I ask, why it is they are not extended to all. Liverpool and Manchester enjoy the feast. And it certainly behoves the people of this metropolis to labour earnestly until the great stigma is removed, and the people have within their reach the same opportunities for mental culture which the foreign workmen possess; and then some hopes may be entertained that the workmen will see the folly of wasting their substance in the gin-traps* of the metropolis, and that they will, when possessing the purest and least expensive of all gratifications, keep pace with the progress of workmen in foreign countries. There are so many points in the question; and as I have merely touched the outlines, I hope you will, sir, think the above worthy of insertion; so that other workmen may fill up the inner lines, and at last we shall be able, by a thorough organisation, to pay with interest those who have so long blocked the way in London.

JACK FLANE.

THE SEWAGE QUESTION.

THE Attorney-General has consented to lodge an information against the Corporation of Birmingham, on the motion of certain residents at Gravely-hill, for depositing the sewage matter near the outlet, and thus causing a nuisance to the aggrieved persons.

Mr. Purchas, the engineer, has met the Sewage Committee of the Bromsgrove Local Board at the Town-hall, and the details of the sewerage plan having been settled, instructions were given for the preparation of the working plans and specifications, upon the completion of which tenders for carrying out the work will be at once advertised for.

The select committee to whom the Thames Navigation Bill was referred have agreed to a special report, in which they say:—

"It appears, on the evidence of Sir John Thwaites and otherwise, that the Metropolitan Board have repeatedly had under consideration the best means of utilising the sewage of the metropolis, but that nothing effectual has yet been done, and the sewage still flows into the river Thames. Your committee recommend that immediate attention should be given to the subject, in order that the sewage of the metropolis should be utilised as far as practicable; and, in the mean time, until this can be accomplished, your committee have deemed it expedient to approve the bill which they have reported to the House for preventing any obstruction to the navigation of the river from the flow of sewage from the metropolitan outfalls."

THE DISTORTED STYLE.

SIR,—Some people see everything through a distorted medium. Your correspondent, "J.K.," refers to "the reproduction in costly stone of the topping lath and plaster features of Old Edinburgh," now excluding dwellers there from plain substantial houses so much required by workmen, and also, by way of contrast, to the ridgy back, piled deep and high, of the Old Town."

This is apparently a hit at the works of the City Improvement Trust. Now, although the buildings erected under the cognisance of that body are in the old style, they are of strictly stone construction, and in none of them is any attempt made to imitate the half-timber style.

When I hear a man talk of a "plain substantial house," as his idea of a dwelling, I at once have a clue to the amount of art-culture he has enjoyed. According to him, nothing in stone is substantial unless devoid of ornament, and no house comfortable unless rectangular on plan.

* Memo.—"Gin" and "snare," or "trap," are synonymous.—Ed.

To be perfect, the door must be in the centre, and flanked by an equal number of windows; if the whole are not required for use, then a blank one is requisite for symmetry. Of course, the chimneys must balance also, and all that is necessary to complete the effect aimed at is to get the smoke from them to fly off at opposite angles (when at school I used to manage this with slate and pencil). Enter this model dwelling, and you find its occupant has no idea of restricting himself to what is plain and substantial in the internal decorations; he reserves what appears to him to be beautiful for his own enjoyment and that of his friends. Marble walls and ceilings; doors of oak, walnut, and maple (?); carpets with roses 2 ft. in diameter; lovely hearth-rugs with peacocks depicted thereon; and furniture—why describe it?—of the orthodox type. In fact, our model man prides himself upon being orthodox in everything; the beaten track is the right way; diverge from it and you are anathematised.

The new streets referred to certainly do lack the spirit of the ancient ones, but these were the work of many minds. If various architects had been allowed to design the respective elevations for their clients, subject to the revision of the architects of the Trust, greater variety and more of the spirit of the old streets would most probably have resulted. Victoria-street is a noteworthy example of this; and, although modern, it is one of the most picturesque bits in the City. DUN EDIN.

ACCIDENTS.

ON the Anlaby-road, Hull, a chapel, now approaching completion, for the use of the Primitive Methodists, has suffered considerably from a gale of some violence. The roof (to a great extent completed) gave way under the effect of the wind, and in one mass, the greater part falling into the interior of the building, breaking the gallery timbers and destroying nearly all the woodwork which had been fixed, and doing very serious damage. The chapel inside appears one mass of broken spars and timbers and iron. The accident, besides delaying the progress of the work, will be a serious loss to the contractor. While some men were repairing a well at New Crane, Wapping, one of them descended, and when within a few feet of the bottom the whole of the walling of the well fell in upon him. Immediate efforts were made to extricate him, but without the slightest hope of getting him out alive, the well being 60 ft. deep. When the rubbish was removed to within about 40 ft. of the bottom, the sufferer was heard shouting to those above, who redoubled their exertions to save him, and at half-past six the poor prisoner was set free, without a bone broken, but, as may be supposed, very much bruised. There is no doubt of his ultimate recovery.

ELECTION OF DISTRICT SURVEYOR BY THE METROPOLITAN BOARD OF WORKS.

ON the 17th inst. the Metropolitan Board of Works met to appoint a surveyor under the Building Act for the district of Greenwich.

The following document was submitted to the Board:—

"The respectful Memorial of **SIDNEY GODWIN**, Fellow of the Royal Institute of British Architects. Sir, and Gentlemen,—Your memorialist ventures to approach you, and to say,—

That he has passed seventeen years in daily assisting to supervise buildings under the Metropolitan Building Acts, with the object in view of being appointed a district surveyor, and is fully competent to discharge the duties of that office.

That, at two separate periods, he has received the confidence of your Board, by being appointed to act as deputy district surveyor.*

That he has been before you as a candidate for a surveyorship under the Acts for seventeen districts without success, on account, as he has been informed on many occasions, of his having a brother a district surveyor,—the district surveyor of South Islington.

That, at the election for Hammersmith, in May, 1863, he was at the top of the list of first voting, when Mr. Knightley was eventually elected; and, at elections following, he, late while, at the last election, his name was much lower on the list, on account, as he has reason to believe, of the opinion above mentioned.

Your memorialist therefore humbly prays that your Honourable Board will take into consideration the time he has devoted, with a view to obtaining an appointment as district surveyor, and will not allow this objection to weigh, and will grant him, on the next occasion, the object for the attainment of which he has so long struggled at the cost of so many years of his life. If appointed, he will

devote his best energies to perform the duties satisfactorily.

With a view still further to lessen the objection expressed, your memorialist is authorised to state that, should your Honourable Board grant his prayer, the said district surveyor of South Islington will, within twelve months from that event, place his resignation in your hands, to be dealt with as your Honourable Board may desire.

Twenty-four candidates presented themselves, or were represented by medical certificate.

From these, six were selected by vote to go to the poll. On the first voting after the selection the candidates stood in the following order:—1. Mr. Tabberer; 2. Mr. S. Godwin; 3. Mr. Matthews; 4. Mr. Lansdown; 5. Mr. Piper; 6. Mr. Notley; and ultimately Mr. Tabberer was elected.

CHURCH-BUILDING NEWS.

Handsworth.—During the past twelve months the chancel of Handsworth parish church has been undergoing a restoration. Messrs. M. E. Hadfield & Son, architects, were requested to prepare a report and plans for accomplishing this object, which were adopted, and these gentlemen were instructed to proceed with the work. New roofs of stout oak coupled rafters have been placed on the chancel and chantry, covered with Staffordshire tiling, carved braces being introduced at intervals. In removing the old roof of the chancel several of the original rafters in a mutilated condition were found. The walls of the chancel have been partially rebuilt; single lancets of the old form have been inserted in the south wall, the eastern windows having been repaired. The ancient sedilia and piscina have likewise been brought to light and restored. The north wall has been repaired; but perhaps the most important feature in the alterations internally is the new chancel arch, of hewn stone, having bowtell columns with moulded capitals and bases, sustaining a narrow pointed arch of low and massive style of two orders, chamfered and moulded,—the whole details having been studied from the tower arch of the church. The floors of the chancel and chantry have been lowered 2 ft. and relaid with encaustic tiles, and the old monumental slabs on a bed of concrete. Stalls of oak for the choristers and communion rails of suitable design have replaced the high pews. A new organ to be placed in the Norfolk chantry, in an oak case, is being built by Mr. J. Stacey, of Sheffield. Externally the walls and stonework have been repaired and pointed, and the gable copings renewed and surmounted with floriated crosses. The earth has been lowered and the ground drained. In the north wall of the chantry two new windows have been inserted, with new buttresses and parapet, and the walls partially rebuilt. These, with the new roof, are designed in the Perpendicular style of architecture, to which this part of the church belongs. The works have been executed by Mr. W. J. Greenwood, of Handsworth, mason; Mr. J. Hayball, Sheffield, carpenter; Mr. J. B. Covill, plumber and glazier; and the tiling by Messrs. Harrison & Chadwick; the oak choir fittings by Mr. Marshall, of Handsworth. The whole has been carried out from the drawings of the architects and under the immediate supervision of Mr. Charles Hadfield. Although the chancel has thus been placed in a satisfactory condition, much remains to be done to the nave and aisle of the church westward, where a beginning has been made by the opening out of the original tower archway, which has been fitted up as a vestry. A new floor and ceiling of moulded oak beams have been inserted for the ringers, and a lectern in oak has been given by the Rev. J. B. Mitchell, late curate of Handsworth.

Catcliffe.—A vestry meeting has been held to receive a report on the state of the parish church from Mr. O. G. Wray, architect, and a committee formed to raise subscriptions for making the necessary repairs, as it appeared from the report that the roof is in such a dangerous state that the church was to be closed until it has undergone a thorough restoration. **Bradford.**—A new church is to be built for St. John's parish on a new and more central site in Little Horton-lane. Resolutions to carry out the project have been adopted. About 1,000l. are already promised. **Doncaster.**—The Archbishop of York has laid the foundation-stone of a new free church, or chapel of ease, to be built in the parish of Christ Church, for the use of the poorer population of the parish. The site of the new building is in Catherine-street, and the cost of the proposed edifice will be about 6,000l., towards which sum between

2,000l. and 3,000l. have already been subscribed. The architect instructed to carry out the work is Mr. Thomas Penrice, of London. The contract for the building was given to Messrs. T. & C. Anelay, the contract price being 3,061l. 11s. 8d. The church will be built in the Gothic style of the thirteenth and fourteenth centuries. It will have a western entrance, with deeply-recessed doors, facing St. James's-street, above which there will be a five-light traceried window. The gable will be terminated by a bell-turret, surmounted by a cross. The side elevations will be divided into six bays with two-light windows in each, with tracery in the heads, between the buttresses. At the eaves there will be a cornice, supported by corbels. The roof will be high-pitched, of the angle of 57 degrees, and will be covered with Whitland Abbey slate on felt. The arch leading into the chancel will be built, but for the present will be filled in with brickwork. The organ-chamber, when built, will be situate in the last bay on the south side, nearest the chancel, and will communicate with the nave by an archway. The length of the building will be 86 ft. by 32 ft., and will be arranged to accommodate 500 hearers. The interior will be fitted up with moveable benches. The whole of the stone for the carving will be for the present left in block.

Pitchcombe.—The Bishop of Gloucester and Bristol has re-consecrated Pitchcombe Church, which has been restored by the parishioners. The work has been executed by Mr. Gyde, of Pitchcombe, from the designs and under the superintendence of Messrs. Medland & Son, of Gloucester and London, at a cost not exceeding 800l. The west window is the gift of Mr. Augustus Matthews, in memory of his late father, Mr. Peter Matthews. The subject is the Baptism of John the Baptist. It is placed at the west entrance of the church, and the artists are Messrs. Clayton & Bell.

Cambridge.—The chancel of the new church of St. Barnabas, Mill-road, Cambridge, has been opened. The entire building is designed to have nave and aisles, with a vestry, on one side, and an organ-chamber in Third Pointed. The chancel is 34 ft. long by 22 ft. wide inside, and in height is 48 ft. to the top of the roof. The walls are of brick, with white brick facings on the outside. The windows, string-courses, corbel courses, weatherings, &c., are of Cornish stone. The eastern window is designed for stained glass. Nearly 200 persons can be seated in the chancel. The whole church, when completed, will accommodate nearly 600 adults, exclusive of the chancel. The nave and aisles to be added to the chancel will be 80 ft. long by 55 ft. broad; and a bell-turret and porch will be erected at the western end. The cost of the portion erected is about 1,000l., of which amount some deficiency exists. The funds to complete the building have to be raised by subscription. The architect is Mr. Talbot Bury, of London. The builders are Messrs. Quinsee & Attack, of Cambridge. The interior of the chancel is lighted with gas, and the seats are composed of rush-seat chairs (fixed).

Almeley.—The ancient Church of St. Mary, Almeley, has been opened for divine worship, after undergoing extensive restoration. The fabric was in a dilapidated condition, and the work was commenced some eighteen months ago, the architects being Messrs. Bodeley & Garner, of London; and the contractor for carrying out the work, Mr. T. Holland, of Eardisland, builder. The church is an old stone building, in the Decorated style, Second Period, and was partially restored about 1843, by cleaning the old stone pillars and bringing out the old oak ceiling; it has a nave, aisle, miniature transept, porch, chancel, organ, vestry, and tower, with five bells and a clock. The roofs of the aisles, vestry, and porch have been renewed in oak; those of the nave and chancel repaired, and the whole lathed and tiled afresh; all the coping and other necessary, and ornamental stonework of the exterior having almost entirely disappeared; new work of the character of the old has been substituted; while the pavement, walls, and roofs, within the building, all testify in their changed condition that renovation was imperatively required. The renovations in the interior include the removal, first of all, of the plaster on the walls and the re-pointing of the same, and the lowering of the pavement of the church by about 6 in. The chancel roof has been raised by about 4 ft., so disclosing what had hitherto been totally hidden—the upper part of the arch forming the division between the chancel and

* Dates of appointment, July, 1863, and August, 1865.

the nave. The roof has also been opened out, new quarters being put on, diagonally, at the back of the old oak principals. The old roof of the nave has also been cleaned down. A new four-light stained-glass window, by Messrs. Burlison & Grylls, of London, has been inserted in the east end of the chancel. The head of the window is filled in with angels and cherubim; in the centre openings are the Virgin and Child and St. Ann, and in the lower openings St. Gabriel and St. Mary, the right light being filled with St. Catherine and St. Boniface, and the left with St. Thomas and St. Augustine. The head of the window nearest the east end, in the north aisle, is filled in with the emblems of the Cross in stained glass; and the head of the east window, in the same aisle, with the Virgin and Child, on a ground of ruby diaper. In the head of the east window in the north aisle, is the Crucifixion, and the window next it (the first of those in the north aisle counting from the chancel) is filled in with the arms of several families of distinction. These windows are also the work of Messrs. Burlison & Grylls. A new rood-screen, carved in oak, the work chiefly of the builder himself, has been put up. New open benches of oak take the place of the pews of former days, the old material, some of it carved, being used in panelling. A portion of the old panelling is made to form the roof of the aisles, new oak rafters only being added. The altar is new, and, like the rest of the work, is of sound heart of oak. For the present the tower remains as it was, excepting for some little pointing. The entire cost, including the stained glass, amounts to about 1,800*l.*,—towards which Mr. Gibson Watt, the chief landowner in the parish, contributes 500*l.*, and the Ecclesiastical Commissioners 400*l.* The total amount subscribed, up to the present time, is about 1,400*l.*

DISSENTING CHURCH BUILDING NEWS.

Dumfries.—A new Congregational Chapel has been opened here for divine service. The architect was Mr. Chas. Fortwe, of Chalmersford. The building occupies the site of the old chapel, and is of red brick and slated, partaking of a Romanesque character, the openings generally having semi-circular heads, relieved by white arches, strings, and stone dressings. The main entrance to the building is through triple arches in the centre gable, supported on columns with carved capitals, leading into a vestibule or loggia paved with encaustic tiles. Entrances and staircases on each side of the building communicate with the galleries. Internally a gallery, with open iron-work in front, supported on iron columns, runs round three sides of the building, the end opposite the pulpit being semicircular, and in the rear of the pulpit, in a semicircular space, obtained over the vestries, is provided an organ and singers' gallery. The roof is partly open-timbered and vaulted, divided into panels by arched principals and perforated ribs, through which ventilation is arranged. The ground-floor and galleries are fitted up throughout with open benches of stained and varnished deal. The aisles are paved with encaustic tiles and cement. The pulpit, which is of stained deal, is placed upon a raised semi-circular dais, upon which are arranged seats for the deacons. The lighting is by means of gas starlights suspended from the roof and brackets from the wall; and the heating, by a hot-air circulating apparatus fixed in the basement. The work has been carried out by Messrs. Cole Bros., of Thaxted, builders, under the direction of the architect, at a cost of 2,450*l.*, inclusive of the purchase of a portion of ground, erection of boundary walls, fences, and all incidental expenses. Accommodation is provided for 900 persons.

Gravesend.—The memorial stone of the English Presbyterian Church, in course of erection in the Grove, has been laid. The church will be capable of accommodating 650 persons, and has been erected by Messrs. Bull & Son, of Southampton, from designs by Mr. Alfred Bealborough.

Sheffield.—The foundation-stone of a new chapel, in connexion with the United Methodist body, at Pye Bank, has been laid. Mr. T. Simpson, of Nottingham, is the architect. The chapel will be situated at the angle of Pye Bank and Haywood-street, some 200 yards from the place of worship at present occupied by the United Methodists. It will be in the Early English style, and will be built in two stories, the basement forming a school. The level of the school is elevated, and the chapel will be on a

level with Pye Bank. The chapel is to be amphitheatrical, and will furnish accommodation for 1,200 persons. Ingress and egress can be had at either end from two angular towers. The school is also laid out in amphitheatrical form. It is surrounded by vestries or class-rooms, above which is a horse-shoe gallery, which will accommodate 1,000 children. This gallery will be appropriated to the use of the junior scholars, whilst the arena will be set apart for the seniors. At the end of the school will be a forum, from which the children can be addressed, and which will render the room easy of adaptation to the purposes of a public hall or a lecture-room. The school is 17 ft. in height, 68 ft. in length, and 56 ft. wide in the extreme dimensions, and on the ground floor or arena it is 54 ft. long and 35 ft. wide. The dimensions of the chapel are of similar extent. The basement story is to be built in rock-faced stone with white dressings, and the superstructure in brick with polychromatic dressings. The cost of the whole will be about 4,000*l.*, and the contracts have been placed in the hands of Mr. James White, builder.

Acton.—The memorial stone of a new Congregational Chapel at Acton has been laid by Mr. H. Wright, J.P., Kensington. The building, which will be of Gothic design when completed, will seat on the ground floor 500 people. The estimated cost is about 4,500*l.*, half of which has already been promised, and among the donors are Mr. Samuel Morley, M.P., for 600*l.*, and Mr. Charles Walton, for a similar amount.

Darlington.—The present sombre-looking building in Archer-street, used by the Baptist denomination as their place of worship, says the local *Times*, will shortly be superseded by a stone structure in the Grange-road, the foundation-stone of which has been laid by Mr. J. B. Pease. The building is to be Italian in style, and is to be composed of Forcett stone. The length of the entire building on the ground-floor is 56 ft. by 44 ft.; and on the gallery-floor, which extends over the entrance, 66 ft. by 44 ft. The porch at the entrance of the chapel has two staircases leading into the side galleries. At the rear of the building, on the north side, there are two class-rooms, 13 ft. by 11 ft. Adjoining these is a lecture-room, 27½ ft. by 15 ft.; and on the south side a minister's vestry, 15 ft. by 12½ ft. Over these buildings is the Sunday-school, which is 53 ft. long by 22 ft. The chapel will give accommodation to 600 persons, 350 on the ground floor and 250 on the gallery floor. This will exceed the provision given for congregations in the present chapel by above 350. A platform will be used instead of a pulpit, and behind this, in the centre, on the same level, will be an organ-chamber. The whole of the pews are to be without doors, and will be of stained pitch-pine. The gallery will be fronted with ornamental ironwork, to avoid the heavy appearance which would be caused if formed entirely of woodwork. The building was designed by Mr. W. Peachey, of Darlington, architect.

Langley Mill.—The memorial stone of a new Wesleyan Chapel at Langley Mill, Heanor, has been laid. Mr. Smith and Mr. John Gething Bowes (of Langley Mill), have undertaken to build this new chapel. There will be attached to the chapel a Sunday school, a vestry, and a retiring-room, the cost being set down at 800*l.* Mr. J. Barber, of Eastwood, is the architect.

Booth Town.—On Whit-Tuesday, says the *Halifax Guardian*, the corner-stone of a new Wesleyan Methodist chapel, to be situated in a populous part of this locality, was laid. The building, of which Mr. S. Utley, of Halifax, is the architect, will be in the Italian style of architecture, and will accommodate 540 persons. Adjacent to the building will be a day school, and the estimated cost of the whole will be 2,500*l.*, towards which 1,000*l.* were contributed by the representatives of the late Mr. W. Heap; 100*l.* by Col. Akroyd, M.P.; 50*l.* by Sir F. Crossley, bart., M.P.; and 100*l.* by the Wesley Chapel Building Committee.

Newcastle-upon-Tyne.—The chief-stone of a Methodist Free Church has been laid at Byker, Newcastle. The edifice has been designed by Mr. S. Oswald, of Newcastle, architect, and will be of stone, in the Early English style, having five lancet windows in the north, or front, gable, and ten lancet windows in the east and west walls. The roof will be entirely exposed to view, and constructed with four arched principals of timber. The north front will have two entrance porches at the sides, and a vestry and school-room are to be annexed to the south end of the church. About 270 sittings will be provided, and the cost will be about 800*l.* Mr. T.

Alexander, mason, of Newcastle, and Messrs. Gresson & Stockdals, carpenters, of Gateshead, are the chief contractors. The church will be warmed and ventilated by apparatus devised and supplied by Messrs. Lewis & Co., of Middlesbrough.

Belper.—It has been resolved to build a new Independent Chapel at Belper, at a cost of 3,000*l.*, on the site of the old chapel. The plan of the chapel has been prepared by Mr. Woodhouse, of Bolton, and is to be in the Gothic style, with a tower and spire, and capable of accommodating 450 persons. The present chapel was built about a hundred years ago, and it has been thought better to take it down and build a new one, rather than repair it. The greater part of the money has been provided.

SCHOOL-BUILDING NEWS.

Bowling.—The foundation stone of some new schools in connexion with St. John's Church, Bowling, is to be laid on the 28th of this month, by Mrs. H. W. Ripley. They are to be erected immediately behind the old ones, on a site which has been purchased at a nominal price from the Bowling Iron Company. The plans have been prepared by Messrs. T. H. & F. Healey, architects. The schools will be erected in the Gothic style of architecture of a character suitable for school purposes. The plan consists of three school-rooms, in the shape of the letter H, for infants, boys, and girls, and there will also be class-rooms. The aspect of the building will be south, and the main front will look into a spacious playground. The infants' school will be 48 ft. in length by 19 ft. in breadth; the girls' school, 48 ft. 6 in. by 19 ft.; and the boys', 55 ft. by 19 ft. The entrances to the schools will be separate, and the yard accommodation for the infants and girls, and the boys, will be also separate and distinct. Internally, the rooms will be 13 ft. 6 in. in height to the ceiling. The main gables will be lighted with ornamental circular windows, and the remainder of the windows will have stone mullions and transoms. The schools inside will be boarded round to the height of 4 ft. with dressed and stained woodwork, and the infants' school and class-rooms will contain galleries for the children. The buildings are designed to accommodate 400 scholars, and the cost is estimated at about 2,000*l.* exclusive of the site.

Brightwell and Sotwell.—The school-room erected for the united parishes of Brightwell and Sotwell has been opened. The building is of red and grey bricks, the roof covered with red tiles; and the principal room is 43 ft. long by 23 ft. wide. The partition between the school-room and class-room is formed by folding-doors, which slide back, and thus form a large room, 60 ft. long. The passages on each side of the class-room are used as cloak-rooms, and lead to the out-offices, &c. At the back of the school-room there is a good roomy playground, fenced in. The building was erected by Mr. G. Wheeler, of Dorchester, Mr. Buckridge being the architect.

Gloucester.—St. Luke's new schools have been opened. The architect of the building is Mr. Alfred W. Maberley; the builder, Mr. S. J. Moreland, both of Gloucester. There are three schoolrooms placed side by side,—the boys' on the left, the girls' in the centre, and the infants' on the right. Each room is 20 ft. wide, and the three are respectively 70 ft., 60 ft., and 65 ft. in length. A large entrance-porch, serving also as a hat and cloak room, and a class-room, containing an average space of 250 superficial feet, are provided for each of the three rooms; and there are also lavatories attached. Internally, from floor to ridge, the height is 27 ft., and to the collar-beam of the roof 16 ft. They are lighted by large stone-mullioned windows at the sides and ends. Externally, the schools are constructed mainly of red bricks, relieved by bandings of stone and blue bricks at intervals. The central school gable has a circular window deeply recessed, the arch supported by carved columns, and the whole surmounted by a bell-turret, wherein is hung a bell. The two side schools have three-light windows at each end, with stone mullions, heads, and cells. In order to secure as much light as possible, the side windows have been carried up and finished with carved gables, and the ventilation is thereby increased by square-framed louvre ventilators, finished with spirelets and finials, and fixed in the centre of each roof. The master's house consists of a living-room, kitchen, scullery,

pantry, larder, coal-store, and so forth, on the ground floor, and of three bedrooms in the upper story. The buildings are inclosed in front with brick piers finished by stone caps and iron railing and gates; the other fencing is of wood and brick. The yards have been fitted up with Moule's earth-closets.

STAINED GLASS.

Doncaster Parish Church.—The Standish window, already described, has now been put up by Messrs. O'Connor in the north transept of this church. The committee for the Schofield window for the south transept, which we have also described, have informed Messrs. Clayton & Bell that the work has given great satisfaction.

St. Mary's, Crumpsall.—The east window of this church has just been filled with painted glass. The architecture of the church is an adaptation of the Early Decorated period. The window, which consists of five lights, with upper tracery, is, with one exception, the largest east window in the neighbourhood of Manchester. The style of the painted glass has been designed to accord with the architecture. The subject represented is the second portion of the Apostles' Creed, the articles relating to our Lord. The lower range of subjects represents the Incarnation, the upper range the Passion, and in the tracery is the Ascended Majesty. The three centre lights are grouped together. The lower ones represent the Nativity of the Savior, with the Adoration of the Shepherds and of the wise men from the East. The upper ones represent the Crucifixion, with St. Mary and St. John at the foot of the Cross. Flanking these subjects in the side-lights are, below, the Annunciation and finding in the Temple; above, the Agony in the Garden and the "noli me tangere." In the tracery above is represented the Savior in Majesty, with the Virgin Mary and St. John Baptist below. In the surrounding compartments are busts of the two apostles, St. Peter and St. Paul, and of the archangels St. Michael and St. Gabriel. The cost of the window, which is several hundred guineas, is an anonymous gift. The work has been executed by Messrs. Lavers, Barraud, & Westlake, of London and Manchester. This is the second window which has been filled with painted glass in this church. The former one, to the memory of the Rev. J. W. Wyld, first rector of the parish, is a two-light window in the south side, and represents the Good Shepherd, and "Behold, I stand at the door and knock." This was also executed by Messrs. Lavers, Barraud, & Westlake.

Windermere Church.—The stained-glass window, purchased from the prior of Furness Abbey, at the dissolution of the monasteries, and removed to the parish church, Windermere, 335 years ago, has been removed to London. It is to be restored, from the drawings of similar windows in the Bodleian Library, provided funds can be raised for the purpose.

Coniscliffe Church.—The east window of this church has just been fitted with stained glass. The style of the window is Early English, and it is divided into three compartments. In the central one is a large picture of the Crucifixion, with St. Mary and St. John standing at either side of the cross; in a space beneath is the "Last Supper"; the subjects in the side-openings are the "Agony in the Garden," "Betrayal," "Scourging," "Entombment," "Resurrection," and "Ascension." The groundwork is grisaille, on the best antique glass, and a border surrounds each opening. The window is the work of Mr. Bagley, of Newcastle-on-Tyne. A painted reredos has also been placed against the east wall by the same artist. The church has been much improved of late by the erection of a porch on the north side, and is shortly to have coronas for lighting, by Skidmore. The whole cost will be defrayed by subscriptions, raised through the exertions of the vicar and Mrs. Lynn.

St. Chad's, Saddleworth.—A new stained-glass window of three compartments has just been inserted in the church of St. Chad, Saddleworth. It is the gift of Miss Sarah Radcliffe, of Boarshurst, in the said district, to the memory of her uncle, Mr. J. Nelson, late of Oldham and Bowdon. Subjects illustrated—Christ and the Woman at the Well of Samaria, the Widow's Mite, and the Meeting of Christ with Mary in the Garden, after the Resurrection. This makes the sixth three-light stained-glass window with Scripture illustrations and subjects placed in the above church, and executed by

Messrs. Geo. and J. R. Shaw, architects and glass-painters, Uppermill, near Manchester. The large east window of five lights, containing about 400 ft. of glass, has also been filled in by the same firm, the Last Supper occupying the five compartments below the transom, and the Crucifixion the portion above the transom, the tracery being filled in with a varied collection of figures and ornamental work.

FROM VICTORIA.

Melbourne.—The corner stone of a college, which is to be affiliated with the Melbourne University under the title of Trinity College, was laid on the 10th of February by the Bishop of Melbourne. The building stands near the south-west corner of the reserve, to the north of the University, and considerable progress in the erection of it has already been made by the builder. Only a small portion of the whole design, namely, the provost's lodge, &c., has been undertaken, and it is to cost 7,500*l*. The funds in hand amount to 4,000*l*, and the buildings will be carried out as far as the money will allow.

Strathfieldsaye.—The Strathfieldsaye Shire-hall has been erected by the Strathfieldsaye shire council at a cost of 700*l*, from the design of Mr. George Steane, the shire surveyor; Mr. George Pallett, of Sandhurst, being the contractor. The hall, with the offices and corridor, is erected of red brick with white dressings. The walls are built hollow, open at top and bottom, ensuring a draught to cool them in the summer time. The hall, 30 ft. long, 21 ft. wide, and 16 ft. high, is enriched with a cornice, centre flowers, and numerous ornamental ventilators. The roof, heated by the sun's rays, will create a draught, withdrawing the vitiated heated air from the hall to be replaced by fresh air supplied through ventilators at a height of 6 ft. or 7 ft. from the ground. The area of the shire is about 220 square miles, and the population about 4,000 persons. The shire of Strathfieldsaye is essentially a farming district, and has produced some of the finest cereals in the colony, and it is also the vineyard of Bendigo. There are not at present many manufactories; the only one of any considerable importance being an extensive tannery, making great quantities of leather for the colonial and English markets.

Echuca.—The Town-hall and Court-house, Echuca, is of red brick, with white brick facings, and is covered with a slate roof. The whole when complete will cover a space of 71 ft. by 76 ft. The rooms now built are six in number, the principal being the court-house, which is 35 ft. by 20 ft., and the municipal chamber, 47 ft. by 24 ft. The others are intended for the offices of surveyor and clerk of the courts, on the Crown side of the building, and for the offices of the town clerk and surveyor on the municipal side. The original plans provided for plaster ceiling; but, on further consideration, the borough council deeming that the great heat of the district required wood rather than plaster, the ceiling of their part of the building is accordingly in panel, from designs by Mr. Pascoe, their town clerk and surveyor, and picked out in colours red, white, and blue, with two glass chandeliers suspended from the centre. The total cost of the building, as it now stands, is about 2,300*l*, of which Government gives 850*l*. The architects were Messrs. Vaham & Getzschman; the contractor, Mr. James Mackintosh, of Echuca; and the works have been carried out under the superintendence of Mr. Pascoe, the town surveyor.

Books Received.

Eighty-two Illustrations on Steel, Stone, and Wood. By GEORGE CRUIKSHANK. With letter-press description. London: W. Tegg. In a smart quarto volume, Mr. Tegg has here brought together selections from the illustrations of various books produced, in times gone by, by the veteran artist and sound earnest man, George Cruikshank, — the Life of Napoleon, Life of Nelson, Beauties of Washington Irving, Sergeant Bell, Baron Munchausen, Knickerbocker's History of New York, Peter Parley, Hone's Every-day Book, and others, with "Gin" and "Water," for title pages. Some of them were made so long ago that they will be quite new to the present generation of readers. They contrast strikingly with illustrations of the

present day, in being compositions, real pictures, having half a dozen or a dozen figures in them, with expression in the woe faces, the surrounding background carefully filled in, and illustrating unmistakably, small as they are, the passage to which they are appended, instead of the everlasting two figures, inane and namby-pamby, which now form the staple of too many illustrated works. The volume is equally interesting and amusing.

VARIORUM.

"THE Holiday Number of London Society" deals as usual with excursion-trains, sea-side rambles, and Continental experiences, and has a full allowance of pictures. — The *Illustrated News* of last week contains a large and remarkable view of stately Oxford. — "Tabulated Weights of Angle, T, Bulb, Beam, Round Square, and Flat Iron, for the Use of Naval Architects and Shipbuilders." By Chas. H. Jordan. London: Spon." The author of these tables states that he carefully calculated and compiled them for his own use, as he much felt the want of such tables. — "The Timber Merchant's Pocket Companion." By C. Gane. Gane & Co., Wisbeach." This is a small card, with three tables, useful in the measurement of wood.

Miscellanea.

Tin-lined Lead Pipes.—The patent of Mr. Haines, of Liverpool, is thus described in the local *Daily Post*:—Mr. Haines's patent may be simply described as a lead-encased block tin pipe, which it is found resists all corrosive influences. It is now being manufactured in considerable quantities. We had an opportunity of visiting the factory and of witnessing the process of manufacture, which, however, with one single and most important exception, is the same as that adopted in the production of the ordinary lead piping. The exception is in the casting of the ingot. The molten lead is first poured into a mould, in which, by the insertion of an iron bar, a space is left for the tin. When the lead has cooled the bar is removed, and a mandril of the exact width which the pipe is to take is inserted. Around this again the molten tin is poured, and when the mass has cooled it goes through the usual process until it emerges in the form of a pipe. . . . The engineer to the Glasgow Corporation works has tested the piping with reference to its cohesive power, and has reported that it has on an average of three tested thicknesses a cohesive strength double that of the ordinary lead pipe. The result of the experiments at the Liverpool waterworks on the 5th of May last were even more encouraging. Three thicknesses of the ordinary lead piping tested had an average cohesive strength of 2,840 lb., while the lead-encased tin pipe showed an average cohesive strength of 6,431 lb.

A Civic Sanitary Staff.—The authorities of Glasgow, says the *Daily Express*, have at length the satisfaction of having organised the most complete "sanitary department" probably ever established as a permanent branch of administration in any of our British cities. The object aimed at is no less than to prevent disease,—not only to wipe away the reproach which Glasgow has of late years been incurring from the mortality returns, but to render the town more clean and sweet to live in, to improve the habits and condition of the poor, and to secure more vigorous health and greater length of days to all. The "Sanitary Inspection Service" consists of a chief officer, five district inspectors, and thirty ordinary nuisance inspectors, each of whom has a section of one of the five districts into which the city has been divided under his charge.

Dundee: Strike among Masons.—There are some disputes at present between the operative masons employed in the quarries and the quarry masters. The men contend that all apprentices, especially in quarries, should be indentured; that they should be paid by the day instead of by the piece; and that no stones should be dressed in the quarries. At a meeting on Friday week, the first two points were conceded by the quarry masters, but the third point remains unsettled. We understand the some of the master builders support the men regarding the third point. About 100 men are out on strike till the remaining difference is settled.

Leicester-square.—In reply to Captain Dawson-Damer, Mr. Ayrton said that he had not been able to ascertain whether any person claiming to be the owner of Leicester-square proposed to let it on a building lease. If such were the case, he could only interfere by means of a private Bill, which, according to the Standing Orders, he would be precluded from introducing during the present session. Besides, it would be a dangerous thing if, when a local authority neglected its duty, the First Commissioner of Works were to come forward to undertake it, as the result would be to throw on the Treasury an expense which ought to be paid out of the local funds. If the statement in question were correct, it was only a practical illustration of the necessity for a reform of the local government of the metropolis. He had endeavoured to press this subject on the attention of the House by more than one report from the Select Committee over which he presided, and he hoped his right hon. friend the Secretary of State for the Home Department would be able next session to deal with this very important question.

The Opening of the New Independent College, at Taunton.—The Independent College, at Taunton, of which we gave a view and plan in our volume for 1869, pp. 186, 187, has now been formally opened. The building is situated in a wooded estate of 25 acres, called Fairwater. It is about half a mile from the railway station at Taunton, and is visible to passengers on the Bristol and Exeter railway. The present arrangements provide for the reception of 150 boarders, but admit of extension for the accommodation of 200. The style is Tudor-Gothic, and the building is of West Leigh stone, with Bath stone facings. In the grounds are covered play-ground, gymnasium, tennis-court and bathing-place. The Fairwater mansion adjoining supplies a residence for the principal, besides a considerable space available for other purposes. The cost of the land was £7,600. 4s. 7d.; the contract for building, 10,500l.; and the drainage, ventilation, architect's fees, clerk of works, &c., bring the total cost to nearly 20,000l. The architect was Mr. Joseph James, London; and the builder, Mr. Henry Davis, Taunton.

The Oxford Architectural and Historical Society.—The excursion to Warwick took place on Saturday before last, when between thirty and forty members and their friends visited the castle, the church, and other buildings. By permission of the Earl of Warwick the society enjoyed unusual facilities for viewing the castle; as in addition to the usual portions shown to visitors, the society was permitted to inspect the various vaulted chambers in the basement. The general opinion of the members was that there were none of the existing buildings of earlier date than the reign of Edward III. In his reign there were two Barls of Warwick, named Thomas, father and son, and by them the greater part of the existing castle was erected. This included the great hall, and the range of rooms westward, Caesar's tower, the Barbican, the basement of Guy's tower, and the eastern side of the fortified enclosure. The upper part of Guy's tower was erected in the fifteenth century, and there are also Elizabethan and modern additions.

The Gallery of Illustration.—The plot of Mr. and Mrs. Gorman Reed's new entertainment, "Our Island Home," told in straightforward language, would seem the most terrible and audacious nonsense that a brave author had ever ventured to commit to an intellectual British public. Still it is very droll, looked at from the right point of view, and Mr. Reed has composed for it some very bright and sparkling music, so that being acted with wonderful nerve and undragging spirit by Mr. and Mrs. Reed, Miss Fanny Holland, Mr. Arthur Cecil, and Mr. Corney Grain, it will doubtless run a considerable time, and make a large number of people laugh. An effective scene by the sea has been produced for it by Mr. O'Connor, and the dresses are charmingly fanciful. "The School Feast," by Mr. Corney Grain, of which we have already spoken with warm commendation, concludes the entertainment. Mr. Grain is an actor as well as a musician, and will make his mark.

Engineers for India.—It is reported, says *Nature*, that the Secretary of State for India has determined upon establishing in this country a complete College of Science for civil engineers, for the education of those who are to be employed on the extensive Government works in India.

Public-Houses without the Drink.—The sixth "public-house without the drink" was opened on Tuesday, May 31st, at Chapel-town, Leeds. The well-known motto, "Come and Welcome," appears conspicuously to all passers-by (whether on the top of the omnibus or on foot), as do also the large characters of "British Workman, No. 6," while the old sign of the "Swan" has been erased to make way for the words familiar in other parts of the town:—

"A public-house without the drink,
Where men may sit, talk, read, and think,
Then safely home return."

The tap-room and inner parlour are supplied with daily papers and monthly periodicals, while the large club-room upstairs is admirably adapted for meetings of various kinds which may be held in connexion with the place. Clubs and sick societies can here be accommodated without the necessity of "drinking for the good of the house." The opening was celebrated by a tea, bountifully provided by the ladies of Chapel-town, in the Wesleyan schoolroom: so there was drink after all.

Building Land, Brighton.—Some plots of land sold lately, by order of the Town Council, realised the sums affixed:—Lot 1. Freehold plot of building land, numbered 78 in North-road, adjoining on the east the site on which the Dolphin Inn is to be rebuilt, presenting a frontage to North-road of 18 ft. 6 in., with a width at the north end of 18 ft. 10 in., a depth from north to south on the east side of 40 ft. 2 in., and on the west side of 39 ft. 280l. Lot 2. Plot of freehold building land, abutting on the south to No. 5, Marlborough-place, possessing a frontage to Marlborough-place of 22 ft., a like width at the west end, a depth from east to west on the north side of 56 ft. 1 in., and on the south side of 56 ft. 7 in., 400l. Lot 4. Corner plot of freehold building land, 23 ft. to Marlborough-place and 57 ft. 8 in. to Church-street, having a width at the west end of 25 ft., and a depth from east to west on the north side of 57 ft. 1 in., 560l.

Sales of Property in Bromsgrove and Bromyard.—Mr. Cotton offered, at the Dog and Pheasant Inn, Bromsgrove, 47 a. 2 r. 6 p. of land at the Lickey, and after a spirited competition it was purchased by Mr. Walter James, for Mr. James Woodman, Redditch, for 1,560l. A cottage and 2,760 yards of land near the above was sold to Mr. J. Lea, for 157l. Mr. Nathaniel Taylor, auctioneer, has sold by auction several freehold properties in and near Bromyard, belonging to the late Mr. Humphrey Bowen, deceased. A freehold property, consisting of three cottages, outbuildings, and 5 a. 2 r. 2 p. of land, situate at Edwin Ralph and Edwin Leach, sold for 540l. A freehold house and premises, situate in High-street, let at 13l., sold for 240l.; and a similar house, adjoining, let at same rental, was knocked down for 245l. There was a good attendance, and the biddings were given with considerable spirit.

Egyptian Antiquities.—At the Syro-Egyptian Society (Hat-street, Bloomsbury), last week, Mr. Bonomi described the collection of antiquities found in Egypt by the late Mr. Robert Hay, of Linplam, and now in the rooms of the Society. The collection is very large and various,—1,084 items are mentioned in the catalogue,—and is now for sale. One of the most noticeable objects is a statuette of the Ptah of Thebes, 26½ in. high, an extraordinary work in metal. The core is bronze, which has been covered with a white stucco to represent the white mysterious dress of this god. The face and hands, as well as the necklace, have been gilt; the eyelids and eyebrows, the scalp, and a square projection in front, are in a composition of antimony, which is of a considerable thickness, overlaying the bronze core at this part. The eyes have been inserted.

Water in Edinburgh.—Mr. Gale, C.E., has issued a report on the water supply of the city of Edinburgh. His general conclusions are that Edinburgh is at present using nearly 9 million gallons of water a-day; that the quantity must be reduced to 7 million gallons a-day till the reservoirs get filled up; that not more than 7½ million gallons a-day can be got from the works in a moderately dry year; that the reduced quantity should be regularly spread over the summer; and that the only proper way to accomplish this is to institute a system of intermittent supply. This reads very much like going backwards.

Metropolitan Tramways.—A committee of the House of Commons has sanctioned another extension of the Metropolitan tramway system. The projected line will start from a point near the Bank, and will pass through Moorgate-street, the City-road, Islington, and the Holloway-road, to the Highgate-archway, with intersecting branches from the leading thoroughfares of the district. The Committee have declined to sanction the crossing of Westminster Bridge by tramways.

A Forgotten Bell.—I am putting on a spire to the Archdeacon's Church, near Alnwick, at the cost of a county squire, as a memorial of his son, Captain Carr, who was killed in New Zealand, and I found an old bell in the belfry, the existence of which has been lost sight of for generations. It bears an inscription in German. It strikes me the inscription is unusual.

"Antonius is mimen name. It ben gemact mit parr : : m : : cccc : : lxxxx. +

"Antonius is my name: I was made in the year 1489."—F. R. W.

Ecclesiastical Dilapidations Bill.—In the House of Lords, the Archbishop of York moved the second reading of this Bill, which, he explained, was based on a report of a joint committee of the Convocations of Canterbury and York. At present there was no satisfactory mode of enforcing repairs, and it proposed that a surveyor of high position should be appointed in each diocese, who, wherever ordered, and on any presentation to a benefice, would make a survey. The Bill was read a second time.

Startling.—The church people of Hanley were on Saturday astonished by the announcement that "in consequence of necessary repairs," there would be no service in the Old Church on the following day. On inquiry as to the reason, it was ascertained that some slight cracking of the ceiling had induced a professional inspection. The architect called in has pronounced that the rafters are in such a dangerous state that it is next to miraculous that the entire roof has not fallen in long ago.

Fall of a Building.—The other morning the premises of the Royal Insurance Office, Park-row, Leeds, beside which excavations for a new building were being made, suddenly collapsed and became a heap of ruins. Fortunately the clerks were warned a few seconds before the accident, and they rushed out and escaped: thus no lives were lost and no injuries sustained.

New Public Hall for New Mills (Stockport).—The public interest of this township for a new and commodious public hall, for the purposes of a mechanics' institution, reading-room, &c., and a large room for the intended transaction of the magistrates' business, concerts, &c., has led to the laying of the foundation stone of the intended structure. The streets were gaily decked with flags, and there was a procession with other ceremonial.

Competition, Hull.—The plans submitted by Mr. Samuel Musgrave, Hull, have been selected in a recent competition for a Primitive Methodist Chapel proposed to be built in Lincoln-street, Hull; and he has been instructed to prepare working drawings for the erection of the buildings forthwith. There were seventeen other designs submitted.

International Exhibition of 1871.—The commissioners have resolved to set aside one guinea out of every season ticket sold at three guineas, through the Society of Arts, to purchase works of art and industry out of the Exhibition, for circulation throughout the United Kingdom. This determination will be open to misconception, we fear, by-and-by.

New Temperance Hall at Hanley.—The foundation-stone of a temperance hall has been laid in New-street, Hanley. The building is to be 20 yards by 12 yards, and to contain one large room, with gallery at one end, and committee-room under the gallery. The work is to be done under the direction of Mr. Looket, and the estimated cost of the new building is 800l.

Ladies' Sanitary Association.—A bazaar and fancy sale, in aid of the funds of the Ladies' Sanitary Association, will be held (by permission of Madame Ernest de Bunsen), at Abbey Lodge, Hanover Gate, Regent's Park, on Tuesday and Wednesday, the 25th and 29th inst. A number of distinguished ladies will take part.

* The object of this Memorandum Book is to enable every lawyer to keep a systematic record, reproducible in a court of law, of a investment transaction entered into. No such record was in use at the time, and the want of it was often felt by executors and administrators.

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The Builder.

VOL. XXVIII.—No. 1430.

The Strength of Beams and Columns of Wood, Iron, and Steel.

T would seem that the "architects" of the present day have left the study of the scientific branches connected with construction entirely to the "engineers;" at least, we may infer that such is the case from the fact that the books which appear in such numbers on the strength of materials and other cognate subjects, are produced by members of the engineering profession, to the almost complete exclusion of those of the architectural. Time was when the "architect" was a man of science; that is to say, he was well versed in all the problems connected with laws of force as far as they were then

understood; but in the present day, when science has advanced with such rapid strides, the architect is quite left behind, and appears satisfied with a mere smattering of mechanical or any other mathematical science. This state of things will go on until the more advanced members of the architectural profession see the necessity of compelling their pupils to go through a severe course of mathematical study before they are allowed to practise; otherwise they must not expect that their profession will be regarded as a scientific one by those who are competent to judge of such matters.

But, although architects will rarely take up scientific pursuits themselves, they are very glad to avail themselves of the investigations of those who do so; and, consequently, there is a demand for books in which they can find rules for the strength and proper proportions of beams, columns, &c., ready to their hand, without the trouble of examining and testing for themselves the formula or processes of reasoning by which they are obtained. The book* which Mr. Baker has produced, and of which we now propose to give an abstract (as far as it relates to subjects interesting to the architect) is one that will be of immense service to the student of building construction, as the methods of calculation are very fully explained, and can be worked out with but little use of algebraical formula; the author having "endeavoured to assimilate the process of investigation to the ordinary routine of the drawing office; in other words, he has preferred compasses to equations, and scales to logarithms, whenever the selection was optional."

The student, however, must not jump to the conclusion that there is no need for him to acquire a considerable knowledge of mathematics, for he will find that the whole of the reasoning throughout the book is what may be termed "mathematical," although without any extensive use of the symbols which are supposed to be inseparable from that science; and

unless his mind has been well trained in habits of close reasoning, he will find much difficulty in understanding the greater part of the work.

The object which our author has had in view has been to derive "methods of ascertaining the practical strength of any given section of beam, column, or arch, in cast-iron, wrought-iron, or steel;" and to show how the various data obtained as the results of the numerous experiments which have been made on those materials can be utilised for that purpose.

In testing the strength of a beam supported at each end, the best mode of proceeding is to apply a gradually increasing bending stress at the centre, the deflection and set being noted after each increment of stress; and to find the real value of the material we must know the work done in producing fracture, and this will be proportional to the product of ultimate tensile resistance and of ultimate extension, the toughest and best material giving the highest result if compared with others on that system. It is also requisite in judging of the quality of metal by experiment, to consider the form under which it is presented, as "by injudicious shaping the best material may be reduced to the level of the worst."

It has been shown by Mr. W. H. Barlow that there exists in beams an element of strength which he calls "resistance of flexure." Experiments upon beams which have the web small in proportion to the flanges, demonstrate that the law of the strain being proportional to the load applied is a tolerably accurate one; but that in beams of rectangular section the error arising from calculations made on that principle is very great. This error arises from the effect of lateral adhesion of the material being left out of consideration; but experiment shows that a powerful lateral action exists tending to modify the effect of unequal strains. This new resistance is dependent on the deflection in connexion with the depth of the metal, and is uniform for each unit of area over the whole cross-section; being due to the elastic reaction of the contiguous fibres, which will be a constant amount throughout the whole depth of the beam; the extension and compression of the several fibres being proportional to their several distances from the neutral axis.

The value of the ultimate resistance of the fibres is consequently always higher than the resistance to direct tension of the material; the quantity to be added being variable, and dependent upon the form of section. Its value, however, can be found for iron beams of any form of section, by help of the experiments which have been made on solid bars of the same kind and quality of metal.

The moment of resistance of a given cross section is the area of a flange multiplied by the depth of the beam, or the effective area multiplied by the effective depth. The moment of the weight, or strain, is the bending-force multiplied by the length of leverage at which it acts; and if this last moment is divided by the moment of resistance, we obtain the value of the resistance of the section to the same straining force. When the load is all at the centre of the beam (supported at each end), the moment of the weight is one-half the load multiplied by one-half of the span, that is, one-fourth of the product of span and load; if the load is equally distributed along the beam, the moment is half the above quantity, or one-eighth of the product of span and load. The value of the moment of resistance of a given cross section is determined on the supposition that every fibre is strained according to its direct distance from the neutral-axis, and that the effective leverage is also proportional thereto. On this principle it is easily shown that the moment of resistance of a square section having a side vertical is one-sixth of the cube of the side. If the diagonal of the square section is placed vertical, the moment of resistance is the

same as before, but divided by the square-root of 2, or 1.414. In beams of any other section we must first find the position of the centre of gravity of the section, as through it the neutral-axis will pass. In a beam of T section, having equal thickness of metal throughout, the moment of resistance is half the square of the distance of the neutral-axis from the bottom of the T, multiplied by the thickness of the metal.

The variation in the strength of various specimens of cast-iron that have been experimented on amounts to 100 per cent., and it is generally found that remelting increases its strength. As an average of the experiments made on ordinary cast-iron, the ultimate resistance to direct tension may be taken as 16,502 lb. per square inch of section. A bar 1 in. square, having a bearing of 54 in., is found to have a breaking-weight of 464 lb. in the centre, the moment of which is 6,264; the moment of resistance is one-sixth the cube of the side; that is, $\frac{1}{6}$ in.: therefore, if we divide 6,264 by $\frac{1}{6}$, we get 37,584 lb. as the apparent resistance excited by the above load in a square cast-iron rod. Deducting from this last result the value (16,502) of the ultimate resistance to tension, we obtain the quantity, 21,082 lb. as the value of Mr. Barlow's resistance due to flexure; so that the resistance due to flexure is to the resistance to direct tension as 100 to 78.

It is shown, both by theory and experiment, that the nearer the centres of gravity of the portions of the cross section which are above and below the neutral-axis approach thereto, the higher is the value of the resistance due to flexure; so that in girders where the centre of gravity is near the extreme points of depth, the value of that resistance is very small, and may be practically neglected in the calculation. Suppose it is required to find the section of a girder 12 in. deep, having a span of 16 ft., or 192 in., which shall carry a load of 10 tons at the centre, the strain per square inch of section not exceeding 2 tons; the moment of the weight is half the load multiplied by half the span (in inches), or 480; the moment of resistance is the area of the flange multiplied by the depth of the girder; and the resistance of the section being 2 tons per inch, we find the area of the flange to be 480 divided by the product of the depth (12 in.) and the resistance (2 tons), giving 20 in. for the area of the section of the flange. The area of flange of any other beam of given depth, span, and load, can be found in a similar manner by multiplying one-fourth of the span (in inches) by the load in tons, and dividing the product by twice the depth (in inches); the strain per square inch of section being 2 tons. Conversely, the area of section of flange of a cast-iron girder being given, together with the depth and bearing of the beam, the weight to be laid on the centre can be determined for any given strain per square inch of section: thus, multiply together the area of flange, the depth of the beam, and the given strain per inch, and divide the product by one-fourth the span, all dimensions being expressed in inches, and the weights in tons.

Wrought-iron is found to vary very greatly in tensile strength, the difference between several specimens being upwards of 90 per cent. The tensile strength of plate-iron is from 14½ tons to 28 tons per square inch; and in bars, the ultimate resistance to tension is from 19½ tons to 30½ tons per square inch. It is found in practice that the elastic resistance of the metal is overcome by about the same amount of strain per square inch, whether in compression or in tension, and on this account some engineers make the two flanges of a wrought-iron beam equal, although the usual plan is to give 20 per cent. more to the top (which suffers compression), than to the bottom flange, which suffers extension. The ultimate resistance to compression of a cube of wrought-iron may be regarded as practically

* On the Strengths of Beams, Columns, and Arches. By B. Baker, Assoc. Inst. C.E., E. & F.N. Spon, London, 1870.

unlimited; consequently, as in cast iron, it is only necessary to consider tensile strains. The mean tensile strength of Swedish bars, 2 in. square, is 42,133 lb. per square inch; and their breaking-weight at the centre of 25 in. bearing 14,000 lb. The moment of this weight is half the bearing multiplied by half the weight, or 87,500; and the moment of resistance of a cross section is one-sixth of the cube of the depth, or 14. Dividing the former by the latter, we get 65,625 lb. as the apparent strain on the extreme fibres caused by the breaking weight; from this quantity subtract the tensile strength above given, namely, 42,133 lb., and the difference is 23,492 lb., representing the resistance due to flexure, which has been previously described. In wrought-iron bars, therefore, this resistance is rather more than one-half the tensile strength, amounting in bars strained with one side of the square vertical, to nine-sixteenths of the tensile strength, and in those with the diagonal of the square section vertical, to thirteen-sixteenths of the tensile strength. In beams of an I or H section the resistance due to flexure is small, and can be found by multiplying the tensile strength, 42,133, by nine-sixteenths of the thickness of the web, and dividing by the width of the flange.

As an example we take the case of a beam of this section $\frac{1}{2}$ in. thickness of metal, which was laid with 48 in. bearing, and the breaking-weight found by experiment to be 61 tons. Taking the tensile strength at 22 tons per square inch, and multiplying it by nine-sixteenths of one-third, or three-sixteenths, and then dividing by 2.86, the width of the flange, we get 1.4 tons as the value of the resistance due to flexure; and therefore the apparent resistance is this last quantity added to 22, or 23.4 tons. Now, the area of flange multiplied into the depth of the beam being 3.24, the breaking-weight is calculated by multiplying 23.4 into 3.24, and dividing by one-fourth of the bearing, which gives 6.3 tons for the breaking-weight, or the same amount as obtained by experiment. The above example may be easily generalised into a rule for finding the breaking-weight of a wrought-iron beam of the same form of section, namely, divide three-sixteenths of the ultimate tensile strength per square inch of metal by the width of the flange, and add the quantity thus obtained to the said tensile strength; then multiply the last sum by the product of the area of the flange into depth of beam, and divide by one-fourth of the bearing; the result is the breaking-weight of the beam in the middle, all the weights and strains being expressed in tons, and the dimensions in inches. If, instead of the breaking-weight, it is required to know what load the beam will bear in the middle, when the ruling strain is some fixed amount, such as 5 tons per square inch of section, we have only to substitute 5 tons for the ultimate tensile strength in the above calculation.

The following is the rule for finding the load in tons that may be laid on the middle of a beam of T section so that the fibres may be strained to a given amount, say 5 tons per square inch: multiply 5 times the area of the vertical web by half the depth of the beam, and divide by one-fourth of the span; all dimensions being in inches. For example, let a beam of this form be 3 in. deep, 3 in. wide, and $\frac{1}{2}$ inch thick, the bearing being 60 in.; then the area of the web is $\frac{1}{2}$, the half depth $\frac{1}{2}$, and 5 times their product divided by one-fourth of 60 gives 62 ton as the load in the middle that will produce a strain of 5 tons per square inch of section. The strength of T beams of wrought-iron can also be found in the manner described for cast-iron girders of the same form.

The great improvements recently introduced in the manufacture of steel are rapidly causing its substitution for common iron as the material of beams and railway bars. The quality of this material is greatly affected by the different modes of treatment which it undergoes in manufacture. Thus a specimen of cast-steel highly heated and cooled in oil bore 96 tons per inch, whilst a similar piece cooled in water failed with 40 tons, and another cooled slowly in ashes with 54 tons. Moreover, the resistance to steady tensile strain increases with the hardness of the steel, but at the same time there is a diminution in its power of resisting a blow.

The resistance to impact was 20 per cent. higher in the last of the above-named specimens than in the first, although the ultimate tensile strength was 44 per cent. less; and the same rule holds good in all kinds of steel. The mean tensile strength of Bessemer steel plates is

double that of good iron plates, or about 40 tons per square inch; that of bars is still higher, being about 51 tons per inch. The rate of elongation varies inversely as the cube of the ultimate resistance to tension.

The resistance of short columns of steel to compression is practically unlimited; 98 tons per square inch having only produced a depression of 36 per cent.

From experiments upon various kinds of steel, it is found that the resistance due to flexure is from six-tenths to eight-tenths of the ultimate resistance to direct tension in square bars having the side vertical.

The following is the calculation of the strength of a steel rail of I section:—5 in. deep, $\frac{1}{4}$ in. thickness of web, $2\frac{1}{2}$ in. width of flange: the moment of resistance of the cross section is 7.8; the average resistance to direct tension, 45 tons; and the resistance due to flexure is taken as $\frac{2}{3}$ of that to direct tension for a solid bar: but since the thickness of the web is to the width of the flange as 11 to 40, the resistance due to flexure for this section is $\frac{2}{3}$ of 11, multiplied by 45 and divided by 40,—that is, 9.27 tons. Hence, the apparent resistance is 9.27 added to 45, or 54.27 tons. The ultimate breaking-weight at the centre of this beam, with a bearing of 43 in., is found by multiplying the apparent resistance, 54.27, by the moment of resistance of the section, 7.8, and dividing by one-fourth of the span, which gives 38.9 tons.

The stiffness of a beam is its power of resistance to bending; so that if a beam, supported at its two ends and loaded in the middle, deflects from its original position before being loaded, the amount of that deflection will indicate its stiffness; that is to say, the smaller the deflection for a given load, the greater the stiffness of the beam. Hence it is said that the stiffness or resistance to deflection is inversely as the amount of deflection.

The laws of stiffness in beams are very different to those of strength or resistance to fracture. It has been generally assumed that the deflection is proportional to the stress producing it; but this is not strictly true for any material, and in cast-iron the deviation from that law is found to be considerable under every degree of strain. In deducing a rule for finding the deflection of a beam under a load not exceeding the elastic limit, we shall obtain a sufficiently near result if we take an average of the elongations and depressions produced by experiments, without complicating the question by considering the varying rates of deflection under successive increments of load. We find that the mean result of experiments on pulling and thrusting bars of cast iron, 1 in. square and 60 ft. long, for the first three tons' stress is '00018 per ton for each unit of length. Hence we obtain the following rule for the deflection of a cast-iron beam of any symmetrical form of section, loaded at the centre to any extent within the elastic limit: multiply the tensile strain per square inch of section which the load produces into the square of the span, and also into the fraction '00003, and divide by the depth of the beam; all dimensions being in inches, and the strain in tons. The ultimate direct tensile strength of cast iron is generally taken at 7 tons per square inch of section.

The deflection of wrought-iron beams can be found in a similar manner, but since the resistance of this material to extension is greater than that of cast-iron, the deflections with equal loads are less. As the result of numerous experiments, the extension of wrought-iron bars in terms of their length, within the elastic limit, which varies from 8 to 12 tons per square inch of section, is generally taken at '0001 per ton, that is, the extension is $\frac{1}{1000}$ of the length for each ton per square inch of direct tensile strain. It is also shown by experiment that the effective rate of extension per ton for every square inch of apparent strain, is constant for beams of every form of cross section, when subjected to transverse strain; and that the extension of fibres under similar apparent unit strains is unaffected by the agency exciting those strains. The deflection of any wrought-iron beam of uniform section, under a central load, when strained within the elastic limit, is found by multiplying the square of the span into the strain per square inch of section, and dividing by the depth; the result multiplied by the fraction '000017 gives the deflection; all dimensions being in inches, and the strain in tons.

The stiffness of steel is greater than that of either cast or wrought iron, but the deflection of a steel beam, under a given load, can be found

with sufficient accuracy by a rule similar to those given for iron, the only difference being in the constant multiplier. For average qualities the mean extension of a bar, 1 inch square for each ton of strain, is found to be '00008, or $\frac{1}{12500}$ of its length, and the same result is obtained by experiments on beams laid between supports, and subjected to a transverse strain. This is four-fifths of that obtained in wrought-iron, or the relative stiffness of steel and iron beams of similar section is as 5 to 4. Hence we obtain the following rule for the deflection of a steel beam of uniform section, loaded in the middle to any extent within the elastic limit; the square of the span, multiplied into the strain, in tons, per square inch of section, and divided by the depth of the beam, the result being multiplied by the fraction '0000133, gives the required deflection, all dimensions being in inches.

Wood, as a material for beams, is now made to play a very subordinate part in large engineering structures; but as it still forms an important material in architectural works, it is necessary that we should have correct data on which to ground our calculations of its strength and stiffness. Experiments made upon small pieces of wood of selected quality are found to give much higher results than those made upon large pieces such as are commonly used in practice. Taking average specimens of pine and oak of ordinary scantlings, we find that the breaking-weight reduced to that on a bar 1 in. square and 12 in. long, loaded in the middle, is 2.2 cwt. for pine, and 2.75 cwt. for oak. Hence we obtain the following simple rule for the breaking-weight of a beam at the centre; multiply the square of the depth into the breadth, and divide by the span; then multiply the result by 1.65 for oak, and by 1.32 for pine, and you have the breaking-weight in tons at the centre, all the dimensions being in inches. The ultimate strength of these beams may be also found by putting 2 tons per square inch for pine and 2½ tons for oak in the rules previously given for the strength of iron beams; these being the ultimate strains per square inch of section which the fibres will bear.

The stiffness of beams of wood may also be determined in the same way as for those of iron, the average elongation of a bar of oak or pine being '0022 and '003 of its length per ton per square inch respectively. Hence we find the deflection for any load at the centre, straining the beam with any force per square inch of section within the elastic limit, by the same rule as for iron beams; namely, multiply the given strain in tons per square inch into the square of the span, and divide by the depth; the result, multiplied by '00037 for oak, and by '0005 for pine, will give the amount of deflection at the middle of the beam; all dimensions being in inches. The practical difference in strength and stiffness of oak and pine is not great, where beams of large scantlings are employed; oak being one-fourth stronger and one-third stiffer than pine.

When any portion of a structure has to support a weight acting vertically down its axis, it may be considered as a column. The strength of a column, or its resistance to pressure acting in the direction of the axis, depends very greatly on the relation between its length and diameter; a flat piece of material, even if it be of soft wood, will bear an almost unlimited pressure, which reduces its thickness, but at the same time increases its hardness. In order, therefore, to test the real resistance of material to a crushing force, the height must not be less than $\frac{1}{4}$ times the width at base; in pieces of cast iron of this form, the average resistance to crushing of good metal is 49 tons per square inch of section, and in wrought iron about 16 or 18 tons; the compressive strength of mild steel is about $\frac{1}{3}$ times that of the best wrought-iron, and that of fine-tempered steel about three times that of iron.

In the experiments on the compressive strength of various woods there are great discrepancies; so much depending on the degree of seasoning, as moisture facilitates the failure of wood by splitting. The resistance of elm is 92 cwt. per square inch; that of English oak, 90 cwt.; of American oak, 67 cwt.; and of pine, 54 cwt.; but the strength of all will vary according to the dryness of the specimens.

In columns having a length amounting to several times the diameter or width of base, the compressive force acting down the axis produces a tension tending to cause failure by bending. The strain, therefore, on a column is partly transverse and partly compressive; where the length is very great as compared with the

diameter, the transverse strain is the principal one to be considered, but there is also an initial compression due to the insistent load uniformly distributed over the cross section, which is sufficient in effect to make the circumstances different to that of a beam strained by a transverse force alone. In columns of which the length exceeds thirty-five times the diameter, experiments show that the influence of resistance to compression is imperceptible, but that below that ratio it must be included in the calculation.

The strain on a column results from two distinct forces; one acting along the axis which is inversely proportional to the area, and the other perpendicular thereto, which varies as the stiffness of the material. The former of these forces being the average compression per square inch of section, is the load divided by the area in square inches; and the latter, or the bending force, is proportional to the compression and to the square of the ratio of the length to the diameter, and also to the increment of length received within the elastic limits. In this way we obtain, by a comparison of the results of numerous experiments, the following rules for finding the breaking-weight of solid columns having flat parallel ends, the load being laid uniformly over the whole section, and pressing directly down the axis.

To find the breaking-weight in cwt. per square inch of section of round cast-iron columns, add 330 to the square of the ratio of length to diameter, and divide 270,000 by the sum. The safe permanent load may be from one-fifth to one-seventh of the breaking-weight obtained by this rule.

To find the breaking-weight in cwt. per square inch of section of round wrought-iron columns; add 2,000 to the square of the ratio of length to diameter, and divide 680,000 by the sum. The safe permanent load may be one-fourth or one-fifth of the breaking-weight.

Comparing the results obtained from these rules, we find that when the length is from five to ten times the diameter, a cast-iron column is twice as strong as a wrought-iron one of the same size; when the length is from fifteen to twenty times the diameter, the strength of a cast-iron column is one and a half times that of a wrought-iron one; when the length is from twenty-five to thirty times the diameter, the strength of wrought-iron and of cast-iron columns is about equal; when the length is from thirty-five to forty times the diameter, the wrought-iron column is one-third stronger than the cast-iron one; and when the length is above fifty times the diameter, the wrought-iron column has double the strength of the cast-iron column.

The breaking-weight of square columns of wood, whether oak or pine, is nearly the same, provided the length is over fifteen times the diameter; the rule being, add 350 to the square of the ratio of length to diameter, and divide 17,000 by the sum; the result gives the breaking-weight in cwt. per square inch of section. To find the breaking-weight of an oak or elm post less than fifteen diameters in length, multiply the breaking-weight just found for long pillars by 45, and divide by the ratio of length to diameter added to 30. The safe permanent load may be from one-seventh to one-tenth of the breaking-weight.

To find the strength of a round wooden column, we must first substitute eight-sevenths of the actual ratio of length to diameter in the above rule for the true ratio, and proceed as before.

To find the strength of a square iron column, we must substitute seven-eighths of the actual ratio of length to diameter for the ratio in the above rules for round columns, and proceed as before.

In calculating the strength of hollow columns, the thickness of metal must be considered: when the thickness of the metal is one-tenth the diameter, take three-fourths of the ratio instead of the actual ratio in applying the before-mentioned rules; if the thickness is one-seventh the diameter, take four-fifths of the ratio; if the thickness is one-fifth the diameter, take seven-eighths of the ratio; and when the thickness is one-fourth the diameter, take nine-tenths of the ratio.

For finding the strength of columns of L, T, or + sections, the ratio must be multiplied by $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{3}$, and $\frac{1}{5}$, to obtain the equivalent ratio in the before-mentioned thicknesses of metal as compared with the diameter; pillars of these last sections being weaker than solid pillars containing the same quantity of metal; whilst hollow columns are stronger than solid ones for the same quantity of metal.

In order to find a rule for the strength of a steel column, we may suppose that if a bar is bent by a force at the middle, and kept so bent by a tie-rod attached to its extremities, the strain on the tie will represent the weight the bar will sustain as a column if set upright and loaded at the top: so that, by aid of the rules for deflexion of beams, we can deduce the value of the elastic reaction, since the strain on the tie is the same as the thrust of an arch having the rise represented by the deflexion, and the load by the lateral stress producing it. Hence we obtain the following rule for the breaking-weight of a round steel column in cwt. per square inch of section: for mild steel, add 1,400 to the square of the ratio of length to diameter, and divide 840,000 by the sum. For strong steel, add 900 to the square of the ratio, and divide 920,000 by the sum. In steel columns of square section, the strength per square inch is one-third greater than in round ones. The strength of a long column may be considered as exactly proportional to the stiffness of the material.

WORKS OF ROUBILIAO IN TERRA-COTTA.

In many former numbers of this journal we have discussed the subject of the capabilities of terra-cotta for architectural purposes. We have referred, first, to the great antiquity and permanent durability of burnt earth; then to the use made of this material in Asiatic and in Italian art; and, lastly, to the mode in which the work of the mere decorator rises into that of the sculptor, as is especially the case in the enamelled Della Robbia ware.

In investigating the history of ornamental and structural earthenware in this country, we have been struck with the fact, that it is to the sculptor of some of the best marbles to be found in England that we also owe some of our most spirited and instructive specimens of statuary in terra-cotta.

Roubilliac appears to have been in the habit of first working out, in a clay which is not that usually employed for the purpose, those conceptions which he afterwards embodied in marble. Not only did he, like other sculptors, study in a plastic material, but he submitted his sketches to the fire, and has thus left, should they ever be collected together, a most instructive series of his productions in successive stages of perfection.

We are not about here to enter into the question of the proper rank of Roubilliac as a sculptor. By his contemporaries it was unquestioned. By most writers of authority since his time it has been undisputed. Lord Chesterfield said that the Gascon artist was "a true sculptor, while his contemporaries were no more than stone-cutters." Allan Cunningham, by no means given to compliment, calls Roubilliac "a genius and a gentleman." The effect of his works, especially of the terrible "Death" in the Nightingale monument, on the public mind, was extraordinary in his time; nor does it seem to be much less forcible at the present day, if one may judge from observation of the groups that make the tour of the chapels of Westminster Abbey. But, on the other hand, there are men not devoid of taste who sneer at the allegorical conception of certain of Roubilliac's monuments. A word on this subject is therefore not altogether uncalled for, when we refer to the works of this artist in terra-cotta.

The vigorous and energetic protest embodied in the works of Hogarth against the "Goddesses and Shepherdesses, the Roman Emperor school of portrait-painters and their patrons, the collectors of fiddle-brown saints and ropy-tendonned martyrs, of pseudo-Titians and second-hand Raffaelles," to use the vigorous language of Mr. Redgrave, may perhaps be more fully appreciated in our day than it was in his own. It was the attempt of an original genius to draw its inspiration fresh from nature, when the style of such remains of academic teaching as the century could boast had sunk from the conventional into the simply contemptible. It was a protest such as that which was made by Wordsworth and his school against the followers of Pope; a protest of self-taught genius against classified dulness and incompetence reduced to system. It was, like so many attempted reforms, a work commenced on a low plane. There is an honest and hearty vulgarity about Hogarth which reminds one of the outspoken German of Luther. The English painter saw what was true; he saw how much that truth exceeded the

false feebleness of the time. So far he did well; but he seemed unaware that excellence in art requires not only truth, but noble truth. It is not merely nature that should inspire the artist, but nature in her loftiest moods of beauty, of pathos, or of grandeur. Hogarth was a student of nature; he was, moreover, influenced by a sound and well-intentioned morality; but he did not rise to the level of an artist who at once elevates, purifies, and ennoble the soul, by the imaginative representation of the grander aspects of nature.

In the arts of the painter and of the engraver there are, however, different strata of excellence. Hogarth wrought on a low level, but he wrought well on his selected plane. In sculpture the case is altogether different. That severe and lofty art lends her aid with difficulty, almost with shame, to any but the nobler phases of imitative skill. Satyrical sculpture, comic sculpture, burlesque sculpture, are pseudo forms of the art; which they caricature as the monkey does the man. We may admire the cleverness shown in the clay figures which grotesquely recall the features of contemporary notoriety, or in the curious monstrosities of Japanese carving. But we look at these things as we do at wax models. We appreciate the talent of their authors, but we cannot regard them as sculpture.

Bearing in mind this limit to the range of the sculptor's province, it is impossible to refuse to Roubilliac the title of a reformer and restorer of taste in plastic art, not less energetic, although far less homely, than Hogarth was in painting. The painter or the draughtsman may, to a very great extent, follow the bent of his own genius. The sculptor works always in fetters. The costliness of the material in which his ideas can alone take their fairest form is in itself a very great barrier against the exercise of original power. In monumental works not only have the tastes and wishes of the family for whom the artist is to toil to be consulted,—frequently as to those questions of size, of locality, of execution in relief or in the round, which the freer pencil of the painter overleaps at a single bound,—but the requirements of the architect often cramp the genius of the sculptor. In some of Roubilliac's larger monuments the bad effect of the architectural requirements of his day may be distinctly traced. Monumental effigies, by the middle of the eighteenth century, had assumed stilted and ostentatious proportions. The modest brass, reminding the worshipper of the dust beneath his bones, and pleading for a prayer for the soul of the departed, no longer recalled the lineaments or the heraldic bearings of the dead. The simple effigy of cross-legged knight, the grand simplicity of the plain coffin-shaped tomb, such as that sacred to the memory of our first Edward,—had given way to the costly frippery of canopies and shrines. To cover with marble panelling as much of the time-stained diaper of a thirteenth-century wall as might assert the importance of the defunct, came to be considered a point of honour among those who could afford the cost of stately monuments. At times an entire chapel was occupied by a ponderous composition, as in the case of the weeping Virtues that watch the last repose of Lodovick Stuart, Duke of Richmond, and the substantial Fame that is perched upon the floriated metal canopy over his head; or the corresponding bronze tabernacle dedicated to the excellence of Villiers, Duke of Buckingham. It was not enough that Allegory should be made to bear false witness over the tomb. Portraiture was equally corrupted. One of the finest marble statues in London, that of William III. in the hall of the Bank of England, represents that Dutch warrior in the armour of a Roman general, with bare legs and buskins; or, at least, in such a conventional representation of Roman armour as suited the uncritical notions of the time. Sculpture, like painting and poetry, had passed, by the commencement of the eighteenth century, into a pseudo-classic, melo-dramatic, stage; and the representations of the flowing wigs that assumed their fullest proportions when the long and curling locks of Louis XIV. had been replaced by the productions of the hair-dresser, were almost the most unartificial part of the attire rendered historic by the sculptor. Vanity called on subversive art to represent great men as heroic. The only result was that they were drawn like the heroes of the stage.

Against this apotheosis of toad-eating and bad taste, Louis François Roubilliac entered a sculptor's protest. He could not suddenly or altogether purify a depraved public taste; but he did all that was possible to exalt and ennoble it.

fessional or amateur societies of the kind, the chief questions of interest before the members were details relating to the canals for the irrigation of Lombardy, conceded to the engineers, Sig. Villorresi & Meraviglia, which occupy a large space. A commission of five Milanese engineers was appointed to examine and consider the project, and the information brought before the college is the result of their deliberations.

The proceedings of the Italian Society of *Scienze Naturali* are briefly given for the year 1869, when the reunion was held at Catania, and numerously attended, including a letter, addressed to the Society, by the Alpine Club, detailing their botanical achievements. Shorter, still, is a report of the proceedings of *Geodetica Nazionale* Association, notwithstanding this also includes a letter from another society, a fifth association of savans, the *Societa Edipsometrica*. All tell of work and progress. The journal itself is most creditably conducted.

SCIENCE IN ARCHITECTURE.*

AN architect's specification is a good illustration of what constitutes science in architecture. In this paper I purpose dealing with some of the points that the carrying out of a specification suggests.

FOUNDATIONS, DRAINS, AND BRICKWORK.

The best foundation, as a general rule, is growing sand, and the least number of settlements are usually observed to buildings upon this foundation. Rock, known to be solid, is equally good, but rock is often treacherous, such, for instance, as may be found about Litherland. Most of the houses in Litherland Park are upon rock, and they have given seriously. Faults in the rock, holes, loose strata, or soft stone underneath may give, and if the rock does give, from any cause, the building receives a shock resulting in the usual defects of serious settlements. Growing sand will not give in this way; it has often a tendency to expand rather than to sink, and if it gives it does so but little, and that evenly, and does not hurt the structure upon it.

For the same reasons that make rock doubtful as a foundation, clay is more so: there may be, though hidden, what is technically termed ravines or other holes in the clay; these cause the structure to slip. If a solid bed can be assured, the architect may determine upon building without fear, but this is often impracticable. A thin bed of clay with rock underneath is a very treacherous foundation; the clay is almost sure to move, and should therefore be excavated. Cracks in buildings do not always arise from settlements in the foundations or defective work. All buildings have a tendency to settle, and contract as the materials with which they have been built become dry. Brickwork, for instance, must contract and settle to some extent, and stone put into a building fresh from the quarry is more or less wet, and will shrink in some degree while drying. This accounts for the open joints sometimes visible in new buildings; these cannot be altogether avoided; better that this appearance, which can easily be set right, should exist, than the stone be made so tight that it will snap when contraction begins, and the materials dry. We require cills and steps to be bedded hollow for this reason, to provide for the results of contraction.

DRAINAGE.

Drains, where there is not much fall, are best of brick or of unglazed tiles; the idea that glazing improves drain tiles for all purposes is not correct. It was at first thought that the invention would cause the soil to pass easily through, but, instead of that, experience proves that in flat drainage the soil clings to the glazing far more tenaciously than to the unglazed material. It may be accounted for in this way; the glazing keeps the sides of the drain pipes very dry; they are so impervious that water cannot be communicated from the outside; and the soil will cling to the dry article while it will fall from the wet one, or be easily removed by a slight flushing of the pipe. Unglazed pipes are generally wet when in use, because moisture from the outside earth soaks into them, and the moist surface thus presented to the soil keeps the whole in a favourable state for the removal of the soil when a slight flushing takes place. Brick drains are for the same reason much better than glazed stoneware. I have known 6-in.

drain tiles taken up in the neighbourhood of Liverpool, after having been laid but a year or two, and soil 2 in. thick has been clinging to the sides all round, fast, like mortar, leaving but 2 in. for water and other drainage to flow through; such pipes must evidently soon become choked up. This instance occurred where the ground was flat. Brick or unglazed pipes should be used in such cases. Where there is a good fall glazed pipes may be used, as they are more durable. Within the last few years we have known drains laid about Liverpool of 18-in. glazed pipes where there has not been much fall, and where the drains have often run 18 ft. below the ground level; these, it seems to me, are liable soon to choke from the cause named, and then how are they to be cleaned? Flushing will not take the soil off; it clings so fast to the smooth surface that forcible pressure is necessary, and at such a depth it is not safe for men to go down 18-in. pipes. A good brick drain would cost very little more, and would answer better in every way. In such rocky ground as is to be found about Liverpool a cheaper drain than the glazed pipe might often be obtained by cutting an opening in the rock and covering it with flags, and this would answer every purpose.

If drains are laid in running sand, it is better to set them in cement, then cover the joints with clay, as the sand will otherwise find its way into the drains before the cement is dry and choke the pipes; by covering this cement with clay, the latter, which will not at once let the water soak through, becomes a covering to the cement long enough to let it harden, and though the clay will in time be washed away, it will then have done its work.

In ordinary foundations, as generally understood, clay only is the best bedding for drains; there is no fear of the earth or growing sand getting into the pipes, and the clay allows them to yield to a pressure which might break them if set in cement. Of course, the danger of the pipes breaking, in case of an uneven pressure, when they are set with cement in running sand, still remains; but this is the less evil of the two, and must be borne.

MORTAR.

Mortar is better old than quite new; it is a mistake to specify,—"only new mortar is to be used." It is with mortar as with clay for bricks, if clay is used for bricks after having been tempered but a short time, the result is apparent in inferior bricks; they are brittle, and will not stand fire or weather; but if the clay is allowed to lie a long time it consolidates, works together, bonds, and makes tougher and more durable bricks: so if mortar is used while fresh, it is brittle, technically—short, the particles do not bind; but if allowed to stand for some days, the particles work well into one another, the whole becomes tough and clammy,—a great essential. When we try mortar, as architects, we like to feel it tough and clammy; but we cannot obtain this so well if we require it fresh. The difference between modern and ancient usage may account for our modern mortar not being so good as that of the ancients. Our mortar is now, as a rule, used fresh; in olden times it was frequently buried for twelve months before using. Mortar, though not used fresh, should be protected, according to the weather, and be kept moist; it is injured if allowed to become so dry as to require remixing.

It seems to me a belief is current that mill-made mortar is necessarily better than hand-made. I cannot agree with this notion. We were told last meeting that in the building of concrete houses fine sand separates from the cement, does not bind, and that coarser material is better. We all know this to be the case with cement work, hence we specify gravel; for the same reason, sand in mortar will not bind so well with the lime if ground fine in a mill, but is better for being coarse, while the bonding of the separate ingredients accomplished by the mill is, in hand-made mortar, better secured by capillary attraction when allowed to lie unused for a few days. The ancients, or Mediæval builders, it is evident, did not use any mortar to correspond with our mill-made; if old buildings are examined, it will be found large particles of the ingredients still exist in the mortar, showing material very much like gravel has been mixed with the lime. Another reason why mill-made mortar does not in practice prove so good as hand-made is, the men at the pug-mill will, however they are cautioned, throw in soft broken bricks and other refuse to grind up with the sand; and this refuse will not adhere so well to

the lime as sharp sand or gravel. If men merely screen the sand for mortar, they cannot adopt this practice. Mortar for pointing is now sometimes buried from force of circumstances. If too much is made the builder buries it, and never finds it worse for such treatment. Mortar for pointing should not have much burnt marble in it, as the burning of the marble destroys its nature. Ground refuse from glass-works is now very frequently used for pointing, and with great success.

SMOKEY CHIMNEYS.

It would be out of place here to attempt to deal with this evil in detail. I will simply allude to one principle only, apart from defective building, and the numerous inventions as remedies. It will invariably be found that chimneys have a tendency to smoke when at the side of a house where no building the same height adjoins. The space at the side of the house being sheltered forms a vacuum, and as wind passes over the building, it has a tendency to fall down and fill up this vacuum, and in so doing it rushes down the chimneys at that end of the house. This explains why such chimneys smoke during particular winds only. They do not smoke when the wind blows directly against them, but when it comes from an opposite quarter passing over the roof of the house. This, of course, suggests the necessity of making special preparations for all chimneys in such positions. A good cure to the flue will often prove sufficient. Chimneys smoke worse in Gothic houses, because the vacuums created are more numerous. In flat-roofed houses, if the chimneys are in the middle of the roof there is not much fear of their smoking.

MASONRY.

The frequent failures in the use of Bath stone in and near Liverpool,—the utter want, as it has appeared to me, of its adaptability to our climate,—have often attracted my attention, and I have tried to find out the reason why a stone of such pleasing appearance, and so useful in working, could not be more generally used by us. When in Bath, a short time ago, I had an opportunity of paying attention to the subject. I soon came to the conclusion that the cause of failures in the use of this stone in Liverpool exists mainly in applying to the wrong quarries for stone for outside purposes.

If we require a good stone for outside purposes, we should specify "Box Ground," or the "Combe Down" stone. These are the most durable; they work freely, and the former is considered equal to Portland stone in durability, while much cheaper. The Combe Down stone was used in the building of Bath Abbey; nearly 300 years have elapsed since this abbey was restored, and yet many of the mouldings are still perfect. The Combe Down stone is not equal, on the whole, to the Box Ground; for outside purposes, it requires to be selected, but when selected, gives great satisfaction; the blocks are not so large as those of the Box Ground; its texture is hard and coarse.

The Box Ground is coarser and harder than any of the Bath stones, and while most sorts will go to pieces in frosty weather, this will stand the hardest frost. It may be safely used for any external work, plinths, copings, or weatherings. Laying Bath stone on its proper bed has a great deal to do with its lasting well. This may always be determined by the thin black veins which run up the bed; they never run in the bed; and in some of the stone there are hard black veins termed lists or ribs; these are always run in the bed and never across. The Box Ground stone can be obtained in lengths of 12 ft. 6 in., or 14 ft. 6 in.; the blocks vary in size from 4 ft. to 120 ft. cube.

The Corsham Down stone is the best to specify for inside purposes. It has a beautiful warm colour, and looks more effective than any other; while the other stones alluded to are very coarse, this is, on the contrary, of very fine texture, but durable and strong. It is free and easy to work, as, indeed, are all the Bath stones. It absorbs a great deal of water, and so in hard frost requires to be covered up, as it would burst if left exposed. It is the most regular in quality of all, and considered the best of our English stones for internal work. Patches of dark blue or slate-colour are sometimes found. These portions work in with the rest for ornamental effects in chimney-pieces, &c. The stone is sounder where these patches exist.

Another sort is the Farleigh Down stone, the principal feature of which is, that the quarry contains two beds, the red bed and the white

* By Mr. Wm. Parslow. Read at meeting of the Liverpool Architectural Society. Some of the opinions expressed are open to discussion.

bed. This stone does not stand the weather well. It is more easily worked than any of the others; but the appearance is not so pleasing as the Corsham; it dries out often in red patches, giving an appearance termed fox. It is in great demand in the neighbourhood where quarried, because of its price and easy working, but has no advantages to offer for Liverpool.

MARBLE.

With reference to this material for lavatories, wall-linings, chimney-pieces, &c., it is surprising at first to observe the difference in prices of articles from different works. Chimney-pieces, &c., sent over here direct from Belgium are, as a rule, much cheaper than those that can be bought from marble works of any standing in England; but the difference, as it appears to me, arises mainly from the less amount of labour bestowed upon the polishing. I have frequently known cases where chimney-pieces brought direct from Belgium have had to be polished again within two years, and the expense of this second polishing necessarily makes the article in the end very costly. Although I do not know the exact method of polishing adopted by the Belgians, it seems evident that they depend more upon a quick dry polish and chemical processes than the slow-laboured style of our English marble masons. The English plan is to grind and form the surface of the marble by means of wet friction, which is much slower than dry, and does not injure the marble, while dry rubbing does, by making it softer. This process is repeated three or four different stones in order, and then the surface is glossed with lead and felt. This genuine English plan is superseded in some marble works, and doubtless in Belgium, by dry rubbing, a quick process, but one destroying the hard surface of the stone. The glossing operation is then performed, not by rubbing with lead and felt, but by pouring on the marble some such chemical as spirit of salt. This is so strong, that when passed upon the marble it produces a hissing sound, and must necessarily soften the surface. It then receives a slight rubbing, which soon occasions a polish; but this may be detected from the genuine English polish by a peculiar deadness. In course of a few years this polish disappears, and requires reviving. The true polish lasts for a generation, with ordinary care.

This chemical wash, but without the dry rubbing, is the English mode for polishing carved work; the ordinary rubbing would destroy the spirit of carved marble-work: it is therefore simply toiled, or, at other times, sanded, and then washed with spirit of salt: the consequence is, all English carved marble-work has rather a dead look, but this is not objectionable. It will in the course of a year or two, but may be restored by a washing of American potash or chloride of lime. The Italian marbles, as they are called, most generally used in England, are the black and gold, the dove, Bardilla (which is like black and gold, but inferior); also the statuary, the vein, and the Sicilian. Lately the Irish marbles have been freely used in England. There are four sorts, red, green, black, and the fossil, a dark colour. Of the Belgian marbles, the St. Anne's must be classed among the best. The Belgian black is a very inferior article, and not equal to our common Derby black. All marbles are more or less rotten, that is, they are composed of so many parts that they have a tendency to come to pieces. The more beautifully they are marked, the more rotten they are. The various marks show the junctures or formations in the marble that produce this quality. For this reason, marble, if intended to be worked as a pillar, and to bear a weight, must be carefully erected; if out of the perpendicular, and supporting much weight, it is liable to snap at some of these formations. The black and gold marble, though one of the most beautiful, is one of the most rotten, and when polished is exceedingly susceptible to scratches and snips. The Italian dove and the Belgian St. Anne's are the most durable dark marbles. The Italian statuary, though a very beautiful marble, is soft. The vein and Sicilian are more durable, and will consequently resist dust better. The Irish marbles are equal to the Italian in quality; they are rather less expensive, on account of the cheapness of Irish labour.

Inferior marbles may be told by blotches and other faults, and by being soft they will not bear a fine angle. In less than a month after working inferior light-coloured marble-work will look black at the corners, which blackness cannot be

wiped off. In good hard marble-work any such soiling will wipe off. Dark-coloured marbles are very rarely soft.

TIMBER.

With reference to the timbers used in this neighbourhood, spruce from St. John's or Quebec is good bearing timber, but when it does give it breaks clean; it snaps off very short. The fibre of the wood is short. Spruce curves and twists very much, and often the cracks we see in plaster ceilings are to be attributed to the twisting of the joists and spars, and are not the plasterer's fault. On the Eastern coast, Baltic timber has hitherto been used for the purposes for which we use spruce, and now, on account of increased facilities for importing Baltic timber, it is becoming more generally used in Liverpool. Baltic red pine is one of our best bearing timbers, and stands the weather well when used for outside purposes; its fibre is long, and it will bend rather than break quickly. Pitch pine, besides being most useful for finishings, is good for outside purposes, and stands the weather well, but occasionally the hot sun will bring out the resin, which runs down the wood, taking the paint with it: this makes it less desirable, on the whole, for outside purposes than red pine. Baltic white is a very nice wood, and looks well in floors; it is not so good for bearing purposes as the red; the knots in the white are often what are called pin knots small and black; they dry and drop out. The knots in the red are larger, but sound. Baltic timber is often disfigured by a redundancy of knots: these do not militate against the wood, and often would not appear if the logs were cut up with judgment. A skilful workman can so cut through the knots that they do not show, simply by studying the way they run, and cutting through the leather of them.

Quebec is a superior yellow pine to that from St. John's; in the rough it is clearer, and when cut up is finer looking. If a piece of St. John's yellow pine be rubbed it will occasion a very fleecy surface; that from Quebec has less of this quality, and is often free from it altogether. Good St. John's and Quebec, however, cannot be distinguished by any but experienced judges.

The best Spanish mahogany to specify is that obtained from the city of St. Domingo; this is the most beautifully marked. That from the country of St. Domingo is an inferior sort. The bastard mahogany and the bay-wood are also inferior sorts. The bay-wood, of which we make such use, comes from the Mexican coast.

In French-polishing mahogany, polishers, if not well watched, will often lay a ground of red lead, whiting and plaster of Paris, then polish on top of this: this makes the work easy, which is otherwise very laborious. It, however, hides a great deal of the ornamental figure, and the polish quickly disappears. If ever this process is detected, the best plan is to have the whole taken off with American potash, and start afresh. Fine polishing is accomplished only by means of laborious rubbing with the different French gums in their proper order, and gradually the whole figuring on the wood becomes developed.

A peculiarity of the poplar wood, that makes it suitable for special purposes, is, that it will not burn; it only smoulders.

In practical joiners' work a great difficulty with men is to get them to bore their work before nailing. I refer principally to framing, and fixing mouldings. It is a little more trouble to bore first, and if men are not constantly reminded, they will neglect this in good joiners' work as well as in common. If there is no bore made first, there is a great tendency for the nail to slip off the stile into the panel, and the result is, if the panel shrinks at all, it takes the moulding with it and leaves a slovenly finish.

Extra attention is becoming necessary to these particulars, for, according to appearances, it is probable the principal work for joiners will eventually be fixing, since all work may in course of time be made by machinery.

At present English machine-work is not of that finish that will admit of its being used universally, but most of the foreign work has a very fine finish, and there is no doubt English machinists will before long be able to equal if not surpass this, and then I cannot see what objection there will be to machine-work generally. At the present time the cost of machine-work is not reduced to what it might be: so much of the tree has to be cut up before a proper grain for machine-work is obtained that considerable waste results. When this difficulty is better

understood, and the portions of the timber that cannot be adapted to machine-work more successfully utilised, then the cost will necessarily be reduced. The portions of the tree where the branches unite causing a cross grain interfere now with the successful working of the machines, and occasion the waste.

Of those portions of joiners' work that cannot at any time be made cheaper by machinery, the rebated sashes are a good illustration. Although these are frequently made by the machine, the result is not satisfactory; being run in long lengths, they do not cut well for mortising, and there must be a considerable amount of piecing before they are completed: this makes them almost as costly as home-made work, and not so satisfactory.

IRONWORK.

Architects often specify the cold-blast iron, and do not get it. The same with the Low Moor iron.

The Low Moor iron from this country is the best wrought iron we can get; it is an extremely expensive material, being very hard to work; the expense per ton wrought is double the expense of iron wrought from Sheffield, Warrington, the Clyde, or any of the ordinary black countries. I do not think it wise to specify Low Moor in the ordinary way: instead of 24s. per ton we may be charged 50s., and, after all, not get what we pay for. For most purposes ordinary iron will answer equally with Low Moor, if a little thicker material is used; but where small size is required, and great wearing power, of coarse Low Moor is best. In bolts, for instance, they do not wear much; if 1 in. of Low Moor iron will be strong enough, then make them of ordinary iron 1½ in. thick. By specifying these you save the extra charge, besides avoiding the risk of having 1-in. bolts of ordinary iron put into the work, which might prove too weak. Low Moor iron is more malleable and tougher than the other; it has long fibres; the difficulty in severing it is the best means of testing it; its parts have to be literally dragged asunder. Cold-blast iron from the various depots in Wales is the best class of cast iron; and as it is difficult to drag the Low Moor into pieces, so is it difficult to break this. I have myself broken ordinary pig with one blow from the hammer; but cold-blast iron will sometimes bear twenty blows from a smith without breaking. The difference between cold blast and ordinary cast iron is more easily seen than that between Low Moor and ordinary wrought iron. When cold blast is placed beside common iron it has a bright look, while the common has a dull, dead appearance. But as a rule it takes experienced men to detect these metals from the common iron: it is, therefore, well when they are required for special purposes to specify an amount for them, and take special means to get the work done.

IRONMONGERY.

The numerous qualities of ironmongery fittings necessitate the most careful attention on the part of the architect. As a rule, good class ironmongery may be told by its finish; if the finish of an article is workmanlike and satisfactory, it may generally be concluded that the hidden portion is good; but if there is a rough and uneven finish, a tendency to snip and get out of order, then it is well for the architect to pay attention to the hidden work, as the article is not likely to be first-class. Common sash-fasteners, having an effective appearance, often surprise the houseowner by breaking off when more than ordinary pressure is applied; an examination will usually show these to be of hollow metal instead of solid. If we specify solid articles, and see that we get them, we may be generally assured that the rest of the work is good. In order to secure good locks, bell-pulls, or door furniture, the best plan is to allow a price and arrange specially for the purchase of these articles. Handles coming off is a constant source of annoyance to houseowners, and they take for granted when this occurs the furniture must be jerried, whereas the best furniture is liable to this difficulty, and unless Pitt's or Walker's patents are used, I do not see how with present appliances, the evil can be altogether avoided.

Bell-hanging is often a source of trouble to the architect. No. 16 copper wire is a good strength, but difference of opinion exists on this point. Fault is sometimes found with the putting in two or three wires in one tube; this need be no drawback; the difficulty is when the tubes in which the wires are put are too small; a ½ in.

tube, or even a $\frac{1}{2}$ in. tube, will admit of three or four wires working satisfactorily. The cause of bells ceasing to ring properly a few months after the building of a house is often very excusable, though the circumstance in some minds stamps the work as bad. The bells having been put in while the materials of the house are in a green state, they are liable to rust, and in some localities more than in others. The iron portion of the crank rusts and loosens the wires. These, therefore, require a little attention when this occurs, which good bell-hangers are willing to give; indeed, it is well to require bell-hangers always to keep their work in order for six months.

GASFITTING.

A fruitful source of jumping in gas, when there are not the usual irregularities of defective workmanship, is the following:— $\frac{1}{2}$ in. piping is fixed instead of $\frac{3}{4}$ in. or wider: the consequence is, when the gas passes through the pipe of the kitchen or other warm apartments it becomes rarified; it then ascends to the colder apartments, and, through having been heated, is condensed into water; it then by its own weight falls down the pipe. If the pipe were wide enough, say $\frac{3}{4}$ in. or $\frac{1}{2}$ in., then the volume of water thus formed would, because of its own weight, have sufficient power to pass through the pipe to the proper syphon or meter, where it could be let off at will; but the pipe being only $\frac{1}{2}$ in., the volume of water thus formed has not sufficient weight to make its own way down the pipe, and the force of the gas coming up is sufficiently strong to show a balance of power, the gas pressing upwards, and the water downwards proving in turn the stronger.

On account of this tendency in gas to become rarified in warm apartments, and the more easily condensed into water afterwards, a meter ought never to be placed in a kitchen or other such like place; the colder the apartment the better; the pipe ought never to be less than $\frac{3}{4}$ in. for the reason named, and even this size without a good fall is liable to occasion jumping. All gas is liable to form into water, and as it passes through cold regions it invariably does so to some extent. For this reason large syphons are provided in the streets, and a great deal of water may be seen taken from them at times, being merely condensed gas. All gas is liable to freeze; on being made it passes through water; hence it is damp to begin with. Frozen gas need offer no serious difficulty, if the pipes are large enough, and have a good fall to a syphon. By the application of warmth it will melt into water, and then pass away.

LONDON CLUBS.

THE Cocked Hat Club, an institution founded as an adjunct to the Society of Antiquaries, and whose children only, as with the Society of Novitiates, are qualified to become members, had their annual outing on Saturday last. The members present included Sir William Tite, M.P.; Mr. F. Ovary, F.S.A.; Dr. Doran, F.S.A.; Mr. Henry Hill, F.S.A.; Mr. William Smith, F.S.A.; Mr. Durrant Cooper, F.S.A.; Mr. Crowdy, F.S.A.; Mr. A. White, F.S.A.; Dr. Diamond, F.S.A.; Mr. Talbot Bury, F.S.A.; Mr. W. J. Thoms, F.S.A.; and some others. They descended at Three Bridges Station, on the Brighton line, that they might see the Saxon Church at Worth, and were unanimous in the expression of their regret, to use a mild term, that old work had been so ruthlessly removed. The chancel has been rebuilt, and the curious old wooden steeple, formed with four large tree-trunks, cleared away. Some particularly interesting windows of rude character have been opened in the north and south wall of the nave, forming a clerestory; and the north and south doorways are seen to have been very lofty and narrow with semicircular heads. The windows are each of two lights, round-arched, separated by a stout rough shaft. They then visited the pretty village of West Hoathly (it should be *ley*, but the people of the locality stick to the "ly"), and the ancient parish church, passing on their way Selsfield Common, one of the lofliest spots in the neighbourhood, commanding charming views, and where anciently the beacon flamed in reply to others at Ditchling and Chantebury. A fine old stone house in the village, belonging to the end of the fifteenth century, is connected by popular tradition, if in no other way, with Anne of Cleves. The church, now in the hands of the restorer, and roofless, shows, in the north wall of the chancel outside, remnants of Norman work, and elsewhere of Early English. Two east-iron

gravestones (to use an Irishism) in front of the west door of the tower served to remind the club of the ancient iron-works of the county, which flourished till the middle of the last century, and led to large clearances of timber. It was remembered that the ponderous iron railing around St. Paul's was cast in Sussex (at Lamberhurst), and cost over 11,000*l.*; and all had seen some of the many chimney-backs and dogs still remaining in the neighbourhood. It was time now, however, for the real object of the day,—a visit to Rockhurst, the residence of Mr. Charles Hill, F.S.A., and its famous rocks and woods. Here they were joined by Mr. George Smith, of Pad-dockhurst, Dr. Jenson, and some others, and, being first photographed as a group in conjunction with the house, made their way to the remarkable range of sandstone rocks, of which the poised mass called "Great upon Little" in Andreds Wood is the most widely known. Of this Mr. Charles Hill gave a short account. Weighing some 300 and more tons, it rests on what looks in some positions a point, but is in truth a narrow ridge some few feet in length. The faces of the rock are covered with initials and dates, ranging, so far as discoverable, from about the year 1600: one century seems to have been scraped out by the next. Old men mention as amongst those visible not long ago, the initials of Pitt and Fox, the latter of whom, it will be remembered, lived at St. Ann's-hill, near Chertsey, in the adjoining county. The stone has been viewed as the emblem of the British deity Andrast, but on what ground we do not know. Suffice it for us to regard it as a remarkable product of nature, and to hope that it may be long before those influences which have brought about its present form and position may so much farther operate as to cause it to topple over into the valley at its foot, where already lie other huge masses detached from the range above. Sir William Tite, who is strong in geology, had—

"—Ample room and verge enough"

to discourse of early seas, earthquakes, upheaved strata, and channels scooped by rushing water, and used his vantage well. Afterwards the whole party were hospitably and most elegantly entertained at Rockhurst, and quite late in the evening came back rejoicing.

THE BUILDINGS FOR ANNUAL INTERNATIONAL EXHIBITIONS.

THE buildings in which the Exhibition of 1871 will be held have been designed by Lieut.-col. Scott, R.E., and are to be of a permanent character. Those persons familiar with the Horticultural Gardens know the long ornamental arcades parallel with the Albert and Exhibition roads. At the back of these arcades is a piece of waste ground, some 200 ft. wide, extending to the road. On these strips of land the two main exhibition buildings are to be built. At their northern ends, these main buildings will be placed in communication with the conservatory of the Horticultural Gardens, and through it with the new Albert Hall of Arts (the grand promenade of which will be utilized for exhibition purposes, the educational collection being placed therein) by covered approaches, which are being made upon the top of the arcades connecting them with the conservatory. The southern ends of the main buildings will communicate with the permanent portion of the Exhibition building of 1862, which forms the southern boundary of the Horticultural Gardens. This building is now used for the exhibition of objects in connexion with the South Kensington Museum. By this means, the building will completely surround the gardens, to which the public will be admitted at certain times, and under special conditions, which have yet to be decided upon. It is also proposed to connect this series of buildings with the South Kensington Museum, by means of a covered way under the Exhibition road, and also in the same manner with the Metropolitan railway.

The length of the main buildings, on the ground floor at each side, will be 1,100 ft., on the upper floor at each side, 600 ft. Their width throughout will be 30 ft., and the height of the two floors, 60 ft. The level of such a length of building will be broken each side by four raised pavilions or dwarf towers; four of these, on either side of the north and south extremities, will be 35 ft. wide, the two centre ones being 65 ft.

The ground-floors of the buildings consist of

a series of chambers, broken in equal lengths by the varying dimensions of the central portions, the light for which is obtained from large windows in the east and west sides of the respective buildings, but there can, of course, be no windows in the sides which adjoin and continue the present arcade walls.

The lower story will be set aside for the exhibition of woollen fabrics, manufactures, tools, and machinery. The upper floor will be a repetition, on a smaller scale, of the picture-gallery of the Exhibition of 1862; the galleries will have no side windows, but will be lighted with a single centre ridge glass roof. The floor will be fireproof, made on the Fox & Barrett principle, of rolled iron girders filled in between with 10 in. of concrete, and tiled on the upper surface. Provision is made in the built girders for heating the buildings by means of hot-water pipes, and also for ventilation. These galleries, which are to be 30 ft. wide by 25 ft. high, will be used exclusively for the exhibition of works of art and art-manufactures, such as painting, bronzes, sculpture, porcelain, decorative furniture, jewelry; in fact, every kind of artistic work, whether applied to objects of ornament or domestic use.

On the side of the Albert and Exhibition roads, the buildings will not be excessively decorated. In the front, overlooking the Horticultural Gardens, a greater endeavour in that respect will be made. The arcades of the Horticultural Gardens, which are only 12 ft. wide, are being finished, and their stone capitals and cornices are being carved from designs by the South Kensington art-students. The arcades, which are at present only temporarily covered, are being roofed over in a permanent manner, and will form a promenade on a level with the floor of the picture and art galleries of the upper saloons, with which they will communicate through wide doorway entrances. The side next the gardens will have a terra-cotta balustrade, from which rise light ornamental carved wood columns, supporting a trellis-work of iron running along the whole length and breadth of the walk. This trellis-work will be interwoven with vines and creepers. The balustrade will contain vases filled with flowers, and a view will be obtained over the whole extent of the gardens beneath.

The buildings are in the Decorated Italian style, with mouldings, cornices, and carvings in buff-coloured terra-cotta; the brickwork being of the red Faversham bricks, so as to match the garden architecture, and harmonise with the new museum buildings which are rising in front of them. The buildings altogether will accommodate, it is stated, 50,000 people.

POSITION OF CATHEDRAL ORGANS.

THE proper settlement of this question is of so much importance that it is desirable all sides should be heard. We give place, therefore, to the following:—

Sir,—It appears from a published report on the restoration of the interior of Salisbury Cathedral, that Mr. G. G. Scott is advocating the dispersion of cathedral organs into various parts of the building, as one way of getting out of the difficulty of providing for musical, without interfering with architectural, effect. Mr. Scott admits, what in a recent article on the subject of church organs you strongly laid down, that the position on the choir screen is the best possible for the organ acoustically, as affording it free space to speak all round, without having its sounds in any direction driven disproportionately upon the ear by reflection from an adjoining wall. In opposition to the upholders of what he calls the "vista" theory, Mr. Scott is favourable to the choir-screen position for an organ of moderate size (in short, I suppose, for the old-fashioned English cathedral organ), but depreciates the great size to which the instrument has of late attained, "the inordinate growth of modern organs,"—a phrase which could only have been correct with regard to English organs, as there have been in German churches for nearly two centuries organs larger than the largest erected in our cathedrals, except the York organ before it was cut down. In view, however, of this depreciated "growth," he would leave only the small portions of the instrument (the choir organ?) on the screen, and "draft off all the cumbersome parts to the back of the stalls in the first arches (right and left) in the choir aisles, where they would be very much concealed; or possibly, if found practicable, into the triforium." He would leave the organist in his

accustomed seat in the "loft," but would introduce the electric movement, "which would obviate all inconvenience arising from the division of the organ into three sections."

Now, with regard to the musical effect of an organ, the scheme is not promising. It is of the greatest importance that the pipes composing an organ should be so massed together (without being crowded) that their sound should reach the ear simultaneously, and blend together as one instrument. They cannot do this if the pipes are distributed about in the manner proposed; and, moreover, the parts of the organ which it is proposed to place in the confined situations mentioned are just those which ought most of all to have plenty of space round them; if, as I understand, the major part of the "great organ" is to go off the choir screen, as well as the pedal pipes. With regard to those latter, the pedal diapason pipes may be placed on the floor with advantage in one respect, as these are not noisy, but only sonorous, and gain in resonance by being near the floor, though their effect sounding on each side of the listener alternately would not be good. But nearly every large organ now includes (and every one ought to include) in its pedal organ one or more powerful stops of the "reed" class, which are among the largest pipes in the instrument, and which, from their loud and harsh *timbre*, especially need to be placed away from very close contiguity to listeners, and to be as unconfined as possible with regard to sounding space. So much is this the case, that I have known a distinguished professional organist refuse to sanction the introduction of a pedal *trombone* stop into an organ which he was superintending, and which was to be erected in one of the new usual "organ-chambers," on the ground that "there was no space for it to sound, and it would only be a nuisance." If the people of Salisbury are content to have their instrument so dismembered it is of course more their business than mine; but they should think twice before they assent; and at all events this mode of treatment ought not to be made a precedent in dealing with cathedral organs. I understand that it has been already suggested for another cathedral which is being restored under the same direction. The system proposed would have all the drawbacks, which you have before commented upon, of the confined organ-chamber, together with the additional defect of widely separating portions of the instrument which have to be heard together, and ought to have a homogeneous effect. My attention has been called to the recommendations in the report on Salisbury Cathedral, by a cathedral organist of long experience, who completely and unreservedly deprecated such a scheme; and Mr. Scott may be assured that on this head he will have the musicians against him to a man, or, at all events, to an organist.

[Our correspondent knows something of the matter on which he writes, and we allow him to be heard, but we by no means desire to pronounce at once against the architect's proposition: the success or otherwise would depend entirely on the way in which it was carried out. We know a church where the organ has been divided and placed on each side of the choir (in the first archway north and south at the west end of it), the communication being effected through a tunnel under the pavement of the chancel, and the result, so far as sound is concerned, is satisfactory in the extreme. It has the effect, however, of blocking up the chancel arches and, partially, the aisles, and certainly does not commend itself in that respect.—Ed.]

PROPOSED ADDITIONS AT THE PARLIAMENT HOUSES.

SINCE we called the attention of our readers to the proposed alterations and additions for new refreshment-rooms, the Select Committee of the House of Lords has reported upon them. We subjoin a copy of their report, which notices several of the points to which we referred. The remarks of their lordships on the manner in which the work should be carried out, and on the risk of disfiguring the building, for want of a proper design, will commend themselves to all; and we cannot too strongly urge their importance on the Government and the public. The report is limited to that part of the proposal which affects the accommodation of the House of Lords:—

"That the committee have again met, and have been again attended by the Clerk of the Parliaments. The committee have considered the report of the committee of the House of Commons, of the 26th May last,

referred to them by order of the House, in which that Committee states, that they have considered the last report of this committee, and inform the House that this committee had advised their lordships to give up the Painted Chamber to the exclusive use of the Commons, in the event of the plans recommended by this Committee being agreed to.

It will be recollected that the House of Lords had, through this committee, expressed their readiness to give up their best committee-room, to meet the convenience of the Commons. In the report of the Commons committee it is stated 'that they abstain from entering into any inquiry respecting the arrangements of the House of Lords, as they consider such arrangements should be made by their lordships directly with Her Majesty's Government.' The committee therefore consider it necessary to recommend that steps should be taken by the House to secure an assurance from Her Majesty's Government that the conditions on which they have advised that the Painted Chamber should be given up to the Commons shall be fulfilled, as without such assurance they cannot advise that the concession in relation to that apartment, which has always belonged exclusively to the House of Lords, shall be made.

The committee hope that a competent architect may be employed to prepare the plans for the new room proposed to be given in exchange for the Painted Chamber, and for the approach to it from the landing place on the staircase in the lower hall. As some alteration must be made in the window there, care should be taken that it is done in a manner consistent with architectural effect. The committee are confident that the House would be unwilling that, for want of a proper design, the building should be in any way disfigured, in carrying out their proposal.

Having examined the plans appended to the report of the Commons committee, they find that the kitchen therein designed will be only 14 ft. 9 in. wide, and, as they are informed, only 12 ft. 9 in. high. In the plans prepared by Mr. Barry, the kitchen was to have been placed under the new room to be erected for the House of Lords. By this, or some similar plan, very superior accommodation in space and height would be obtained, together with a more convenient situation for the joint service of the two Houses from the same establishment, should such an arrangement at any time prove desirable.

The committee have been informed that the difference in the estimate for this portion of the work between Mr. Barry's plan and that of the First Commissioner is not large; and the committee desire to repeat the remark made by them in their former report, that while they are very sensible of the importance of observing reasonable economy in all public expenditure, they feel that in making any permanent provision for the accommodation of the House of Parliament it is desirable that all should be done in the best manner, and that some additional outlay, by which greater convenience will be obtained, will be money well laid out.

The plans laid before this committee by Mr. Barry last year, so far as they relate to the kitchen department and the new room, are appended to this report."

THE DONCASTER NEW CORN EXCHANGE AND MARKET IMPROVEMENTS.

A SHORT time ago the Corporation of Doncaster caused to be completed a new cattle-market and public slaughter-houses, which will compare favourably with those in any town in Yorkshire. The cattle-market is laid out with taste, while the slaughter-houses and the conveniences connected therewith leave little to be desired. These provisions are about to be followed by the erection of a new corn exchange and an additional wing to the present market hall, to be used as vegetable-market. The work for this work have just been opened. The work is divided into two parts. The first contract, A, includes the erection of a corn exchange, 91 ft. by 87 ft., and a vegetable-market, 64 ft. by 64 ft., having frontages of 300 ft. by 40 ft. in height. The buildings, so far as the stone-work is concerned, are to be of ashlar. The tenders for the mason's and other works were found to be of a very formidable character, no fewer than twenty-seven of the leading firms competing for the work. The amounts varied very much, the difference between the highest and lowest tender being considerably over 5,000l. The highest was sent by Messrs. Simpson & Malone, of Hull, the amount being 16,927l., and the lowest by Messrs. Weatherley & Rymer, of York, viz., 11,005l. Not fewer than five Bradford firms were amongst the competitors. The market committee, who had the management of the tenders, accepted that sent in by Mr. J. Athron, of Doncaster, the amount being 11,172l. The tenders relating to Contract B were also opened at the same time. The contract consisted of the roof of the Corn Exchange, including eight semicircular latticeworks, 60 ft. in diameter, and the T iron ordinary king-trusses for the vegetable-market roof, cast-iron columns, girders, and other works therewith. As in the first contract, the tenders were very numerous, not fewer than twenty-five of the leading Yorkshire and London firms competing for the order. Amongst the competitors were Messrs. Westwood & Bailey, London Engineering Company, Isle of Dogs, whose tender amounted to 3,200l. 3s., being the highest sent in. Messrs. Kirk & Parry, Westminster, sent in the tender No. 7 in amount on the list. The committee, as in the other case, accepted the lowest tender but one, which, in this

instance, was sent in by Messrs. R. & J. Rankin, of Liverpool, the amount being 2,096l. The total amount of the two highest tenders was 20,187l. 3s., whilst the two lowest amounted to 12,955l. The total amount of the two tenders accepted was 13,268l.

SCHOOLS OF ART.

A School for Winchester.—A meeting of a highly influential character has been held, Mr. J. Bonham Carter in the chair, for the purpose of considering the propriety of establishing a School of Art for Winchester. Mr. Buckmaster, of the Science and Art Department, explained what the department did to foster a love for art. It did not seek to make painters or sculptors, but to raise the standard of taste. The Mayor, Mr. E. Underwood, moved a resolution, which insisted on the desirability of establishing a School of Art, and read a list of names, commencing with Lord Carnarvon, Lord Eversley, Lord Northbrook, the county and city members, and other highly influential men, who had promised their patronage.—The Archdeacon of Winchester seconded the resolution, which was agreed to unanimously. The appointment of a committee was also voted, and subscriptions were invited, to provide a proper building (which Mr. Buckmaster said the department would assist to the extent of 2s. 6d. per cubic yard).

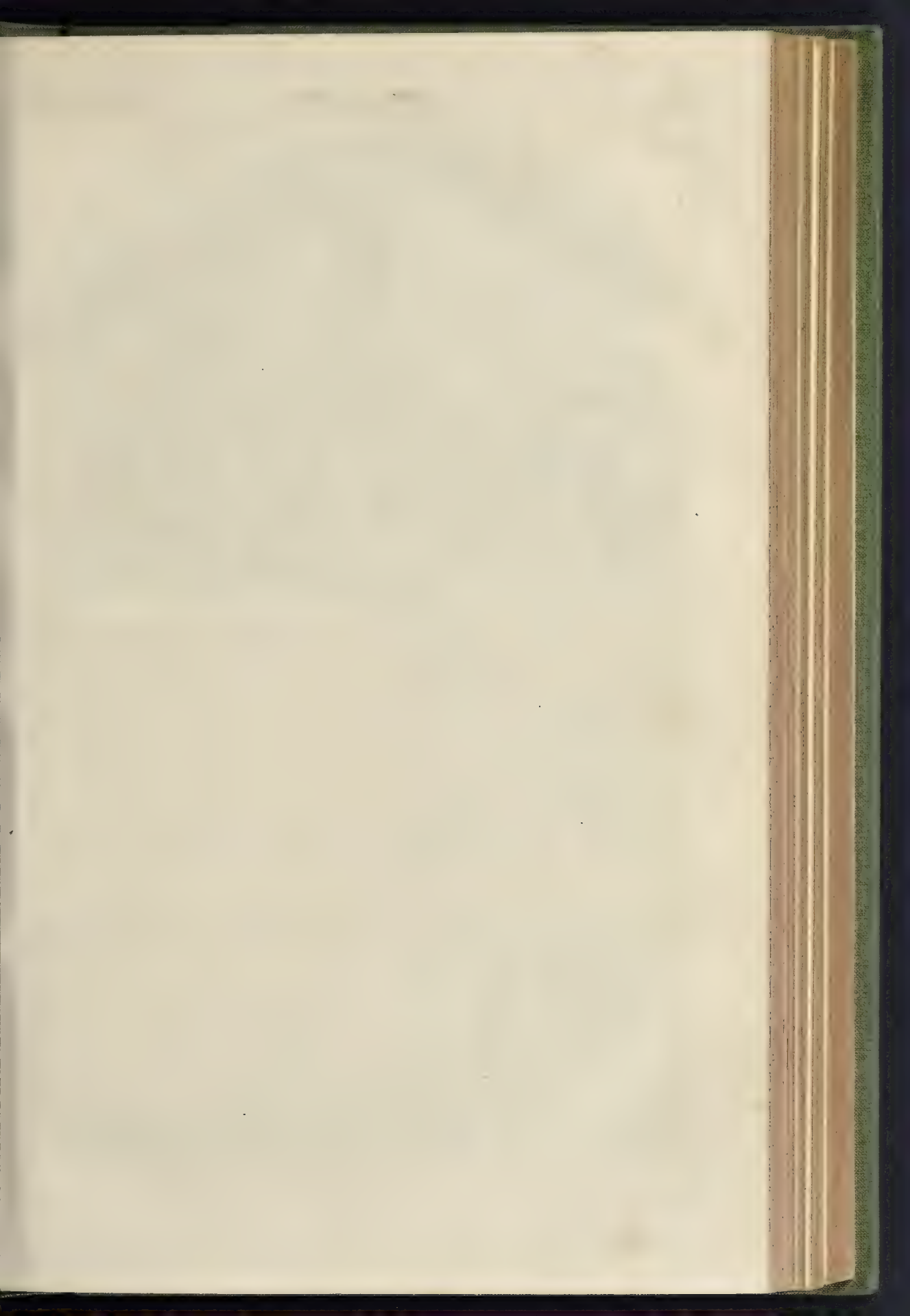
The Cambridge School.—On Thursday, the 23rd ult., the students went to Angelica Abbey, for a sketching excursion. The party (of nearly forty) left Cambridge at a little after 10 a.m., and on arrival soon settled down in different parts of the grounds to sketch the interesting old house. Several very fair sketches, in colour as well as pencil, were made.

A PROFESSIONAL GATHERING.

ON Wednesday last Sir Digby Wyatt entertained at dinner a number of the members of the Royal Institute of British Architects invited to meet the new President, Mr. T. H. Wyatt, including Professor Donaldson, Professor G. G. Scott, Mr. Pennothorne, Mr. B. Ferrey, Mr. C. C. Nelson, Mr. G. E. Street, Mr. F. Marable, Mr. P. O. Hardwick, Mr. Godwin, Mr. I'Anson, Mr. Penrose, Mr. E. Christian, Mr. E. M. Barry, Mr. Horace Jones, Mr. Owen Jones, Mr. David Mocatta, and Dr. James Fergusson. In reply to the only one toast given, "Prosperity to the Institute," the President, in a few well-chosen sentences, expressed his desire to maintain its dignity, and that of the profession generally. Professor Donaldson alluded to the meeting about to be held with a view to the completion internally of St. Paul's, as a matter interesting to architects; and Mr. Penrose, on the part of the Dean and Chapter, bespoke the good offices of all there.

CORPORATION BATHS, ASHTON-UNDER-LYNE, LANCASHIRE.

ILLUSTRATIONS are given in our present issue of the Baths now in course of erection for the Corporation of Ashton-under-Lyne, from the designs of Messrs. Paull & Robinson, architects. The covered bath, it will be seen, is of very considerable size. Around it is a gallery. During the winter months it is proposed to floor over the space otherwise occupied by water, and convert the interior into a gymnasium. The remaining one-third of the area of the site is occupied as follows, namely: a plunge-bath for females, having a water area of 25 ft. by 18 ft., where the lasses of Ashton may learn to swim; six first-class and thirteen second-class private baths, so arranged as to be accessible for men and women, as may be required; a dwelling-house for the manager or curator in charge of the premises; and a complete set of Turkish baths. The last-named are placed in a story above the ground floor, and flank the ventilating shaft next Henry-square, thus giving height and importance to the principal facade. The women's plunge-bath will be furnished with two sets of dressing-boxes, on the same principle as the great swimming-bath. It is also arranged for access from the principal entrance, in Henry-square, as well as from the women's entrance, in Portland-street, so that when the latter bath is used as a gymnasium in winter, the smaller bath may be used for men also. It only remains for us to state that the style of the building is Romanesque, and that the exterior is of brickwork throughout, stone being introduced only where absolutely necessary for constructive purposes.



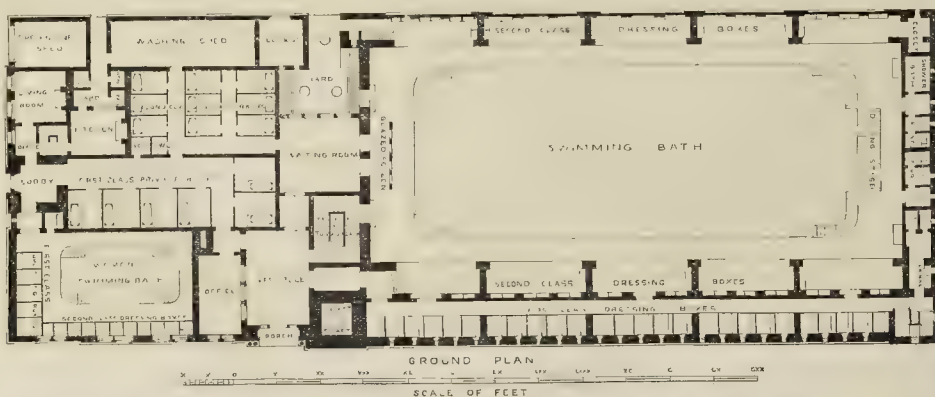
CORPORATION PUBLIC BATHS, ASHTON-UNDER-LYNE.



EXTERIOR VIEW.



FIRST FLOOR PLAN



GROUND PLAN

SCALE OF FEET



CORPORATION PUBLIC BATHS, ASHTON-UNDER-LYNE.—MESSRS. PAUL & ROBINSON, ARCHITECTS.

THE SEWAGE QUESTION.

Newent.—An order has been received from the Home Secretary, directing that in three weeks from the date of the order, a meeting shall be called at Newent, and a committee formed there, to carry out the Sewerage Act, and that the work must be begun in six weeks from the date of the meeting. If the committee is not formed the Government will send down an inspector, who will employ men to begin the work at the time named. There are great complaints that the area upon which the rate will fall, as laid down by Mr. Arnold Taylor, is not extended enough, especially in some directions.

The Treatment of Liquid Sewage.—An occasional summary of what is being done is useful. At fifteen of the places which are sewered wholly or partially, the liquid sewage is subjected to treatment, either by allowing it to remain for a time in settling-tanks, from which the deposit is occasionally removed, as at Burton-on-Trent, Birmingham, Epsom, Fareham, and Andover; or by filtering, as at Uxbridge and Ealing. In eight instances, deodorising materials are added to the sewage. Lime and carbolic acid are used at Carlisle and Harrow; lime alone is used at Leicester; lime and chloride of lime at Luton; perchloride of iron at Cheltenham; perchloride of iron and lime at Northampton; ferruginous clay treated with sulphuric acid at Stroud; and at Leamington, the lime treatment has lately been superseded by the method proposed by Messrs. Sillar & Wigner. By this treatment the sewage is clarified, and a deposit is separated which is sold as manure. In regard to the effects thus produced, it is stated that at Leicester the sewage runs off as pure as ordinary rain-water; at Ealing, it is said to be free from smell, colourless, and harmless to vegetable or animal life; at Stroud and Luton the effect is stated to be satisfactory; at Harrow the nuisance is said to be somewhat mitigated; and at Abergavenny the stench is said to be abated, by the treatment of the sewage. At Bury St. Edmunds, upward filtration through charcoal and gypsum has been abandoned, as too costly, in favour of irrigation. At Banbury, treatment of the sewage has failed, and irrigation is now resorted to; at Hereford, where it was proposed to be adopted in the Parliamentary plans, it has not been tried, on the score of expense; at Tonbridge it is about to be tried; and at Hastings and Cambridge experiments are being made. The cost of treatment amounts to 1,200*l.* a year at Leicester, for a population of 89,000, discharging into the sewers; at Ealing, with a population of 7,500, the annual cost is 300*l.*, and the cost of the plant for the purpose was 3,000*l.*; at Luton, with a population of 18,000 the annual cost is 500*l.*; at Cheltenham, with a population of 36,000, it is 350*l.*; at Uxbridge, with 7,000 population, it is 200*l.*; and at Alton, with 3,300 population, it is 46*l.* The solid deposit obtained by treating liquid sewage is sold at prices varying from 6*d.* to 2*s.* 6*d.* per ton. At Leicester as much as 5,000 tons is produced. At Luton, the deposit is mixed with night-soil; at Banbury, with street-sweepings; and at Stroud it is made the basis of a manure that is said to be sold at 7*l.* 10*s.* per ton.

FREE LIBRARIES IN LONDON.

SIR,—I have read with great interest the excellent letter of your correspondent "Jack Plane," on the necessity of free libraries in London.

If, as he says, ratepayers will not, as yet, submit to compulsory enlightenment, as represented by a free library rate, is it not possible that well-directed volunteers might commence the task, and leave a converted Bumbledom to complete it?

Some months since, it was suggested by the Workmen's Club and Institute Union, 150, Strand, where, if I mistake not your correspondent, "Jack Plane," is well known and appreciated, that a free library, in conjunction with a workmen's hall, might be established as a fitting memorial of Lord Brougham. Whether or no the times are ripe for a proper recognition of Lord Brougham's services, I cannot say; but, as yet, the response to the proposal of the Working Men's Club Union has been but small. During the last few weeks, however, we have endured a loss which, as it affects popular literature, is perhaps even greater than that of Lord Brougham, who died in a ripe old age, when his work was done. I need hardly say, I allude to the loss of Charles Dickens. Would

not a free library as a monument to Charles Dickens be a more noble memorial than all the statues or obelisks that the admiration of his countless readers may suggest? I now only make the general suggestion; but I feel certain that others, with larger leisure than myself would soon be found to organise the work and carry out the details, if, as I believe would be the case, the public mind responds to the suggestion.

Only last Friday evening, the manager of a small but thoroughly self-supporting workmen's club, in a densely-populated part of London, said to me, in speaking of the slender library now at the command of its members, "If we could get a set of Dickens's, we should double our number in a month." With half a dozen free libraries in the various districts of the metropolis, the good and gracious creations of Dickens's genius would be as familiar as his name now is to the masses of the people. Let the Dickens Free Library be started at once.

ALSAGER HAY HILL.

TO WHOM ARE WE TO LOOK FOR PAYMENT?

SIR,—An architect calls on a manufacturer, and orders some work, and names the builder who is to send sizes and measurements, and the builder sends his cart for the work when done, and the manufacturer books the work to the architect, as he had not given up the name of his principal. On applying for payment to the architect, the manufacturer is put off with the name of the builder. The principal then writes to the manufacturer, advising him to get his money from the builder, and speaks of the architect as having been employed by him.

Is not the principal liable to pay for the work, or is the manufacturer to look to the builder only, of whom he may have no knowledge?

P. & SONS.

. The architect would, doubtless, be liable, unless he made his position clear at the time; and he would have his remedy as against the person for whom he acted.

DRINKING FOUNTAINS AND CATTLE TROUGHS.

The eleventh annual meeting of the Metropolitan Drinking-Fountain and Cattle-Trough Association was held on Saturday afternoon last. The report showed that the society have now 130 fountains and 182 troughs under their care; that the consumption of water at some of the larger troughs amounts to between 2,000 and 3,000 gallons a day; that in some instances a single trough thus involves a cost of from 20*l.* to 30*l.* a year, and that in one parish alone the water company's accounts against the society, for 1869, exceeded 200*l.* It is to the erection of new troughs and to the efficient working of troughs and fountains already erected that the general contributions of the society are now exclusively devoted, the erection of new drinking-fountains for the people being commended to the philanthropy and public spirit of private individuals. The ordinary donations to the society for the year have amounted to 1,645*l.*, the donations for special fountains and troughs to 194*l.*, and the annual subscriptions to 861*l.* Mr. Smithies, in seconding the adoption of the report, expressed a hope that the committee would persevere in their exertions for the restoration of the Snow-hill fountain, at the corner of St. Sepulchre's Church. It was the gift of Mr. Samuel Gurney, and much historical interest attached to it as being the first fountain ever erected in London, but it had been taken down in consequence of the alterations in connexion with the Holborn Viaduct. Mr. Gurney, the chairman, announced that a lady had forwarded 1,000*l.*, this being the third sum of 1,000*l.* which the society had received from the same anonymous donor.

BRIBING A CLERK OF WORKS.

At the usual meeting of the Metropolitan Board of Works on the 24th ult., it was stated in one of the reports presented by Mr. Bazalgette, the chief engineer, that two of the contractors executing works for a company, but over which this Board had supervision and control, had paid to one of the clerks of works employed by the Board to see that the work was properly done, the sum of 5*l.*, to induce him, it was supposed, to neglect his duty. This man, however, instead of doing so, reported it to his

superior officer, the chief engineer, Mr. Bazalgette, who now reported it to the Board. Several members expressed their approbation of what the clerk of the works had done, and it was agreed that the names of the two contractors, with the letter they sent to the clerk of the works enclosing the 5*l.* note, should be printed in the minutes, and sent to all the vestries and district boards in the usual manner,—a scare-crow.

OPENING OF KEBLE COLLEGE, OXFORD.

THE closing event of the commemoration week at Oxford was the opening of the new college erected to the memory of the Rev. John Keble, author of "The Christian Year," who died about four years ago. The last occasion on which a new college was added to the University was in 1714. It is intended that Keble College shall offer a religious education on Church of England principles to a class of men who are now shut out from the complete advantages of university training by the high charges made in other collegiate foundations. The want of such an institution was often expressed by Mr. Keble himself. About 44,000*l.* have been already contributed, leaving a deficiency of 6,000*l.* The building, capable of accommodating 100 undergraduates and an adequate staff of tutors, is now complete, with the exception of the hall and chapel, which are only temporary erections. The college will be open for the reception of a few students in October of this year.

DISTRICT SURVEYORS' FEES.

TUBB V. GOOD.

SIR,—As this case when before the magistrate was reported in your journal, we think that a report of the judgment of the Court of Queen's Bench, reversing his decision, will be of service to your readers.

The point raised by the case was upon the construction of the 51st section of the Metropolitan Building Act, 1855, which states that the district surveyor shall be entitled to receive the amount of his fees from (among other persons) "the owner" of the building erected, or in respect of which the work or service has been by him done or performed; and the question for decision was whether the district surveyor was entitled to recover his fees from an owner of the building who became owner thereof *after the fees had become due*.

The Court of Queen's Bench has unanimously decided that the word "owner" refers to the person who was owner within the meaning of the Act at the time when the fees became due, and that subsequent owners are not liable to pay the same.

APPLEBY, WRIGHT, & CROWTHER.

DRAINING WITHOUT SCIENCE.

SIR,— "M. U." is wrong in attributing the depletion of our great water-basins, or the barren appearance of our fields, to *draining without science*, &c. My own experience assures me that drained lands retain considerably more moisture than undrained, by the water being distributed more equally throughout the under-surface, beneath the drains, and beyond the influence of evaporation. Not only do the rains descend, as our friend poetically remarks, to be kissed and embraced, but the loving earth reciprocates and faithfully retains the gushing shower, till there is a little too much of it, and even then does not part with it too readily. Floods, it strikes me, are more frequent in countries where subsoil drainage is not attended to, non-paying, or impracticable, such as thin, hot soils, moor, or mountain. An exceptionally dry season or two not being sufficient to keep up the supply from the great absorbing surfaces to the reservoirs in the basins below, whilst a constantly increasing demand is made on these for the use of an ever-increasing population in our great cities, keeping the huge steam-pump ever going to provide pure water for mankind; and numberless steam-horses employed in every branch of trade and manufacture, may perhaps account for the want of this great element,—certainly not the drainage of bog and swamp, whose *impervious* bottom only retains just sufficient water in dry seasons to fill the land with pestilence and death. The drainage of a city, unutilised, is a frightful waste and a national evil; the drainage of the land is, on the contrary, a national benefit.

A CLOP.

WATER SUPPLY.

THE Maidstone Waterworks Company have for some time been sinking a well at their works at East Farleigh, and the result is a success. After sinking 400 ft., a boring was made for 195 feet further, and, after passing through the Wealden clay, a stratum of sand was entered, in which so plentiful a spring of water was found that the well was soon filled nearly to the surface, and several feet above the level of the river. Whether the supply will be permanent remains, of course, to be tested by boring still deeper, which we understand will be done, and the quality of the water has equally to be proved; but the indications at present are that, both in point of quantity and quality, the new supply will fully meet the public requirements. The result has also some scientific value, of which geologists will, doubtless, know how to avail themselves.

Professor Runge has made observations on the purification of water, which offer some interesting points. His conclusion is, that metallic iron offers the readiest and simplest means of disinfecting water, and of preserving it fresh. Thames water taken to sea in iron tanks soon becomes perfectly sweet, and remains so through a long voyage. A small piece of sheet iron or some nails placed in the water in which out flowers are put will keep the water sweet and the flowers fresh for a long time. He also put some iron filings in a vessel with a very small quantity of water, and placed a leech therein, and found the water quite fresh and the leech healthy after six months had passed.

COMPLETION OF THE LOW-WATER PIER AT CARDIFF.

THE completion of this pier is looked upon as an important event at Cardiff. The first pile was driven in August, 1867, and the last in August, 1868. The work is now finished, and the pier will very shortly be opened. In the first twelve months forty-eight rows of Menel piles were driven in, there being six piles in every row, and the rows are 24 ft. apart. Each pile was driven down about 40 ft. below the surface of the mud, where it found solid resting-place in the gravel substratum, or in firm ground of some other nature. The pier is constructed throughout of timber, in bays of 25 ft. for two-thirds of the distance, and 16 ft. for the remainder, and two rows of continuous wrought-iron girders run down the centre of the pier from end to end. It is 1,350 ft. in length, and 34 ft. 6 in. in width, except at the end, where it is widened to 100 ft. Here, at the end, to give it additional strength, and to preserve the main piles from injury by vessels, fender piles of elm have been driven in. In the construction of the pier alone, exclusive of the station and waiting-rooms, 150,000 cubic feet of timber have been used. The pier is approached from the East Dock by a carriage road running over an embankment behind the coffer-dam, which closes the entrance to the old Tidal Harbour. It is approached also by railways. The roadway is of planks resting upon the piles, and is protected by a wooden railing. A covered railway station is built above the pontoon. This station is 108 ft. in length, and 20 ft. in height. Throughout its length runs a platform raised to a level with the carriage steps. A light tower some 40 ft. high is surmounted by a dioptric light, around which runs a gallery.

The whole of the work has been carried out by the trustees of the Marquis of Bute, and from the designs of Mr. J. McConnochie, C.E.

NEW MUSEUM OF COMPARATIVE ANATOMY, CAMBRIDGE.

THE New Museums and Lecture Rooms Syndicate have reported to the Senate on the subject of the roof of the New Museum of Comparative Anatomy as follows:—

"Almost immediately upon the completion of the building in the year 1868, the roof was found to be defective. The attention of Mr. Salvin was at once called to the matter, and he was requested to come to Cambridge for the purpose of inspecting and reporting upon it. Mr. Salvin accordingly came, and stated that Messrs. G. Smith & Co., the contractors, would remedy the defect without expense to the University. In accordance with his recommendation, in the spring of 1869 certain tie-rods were added to the principals, and it was asserted that the mischief was remedied. This was, however, far from being the case. Early in the year 1869 the superintendent of the museum pointed out to the Syndicate a number of very serious defects. The roof was then examined by Mr. Goddard, architect, of Lincoln, and by Mr. A. J. Gray, the builder, of Cambridge, and the defects traced to the original defective construction of the roof, the condition of which at that time (June, 1869) was described to the Syndicate in the following terms:—

"The elliptic longitudinal arches are too weak at the crown to support the incumbent weight, and the iron tie-rods put in by Mr. Salvin after the completion of the building wholly fail to remedy the original defect; the roof in, in consequence, must sink, and the supporting wooden pillars, the windows are displaced, and the water in the gutters unable to find its way into the downpipes. The Syndicate were further informed that, 'through an original defect in the construction which was not remedied by Mr. Salvin's subsequent application of iron tie-rods across the building, the supporting wooden pillars, as well as the external walls, were thrust out of the perpendicular,' and that, 'from the above mentioned causes the roof had become separated from the end walls, and was already in some places more than half an inch from them.'

The Syndicate at once laid the information which they had received before Mr. Salvin, with a request that he would give his early attention to the subject, which he promised to do. Nothing more having been heard from Mr. Salvin in October, 1869, when the Syndicate first met after the long vacation, the Syndicate again addressed him, and it was ultimately (November, 1869) agreed between him and the Syndicate that the building should be examined by two practical persons, one appointed by Mr. Salvin and the other by the Syndicate. Mr. Salvin appointed Mr. Brownish, but the Syndicate agreed upon Mr. Arthur John Gray, builder, of Cambridge. It does not appear that there has ever been any question between the two referees respecting the defects of the building, but they have since then agreed upon the proper mode of making them good. Mr. Brownish proposing a plan in accordance with which he maintains that all defects may be made good for an outlay of 116£, Mr. Gray contending that the plan proposed would not remedy the original errors of construction, but would leave the roof still insecure. The plan which Mr. Gray suggests, as the least expensive that he can devise with the assurance of its being effectual, will require an outlay of 350£. In the end Mr. Brownish has, on behalf of Mr. Salvin, offered the following alternative, viz., either to put the building into proper repair in accordance with the plan which he had proposed, or, if the Syndicate preferred some other plan, to pay the sum of 135£, in satisfaction of all claims upon Mr. Salvin. The Syndicate, having examined both Mr. Brownish's plan and that of Mr. Gray with great care, have come to the conclusion that Mr. Gray's objections to Mr. Brownish's plan are sound, and that they could not safely recommend it to the Senate. On the other hand, they are decidedly of opinion that Mr. Gray's is a satisfactory plan, and the best which can be adopted under the circumstances, and they recommend that his estimate should be accepted, the balance of the expense being charged to the New Museums and Lecture Rooms Building Fund. And although they cannot regard the offer of 135£ made by Mr. Brownish on behalf of Mr. Salvin as a proper or adequate offer, yet, having regard to all the circumstances of the case, they recommend that it be accepted."

REMOVAL OF WHITEWASH.

SIR,—Can any of your readers give information of a sure and economical mode of removing old whitewash from the exterior walling of a brick church now being restored?

E. K.

A READY-MADE IMPROVEMENT.
COVENTRY-STREET AND OXFORD STREETS.

TO utilise the existing lines of streets now closed against traffic, which is struggling in all directions to get the nearest way to various points, is at once the simplest and cheapest, as well as the quickest, way of giving relief to this over-crowded city; and we are glad to observe that there is one vestry, at least, which is alive to the importance of brisk and ready action, when opportunity occurs.

It seems that very favourable circumstances now exist, whereby a direct route from the centre of Oxford-street to Coventry-street can be opened almost immediately; and "the Crown," for once, is ready to assist, and actually promotes, this public improvement. Between Berwick-street (which is in a line with Wells-street, on the north side of Oxford-street) and Rupert-street is a block to remove which would, in itself, be a boon, but which, if removed, would open up the route indicated above. Quite lately a fire occurred, which has reduced the difficulties originally existing, by destroying one side of a court, that would have been required to have been set back; and it only remains to set back the side of one court (Walker's-court), and remove one house, to have the line complete. The following quotations from a statement made by the worthy and energetic clergyman of the Church of St. Luke, situated in the midst of the district, will show that the matter was under consideration as long ago as 1863, when—

"An attempt was made to effect the improvement indicated. The matter was brought before the vestry, by a very influential deputation, headed by the present Lord Derby. The result was the rejection of the scheme by a very narrow majority."

At the present moment the difficulty is somewhat diminished by the destruction, by fire, of three of the houses in Crown-court, which stood in the way of the improvement.

As to the expense, I believe I am justified in thinking that you would now find the terms offered by the Metropolitan Board of Works more favourable than they were seven years ago; while all the arguments hitherto used to show that the removal of the block would be of little or no benefit, in the diminution of poor and police rates, are as strong as, or stronger than ever. I have already referred to the

liberal offer of the representatives of the Crown property which stands in the way; and the interest of the Woods and Forests in it is offered for the nominal sum of 1£, so convinced are the owners that the junction of Berwick-street and Rupert-street would enhance the value of the neighbouring property."

We must congratulate the west end of London on the action already taken by the St. James's vestry, where the subject is under serious consideration.

THE VOLUNTARY ARCHITECTURAL EXAMINATION.

It has been announced that six candidates presented themselves at the Institute of Architects for examination this year in the Class of Proficiency, and that of those gentlemen, the four following passed:—

Thomas E. Mundy, Park-lane, Tottenham; William Scott, 25, Horsemarket, Northampton; Walter L. Spiers, 31, Bernard-street, Russell-square; John S. Quilter (Associate), 9, Conduit-street;

and that in the preliminary examination, established this year, four candidates had come up for examination, of whom the three following passed:—

Joseph B. Cohen, 15, St. John's-terrace, Regent's Park; Thomas Garratt, Friary Cottage, Northampton; Thomas J. Street, Manor House, Sutton, Guildford.

In conformity with the present regulations of the examination, certificates will shortly be issued to all candidates who have passed in the respective classes of proficiency and distinction.

THE PLYMOUTH TOWN-HALL TENDERS.

At a special meeting of the Plymouth Town Council, to consider a report from the Guildhall Committee of the tenders received by them for the erection of a new Guildhall and Public Buildings, the following tenders were presented:—

	For the entire Buildings.	Reduced Buildings.
Hunt & Seacombe, Exeter	£37,916	47,000
Shaddock, Saltash	44,000	38,400
Blatchford, Tavistock	39,484	31,785
Clarke, Plymouth	37,150	30,778
Clark, Bath	36,445	29,168
Harvey, Plymouth	33,987	28,111
Finch, Plymouth	33,687	27,688
Marshall, Plymouth	33,610	27,600
Matcham, Plymouth	33,415	28,234
Fletcher, Salisbury	32,650	25,318
Call & Pethick, Plymouth	32,475	26,904
Trevana, Plymouth	25,969	224,089

The reduction in the buildings consists in the omission of the tower, of the third law court, and the buildings adjoining Westwell-street connected therewith. After some discussion and several motions, it was resolved, by a majority of 21 to 10, that the tender of Messrs. Call & Pethick for the whole work be accepted.

AN EPITAPH IN ALL SAINTS' CHURCH, LEICESTER.

SIR,—I send you a relic of the past which I found hanging in this fine old church, which is sadly in want of restoration, or it will tumble down.

The charity now amounts to 20£ a year, and is disposed of as follows:—10£. are paid to the Vicar of St. Nicholas; 3£. 6s. 8d. to Trinity Hospital; and 6£. 13s. 4d. to ten poor persons.

H.

"In this churchyard doth lye the corps
Of William Norrice, dead and gone,
Whose grave from all the rest is knowne
By linding out the greatest stone;
A homely tombe, yet grac'd with fame
Of worthy works which he had done;
A monument which he did choose
Before his howre-glasse was runne.
Thrice fiftene yeares he gave the school,
Which yearly ever shall renew
And to be given to All Saints poore
On the feast day of Bartholmew.
O, happy All Saints which he bred
Such saints on earth to feed the poore;
Let saints in Heaven and earth below
Give prayes to the Lord therefore.
Five marks he gave unto the schoole,
An annual stipend for to be,
And that it shall be yearly pay'd
To the second Master of the schoole.
There was he grac'd with serving twice
The office of the Majoritie;
Three wives he had, and had his will
To be entomb'd amongst them thre.
But death, the end of flesh and blood,
Did wound to death the good old man;
Though ninety-six yeares liv'd on earth,
Yet was his life in length a span,
J. B.

* On the board opposite is, "He departed this life January 8th, 1615."

CHURCH-BUILDING NEWS.

Darlington.—The chief stone of a new church for St. Paul's district, Darlington, has been laid. There remain only about 600*l.* to be raised to meet the cost of erection. The designing and carrying out of the new work have been placed by the committee in the hands of Mr. J. P. Pritchett, of Darlington, architect. The church is designed in the Early Decorated style, and consists of nave, 75 ft. by 26 ft.; chancel, 28 ft. by 22 ft.; aisles, each 75 ft. by 14 ft.; vestry, organ-chamber, and a tower and spire at the south-west angle of the nave, 130 ft. high. The west end, which faces Durham-road, has a doorway in the centre, with a large three-light window over it; the end of the north aisle being relieved by a two-light window, and the end of the south aisle being finished by the tower. The sides of the aisles are pierced by two-light windows, separated by buttresses, and a lofty clearstory is similarly arranged. The east end is filled by a large four-light window, the sides of the chancel by long two-light windows, and each gable is surmounted by an ornamental cross. The tower is divided into four stages, the first being a porch, the second the ringing chamber, the third the clock-chamber, the fourth the belfry, and a spire surmounts the whole. Internally, the nave is separated from the aisles by five arches, springing from pillars, with moulded bases and caps, which will be relieved by a little carving. The roof of the nave is left, and open to the ridge; that of the chancel "wagon-headed" or arched. The seats are all to be of pitch pine, open, with low slanting backs and moulded ends, and provide accommodation for 600 adults. The floors of the chancel and passages will all be paved with mosaic tiles. The pulpit and font are to be of Caen stone; the reading-desk of oak; the communion-rails of iron and brass. The windows are all to be filled with cathedral tinted glass, having coloured borders. The woodwork will be stained and varnished. The church will be warmed by hot water or warm air, and lighted by gas standards. The site, which consists of an acre of ground standing high and open, is surrounded on all sides by streets, from which it will be separated by iron railing. The contracts have been taken by the following local tradesmen:—Masons', slaters', plasterers' work, Mr. W. Lynes; joiners' work, Mr. T. Teakstone; plumbing and glazing, Messrs. Russell & Sons; painters' work, Mr. Stephen Harrow. The amount of contract is 3,304*l.* 16*s.* 7*d.*, and the total cost, including iron railing, lighting, warming, and professional charges, is expected to amount to about 4,000*l.*

Preston.—The new tower of St. Mark's Church has been formally opened. Mr. William Johnson, of Howden, Yorkshire, brother of the incumbent, was the architect. The tower has been for some time completed externally. It is built of Longridge stone and is a lantern one, in the lower part consisting of eight three-light windows, two on each side, divided by buttresses and glazed with cathedral glass. Under each transept is filled in with tracery. The belfry windows above are divided into two lights by a transept, and the tracery on the top is filled in with cathedral glass. At the south-east corner is a staircase by which to ascend to the top of the tower. The louvres of the upper lights are of Westminster slate. The gables rising over each belfry window is intersected about midway by a parapet pierced with quatrefoils, and terminating with a finial. There are octagonal pinnacles at each corner, canopied at the base of the spiral part of the pinnacles, likewise terminated by a finial and wrought-iron vane. The total cost of this addition to the church is from 1,250*l.* to 1,300*l.*

Brent, Devon.—The parish church of Brent, in South Devon, which is at present in a very decayed state and much overlaid with white-wash, is about to be completely restored, under the direction of Mr. Hine, of Plymouth. The building is chiefly Perpendicular, with a tower and some other portions of earlier construction. The chancel contains a Late Decorated sedilia and an elaborate oak screen, the carving and colour of which will be restored. The roofs and seats throughout will be new, and much of the stonework will be removed. The chancel and passages are to be paved with tile and slate, and the pulpit is to be of stone. Like so many even of the late churches in the West of England, Brent Church possesses a Norman font, which will be placed near the western entrance, on a granite base, cruciform on plan. The cost of the various works will be about 1,700*l.*

Walworth Common.—St. Stephen's Church, in Villa-street, the laying of the foundation-stone of which we recently noticed, will be in the Gothic style of Early Italian character. The walls will be built of brick, and faced inside and out with Beart's perforated white bricks. The arches of the nave supporting the clearstory will be constructed with white moulded bricks and red terra-cotta, which have been specially manufactured by the Whitwick Colliery Brick Company, Leicester, from the designs of the architects, Messrs. Jarvis & Son. The dressings to doors, windows, buttresses, &c., will be of Bath stone. The church will consist of a nave, north and south aisles, and chancel. The nave will be 81 ft. long, 30 ft. wide, and 50 ft. high, lighted by ten two-light clearstory windows, and covered with a close-boarded arch-shaped roof. The north and south aisles will be 81 ft. long and 8 ft. wide, with lean-to roofs. At the west end of the building will be a spacious porch or narthex the whole width of the nave. There will be also a porch in the north aisle facing the new road. The chancel will be 28 ft. deep, 22 ft. wide, and 36 ft. high, terminated by a three-sided apse. It will have a vaulted roof constructed of concrete, supported on moulded stone ribs. There will be three lancet windows in each of the seven bays of the chancel, and beneath these there will be a deeply-recessed arcade. At the south-west corner of the church there will be a tower, 22 ft. square, which will rise to a height of 120 ft., and be constructed to receive a peal of bells. Sittings will be provided for 614 persons on the ground-floor, and 153 in a west gallery. The seats will be open, of deal stained and varnished. The contract is taken for the works, exclusive of the tower, by Mr. Tarrant, of the New Kent-road, for the sum of 5,188*l.*

York.—A reredos, composed of painted tiles from the studio of Mr. J. W. Knowles, York, has recently been erected in St. Sampson's Church. The central portion, which is inclosed in a carved stone frame, is designed to form three quatrefoil panels, divided by small elongated niche panels. In the centre quatrefoil, on a diapered blue ground, is the Agnus Dei, and in the side quatrefoils are angels. In the small panels a conventional treatment of the rose and lily is painted on a chocolate ground. The space under the central portion of reredos, which occurs at each end of the communion-table, is of a diaper in maroon, yellow, blue, and white. The wall space on each side of reredos, extending to the chancel side walls, is also of tiles, on which is painted diaper work. The stonework and fixing of the tiles were executed by Mr. Cole, of York.

Horsmonden.—A chapel of ease to St. Margaret's, Horsmonden, has been opened and consecrated by the Bishop Suffragan, of Dover. The chapel is situate in the most central spot obtainable in the parish, more than two miles from the parish church. The site was the free gift of Mr. Ernest Wilson. The chapel is built of brick, and consists of nave, apse, chancel, and vestry, the bell-turret being over the chancel arch. It will seat about 150 persons. For the exterior walls stock bricks are used, with bands of red and black bricks, the arches of doors and windows being of the same material. For the interior walls red bricks are used, and relieved by strings of white and black brick. The style of architecture adopted is the Early Decorated. The ceiling of the chancel is panelled and moulded, and coloured with a groundwork of blue, with gold stars. At the junction of the apse the mouldings radiate with gold lines from a centre bearing the sacred monogram. In the cornice is painted an inscription from "The Litany" commencing with "By the Mystery of Thy Holy Incarnation." The chancel is lighted by six single-light windows, the centre one being filled in with stained glass by O'Connor, representing the Crucifixion; it has been presented by the Dowager Lady Marriott. It is proposed to fill in the remaining windows with glass, illustrative of the inscription in the cornice above. On the north side of the chancel is the vestry, divided from the former by an archway, terminating with moulded corbels. The organ, by Messrs. Lewis & Co., of London, fills up the archway, and has an oak case, with spotted metal pipes. The chancel is seated stallwise, with wainscot oak stalls. The chancel arch has a span of 17 ft., and springs from corbels, consisting of polished Greek marble and carved capitals, terminated with figures of angels. The floors are laid with Minton's tiles. The roof of the nave has all the rafters framed alike. The

seats are of a plain character, and, together with all the woodwork in this part of the church, are stained and varnished. What has been completed was planned by Mr. Robert Wheeler, of Tunbridge Wells, architect, and executed by Mr. Anscomb, of Maidstone; the carving by Mr. Earp, of Lambeth.

Youghreave.—The restoration of the parish church is drawing towards completion. The roofs had been neglected for many years. The lead had been patched over and over again, but the rain came through in streams, and this, of course, kept the whole of the oak beams continually wet, and consequently decaying. When contracts were entered into, and the work commenced, the worst fears were realised. Nearly all the rafters were decayed, the boarding under the lead entirely, and many of the main beams were in a very critical state. It was determined, however, to retain every portion of the old work that could be retained. A sort of framework of iron was therefore placed above the old oak roof, having iron beams over the old oak ones, to which the latter were secured by large iron bolts. All the intermediate timbers were similarly secured. The decayed rafters were all removed and new ones inserted, and the whole reboarded and covered with new lead. The aisle roofs were, fortunately, not in such bad condition, but were all stripped, the decayed portions cut out, and new oak inserted; and were reboarded and covered with lead. With the limited funds in hand it was impossible to attempt the reconstruction of the chancel roof. In this emergency his grace the Duke of Devonshire was appealed to,—already a donor of nearly 800*l.* to the restoration fund,—and he at once directed the work to be finished as it ought to be, and undertook to defray the whole cost of this portion. What is, in effect, a new roof, has been put to the chancel, in which the old beams and other portions of the old roof are plainly visible from the darker colour of the oak. The chancel walls are lined with ashlar. A new east window has been inserted. The levels of the chancel have been raised. The floor is all laid with encaustic tiles, interspersed with bands of white stone. An attempt has been made to introduce colour in the lower portion of the chancel walls by the use of tiles. They are a sort of majolica ware. The rest of the church has been paved with tiles, with wood floor under the seats, and a heating apparatus has been placed in a vault under the church, by Haden, of Trowbridge.

Rochdale.—The foundation stone of a new church at Facit, near Rochdale, to be dedicated to St. John, has been laid. The design for the church comprises a nave, chancel, transept, baptistry, south-west tower and spire, vestry, and organ-chamber. The building is to be of stone, mainly from an adjoining quarry. Although by the same architects,—Messrs. Medland & Henry Taylor, of Manchester,—the design differs essentially from the other new Rochdale churches.

Ashford (Derbyshire).—The little village church of Ashford, according to the *Derbyshire Advertiser*, has recently, with the exception of the tower, been rebuilt, mainly through the liberality of Lord George Cavendish, M.P. The old building possessed little architectural or antiquarian interest, and it was, besides, in so dilapidated a condition, that its reconstruction had become a work of necessity. The Tudor feeling in the old church has been maintained throughout the new work. The roofs are open-timbered, covered with tiles, and asphalted and boarded underneath. The chancel roof is, of course, the most ornate. On the south side of the church is a stone porch, a new and much-needed feature. The heads of the windows are all more or less traceried, the pattern being varied according to the position of the windows. The windows themselves are filled with glass of a yellowish tint, in small diamond panes. The old west gallery has been removed, and the tower-arch, under which is the font, has been opened out into the church. The walls are built of grey limestone, and the windows, doors, and other parts, of the yellowish local sandstone. The chancel arch is supported on corbels with carved caps, the shafts being of the Duke's red marble. The churchyard-wall has also been rebuilt, and new oak gates, with suitable stone piers, provided. The contract was taken by Mr. Joseph Brown, of Matlock Bridge. The architects were Messrs. Medland & Henry Taylor, of Manchester.

Ashford (Kent).—The restoration of the chancel of the parish church has been begun by a local firm, under the direction of Mr. Ewan Christian, architect to the Ecclesiastical Com-

missioners. The east window is to be restored and reglazed. Many of the parishioners have expressed a wish that it should be filled with stained glass. The vicar has obtained a design of the Ascension from Messrs. Lavers, Barrard, & Westlake. The cost would probably be about 400l.

Bishampton, near Pershore.—Excepting the tower, the old church of Bishampton has been swept away. To rebuild and furnish the body of the church the total expense has been 2,000l. The tender for taking down and rebuilding the edifice was 1,699l. 10s. This, which was accepted, was by Mr. Griffiths, of Eldersfield, near Tewkesbury; the highest tender being 1,877l. Mr. Freedy, of London, was the architect. The style adopted is the Perpendicular, and the material is stone from Inkberrow, with Bath stone facings. The new church consists of chancel, with vestry on its north side (also capable of containing a small organ or harmonium), nave without aisles, and the western tower opening into the nave. The old Norman fragments are preserved in the new structure, namely, the doorways, north and south, and some deeply splayed lights in the nave walls. The east and west windows are of three lights, traceried heads, and the side windows are of one, two, and three lights, square-headed. The Norman doorway on the north is blocked up, the principal entrance being by the south porch, which is a stone structure, having a two-light window on each side, stone benches, an open timber roof, and an exterior door of open wire lattice-work for ventilation. The roofs of chancel and nave are nearly of the same height, and are both of open timber-work, the principals of which rest on moulded and carved brackets. The floor of the whole church is covered with Lurgwardine tiles, of rich patterns in red, black, and buff.

Knowle.—The foundation-stone of a new church has been laid by the mayor at Knowle. The sum raised having now reached 2,400l., the permanent building has been begun. Messrs. Ponton & Gough are the architects; and Mr. W. Brock is the contractor. The church is to be in the Byzantine style, and will be principally built of brick, both inside and out, with coloured stone marble, and tiles worked into the columns of the arches and the floor. The extreme size will be 120 ft. by 44 ft., and the designs provide for a sanctuary or apse, organ-chamber on the north, and two vestries on the south side of the chancel. There is to be a tower 92 ft. high at the south-west corner of the church, and a porch on the south-east. The chancel, as well as the nave, is to be 30 ft. wide; the other part of the width is devoted to aisles, which will be used simply as passages. The church will be lighted by windows on both sides, filled with ornamental glass. The sanctuary will be partly lined with marble, and the fittings of the same; red Aberdeen granite will be used in the columns of the chancel, some of which will be circular and others octagonal. There will be inlaid ornamental work between the arches. It is in contemplation to paint the dome of the sanctuary with a picture of "The Last Judgment," and to have other paintings and freestone bas-reliefs beneath the windows. The ceiling will also be decorated in colours. The roof will be covered with Bridgewater tiles, and the tower with green Westmoreland slates. There will be an oriel window in the west end, in harmony with the other parts of the building. The total estimated cost of the church is 5,000l. The money already collected will suffice for the erection of the sanctuary and two bays of the nave. A temporary junction of the new with the old building will then be effected, and service be conducted in this enlarged space till funds shall justify the completion of the structure. Owing to the irregular slope of the ground, the floor of the sanctuary and chancel is supported on iron girders laid on stone arches, and the space beneath, which will hold a couple of hundred people, will be found useful for practising the choir and for parochial meetings. So far the work has already progressed.

STAINED GLASS.

Long Sutton Church.—Messrs. Ward & Hoghes, of London, have been engaged in placing a coloured glass window in the altar end of this church. In the top division of the circle, in the tracery of the window, are portrayed two triangles intertwined, representing the Highest, the Holy Trinity, the Trine God. In the centre of these triangles is a brilliant star, beaded in vermillion, the Star of Bethlehem. In three of

the divisions of the circle are represented angels adoring the Holy Trinity. In the other two divisions of the circle are, on the left, the Dove to represent the Holy Ghost, and on the right, the Lamb of God. At the base of the circle, on the left, is an alpha, on the right an omega, and beneath them the monograms of I.H.S. and X.P. Below the tracery each of the centre lights is surmounted by a star. In the left the Holy Ghost, in the figure of a dove, is seen descending on the Saviour's head, on whom John the Baptist is pouring out of a shell the water of baptism, whilst the virgin mother is seen seated below. In the centre light, on the left of the cross on which Christ is giving up the Ghost, is represented the centurion supporting the Roman standard; below him St. John; opposite to him, at the foot of the cross, is the virgin mother, and above her are soldiers and a turbaned chief. In the lower compartment, on the left, is represented the Adoration of the Magi; in the centre, the Last Supper; and on the right, the Angel at the Sepulchre, as saying to the two Marys, "He is not here, but risen." The Latin inscription at the base signifies that the window is dedicated by his widow to the memory of John Bailey, surgeon.

Holy Trinity Church, Lickey (Birmingham).—A three-light window of stained glass has just been fixed above the altar in this church. The subjects portrayed are emblematical of Faith, Hope, and Charity; the illustration of Charity being in the centre, with the sacred monogram above, and underneath the arms of the late Baroness Windsor. The work was executed by Mr. Camm, of Smethwick, formerly principal designer to Messrs. Chance, and cost between 70l. and 80l.

St. Stephen's at Barbourne.—This church has been further beautified by the insertion of a stained-glass window at the east end of the south aisle. The window is of three lights, trefoil-headed, and in the tracery above are three quatrefoils. The principal subject spreads over the three lights, being John the Baptist preaching in the Wilderness. He is surrounded by a group of men, women, and children, soldiers and civilians, all in the act of listening attentively to his admonitions. In the quatrefoils above are the Lamb of God and two angels. The artists were Messrs. Lavers & Barrard.

St. Jude's, Wolverhampton.—A memorial has just been erected in St. Jude's, Tettenhall-road, by Mr. Mander. The window is situated at the east end. It is, in accordance with the architecture of the church, of the Decorated period, and illustrates, in a series of canopied panels, the Life, Passion, and Glory of our Lord. The arrangement of the subjects is as follows:—On the lower tier, the Annunciation, Nativity, the Finding in the Temple, and Baptism; on the upper, the Agony in the Garden, Carrying the Cross, and the Crucifixion and the Resurrection; whilst in the tracery is the Ascension, which occupies the whole space, our Lord being represented with attendant Angels, the Virgin Mary and Twelve Apostles standing in groups below. The work was designed and executed by Messrs. Lavers, Barrard, & Westlake, of London, at a cost of 200l.

FROM SCOTLAND.

Kelso.—Alterations are at present being made, by direction of the Duke of Roxburgh, at the Abbey of Kelso, which will greatly improve its appearance. For many years this structure has been disfigured by a stable built against its walls. The property of which the stable is a part was purchased recently by the Duke of Roxburgh, who has now caused the removal of the stable and of an old wall, so that one of the finest views of the abbey is now again to be opened up. This abbey is one of the oldest of the Scottish abbeys of which remains of any great extent exist, having been founded by King David I., in 1128.

Miscellaneous.

The Tower of St. John's Church, Cardiff. At a vestry meeting the parishioners have resolved to rebuild one of the turrets of this tower, and have requested Mr. Waring, the borough surveyor, to make an estimate and advertise for tenders. The cost, it was stated, of rebuilding, would be about 80l. or 100l.; while its repairs for a few years would be 25l. to 30l.

Refusal to Consecrate a Church.

An unusual scene of excitement occurred at a new and elaborately-finished church in West Derby, about three miles from Liverpool, which has just been erected at the sole expense of Mrs. Reade, a wealthy lady in the neighbourhood, and which was to have been consecrated by the Bishop of Chester. At the last moment the bishop refused to consecrate the edifice. The walls, roofs, and almost all parts of the church are artistically decorated, together with full-length paintings of the apostles, prophets, and other characters in Scripture history, as well as a large number of allegorical figures. The nave is divided from the chancel by an oak screen, which is decorated in gold and colours, whilst the roof and walls of the chancel itself are even more elaborately decorated, and the altar-piece, which rivals in its costliness and beauty the best works of Mediaeval times, consists of richly-carved and gilt woodwork, with scenes from the Passion of our Lord, from His betrayal to the visit of the Marys to the sepulchre. The bishop is said to have expressed his strong disapprobation of these decorations as out of place in such an edifice, more especially the altar-piece, and refuses to consecrate the church until it is removed, with several other portions of the decorations. It is stated that the donor of the church declines to permit any of the decorations to be removed, and threatens to resort to measures to enforce the consecration of the church as it now appears. The cost of the edifice amounts to about 30,000l. It has been erected from designs furnished by Mr. G. F. Bodley, of London, architect.

To India in Four Minutes.—The opening of telegraphic communication direct with India has been inaugurated by the Prince of Wales, at Arlington-street, Piccadilly, in the presence of some seven hundred members of the scientific, the political, and the fashionable world, when the Prince conversed freely with the King of Portugal, the Khedive of Egypt, and the Viceroy of India; sending messages to and receiving answers from Lisbon, Cairo, and India, in the course of a few minutes. The communication was through the Falmouth, Gibraltar, and Malta, and the British Indian cable lines. When Lord Mayo's message came, soon after 12 p.m. in London, it was dated Simla, 5.4 a.m. His Excellency had been roused from his bed in the middle of the night—"or to-morrow morning, isn't it?" as one inquirer remarked, condescendingly to pass compliments with his Royal Highness and the gay crowd in Arlington-street. This was the climax of the meeting. Communication was also made, on the other hand, with the President of the United States; and had one been made with California, nearly the whole globe might have been girt in much less time than in forty minutes by the slow Fairies. The actual time occupied by the messages from India to London is said to have been four minutes and two seconds, but we suspect a little exaggeration here.

Railway Matters.—The Great Western railway authorities have provided comfortable barouche and Brongham cabs at Paddington, which ply for hire at the rate of 9d. per mile, or 2s. 6d. per hour. Mr. Brassey, the contractor, is about to proceed with the construction of a railway from Berlin to Stralsund. A new system of mountain railway has lately been laid down in Hungary. The line requires no permanent way at all. Square bearers of oak, 8 in. thick and 14 in. broad, are laid on the ground, and only at rare intervals cross sleepers are used. On the two edges of the bearers are rails only 2 in. broad, and so thin that they only weigh 1 lb. per foot. The trucks run on a pair of wheels 8 in. in diameter. The bodies of the trucks are three times the width of the rails, and placed so low on the wheels that they have just room to move. This system was originally proposed by an Englishman. The cost is about 200l. per mile. The use of steel rails for railways is increasing. The "life" of a steel rail is reckoned to be five times as long as that of an iron rail, or, according to United States engineers, in all about forty years.

Value of Land at Stoke Newington.—Nearly five acres of freehold land, with a frontage to the Green-lane, and an approach from Abdon-road, were brought to the hammer in one lot by Messrs. Debenham, Tewson, & Farmer, and after a spirited competition the property was knocked down at 7,550l., or upwards of 1,500l. per acre.

Opening of a New Cotton Mill at Over.

The opening of a new cotton-mill at Over has been signalled by public rejoicings there. Like most mills, it is parallelogrammic in form, brick built, and covers six times the space of the old mill. It is six stories high, the large rooms being 105 ft. by 115 ft., and the others 60 ft. by 15 ft. The approach to the large rooms at the eastern end of the building, the one which will be used by the workpeople, is by a stone staircase in a projecting semicircular tower, which is about 71 ft. high, and rises some 4 ft. or 5 ft. above the six ridges of the slated roof. At the top of this tower is a cistern which supplies a lavatory on each landing, and would also be useful in case of fire. Besides the doors at the eastern ends of the rooms, there is a communication with the smaller rooms at the western end of the building, where there is also a stone staircase. The rooms are all well lighted, and for the purpose of ventilation the top row of panes of some of the windows form sashes which can be opened. Adjoining the main building are the engine-sheds, which will receive two pairs of engines of 120-horse power. Beyond these sheds is a circular chimney-stack, 19 ft. across the base, and rising to a height of 169 ft., with a cap at the top 14 ft. in diameter. The total cost of the building and machinery will exceed 100,000*l.*, and it is hoped that employment will be afforded to 600 persons. The building was planned by the proprietor, Mr. Haigh, and erected by a Stoke contractor.

Royal Italian Opera, Covent Garden.

The new opera, "Esmeralda," has not been received by the musical press so warmly as it deserved to be, and the result is some little carelessness about it out of doors. The public are at times very unreasonable: they cry out for novelty, and when it is given neglect it. Signor Campana is not a Rossini or a Meyerbeer, but he has composed a very good and agreeable opera, including many charming things, and, set forth as it is by four such singers as Mdlle. Patti, Mdlle. Scalchi, M. Naudin, and Signor Graziani, the result is unexceptionable. The quartet in the first act, the air "Son galante e capitano," sung by Naudin, and "E ver Son Zingara," and "Visse al Mondo un Capitano," both sung by Patti, to mention no others, lift up the house to enthusiasm every night it is played. Mdlle. Patti was perhaps never heard to greater advantage. Some excellent scenery has been painted for the opera, which we have no hesitation in calling a genuine success.

The Sanitary Condition of Wigan: Government Complaint.

On Thursday, at a special meeting of the Wigan Public Health Committee, a letter was read from the Medical Department of the Privy Council, in which a very severe censure was conveyed with regard to the manner in which the sanitary regulations of the town are conducted. The letter stated that it was evident to their lordships that very serious sanitary defects were frequent in the district of the Board, which had, with very grave results, neglected its duty in some very material points, and it was recommended, therefore, that in future there should be a regular and frequently recurring inspection of the houses and domestic offices throughout the town, efficient and peremptory action against every nuisance that is discovered, the proper removal of excrementitious matter, and the appointment of a medical officer. After some discussion, the Board resolved to appoint a medical officer at 50*l.* per year.

Rochester Castle and Grounds.—It is understood that the ruins of Rochester Castle and the adjacent extensive grounds have been let to the corporation of that city, on a long lease, at a rental of 250*l.* per annum. The castle grounds will be immediately converted into a public park for the use of the inhabitants of the city, who have subscribed a considerable sum towards the preliminary expenses. It is to be hoped that nothing will be done to lessen the archaeological value of the castle.

Sheffield Architectural and Archaeological Society.—A small party of the members of this society had, on Tuesday, a very delightful excursion to Stow and Yorksey, in Lincolnshire. At the former place the president read a paper on the history and architectural features of the venerable church, and the party afterwards adjourned, by invitation, to the vicarage, where they were most kindly and hospitably entertained by the vicar and his family.

Society for Improving the Position of the Labouring Classes.

The annual meeting of the members of this society was held at Willis's Rooms, under the presidency of the Earl of Shaftesbury. The report stated that the house for single men in George-street, Bloomsbury, comprised an average of eighty-five inmates. The Streatham-street, Bloomsbury, house for families, contained an average population of 222. The model lodgings in Portpool-lane, Gray's-inn-road; the Hatton-garden house for single men; the renovated lodging-house, Charles-street, Drury-lane; the renovated dwellings in Wildcourt, Drury-lane; and Tyndall's-buildings, Gray's-inn-road, had received an increased number of tenants. The total amount received from all sources in 1869 amounted to the sum of 5,937*l.* 6*s.* 10*d.*, and after providing for all items of expenditure there remained a balance of 697*l.* 18*s.* 10*d.* in hand. On the motion of the Rev. J. B. Owen, seconded by Canon Conway, the report was adopted.

Royal Academy.—On Tuesday night the annual conversations were held at the Royal Academy. From half-past nine to half-past eleven the arrivals were incessant, and, according to precedent, the guests were received by the president, Sir Francis Grant. On occasions of this kind an examination of the pictures does not seem to enter into the philosophy of the friends of the Academicians, but from the entire absence of overcrowding, every facility was at hand for those who preferred to form an exception to the general rule. A conversation on such an extensive scale would be incomplete without the attraction of music, and at frequent intervals throughout the evening a portion of the Grenadier Guards' band, under the conductorship of Mr. D. Godfrey, gave selections. Refreshments were served in the first suite of rooms, and the arrangements generally were admirable.

Bow-street Police-court.—Attention is very properly being called to the unsuitability of this building, in which the increasing business of the court is carried on, and which has been for years a subject for continual complaint. The only approach is a long narrow passage, about 6 ft. in width, and the complainants, witnesses, solicitors, and others attending on business have often to fight their way through a mob to get access to the magistrate. The only waiting-room for the public is a small apartment about 12 ft. square; and in this room prosecutors, defendants, witnesses, and professional men are expected to find accommodation. The necessity of a new court, with open yard for the prisoners' van, proper waiting-rooms, &c., was never more manifest than now, and, even on sanitary grounds, has become a public necessity.

The North Oxfordshire Archaeological.

This society met, on the 23rd ult., at Shipton, and proceeded by Swinbrooke and Aethall to Burford, where, after visiting the church and priory, bridge and old hostelry, they dined, numbering little less than twenty. Papers and discussions followed, closing a very successful meeting. Shipton-under-Wychwood (subtus Wychwood), on Domesday Shipton, in early times was a place of considerable consequence from its vicinity to Woodstock and Langley. In the latter (a chapelry to Shipton) at the time of the survey Edward Copps had a mural mansion, one of the twenty belonging to Earl Algar. The remains of what is called King John's Palace are yet traceable.

Saltire Almshouse Chapel.

A little chapel has recently been made out of one of the Almshouses, at Saltire, in which it is intended to hold religious services on week days for the old people. It is situate on the north-west corner of the square, and has been fitted by order of Sir Titus Salt, and will hold comfortably about seventy persons. The place has been formally opened for divine worship, and a tea given by Mrs. Titus Salt, to fifty-one of the old almshouse tenants, besides others, including the Rev. Mr. Cowan, Sir Titus Salt, bart., and Lady Salt.

The Site of the New Law Courts.—In reply to Mr. W. H. Smith, Mr. Ayrton, in the Commons, said, as far as he could judge, the excavations for the foundations of the New Law Courts would be made at such an early period that it would not be practicable to make a thoroughfare for foot passengers from Carey-street to the Strand, for the temporary use of the public.

Incombustible Wood.

—In the *Annales du Genl Civil*, Dr. Reuss gives the following directions for rendering wood difficult of combustion and preserving it underground:—The wood, unplanned, is to be placed for twenty-four hours in a liquid composed of one part of concentrated silicate of potassa and three of pure water. After being removed and dried for several days, the wood is again to be soaked in this liquid, and after being again dried, painted over with a mixture of one part of cement and four parts of the above liquid. When the first coat of this paint is dry, the painting is to be repeated twice. This paint mixture should only be made up in small quantities, as it rapidly becomes dry and hard. Wood thus treated becomes unflammable, and does not decay underground.

Opening of the New Synagogue at Rochester.

—The new synagogue, erected at the cost of Mr. Simon Magnus, and already spoken of in the *Builder*, has at length been consecrated and opened by the Rev. N. M. Adler, D.D., Ph.D., the Chief Rabbi of the United Jewish Congregations of Great Britain. The architecture is Byzantine, and the materials are Kentish Rag, with freestone dressings. Throughout the synagogue a free use has been made of carvings, the objects delineated being fruit and flowers. The whole of the windows are of stained glass, and the floor is of Minton's tiles. Suspended from the sanctuary is a glass receptacle to contain "the Light of Memorial." The receptacle is a gift from Mr. Defries, in memory of his deceased wife, who was a daughter of Mr. Magnus.

Escape from Fire.

—It is said that when a stable is on fire there is only one way of inducing horses to make their escape, and that is by throwing something over their eyes to blindfold them, when they can be led out with the greatest ease, just after they may have resisted every attempt to compel them to go. With many human beings, we dare say, in the excitement and terror of fire it is much the same case. Mr. E. Steane, of Barking, proposes—not exactly to blindfold them, but—to send them down from windows in a case or bag with an apron over the window-opening, the case being drawn to an easy angle below. His apparatus has a rope inside to aid the descent, and grapnels above and below wherewith to fix the apparatus.

Drain Ventilation in Bradford.

—The Corporation of Bradford are about to make trial of a system of ventilating drains. The manner in which the ventilation is to be effected is by an 18-in. jointed metal pipe, the bottom end of which is inserted in the drain. The pipe is then carried up into the air to a great elevation, either by means of a shaft specially built for the purpose, or by fixing the pipe to the side of some building. It thus acts as a funnel by means of which the noxious gases and vapours generated in the sewer beneath are carried far up into the air and there escape, instead of rising from all the gratings and crevices above the drain.

A Trade Dinner.

—The good old style of "mutual interests" with the employed and the employer, was pleasantly illustrated at the annual dinner of the "Hands" of Messrs. Morant, Boyd, & Blanford, of Bond-street, at the Crown Inn, Broxbourne, Herts, on Saturday last. The "Hands" cordially united themselves with the "Hands," and formed a body/corporate, developing its energies in foot-races (handicaps) for silver cups, in which all ages took part; and at the very good dinner that followed, expressions of loyalty to the Queen were coupled with those of loyalty to one another's united interests in the continued success of the well-known and long-respected firm.

Metropolitan District Schools.

—In the last Report of the Poor Law Board, Mr. E. C. Tuffnell, Inspector of Schools, notices a considerable increase in the number of children at the separate or district schools in the metropolitan district, and attributes it chiefly to the disposition of the guardians to avail themselves more extensively of the disappearing influence of the large London schools. He says it is a very rare circumstance for any children brought up in them to fail to obtain an independent livelihood when launched into the world; indeed, the children trained in those establishments often succeed in disappaupering their relations. Not 4 per cent. fail to become independent work-people.

Free Libraries.—The family of the late Mr. William Ewart, M.P., have presented to each of the forty free libraries in the United Kingdom, a portrait of their father bearing the following inscription:—

"WILLIAM EWART.
A Member of the House of Commons for thirty-eight years, between 1826 and 1868. He was one of the foremost promoters of the great political and social reforms of his time, and among many other important measures he originated and carried the Act which gave free libraries to the people of Great Britain and Ireland."

The portraits are delicately finished in monochrome on a photographic basis, and recall agreeably the presence of the deceased gentleman. They are by Mr. John Watkins, of Parliament-street, being replicas of one from life taken by him in 1859.

A Single-rail Tramway.—Mr. W. J. Addis, a civil engineer of Tanna, in the Bombay Presidency, has patented an invention for a single-rail tramway, and cart to work upon it, which, it is said, can be laid down—including four carts capable of carrying 3 tons each—at a cost of about 5,000 rupees per mile. There are already two short tramways in operation, as feeders to the Great Indian Peninsula Railway. Two bullocks are said to be able on this line to draw from four to six times the load that they could do on an ordinary road, and with less labour and at a better pace. The prospectus of a company to make a line 109 miles in length, from Carwar to Hoobles, has been issued at Bombay.

Protection to Inventors.—A short Bill has just been introduced into the House of Commons in the interest of inventors. It is believed that many working men are discouraged from exhibiting their inventions at international exhibitions by their liability to piracy; and to provide for this a Bill has been introduced for the protection of any new invention which may hereafter be exhibited at any international exhibition which may take place this year, or at any international exhibition which the Board of Trade may, upon the application of any persons desirous of holding such exhibition, certify to be, in their judgment, calculated to promote British art or industry, and to prove beneficial to her Majesty's subjects.

Floating Sunken Vessels.—Messrs. Bewley, of Dublin, according to *Saunders's News-letter*, have recently perfected an invention which may be of advantage to seaport towns and the shipping interest. Balloons are attached by divers to a sunken vessel. These balloons are composed of strong vulcanised india-rubber. At the same time tanks are lowered, in which there are fillings of zinc and sulphuric acid; and by liberating a valve the zinc fillings fall down into the acid, and the hydrogen produced inflates the balloons, with which, of course, the tanks must be connected, and the vessel rises to the surface. Several large ships, it is said, have already been lifted by this means.

Birmingham Architectural Society.—The council of the Birmingham Architectural Society have invited pupils and assistants, under twenty-five years of age, in the offices of members of the society, to send in sketches and drawings of interesting buildings, and other architectural subjects, for which they will award premiums, viz., five guineas for the best, three guineas for the second best, and two guineas for the third best set of drawings, the merits of which will be determined by the council of the society. The subjects for sketching are portions of Aston Hall, and the Collegiate Church of Wolverhampton; the selection of which portions is left to the judgment of the student.

The Industrial Art Museum at Birmingham.—The movement begun on Monday, to provide a Museum of Industrial Art in Birmingham, under the care of the corporation, is making very satisfactory progress. We (*Birmingham Post*) have already announced two donations of 100l. each, for special purposes, and we have now the pleasure of stating that Messrs. Elkington & Co. have most liberally given 100l. to the general fund. Several other donations have been forwarded to the secretaries, Mr. Mullins and Mr. Smith.

St. Paul's Cathedral.—A correspondent proposes that a part of the decoration of St. Paul's, such as a window or carvings, should take the shape of a memorial to the late Dean Milman, and thinks many would subscribe to that who might not care to subscribe for the building merely.

The Proposed New Promenade, Hull.—A liberal offer has been received from Mr. Strickland Constable, the owner of a considerable portion of the land lying between the Anlaby and Heale roads, and which will be required for the purpose of making the intended promenade between the Heale-road and Springbank, offering to give the land required of him, and 1,500l. in addition, on condition that the Board of Health make the road, and complete a portion of it, within twelve months.

The Trades Movement in France.—Many of the trades in France are now again suffering from the strikes of the workmen: carpenters, ironfounders, and workers in metals generally all over the country are asking for higher wages. The men say that the increased cost of living and lodging compels these demands. There is truth in this assertion; but French workmen have got into a bad habit (their own countrymen say) of wasting two days of the week in idleness.

Buildings in Redruth.—The building trade in Redruth has not been so brisk for years past as it is at present. A large workshop is in course of erection for the Messrs. Clarke & Co., and a shop at the east end for Mr. Anthony Luke. The Messrs. Tronnoen's shop is now rapidly approaching completion. The tender of Mr. Thomas Jenkin, of Devonport, for enlargement to Mr. Lanyon's house, has been accepted at 895l. The whole of the works are being carried out from the designs and under the superintendence of Mr. James Hicks, of Redruth, architect.

Stoke Newington Green.—The Parks and Open Spaces Committee of the Metropolitan Board of Works have under consideration the improvement of this green. There are many literary and historical associations connected with the place. The house in which the late Samuel Rogers, author of the "Pleasures of Memory," was born is still in existence there. It is in contemplation to erect by subscription a statue of De Foë, who was educated and afterwards resided at Newington-green.

Steam Road Roller.—At the exhibition of machinery, held last week at the large town of Lille, Messrs. Aveling & Porter were awarded the large gold medal for their 15-ton steam road roller.

Dulwich College.—The roofs of the new buildings are covered with patent tiles, supplied and laid by the Broomhall Tile Company, glass tiles being inserted where light is required.

TENDERS.

For alterations to Yorkshire Grey Tavern, Piccadilly, for Mr. Joseph Henderson, Messrs. Bird & Walters, architects. Quantities supplied:—

Williams & Son	2,579 0 0
Brown & Robinson	1,772 11 0
McClachlan	652 0 0
Watson Brothers	540 0 0
Sprague	437 0 0
Saunders (accepted)	485 0 0

For rebuilding No. 343, Oxford-street, for Major Gossett. Mr. Jennings, architect. Quantities supplied:—

Fish	41,089 0 0
Woodrough	1,826 0 0
Watson Brothers	1,594 0 0
I'Anson	1,578 0 0
Longmire & Burge	1,559 0 0
Harding & Roberts	1,519 0 0
Cook & Green	1,431 0 0

For private improvement works, at Much Woolton, Lancashire. Messrs. Reade & Goodison, civil engineers. Quantities supplied:—

Morrison	21,849 13 3
Jones & Doyle	7,772 11 0
Sewall	1,534 18 0
Lee	1,497 10 0
Hardacre	1,432 12 3
Standing & Luttler	1,410 9 8
Fawkes & Maude	1,321 18 2
Radcliffe	1,225 9 0
Mitchell	1,221 17 8
Hartley & Jackson (accepted)	1,129 1 1

For building addition to St. Paul's Schools, Broke-road, Dalston, for the Rev. W. Stone, M.A. Mr. Wm. Mundy, architect:—

Conger	2,449 0 0
Easton & Chapman	447 0 0
King & Sons	445 0 0
Blackmore and Morley	415 0 0
Brown & Sons	390 0 0

For rebuilding premises, Tooley-street, Southwark, for Messrs. Brook & Roberts, Mr. V. J. Grove, architect:—

Keble	22,758 5 0
Greenwood	2,680 0 0
Little	2,639 0 0
Cooke & Greene	2,473 0 0
Rent	2,387 0 0

For drainage works at Sawbridgeworth, for Messrs. Russ & Minns:—

Killingback	2,656 0 0
Carter	491 0 0
Morton	460 10 0
Swinford	438 10 0
Wybush	450 0 0
Harris	423 0 0
Cole	426 14 0
Pizzey	426 6 3
Jackson	425 0 0
Stevens	450 0 0
Brown	389 0 0
Woodcock	386 0 0
Glasscock	385 0 0
Potter	385 0 0
Young	375 0 0
Elcoud	372 0 0
Bugbird	369 10 0
Goodair	348 10 0
Prior (accepted)	319 10 0

For the erection of a Corn Exchange and Vegetable Market for the borough of Doncaster. Mr. William Watkins, architect. Quantities supplied by Mr. B. S. Brundell:—

Builder's Work.—Contract A.	
Simpson & Malone	216,927 0 0
Henshaw	16,790 0 0
Stephenson & Western	16,720 0 0
Booth, Illingworth, & Sons	16,200 0 0
Paylor & Fitts	15,416 0 0
Whiteley	14,713 12 4
J. & W. Beaman	13,977 0 0
Neill	13,800 0 0
Maywood	13,738 0 0
Dennett	13,658 0 0
Kirk	13,655 0 0
Butler	13,550 0 0
Kirk & Parry	13,540 0 0
Nicholson & Son	13,500 0 0
S. & W. Pattison	13,500 0 0
Stevens	13,380 0 0
Bellamy	13,284 0 0
Barry	13,250 0 0
Thornton	12,958 0 0
Pearson & Son	12,910 0 0
T. & C. Anelay	12,678 0 0
Keswick	12,550 0 0
Warburton Bros.	11,653 0 0
T. & E. Asher	11,632 0 0
Waring Brothers	11,582 0 0
Athorn (accepted)	11,172 0 0
Weatherley & Myner	11,055 0 0

Smith and Ironfounder's Work.—Contract B.

Westwood & Bailey	43,329 3 0
Butler & Fitts	3,876 0 0
Harrison	2,834 0 0
Kirk	2,720 0 0
Tildersley	2,696 0 0
Haywood	2,687 0 0
Kirk & Parry	2,674 0 0
S. & W. Pattison	2,670 0 0
Powell	2,633 0 0
Cliff & Co.	2,630 0 0
Pearson & Son	2,590 0 0
Crosey	2,583 19 0
Newton, Chambers, & Co.	2,500 0 0
Nelson & Son	2,400 0 0
Woulter	2,360 0 0
Whiteley	2,360 0 0
Handyside & Co.	2,374 0 0
Hill & Smith	2,356 19 7
Ratcliffe & Nusscher	2,355 0 0
Jukes, Coulson, Stokes, & Co.	2,288 0 0
Niell	2,130 0 0
R. & J. Rankin (accepted)	2,000 0 0
Cornell	1,930 0 0

For fitting up a hippodrome, in Argyll-street, Regent-street, for Mr. F. Hellewell, Messrs. Elliott, Cree, & Bernard, architects. Quantities supplied by Mr. Bagg:—

Winterton	2,790 0 0
Richards	2,790 0 0
Conder	2,714 0 0
Sharphington & Cole	2,655 0 0
Reading	2,616 0 0
Lewis	2,600 0 0
Rudkin	2,555 0 0
Garrud	2,459 0 0
Jackson & Shaw	2,410 0 0
Kulby	2,375 0 0
Shurmer	2,068 0 0
Blease	1,787 7 0

For shop and house, adjoining Camden-road Station, North London Railway, for Mr. J. R. Bonny. Mr. E. H. Horne, architect:—

Manley & Rogers	21,587 0 0
Mansfield, Price, & Co.	1,580 0 0
Wheeler	1,450 0 0
Wall, Kedell, & Wainman	1,440 0 0
Scribner & White	1,398 0 0
Sewell & Sons	1,393 0 0
Wicks, Bangs, & Co.	1,387 0 0

For Child's Hill Chapel. Mr. Wm. Allen Dixon, architect:—

Mann	21,430 0 0
Brown & Robinson	1,236 0 0
Eaton & Chapman	1,234 0 0
Higgs	1,234 0 0
Masley & Rogers	1,226 0 0
Wicks, Bangs, & Co.	1,187 0 0

For the erection of a building at the corner of Swinburn-lane, Cannon-street, E.C., for the Estate Company, Limited. Mr. E. A. Gruning, architect. Quantities supplied by Messrs. W. R. Gritten & Son:—

Asby & Sons	27,928 0 0
Holland & Hannen	7,897 0 0
Trellone & Sons	7,983 0 0
Hill, Kedell, & Waidman	7,890 0 0
Brace (accepted)	7,453 0 0

For a pair of semi-detached cottages, at Taston, Oxford, for the Hon. Miss Dillon. Mr. J. B. Spencer, architect:—

Honour & Castle (accepted)	2,407 0 0
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The Builder.

VOL. XXVIII.—No. 1431.

Lands that want Hands.



HE echo within the walls of the Westminster Palace to that loud and portentous voice, which is daily becoming more and more audible throughout the country, on the great question of

industrial emigration, has, as yet, been faint and uncertain. No speaker has risen to the true level of the subject—not one has brought before the country anything approaching an exhaustive and well-ordered statement of facts; not one, in fine, has succeeded in dealing with the subject in the tone of an educated and patriotic statesman.

And yet the question is one that presses most forcibly for solution. It is one not to be turned, or evaded, or tided over, or run away from, but to be definitely fathomed and righteously dealt with. It is discussed with a range of opinion that is singularly wide. On the one hand, a claim is urged, in language which despair makes eloquent, by or on behalf of men who are strong in a passionate sense of injustice and of suffering, and to whom the stern logic of hunger supplies an unanswerable argument. On the other hand, it is met, or rather not met, by the feeblest doctrinaire maxims, delivered in the most cant and pedantic tone. The claimants are told that it is not to be expected that the money of the community is to be laid out on those who do no service to the community. They are told this by voices which will, in the next breath, vote sums of no small amount for gaols and for poor-houses, and in the midst of an assembly that is rightly about to vote some millions sterling per annum for the primary education of those who are diverted from their wonted bondage of earning a few pence for their parents—and thus for the community—for the expensive process of being taught? Between the two extremes of claiming something and of refusing everything, there must be that *via media* which is usually the safest path of the statesman.

The subject is one of especial interest to our readers. We fear that a large number of those who now seek to leave our shores are left destitute, or nearly so, by the slackening of employment in all trades connected with that of the builder. The chief sufferers, no doubt, are those accustomed to the various branches of naval construction; the closing of the private yards on the Thames (for which we fear that an unwise application of the spirit of combination has to a great extent to answer), being complicated and intensified by an ill-timed winter thinning of the Government artificers, which many do not hesitate to pronounce to be unjust as well as inhuman. Certainly the *prima facie* case for investigation is very strong.

It is impossible to distinguish the tones of reason amid such a din as surges up when the phrase industrial emigration is mentioned, without asking the question,—What is the relation between those who now demand this aid, and the remainder of the community? Does a man cease to be a citizen when he becomes penniless? or does penury give him a claim on those less poor

than himself which he had not before he was a pauper? Is it right—we know it is legal—to compel a man to become a criminal before the law will take cognizance of his wants?

Abstract, theoretic, metaphysical, reasoning on this subject for the most part has the fatal infirmity of want of a basis. But a plain, practical man can glance at our history for the last eight centuries; and must so glance in order to understand the England of to-day. Since the wars of the Roses, and the astute policy of Henry VII. (who did in England much of the work executed in France by Louis XI.), broke the power of the great nobles, and ruined the symmetry of the feudal system, the power which the sovereign once held has gradually been passing into the hands of the people. All over Europe the tendency of change is acting in the same direction. In the process of these changes, more or less violent, or more or less gradual, as they have been in different countries, the relation borne by the citizen to the State has come to be regarded in a varying light. Originally it was held to be a religious duty to honour and obey the king. The phrase was coupled, by a very high authority, with the fear of God. As the ancient functions of royalty became merged, in general opinion, in the duties of the executive magistracy, the idea of conformity to law replaced the earlier idea of obedient royalty. As power sinks or drifts into the hands of a single chamber—first of representatives, then of delegates,—the idea of a moral obedience to law becomes lowered to that of temporary submission to the votes of the majority. And, as the majority will always consist of the less educated, the less moderate, and the persons least endowed with true governing qualities, when revolution has proceeded thus far, it is likely to advance more rapidly. The minority resist,—if successfully, it is reform,—if unsuccessfully, it is rebellion. The politics of the states visited by Aristotle, two thousand years ago, are reproduced under our eyes to-day.

Now, when men are in a state in which innovation on law or on custom, has become a question of counting heads, the relations of the unit to the man are relaxed. Although history knows of no such thing as a "social compact," the loosening of the old bonds of society may proceed till it induces each man to look at his citizenship somewhat under that light. Mutual benefit, in that case, has become the sole bond between the individual and the State. The first gives up, or waives, the exercise of certain natural and instinctive rights, on the condition that the second protects him in their enjoyment. Thus we have made it illegal to carry arms, to bear which once was the birthright of the noble and the free. We have given up the right of private war, because the armed hand of society can protect our property, our lives, and our families, more surely and more to the general advantage than each of us could individually do, if, as was the case previously, the duty devolved on ourselves.

When man finds himself outside of this tacit and equitable social compact, he becomes a member of what are called the dangerous classes. He passes into a state of warfare against society. His hand is against every man's pocket which it can reach, and the armed hand of society,—the policeman,—is against him.

The number of the dangerous classes in England, and in other parts of Europe, although small as compared with that of the social classes, is yet sufficiently large to be menacing. The most anxious care of the most provident statesmen is demanded by the necessity, not only of guarding against the inroads, but of checking the increase, of the members of the dangerous classes.

These may be divided into the actively and the passively dangerous. The first are those who make the profession of crime, who openly live by vice and wrong; the latter are those

who are simply paupers,—consumers of food,—and not exercising even a villainous industry.

There can, we fear, be but little doubt that our present Poor-law system, in seeking to effect economy by making relief dependent on what the recipients consider degradation, systematically increases the number of the dangerous classes. It is much to save the money of the community; it is much to reduce the annual budget of the State, or to lower the rates of a district; but if this economy be effected at the cost of pauperising a larger proportion of the poor, it is a bitter and ruinous parsimony for the country. It is to be feared that this fact is too much lost sight of.

Now, in the actual state of the case in many parts of England, but more especially in the eastern part of London, the great guerrilla army of the dangerous classes has been suddenly, or at least rapidly, augmented by a large body of men who are by no means anxious to march under that ominous flag. Workmen, skilled and strong—with their wives and families depending on their exertions—find their work cut from under them. What shall these men do? Will you force the craftsman into the poor-house, and console him with the statement that it is quite according to the laws of political necessity that he should go there? That, in fact, it is an exceptional departure from true principle that there should be any poor-house at all, as the proper thing, when the supply of workmen exceeds the demand for workmen, is for the surplus workmen to starve; because, by that process, the equilibrium is most rapidly and most surely restored.

Now, if we once depart from this grand principle (which, disguise it as we like, is in point of fact the consistent doctrine and logical outcome of a certain school), if we once admit that motives of humanity to others, or, it may be, of fear for ourselves, can break down the stern law of "starvation to the idle," however they become idle, it evidently becomes a matter, we will not say of policy, but of common sense, to apply such relief as we do afford in the most effective way. In-door and out-door relief, partial aid or total support,—put it as we will,—all must come under that master principle. We have resolved not so sternly to refuse to be our brother's keeper as to let him starve under our eyes, while we have enough and to spare. It would be the part of fools to hesitate as to the propriety of making what we do give go as far as it can be made to go.

This, then, is the logical nature of the position taken up by those who are now calling for State aid to industrial emigration. They can point out that any permanent increase to the entirely non-productive classes is a grave peril to the State. They may assert that the nation neither can nor will allow the simple remedy of the politico-economical purist—actual starvation—to take effect. They say that it is a question of how best to apply the aid that we feel ourselves forced to render, in one form or in another. And they conclude that this aid can be most cheaply, and most advantageously, rendered, by assisting in industrial emigration.

If we have carried our readers thus far along with our statement, they will see that the point at which we have arrived is this,—how far is emigration the best remedy for a disastrous state of things, as to the main facts of which there is no question? But, even supposing this question, which is not a simple one, to be decided in the affirmative, the further question as to the form in which such aid should be supplied by society still remains open to discussion.

On the first blush of the matter, the simple statement that on the one hand we see industrious men driven to the verge of starvation for want of work, and on the other hand we see broad tracts of country desert for lack of men to

till the ground, leads to the conclusion that to apply the arms of the men to the acres of the waste is a self-evident duty. But yet we have much to clear up before the course is free from difficulty.

We have to regard three parts of any scheme of emigration. We have to consider its effect on the emigrants themselves, on the country to which they are sent, and on the country from which they are transported.

With regard to the third of these points, which mainly affects each of us who stay behind, we must remember that a full-grown man, capable of exercising any craft, or even of felling the forest, or ploughing the ground, is an expensive and a valuable product. So much is this the case that, when the price of labour was in the market in a more tangible form than is now the case,—when a man could be sold like a horse in certain parts of the world, a considerable money value was attached to the purchase. It is true that coloured labour, as it was called, was chiefly in demand for climates in which white labour fails, but this does not alter the principle. We should be far from overrating the English labourer, if we consider that his production, at the age of manhood, has cost the country from 150*l.* to 250*l.*, and that his power of production is, at a minimum equal to an earning of from 30*l.* to 50*l.* per annum. That is the article we are about to get rid of, because we do not know what to do with it.

Now, if it be undeniable that we have no home use, present or proximate, for this valuable article, it may be held to be evident that it is good policy to remove it to a locality where it may acquire its natural value. By so doing we shall serve, if not directly our own pecuniary interest, at all events the interests of mankind. Nor have men ever been blind to the fact that colonists, well planted and well directed, may become most valuable aids to the mother country.

Thus comes the consideration that, by finding the means of exportation, we can effect a positive financial saving. The cost of permanently getting rid of our *embarras des richesses* will be that of four, five, or six years' maintenance. But in the one case the money is paid at once, and the expenditure is at an end; in the other it is paid by instalments, but the instalments are interminable. From the ratepayers' point of view, therefore, emigration means economy.

From what we may call the police standpoint, the aspect of the affair is similar. The more we reduce the dangerous and non-productive classes, the less difficulty shall we encounter in dealing with the residue. If we allow their increase to a certain point, the result may become an evil hard to manage. To allow the increase of this menacing army by a body of able recruits, burning with a sense of injustice received from society at large, would be a positive danger to the rest of the community, whether that sense of injustice were well or ill founded.

Thus for those who go, and for those who stay, the plan of emigration has its advantages. There remains what has been called the Colonial question. And this is intimately connected with a matter which requires careful attention. It is that of the organisation of emigration.

Emigration, as we are accustomed to regard it, means the engagement, by certain agents, of a certain amount of shipping accommodation,—the collecting on board these vessels of as many passengers, of all sorts, as can pay their passage money or have it paid for them, and the disgorging of this living freight at some selected port abroad.

Now, so long as we conduct emigration in this way it is quite natural that our own colonies, or any other State, should strenuously object to receiving what has been termed our moral sewage. To pour an unassorted stream of emigrants into the turbulent water of a rising settlement, is simply to endeavour to shift our own burden upon their shoulders. The selected place of debarkation would have full justification for resisting such an infliction by all the means in its power.

Another interest is lost sight of in this rude and summary process. It is that of the emigrants themselves. Such a mode of assisting emigration means merely getting rid of our paupers. It is an euphemism for transportation for life as the penalty of poverty. Turned adrift in another hemisphere, the poor and unprovided emigrant is no less helpless than he was at home. Earth does not yield her fruit untill. Harvests require seed-time, and growth-time;—and

how shall the artisan, sent for the first time from the bosom of artificial city life to behold the face of nature in her wildness, find food and shelter while he is learning how to procure both by his own honest and patient toil?

The objections, then, of our colonies, or of other countries, are not only just, but they are exactly accordant with the wants of the emigrants themselves. The interest of both point in the same direction. To transport the population wholesale may—we do not say would—be a benefit to those who are left behind. It could only be an evil to those who are sent out, as well as to those amongst whom they are sent to dwell.

These difficulties disappear before the scheme of an organised emigration. It is too much our habit to trust to the chances of the moment, or to the energy of our exertions, and to lose sight of the advantages to be commanded by patient forethought. This unreadiness is a special peculiarity of the English character. Those of us who have had the experience of the command of large bodies of workmen of different nations, are aware of the helplessness usually evinced by an Englishman under circumstances in which a Frenchman will make himself rapidly at home. Put him in the groove, and the English workman will hold his own, and will distance most of his competitors,—but he is slow to make a new groove for himself.

To do this, however, is necessary for the success of emigration. At the present time the main requisites of a new colony can be plainly and precisely foreseen. The site should be not only purchased, but mapped, and the lot of each settler appropriated, as a preliminary step. Trades and occupations should be proportioned; those who are to exercise them being selected according to proper considerations. Not only should the *cadre* of the colony be thus properly framed, but a deed of settlement should be drawn up, and signed by each emigrant; and the functions of the magistracy and the police should be as carefully provided for as those of the doctor or the schoolmaster. Organised in this manner, a colony, from the time of the arrival of the emigrants at their location, would be a "going concern." As it is intended to be self-supporting, the commissariat must be properly organised, and the supply of bread-stuffs made adequate to the time that would elapse before the first harvest would be secured. Sheep, goats, kine, horses, fowls, pigs, if not taken with the emigrants, should be purchased and forwarded so as to be available on the arrival of the inhabitants at their new homes. Thus the work of inclosure, of building, and of tillage, might commence with order and with spirit on the morrow of the arrival; and instead of a helpless mass of bewildered fugitives, we should see an organised body of men fit to be the founders of a new state or city. The mother hive, in throwing off its swarms, must see that each is grouped round its selected queen-bee. Without this, as we all know, no honey is collected, and no comb will be formed.

In the organisation of a colony of this kind, private effort must take the lead. Every colonist must bring to the common stock a certain fixed proportion. Here is an admirable field for private charity. The smith, the carpenter, the bricklayer, who agrees to form part of the industrial body, and to whom lots *a*, *b*, and *c* are allotted, must each pay a fixed amount on execution of the deed which makes them proprietors. This much, as a pledge of respectability and of earnestness, the managers of the enterprise will have the right to expect. Among a people who spend so many hundreds of thousands in annual charity, this starting-point will not be looked for in vain. This attained, a basis will be formed on which to ask for aid from the local rates, or the ground of the permanent reduction that will be effected in their amount; and then, and hardly till then, will there be such a claim established on the central administration for further support and aid, especially as to matters readily within its competence (such as freight, communication, gift or purchase of land, scientific information, schools, books, and requisites, and the like), as it will prove unwise as well as ungracious to refuse.

That a well-ordered scheme, or series of schemes, of this nature would fail we do not believe. That public opinion would demand that the aid of the community (whether by local or by imperial aid, or by both combined), should be given to the formation of infant colonies on this basis, we think a mere question of time. That waste labour thus applied to waste lands

would fructify into a golden harvest we have no room to doubt.

There remains the question of the locality. Leaving aside for a moment the consideration of those wide geographical ranges amid which we have to choose—the Australian continent and islands; Southern Africa; Hillside India; Canada, that is asking for emigrants,—there is yet another suggestion to make. In the United Kingdom only 46,000,000 acres out of the entire area of 77,000,000 acres are at this moment under cultivation. Why not save the expense of flight, and start a normal home colony or two? We have asked the question before. Why not make the experiment of an organised settlement on a few square miles out of those 89,000 acres of the new forest, of which we have heard so much lately? There is no untried climate to dread, no savage beast to fear, while the soil is principally sandy. We have the very finest opportunity for the application of sewage; and fertilisation would keep pace with increase of population. Without prejudice to other efforts, we might readily and rapidly establish one or two normal home colonies. Charity, too, might in this case be tempted by the offer of security—that is to say, the advances asked from private sources would take the form of philanthropic loan (with a good prospect of return), rather than of charitable gift. Who will be the first to start a home colony on the *Builder's* plan, and to show that it is not in poisoning our rivers by the rich nitrates contained in our sewage, that we show our most lamentable blindness, and our most irretrievable waste of the sources of national wealth? Were the matter taken in hand at once, Victoria colony, or Alexandria colony, on the Hampshire forest land, might garner good harvests, and develop remunerative industry by the autumn of 1871.

PROVINCIAL IMPRESSIONS OF TOWN STRUCTURES.

BURNS has hinted, in his well-known verses on an unmentionable subject, how desirable it may be on occasions "to see ourselves as others see us." Perhaps this principle, backed by the recommendation of the Scottish bard, may be accepted as an excuse for intruding upon metropolitan readers some few reflections which suggest themselves to a provincial architectural mind, after surveying rapidly what has been done, and is doing, in the modern Babylon—"going round about, and telling the towers thereof."

With regard to its great places of work, not long since brought to its conclusion, the Holborn Valley improvements, it may be said that there is little room for anything but praise, so far at least as the Holborn line of route is concerned, unless we add something like astonishment that so great a piece of work, involving such breaking up and temporary derangement of valuable property, should have been attempted, and satisfactorily got through at all. The work, in connexion with the railway, is indeed not very satisfactory, architecturally; and the bridge crossing the bottom of Ludgate-hill, though, perhaps, one of the best-abused structures of the day, has certainly received no more abuse than its exceeding and superabundant ugliness entitles it to. But in the bridge which carries the raised and reassociated "Holborn," no longer "Holborn-hill"—across Farringdon-street, the engineer, if guilty of leaving room and verge enough for some slight practical failure, has done much to redeem the credit of his profession with regard to the artistic appearance of the work, and the Farringdon-street Bridge, from below, at all events, is a structure which the architectural eye may rest upon with pleasure. As to the bronze statues, and the lions or griffins playing at ball on the parapet, one may pass over these as harmless and playful excrescences, which amuse one for the moment. But the bridge, with its cluster of granite piers of a very effective plan, and the noble roadway above, constitutes an achievement of which London may be proud,—a fine play, and very notably discharged. Coming into the "City" *par excellence*, one of the chief wonders of a country architect is where all the Gothic buildings have got to. We see continually prints of "new warehouses in the City," and other such structures, designed in startling champleve Gothic of the most approved type, but none of these appear to the casual stroller through the regions of Cornhill and Leadenhall-street. Are they all in back

alleys, known only to the initiated? At all events, Classic, "or something like it," still reigns supreme in the chief and most historical thoroughfares of the City. Here, as in some provincial towns, the increasing tendency to expend a portion of capital in architectural effect (to the street, at all events,—they may "build the back part shabby") is evinced, in the remarkable contrast between the showy expensive appearance of some of the newer buildings, and the meagre impotence of the average linings of the streets, brick screens with holes in them gazed nearly up to the front, leaving scarcely an apology for a "reveal." Among these are here and there to be seen some of those specimens of projecting upper stories, remnants of an attempt at the picturesque, or a desire to make the most of the ground, which Metropolitan Building Acts ruthlessly discontinue. Banks appear to be the order of the day among the newer and most showy structures; let us hope these stand as outward and visible signs of actual wealth and prosperity, and not as mere counters to catch the eye. While mentioning this class of structure, it is difficult for a stranger to avoid a word of recognition for the general truthfulness of design displayed in the aspect of the "old lady in Threadneedle-street." We have arrived at some better perceptions, since Sir John Soane's time, as to the style of detail suited to a northern climate and to London smoke; but have we made any advance upon this building as to truthfulness and suitability of expression? Say what we will about its heaviness and squatness of appearance, the fact remains that the "Bank of England" is emphatically in its whole design a bank, pure and simple,—that and nothing else; and quite as successful in expression as "Newgate" has elsewhere been said to be. Nor will we speak otherwise than respectfully of the Exchange, the inscription over which, "The earth is the Lord's and the fulness thereof," so much scandalised a republican Frenchman, who, reading plural for singular, exclaimed, "How these English do flatter the aristocracy!" Among the new banks we can scarcely hesitate to single out for praise the "National and Provincial," in Bishopsgate-street, not long since engraved in the *Builder*. Novelty of treatment, without any touch of the grotesque or sensational, a happy and successful introduction of bas-relief of a somewhat higher class than architectural sculpture in general can claim to be, and a piquant and effective treatment of ornamental detail,—all combine to characterise this as a more than usually successful design. The manner in which the rustication of the plinth below each column is effected, so as to give something for the eye on a near approach, while securing the general effect of rustication at a distance, is commendable. Further up Bishopsgate-street, Crosby-chambers and Palmerston-chambers, side by side, are not bad specimens respectively of commonplace Gothic and Classic (or Italian) as applied to offices: anything more thoroughly uninteresting than the latter (which is, unfortunately, a very typical building of its class) could not well be imagined: rather than this let us have the comparatively ill-lighted Gothic building; but a compromise between the two is certainly possible. We may walk some way up Bishopsgate-street without seeing anything else to attract even an unaccustomed eye, unless it be the tower of St. Botolph's, not certainly one of the happiest of Wren's inspirations, the strange flabby floral decorations on which raise some speculation as to what, in the talked-of "restoration" of Wren's City churches, would possibly become of these excrescences under the hands of the modern restorer. Excision, it is to be feared, amputation, "without benefit of clergy," would be the only cure; at any rate, the sight of these stone roses frightens us back to the corner of Leadenhall-street, where, looking to the left, the long block of offices under one design, but with no visible distinguishing title, suggests some considerations as to "sky-line." Indeed, we are not here going into the discussion of the great question of gable *versus* cornice,—much may be said on both sides as to that, though, as a matter of practical convenience, we may surmise that the cornice would carry the day; but it should be observed that the effect of a long horizontal cornice, unquestionably fine in itself, is marred, if not nullified, when the building, cornice and all, follows a slight and irregular bend of the street. A horizontal cornice, to produce its effect, must be a straight line, not only "in altitude," but "in azimuth," or must follow

some distinct and recognisable mathematical curve, or a crippled unsatisfactory appearance in the skyline is the result; most of all when, as we noticed elsewhere, one portion of the front of a building is straight, and the rest curved on plan, and the same cornice is carried along the whole without the slightest break to mark the transition from straight line to curve. The display of polished granite in the front of the "Scottish Widows' Fund" building in Cornhill is something overpowering, and one scarcely knows whether to congratulate the "Scottish Widows" on having so much money to expend in granite, or to condole with them on this reckless waste of their capital; or is all this granite a present from some Peterhead firm, on the principle of "as me and as thee?" This sort of thing is at best a very vulgar source, if it can be called a source at all, of architectural effect. Another vulgarity which we may notice in new buildings up and down the City is the reckless employment of very ornate and exuberant foliated ornament, as, for instance, in the "British North American Bank," which is a flagrant specimen; here and elsewhere the deep hollows and under-cutting only serve as a receptacle for soot and dirt, which will soon choke them, besides that the foliage is in itself very deficient in refinement and artistic character. There is far too much of festoons and garlands and such things about. In the hotel which forms the front of the Cannon-street Station, Mr. E. Barry has hit something like the right mean between over-flatness and over-projection in ornamental detail, and the whole building in point of design is an improvement upon his Charing-cross Hotel, exhibiting more refinement and less of show and glitter. Opposite the Cannon-street Station, some "eligible offices to let," apparently quite new, show a style of decoration which may be a little too flat and deserve to be called tame, but which is at all events better suited to a London atmosphere than nine-tenths of the decorative ornament which one encounters during a walk through the City. Let those architects who are to have the task of giving architectural expression to the new "Queen Victoria-street" (a name which will certainly clash with "Victoria-street") consider well this point of ornamental detail, and endeavour to provide such ornament as will retain its effect when old and have something of refinement about it, whether new or old; they have a virgin field before them, a new street to be entirely lined on both sides, and here is an opportunity for enterprising and original men to strike out some new suggestions in ornament and design, especially if the buildings here are to be shops. In this latter case let them endeavor to persuade their clients to permit something like a solid foundation for the design in the shape of stone piers, a matter in which Messrs. Negretti & Zambra, in their new premises at the Farringdon-street crossing, have suggested a move in the right direction, though not so decisively as could be wished.

The opening of the new branch of the Metropolitan Railway along the Thames from the City to Kensington must be a source of gratification and convenience to dwellers on the banks of the now comparatively purified Father Thames. But the aspect of the new Blackfriars Bridge, or of the Embankment, is not at all a source of unmixed gratification to the architectural visitor. The bridge is a fine piece of work, no doubt, apparently very well carried out constructively, but is one of the oddest exhibitions of engineering aspirations in design that could well be seen. The immense heavy granite columns with their big capitals (a sort of crib from the "stumpy column" Gothic of the day), which adjoin each pier of the bridge, have a kind of imposing appearance at first sight; but all this changes to wonder at the waste of material and misapplication of design involved when it is discovered, after a moment's inspection, that these massive columns have absolutely nothing to do, terminating simply in a small projecting balcony at each side of the bridge, with a seat in it. If it is supposed that those heavy masses of material add to the stability of the bridge piers, then they should have been treated as buttresses, and not as columns; as it is they are worse than useless, for their design and proportion conveying no idea of their real size, they completely destroy the scale of the work. The columns, with their balconies over, we heard compared to a series of "fontes" applied to the sides of the bridge; and the whole feature has, in fact, just the proportion and appearance of the kind of design most

in vogue for church-fonts now-a-days. Then the iron balustrade of the bridge is another falsity, of a design totally unfitted for cast iron, and looking like a bad attempt to imitate wood-work. Nor is a walk down the Embankment more satisfactory to the æsthetic sense of the visitor. That this is practically one of the most successful works of modern engineering no one, probably, will be disposed to question; its very success in this respect, and the magnitude of the work and expenditure involved, increase our regrets that more has not been made of so grand an opportunity artistically. The commonplace and monotonous balustrade, the square blocks of hard masonry intercepting the line of the embankment here and there, and the ugly plinth stones at intervals unmounted by a rusty iron dowel prepared for the reception of we know not what possible failures in modern sculptural design, are enough to give one a melancholy feeling in walking this now far-famed promenade, a conviction that no opportunities for achieving architectural grandeur will ever occur in this country without being eventually thrown away or misused. Opposite the Westminster Palace, the new hospital, on the pavilion system, rises in a series of square blocks of building not picturesque in design, or, at least, in general effect, and forming, with their reflection in the river below and their numerous little erections (for ventilation?) on the roofs, a very pretty *tout ensemble*. How the details might stand a closer inspection deponent is unable to say. No one, in walking along the embankment from Waterloo-bridge towards Westminster, should omit to turn round and take note of the fine effect of architectural composition formed by the curved line of the embankment crossed by the bridge, and crowned, over the bridge, by the long perspective of Somerset House front; and those who travel by the new branch of the Metropolitan Railway will find it worth while to visit Blackfriars Station, and obtain a new view of St. Paul's dome and western cupolas, which, as seen from the railway platform, here rise into the air, almost undisturbed by the sight of any inferior structure, with a peculiar magnificence of aspect. What a strange contrast between this and the Westminster Clock-tower, with its gilding glittering in the sun; the old and the new "revivals!" Which will longest retain its hold on men's minds? Far be it from the writer to slight the Westminster Palace; the Victoria Tower is a notable monument for any architect to have left behind him; but will future generations gaze at this erection with the same feeling of entire satisfaction, the same uplifting of mind, which the sight of that noble composition of dome and cupolas never fails to stir in most of us, especially on revisiting it after a long absence? Of course, we speak now of the general design of St. Paul's, passing over mannerisms of detail. Perhaps we had better leave (in Sir Hugh Evans's phrase) "our ancestors that come after us" to settle the point. But one thing that always strikes us on revisiting the Westminster Palace is the want of breadth of wall surface; the whole is so much broken up into detail as sometimes to suggest to a profane mind the idea of an *écroulé*—something from which the smooth outer surface has been removed. The new external corridor or cloister added, under the direction of the present architect, is a good solid piece of work, not without some humour, too, in the carved decoration in the archivolt of the entrance archway; and a pleasant feature adjoining the Palace is the laying out of the open space at the bottom of Parliament-street, into grass-plots and flower-beds, which are protected, let us notice, by an iron railing of good design, in perfect keeping with the material. Might not other such spaces, here and there about London, be made available in the same way for flower-beds; a slight relief to eye and mind, amidst miles of brick and pavement?

One impression which a provincial architect is apt to feel, after taking note of what is going on in the metropolis, is that, though there are splendid opportunities open just now, there is a want of artistic or architectural purpose in making use of them. The engineers have got too much the upper hand, for one thing; their structures are the largest and most expensive of all, but will not hand down our name to posterity as an artistic generation. The architects seem too much divided in their aims,—too fully bent to do each what seems good in his own eyes, to enter upon any broad scheme of improving city aspects in rebuilding the altered thoroughfares. Otherwise

we should say, in carrying out this, strive rather for a general architectural effect than for showy elevations here and there, alternating with mere builders' work. Shall we ever have an artistic "Minister of Public Works" to act as a directing mind over the whole? As it is, it cannot be said that London, with all its vast opportunities, is doing very much to redeem us from the discredit of being probably the most unattractive of civilised nations.

SANITARY DISTRICTS.

THE frequent announcements of late that "a meeting of the Royal Sanitary Commission was held yesterday. Present—Right Hon. Sir C. B. Adderley, M.P., in the chair," with numerous other members of the Commission,* show that they are in great activity, and that we may expect a report from them soon. The report they have already issued, the first, contains no expression of their opinion or recommendation, but gives the evidence taken before them up to the date of issue. Whenever the Commission may feel themselves to be in a position to offer their opinion on the whole question, or on any part of it,—as, for instance, on the best way of dividing the country into sanitary districts,—the public will be much interested in whatever the Commission may report; and it may be useful, therefore, to see in anticipation upon what evidence their future report will be based, so as to be able to discuss it immediately, for the case is urgent.

One of the chief questions raised at the outset of the inquiry is how to divide the country into districts for sanitary purposes, so as to interfere as little as possible with existing arrangements and customs, and at the same time to make effective the legislation that will be hereafter founded on the inquiry now being made by the Commission.

The division of the country into counties, parishes, union districts, boroughs, cities, and towns, has been made from time to time with no uniformity of boundaries and on no general plan. The Commission, therefore, meet with this difficulty at the outset, and have to choose from amongst divisions whose boundaries are not coincident; they are,—

1. *Counties*, the boundaries of which are generally natural boundaries, such as the ridges of hills that shed the water in opposite directions, rivers, or other obvious landmarks.

2. *Parishes*, whose boundaries along the county margin are not everywhere coincident with the county boundary, but extend sometimes over the county boundary, and include a portion of the adjoining county. Parish boundaries have in many cases no obvious landmarks, such as water-courses or highways, but are so undefined as to require that the bounds should be traversed periodically by the parochial authorities in order that they may be maintained traditionally.

3. *Unions*, which are aggregates of parishes.

4. *Corporate towns*, the boundaries of which have been fixed by Act of Parliament, and which are not, in many cases, coincident with the parish boundaries. Sometimes the parish is larger than the municipal district within it; and sometimes the town, before it was incorporated, embraced several parishes, and when incorporated was made to include certain parishes in their entirety. The boundaries of other municipal districts, again, have been extended from their original positions so as to include portions of the same town that had grown around the old municipal district.

5. *Towns not incorporated*, whose boundaries have been established for sanitary purposes by special Act of Parliament, and placed under the authority of boards of improvement commissioners; and other towns whose boundaries have been established for sanitary purposes under one of the recent general Acts and placed under the authority of local boards. In most of these cases the boundary does not coincide with the parish or any other pre-existing boundary.

* The other members of the commission originally appointed were the Earl of Romney; the Earl of Ducie; the Right Hon. Lord Robert Montagu, M.P.; the Right Hon. Stephen Cave, M.P.; Sir Thomas Watson, bart., M.D., F.R.S.; Lieut.-Colonel Ewart, R.E.; Mr. John Robinson McElean, C.E., M.P.; Mr. John Tomlinson Hibbert, M.P.; Mr. Evan Mathew Richards, M.P.; Mr. George Clive; Mr. Francis Sharp Powell; Mr. Benjamin Shaw; Mr. James Paget, F.R.S.; Mr. Henry Wentworth Acland, M.D., F.R.S.; Mr. John Lambart; Mr. Francis Thomas Bircham; Mr. Samuel Whitbread, M.P.; Professor Christian, M.D., Pres. R.S.E.; Mr. William Stokes, M.D., F.R.S.; and the Right Hon. Russell Gurney, M.P., Q.C.; with Mr. W. H. Ewley, the secretary.

The boundaries of other divisions, for Parliamentary or ecclesiastical purposes, hundreds and dioceses, hardly affect the question of the sanitary division of the country; and it is from the three first-named divisions that the choice must be made, having regard to the existing interests of the fourth and the fifth.

Of the many witnesses examined by the commission, Mr. Simon, the medical officer of the Privy Council, and Dr. Ramsey, one of the members of the General Medical Council, are able, from their official positions, to form opinions on our present subject which deserve attention.

Mr. Simon recommends that the union districts formed under the Poor Law for destitution and registration purposes should be made the initial districts for sanitary purposes, presided over by the boards of guardians, who should be the authorities for all sanitary purposes, where special sanitary districts are not already formed within such unions. The guardians should not act *ex officio* as the sanitary authority, but be appointed for the double purpose of administering the Poor Law and superintending the laws of health. We strongly insist on this latter provision.

There should be no intermediate authority, Mr. Simon says, between the guardians as the local authority and the Minister of Health in London as the central authority. The Minister of Health may be, as it may be hereafter determined, either the Home Secretary or the Privy Council.

The Minister would appoint a chief of the department of health, who would have the assistance of inspectors, four, six, or eight in number, as may be found necessary, but Mr. Simon thinks the latter number would not be exceeded.

The local authority would appoint a resident medical officer—the present medical officers of the unions in places where a special sanitary district is not formed, or where, if formed, the local authority does not appoint a properly qualified medical officer of health. These resident medical officers of health and registration would collect from the registrars of the unions the statistics of mortality and disease, and remit them, properly classified and tabulated, to the central office, where they would be arranged, analysed quarterly, and the state of health of every community ascertained, and where epidemic disease appeared to exist one of the inspectors would be directed to proceed to the place and make an inquiry into the cause and report to the head office. He would, while making his inquiry, offer advice founded on his more extensive knowledge and experience, to the local authority and officers. The inspector would exercise his judgment on the case whether the cause was only of a temporary nature, such as the existence of a distinct nuisance, which might be removed, and which he would at once advise to be done, or he might report that the case required a more fundamental remedy, such as an engineer only could advise upon; whereupon the Minister of Health would direct an engineer to make an investigation of the nature of the case and advise the local authority what, in his opinion, would remedy the evil, which if done would stay further proceedings, but if not done within a certain fixed time would be formally represented in that respect to the Minister, who would then issue a final order that the work be done.

Mr. Simon would take the existing Nuisance Law and extend it to include the pollution of rivers, and the obstruction of rivers. In the Sanitary Act, 1866, certain exposures of persons with contagious diseases are prohibited, and cases like those should be brought within the meaning of the word nuisance, and so with many other things that are now dealt with by separate action and under various Acts of Parliament, they might be brought under the one head of Nuisance, and dealt with accordingly.

Dr. Ramsey says the main causes of sanitary mismanagement in country districts may all be referred to a few primary and fundamental deficiencies in organisation. First, the want of systematic inquiry and constant sanitary inspection, aided by complete statistical returns of sickness and mortality, and their causes, in every district. Secondly, the want of highly-qualified resident officers, in proper position, by whom sanitary inquiries and inspections should be made and recorded, and statistical returns verified and collected for local use. Thirdly, the want of a single order of competent local authorities, fortified by scientific advisers, and made respon-

sible for carrying into effect all necessary sanitary measures in districts of sufficient and suitable extent. Fourthly, the want of some clear and adequate definition of the qualifications, duties, powers, and relations of both local authorities and officers. With regard to the first-named deficiency, Dr. Ramsey submits that a national system of sanitary inquiry ought to be universal as regards localities, continuous and regular as to times, and comprehensive as to subjects. Its results ought also to be readily applicable to sanitary administration. There are at present no arrangements for sanitary inquiry in this country which are at the same time universal, continuous, and comprehensive. As to local reporters, few and scattered as they are, there is no security for their competency or their due independence.

Local registration of returns of vital statistics, full and complete, are indispensable. They are the very foundations of sanitary science and practice. The registrations now made by the medical officers of the union districts are incomplete, uncertain, and are not brought home to the authority and people of each district in a serviceable form.

Local sanitary legislation based upon these becomes open to question, if not inefficient in operation. In all but a very few populous districts, where there happens to be a superior officer of health or some active sanitary volunteer, there are no skilled persons empowered to examine, analyse, explain, and edit the returns, nor are the local authorities able generally to act upon the information rendered.

Dr. Ramsey thinks the vital statistics now registered by the registrars of the Poor-law Unions might be collected by Boards of Health or corporations, or whatever the local authority may be, and utilised; but this is rarely done, and, after all, these returns form only a part of the information required. However, the registrations cannot be analysed, still less can they be revised and corrected for local use, in the absence of officers empowered to collect and revise them. The labour of extracting the particulars relating to any group of population, not being a registration district, is immense. It is no one's duty to make the abstract, and no one can be expected to undertake it as an amateur. A special officer is therefore required to bring this information into a correct form to bear upon local administration. There is much more required to be ascertained than the general rate of mortality in towns or districts.

On the question of how registration districts should be formed—that is, with what boundaries, whether the parish should form the unit, and so aggregate a number of parishes to form the district, or whether district boundaries should coincide with county boundaries—Dr. Ramsey shows that 550 parishes in England extend into counties or hundreds. In forty-six unions, sixty parishes extend into two counties; that is to say, the old county boundaries divide this number of parishes, so that the result is, that the unions being formed without respect to the county boundaries, no fewer than 180 of the 620 unions extend into more than one county. Now, if the old historical counties, under county law and government, are to be taken as the basis of areas for sanitary administration, these unions or registration districts would have to be again divided for sanitary purposes, and on the whole Dr. Ramsey recommends that course. Wherever a registration district is divided by a county boundary, the vital and sanitary statistics of the two portions should be returned separate, and carried each to its own proper county.

GLASS-MAKING IN THE MIDLANDS.

THE manufacture of plate, crown, and sheet glass, in the Midland Counties, has for its principal centres the towns of Birmingham and Stourbridge. The leading producers are the Birmingham Plate-Glass Company, Messrs. Chance, Brothers, & Co., of Spon-lane Works; and the Stourbridge Glass Company (Limited), of Stourbridge.

According to Mr. Swinburne, the art of casting plate-glass, by throwing the molten material on an iron or copper table, and rolling it into a plate of equal thickness, was first adopted in this country, in the year 1771, by a Lancashire firm; but plate-glass of smaller dimensions was made at South Shields, at a still earlier period, and was technically known as "blown-plate."

As recently as 1836, the production of plate glass in the United Kingdom did not exceed

7,000 ft. per week. On the abolition of the glass duty, in 1845, however, the consumption enormously increased, and the weekly supply may now be estimated at 140,000 ft. This is exclusive of the large quantity of glass imported into this country from France and Belgium.

The earliest kind of sheet-glass manufactured in England was known as "German-spread," and was of coarse material and rude finish. To this succeeded the Bohemian, introduced and successfully perfected, after much difficulty, by Mr. R. L. Chance and Mr. James Hartley, about the year 1838. The art of blowing being at that time new to England, foreign workpeople were in the first instance employed, but English artisans soon became initiated into the process. The size usually blown at first was 36 in. by 20 in., but now cylinders are blown occasionally as long as 77 in., and from 45 in. to 50 in. regularly. The improved process of grinding and polishing this description of glass was the invention of Mr. Chance, and the term "patent plate," was given to denote the glass to which this new and beautiful finish was imparted. The present manager of the Birmingham Plate-Glass Company is the inventor of several useful minor improvements in the casting of plate-glass.

The three establishments named employ 2,500 workpeople, and produce 17,000 tons per annum. In addition to these plate-glass works, there are in the neighbourhood of Stourbridge, Woodcote, and Amblesote ten works for the manufacture of flat glass, and two for the manufacture of bottle glass. These industries are two centuries old, and were first established by a company of Hungarian refugees, who settled themselves on a hill just outside Stourbridge, since known as "Hungary Hill." The abundance of fire-clay in the neighbourhood, of a quality peculiarly adapted for glass-house pots, was doubtless the reason of Stourbridge being selected as the seat of this primitive manufacture.

The most interesting branch of glass-manufacture is undoubtedly that connected with lighthouse illumination, and our sketch would be incomplete without some notice of the dioptric apparatus manufactured by Messrs. Chance, who are the only representatives of this industry in the kingdom. The French rightly claim the invention of the dioptric lights, and for many years they enjoyed the exclusive manufacture. Soleil, Letourneau, Sauter, and Lepante are names of honour in this important enterprise, and their labours were appropriately recognised and encouraged by the French Government. In England the State held out no prospect of its bestowing care to those who might choose to embark in the manufacture. Messrs. Cookson tried, but without success, and relinquished the effort with great pecuniary loss. Then came Messrs. Chance; and, as Mr. Kenward well observes, totally unsupported by Government, and unaided by Lighthouse Boards, they worked out, *ab initio*, the most important problems and processes, and centralised in their own establishment the fabrication of every part of the apparatus. The latter, as at present constructed, consists of six orders or classes of lights, each consisting of a hollow cylinder built of lenses and prisms, varying in diameter from 6 ft. to 1 ft., and in height from 10 ft. to 2 ft. Each is susceptible of three chief modifications, viz., a fixed light, a revolving light, and a light which is partly fixed and partly revolving. Arrangements of flashes and eclipses, of constant and intermittent light, are made to suit each case, with regard to distinctiveness or no power. In the middle of the apparatus is placed a single lamp, having one or more concentric wicks. The burner of the lamp is so placed as to allow the most advantageous optical action on the flame, determined by the required functions of the light, and by its elevation above the sea. A fixed light of the first "order" consists of a central belt of refractors forming a hollow cylinder, 6 ft. in diameter and 30 in. high; below it are six triangular rings of glass ranged in a cylindrical form, and above, a crown of thirteen rings of glass, forming by their union a hollow case of polished glass, 10 ft. high and 6 ft. wide.* Mr. Allan Stevenson, after a minute inspection of this wonderful apparatus, says, "I know of no work of art more beautiful or creditable to the boldness, ardour, intelligence, and zeal of the artist." Since the year 1855 Messrs. Chance have produced about 170 of these dioptric lights, some of which were of £2,000 value. One of the most powerful is fixed

off one of the Shetland Islands, and others of great power are to be seen at Orme's Head, and Europe Point, Gibraltar. Messrs. Chance have succeeded in honourably competing with their French rivals; although, in the absence of any assistance or encouragement from the State, such as is afforded across the Channel, they have not been able to carry the enterprise to its present stage without considerable pecuniary loss.

FROM ROME.

The restoration of the interesting and ancient church of Sta. Maria, in Trastevere, is being proceeded with, and carried out in a very costly manner. The beautiful pavement, for which this church is celebrated, is being mended and restored with small pieces of marble from the "marmorata," the treasures of which seem nearly inexhaustible; for not only are immense blocks of marble found upon the ancient quay and strand, but on removing portions of the water wall, it has been discovered that large pieces of marble have been built in, forming a kind of core. This, probably, arose from the landing-quay having been heightened even during the Roman times, when it was found to be less troublesome to build in blocks of marble which were *in situ*, than to bring stone from a distance.

The new Scotch College, erected from the designs of the late Sig. Polletti, has been opened for several weeks. It is in the style of Bramante, and is on the whole a satisfactory and striking building. It is, perhaps, to be regretted that the unsightly old chapel has not also been rebuilt.

An atrium of noble dimensions is now being erected at what we should call the west end* of St. Paul's "Without the Walls." It is square in form, and its walls are continuous with those of the external aisles of the nave. The design comprises also a large octagon baptistery, which is to be entered from the side opposite the end of the church. This, however, has not yet been commenced. The whole work is of the most costly description; the columns, cornices, &c., are of granite and fine marble.

The church of the English College is being slowly carried on. The aisle walls are now their full height, and the columns in their places, but about 1,000l. more are required to finish the walls before the roof can be commenced. We are sorry to say that the design of this building is anything but satisfactory; for, although its architect, Sig. Vespignani, is a man of great talent, he is certainly not at home in Romanesque work, and we fear that the whole building will have a flat, bald appearance. The great doorway, which is nearly completed, is crowded with ornament, but quite devoid of character, from the want of sufficient projection and depth of recessing. The foundations of this building swallowed up an immense sum of money, as they had to be taken down nearly 40 ft. below the level of the street; and at that distance below the present city the pavement of a large market-place was discovered intact.

The decoration of St. Lorenzo "Without the Walls," which was commenced some years ago by Fracassini, is now completed as far as the nave of the church is concerned. The general effect is very rich and agreeable, and all the ornamental portions are very satisfactory. Large frescoes have been introduced into the triforium space, four on each side. The subjects are as follow:—

North side.—1. Ordination of Stephen. 2. St. Stephen before the Sanhedrim. 3. Stoning St. Stephen. 4. His Entombment.

The two first are by Fracassini, and the others by Nardi and Baradi.

South side.—1. St. Lawrence distributing Alms. 2. St. Lawrence before the Judges. 3. St. Lawrence on the Gridiron. 4. Entombment in the Catacombs. As in the former case, the two first are by Fracassini, and the latter ones by Nardi and Baradi. The spaces between the clerestory windows are occupied by figures of saints and popes connected in any especial way with this church. The borders and ornamental portions are in the Early Byzantine style, and are by far the best modern examples of that kind of work to be found in Rome. The colouring of the roof is in imitation of St. Miniato's, at Florence, and looks rather too gaudy and crude; however,

ancient examples often have the same defect. The decoration of the choir is to be proceeded with shortly.

The Church of St. Augustine, which was conspicuous amongst the Roman churches for its cold and bald interior, now no longer merits that reproach, as the whole building has been most sumptuously decorated, and its pilasters are lined with coloured marble. The arabesques are beautiful examples of Raffaellesque decoration, charmingly designed and most delicately executed. The effect of the whole is singularly rich and harmonious.

The same may also be said of the new decorations of Sta. Maria, in Aquiro, generally known as "Orphanelli," the interior of which has been most charmingly treated in colour. The stucco work here is well worthy of notice, as it is singularly beautiful; marble rails and pilasters have been added, and four fine marble statues of the doctors of the church. Many other minor works of restoration and decoration are being carried on, but these are the most important.

THE COMPLETION OF ST. PAUL'S.

At the meeting to be held on the 13th inst., an appeal will be read, from which we may usefully extract portions in advance in the interests of the undertaking:—

"That the interior of St. Paul's is incomplete; that Wren's plans were never carried out; that his intentions were in several respects thwarted and his conceptions spoiled; and that the result is a church, however structurally beautiful and magnificent, and in some respects unequalled, yet cold, bald, and desolate, and almost repulsive, is undeniable. That these facts are not sufficiently known is the only excuse which can be urged for an apathy exhibited towards this noble cathedral for the last 150 years."

"It is almost impertinent, as it ought to be superfluous, to observe, that in London, and for the cathedral of the richest city and diocese in the world,—London, growing as it is daily in architectural splendour,—London, the seat of the Court and Legislature of the greatest of existing empires,—London, the very chosen home of munificence and liberality, whose merchants are, in truth, princes, and where the accumulation of wealth in all the pursuits of life is increasing to an extent which it would be difficult to exaggerate—the present condition of St. Paul's is nothing less than a national reproach and scandal. There is not a town or parish in the empire—and in the empire our colonies must be included,—and there is not a community in which the speech and blood of Englishmen prevail, to which the credit of London ought not to be dear."

"The committee would be guilty of insincerity were they to conceal from those to whom their appeal is addressed, that Wren's work, as Wren proposed it, will cost, not thousands, nor even tens of thousands, but as much, perhaps, in its final completion, as 250,000l. At the same time it is not to be denied that those who in this great empire can give each his 1,000l. for a purpose alike religious and patriotic, are not to be exhausted by the figure of 250. It can scarcely be expected that such a sum would be raised at once, and its expenditure would necessarily be spread over many years."

"As regards the present, it is scarcely necessary to remark that St. Paul's, ever since Wren's death crying aloud for assistance, does so particularly now, when architectural works of great sumptuousness, especially in the City of London, are daily rising; when more and even more costly works, such as the Law Courts, are undertaken; when our own times have witnessed the completion of another great work conceived by Wren, but unhappily long frustrated—the Thames Quay; when the present generation has seen the completion of Cologne Cathedral, delayed for nearly five centuries and a half; and amongst ourselves the restoration of Chichester at a cost of upwards of 58,000l.; of York, which has cost 88,000l.; Landaff, 30,000l.; Worcester, 23,000l.; Ely, 50,000l.; Hereford, 40,000l.; Lichfield, —, Wells, 23,000l.; Salisbury, upwards of 30,000l.; St. Patrick's, Dublin, 150,000l. (defrayed by the munificence of a single person, Sir Benjamin L. Guinness); when the completion of Bristol, of which the nave was never built, is steadily advancing; and when plans are matured for the restoration of Chester and Exeter."

"The Ecclesiastical Commissioners are in the net receipt of about 90,000l. a year, subject

* Illustrations and particulars will be found in a previous volume of the Builder.

* We believe in reality it is the east end, as St. Paul's is built west and east.

moreover to a prospective increase, from the decanal, capitular, and prebendal estates of St. Paul's. These revenues are now expended on the spiritual and ecclesiastical interests of the whole country. That is to say, all England is at the present moment largely benefited by the wealth of St. Paul's. Had these large revenues not been diverted from the Cathedral of London, St. Paul's might well have been called upon to provide for its own completion and decoration. As it is, the whole country stands largely indebted to St. Paul's."

"Sir Christopher Wren's views are consistent with the most magnificent ideal. We know that mosaic painting, rich marbles, and sumptuous gilding entered largely into the calculation of what he thought was due to his design."

"The better to illustrate the idea of the magnificence which has been imagined, let the entrance be supposed at the west end, about to become the easiest access to the cathedral. On passing through bronze doors richly charged with devices, the first most striking effect would be produced by the brilliant roof covered with mosaic patterns, and rich with gold. The cupola immediately overhead, 40 ft. in diameter, and the panels of the exquisite side chapels, would be pictorially treated in the same material. The walls relieved with marble slabs and marble inlay; the pavement also and the windows, enriched with colour, must be so treated as to preserve a due regard for breadth of effect and the necessity in St. Paul's for a large amount of unobstructed sunlight. All panels to be filled with coloured marbles or sculpture, and no niche to be without its statue. The nave and transepts must, however, be in some respects subordinate to the choir."

In the great dome, which has been happily called the very 'essence of the building,' the *grainde* pictures of Sir James Thornhill cannot fail, ultimately, to give place to Sir C. Wren's cherished wish for mosaic pictures. And, in addition to these, the drum and the eight spandrels (the latter already commenced in mosaic) will afford grand scope for the highest efforts of art and magnificence.

The roof of the choir should be a splendid and impressive work in mosaic, elaborate while massive and dignified in general effect, surpassing the richness of the rest of the church. The windows in the apse will here also be more fully coloured; and the marbles, whether used structurally as replacing the stonework of the principal piers, or in panels and inlaid patterns on the walls and pavement, would all be arranged so as to impart a fuller idea of sumptuousness. This must especially be the case with the ciborium and the choir-screen already referred to.

It would be the aim of the promoters of this work to make it the occasion of educating and advancing public feeling in the application of the robust and most beautiful products of human intelligence and skill to sacred things, and for the advancement of national art. It would be, their desire to prefer what was calculated to give religious dignity and artistic value to the building to what is merely fanciful or ornamental merely as ornament.

The following words are adapted and quoted by Sir Christopher Wren himself, and they will fully serve to illustrate his views and those of the committee with respect to his work:—

"'Painting and sculpture,' said the judicious Sieur de Cambray, 'are the politest and noblest of ancient arts, true, ingenious, and fitting the resemblance of life, the emulation of all beauties, the fittest of records of all appearances, whether celestial or sublimity, whether angelical, divine, or human. And what art can be more helpful, or more pleasing to a philosophical traveller, an architect, and every ingenious mechanician?' All must be true without it."—*Paradisius*, p. 222."

ST. SAVIOUR'S CHURCH FOR THE DEAF AND DUMB, OXFORD-STREET, LONDON.

THE "memorial stone" of this building was laid by His Royal Highness the Prince of Wales on Tuesday last. The whole area of the site (which is at the corner of Queen-street and Oxford-street) was covered in and tastefully decorated with a profusion of flags and banners. Seats were provided for about 1,000 spectators, and the whole proceeding passed off most satisfactorily.

An address was read by the Archbishop of York, to which the Prince returned a gracious reply.

The trowel, made for the occasion by Messrs. Hart & Peard, was presented to the Prince by the Marquis of Westminster; the architect, Mr.

A. W. Blomfield, handing to him at the proper time the level and the mallet. Giving three blows with the mallet, his Royal Highness said,—

"In the faith of Jesus Christ we lay the foundation-stone of the Church for the Deaf and Dumb, to bear the name of St. Saviour's, in the name of the Father, and of the Son, and of the Holy Ghost. Amen."

On the right hand side of the platform were ranged between 150 and 200 of the deaf and dumb, who, while they appeared to enter thoroughly into all that was going on, were themselves objects of the greatest interest to the rest of the spectators. The Rev. Samuel Smith, the indefatigable secretary and chaplain of the association, explained to them all that went on in "sign language."

The building when finished will present one front to Oxford-street and one to Queen-street. It consists of a large lecture-hall or room for meetings, with retiring-rooms, and committee-rooms below and the church above. Owing partly to the shape of the site, and partly to the peculiar requirements of those for whose use it is being erected, the building will be unusual in plan and in appearance. The lecture-hall is a room about 38 ft. square, with shallow projections on each side, giving it generally a cruciform character. The recesses thus formed in the site are used as areas where required for the admission of light, or utilised for retiring-rooms, staircases, &c.

The church at the floor level (about 8 ft. above the street), takes up the same plan, except that an apse, containing the altar, is corbelled out over the projecting arm of the cross towards Oxford-street. About 20 ft. from the floor level the angles of the square are cut off with arches, buttressed by the walls of the projecting arms, and the square becomes an octagon. The cruciform projections are next arched off, and the simple octagon is left. This will have a groined ceiling pierced with a circular opening in the centre for a sunlight. The four sides of the octagon above the angles of the square will be pierced with large three-light windows and the apse will be lighted with five lancets, and will be groined with stone and brick.

The principal entrance to the church will be in Queen-street, and it is in contemplation to build a chaplain's house in the same street adjoining the church. Externally the main building will be covered with a high-pitched octagonal roof, with a circle of small lucarnes near the apex. The other roofs are of high pitch, and abut on the main building at various levels. The roofs will be slated. The style of the building is Early Pointed, and the materials are red brick and stone.

The church will accommodate about 250 worshippers, and it is so planned that while meeting all the requirements of the deaf and dumb, it may be equally available for a hearing congregation and the ordinary church services. Mr. Macey is the builder employed.

EXCURSION OF THE LIVERPOOL ARCHITECTURAL SOCIETY.

THE members of this society made their annual excursion on Saturday last, the places visited being the churches at Warrington and at Winwick. The party, in the first instance, went round by Newton Junction (about five miles from Warrington), and spent some time in inspecting the machinery and general working of Messrs. Gillespie & Mason's paper manufactory at Newton, and proceeded thence to the new waterworks and reservoir for the Warrington district, now nearly completed, at Winwick, under the superintendence of Mr. Chas. H. Beloe, C.E. The reservoir is formed entirely with artificial embankment, consisting of a concrete wall in the centre perpendicular on the outer face, and battering, from 2 ft. to 8 ft. thick on the inner face, which is lined with brick and with a coating of asphaltum an inch thick between the concrete and the brick. The outer slope of the embankment is formed with earth in the usual manner. The whole reservoir is to be vaulted with brick, on stone columns, and entirely covered in, when finished: large piers of brickwork being built out from the inner face of the embankment to form abutments for the vaulting. The church of Winwick, though mostly of very late date, possesses considerable interest, and exhibits some rather curious features, especially in the north arcade of the nave, the upper portion of which, above the impost, has been rebuilt upon the old piers, with a thinner wall than before, so that the wall-face sets back

two or three inches from the face of the pier. The piers themselves are of a very unusual plan; and, from the appearance of the bases and the very irregular line of the fillets and mouldings, it was suggested that they were old Norman piers, cut into rolls and hollows by some not over-skilled village mason. There are several fine brasses in the church in good preservation; also an oak rood-screen by the late Mr. Pagin, and a pulpit and font designed by Mr. Paley, of Lancaster. The parish church at Warrington, which was the last object of the excursion, was rebuilt about sixteen years since, by the Messrs. Francis, of London. The old church, on the same site (some portions of which are preserved in the new edifice), was a cross church, with a square tower, which it was originally intended to retain; but, upon pulling down the nave walls for restoration, one of the piers of the tower "followed suit." It was efficiently shored up; but as it appeared, on examination, that the tower had settled hopelessly on one of the perpendicular, that the walls and piers were only casings of masonry packed with rubble, and that the foundations were exceedingly defective, the work was stopped until funds could be raised for re-building the tower. It is singular, by the way, how often the necessity for efficient foundation seems to have been overlooked by the Mediaeval builders; the same thing was found with regard to Chester Cathedral lately; the foundations of the Lady Chapel all required to be underpinned, to prevent the walls actually falling over from failure of the ground. The necessary funds having been collected chiefly through the exertions and energy of the present rector (the Rev. Mr. Queckett), the architects proceeded to build what is now, in fact, a new church, though retaining the plan, and some features of the old one: in particular the vaulted crypt, under the chancel, has been carefully restored, enough of the springing of the old vault having been left to determine the section and course of the vaulting ribs. The present church is a fine and very well-built structure of late Decorated style, with a spire 300 ft. high, which, though perhaps somewhat too slender in proportion, is, nevertheless, decidedly a fine object, and rises up from the flat country as a conspicuous landmark for miles round. There appear to have been an interest and spirit evinced by the good people of Warrington in contributing to the re-erection of their church, which does honour to them. Many portions of the church (each of the carved capitals of the nave, for instance) are gifts from individuals among the congregation, and the attempt has been made to perpetuate the memory of those who have been interested in the work by carving their portraits as corbels to the labels of the arches, and in other situations. There are in the church no less than two hundred such portrait corbels, among which are recognisable likenesses of Colonel Wilson Patten, the late Bishop of Chester, and other local celebrities. The society finished their day by dining at Warrington, returning to Liverpool in the evening.

READING GRAMMAR SCHOOL.

THE chief stone of this new building has been laid by the Prince of Wales as Past Grand Master of the Freemasons. His Royal Highness was accompanied by the Princess.

The site for the school buildings, comprises 10 acres of land on the Redlands Estate, situated near the Berkshire Hospital, on the outskirts of the town. Mr. Alfred Waterhouse is the architect. The entire block of buildings, as designed, consists of two masters' houses, one at each end; a large common hall or school-room in the centre, and between it and them the various apartments for school purposes, and for the use of the boys. It is proposed to place the building, which will have a total frontage of 400 ft., at the upper end of the site, so as to have as much space in front for playground, cricket-field, &c., as possible, and leave room for future masters' residences in the lower portion of the ground. The building has been planned in a straight line rather than in a quadrangular form, in order to receive the maximum amount of sun and air. Each boy will have his own bedroom, and each bedroom its own window. The trustees have recently accepted a tender from Messrs. Parnell & Son, of Rugby, for the erection of the central common hall and school block, the western wing, and the entrance lodge, for the sum of 12,164. 10s. 7d., with power to the trustees to require the contractors to erect the buildings

comprising the eastern wing for the additional sum of £6,522. 17s., making a total sum of £18,707. 7s. 7d. This sum, with the collateral expenses, will bring the entire cost to about £20,000, exclusive of the purchase of the site. The subscriptions already received amount to upwards of £9,000, and the list includes several donations of £500.

PICTURES FOR THE ART-UNION OF LONDON.

The following are the principal works selected by prizeholders since the publication of the former list:—

From the Royal Academy.—The Vestal, E. Crowe, 206*l.*; Highland Castle going South, Henry Garland, 75*l.*; Mountain-Torrent, near Coniston, H. Harwood, 80*l.*; The Worsted-winder, A. Stocks, 35*l.*; Take a Run in the Garden, C. Armitage, 25*l.*; A Backwater on the Wey, Miss A. Escombe, 20*l.*; Shepherd's Daughter, G. Wells, 20*l.*

From the Society of British Artists.—Hillsborough, J. Tennant, 61*l.* 15s.; The Moorland Bridge, G. A. Holmes, 35*l.*; Lyn Heaio—Moel Sioabod, J. Syer, 45*l.*; The River Liure, near Capel Curig, S. P. Percy, 45*l.*; Summer, A. W. Williams, 45*l.*; At Leigby, on the Trent, G. S. Walters, 35*l.*; Leith Roads, J. J. Wilson, 35*l.*; Summer-time, J. H. S. Mann, 35*l.*; River-Scene, Moonlight, J. C. Thom, 31*l.* 10s.; La Petite Mère, E. Roberts, 30*l.*; A Pearl on the Lowther, Walter H. Foster, 35*l.*; The Shepherd Boy, G. A. Holmes, 25*l.*; Morning on the Thames, T. F. Wainwright, 25*l.*; Near Arundel, Sussex, E. Frye, 25*l.*; Rhodé, A. J. Woolmer, 25*l.*; A Mountain Spring, G. Wells, 20*l.*; Beech-tree, Up Park, A. B. Cole, 20*l.*

From the Water-colour Society.—The Rialto, Venice, William Allen, 20*l.*

From the General Exhibition of Water-colour Drawings.—The Birth of a Fairy, J. A. Fitzgerald, 30*l.*

INSTITUTION OF SURVEYORS.

The annual dinner of this institution was held on Monday evening, in the large hall of Willis's Rooms, and was attended by a numerous party of members and associates; Mr. Richard Hall, the president for the current year, occupying the chair.

After the usual loyal and patriotic toasts, that of the army and navy being responded to by Lieut.-Colonel G. A. Leach, R.E., had been given, the chairman presented to the honorary secretary, Mr. J. W. Penfold, a service of plate which had been subscribed for by the members and associates, in recognition of his services in connexion with the foundation of the institution during the subsequent two years. Mr. J. H. Lloyd proposed the toast of "Propriety to the Institution;" and, after his health and that of the chairman and of the past president, Mr. John Clifton, had been honoured, the proceedings terminated. It was mentioned incidentally that the institution now numbers 240 members and associates, including a large proportion of the leading surveyors.

THE FRACTURED COLUMNS, ST. SAVIOUR'S, LINCOLN.

A REPORT on this disaster has been received from Mr. Ewan Christian by the committee. In the course of it Mr. Christian says,—

"And first as to the stones of which they are constructed, and of the weight they are required to support. There is unquestionably a difference in the quality of the stones, but, excepting from natural veins and defects which are not discovered from without, I have no reason to doubt the general goodness of the stone that has been used, whether in the bases or the shafts of the pillars, or other portions of the work. Many of the stones which have cracked are of excellent quality.

"As nearly as I can calculate, the dead weight at present discharged upon each pillar is less than 45 tons, allowing a broad margin. From the best information I am able to obtain, the result of very careful experiments recently made, the crushing weight of the best Ancaster stone is something less than 125 tons to the square foot, and the weight from which by experiment first injury was produced, 84 tons 17 cwt. The superficial area of the shafts is 31*½* ft. If, therefore, we take 84 tons only as the compression of danger, it appears that the load upon each pillar is less than 1/6th of that necessary to produce first fracture, and somewhat less than 1/9th of what is needed for crushing. It may, therefore, I think, be safely assumed that the fractures have not occurred from want of strength to bear their load in the stone required by specification to be used for the pillars. It is certain, nevertheless, that in estimating the power of stone to bear pressure, it is always assumed that there should be a fair proportion between height and base, and that the power to bear weight is greatly diminished by any such imperfection of bed as may cause partial pressure. It follows, therefore, as a natural consequence, that in building a pillar-shaft in courses of stones, the utmost care is needed for making the beds perfectly even and uniform, and that any irregularity in this respect must be an element of weakness, and that every increase in the number of beds also increases this risk.

"It is also of the utmost importance that in building a long wall upon arches and pillars, great care should be exercised to stay them against lateral motion, because any vibratory movement acting upon the pillars is in itself an element of danger.

As regards the circumstances under which these arcades were built, I am informed by both architect and builder, that from the commencement of the work, and as much within the last few weeks, the western end of the nave, where hereafter the piers of the western tower arch are to be built, has remained entirely open; the eastern end of the nave was also disconnected until the end of last autumn, when the arch next chancel was keyed in; consequently, the clearstory walls, which rest on the arcades, had no structural connexion at either end until they were raised to their full height, and had no structural support whatever, except from the abutting walls at the ends of the aisles, and at the north-east corner, where the worst fractures have occurred, of an arch only."

He arrives at the following conclusions:—

"1. The departure from the requirements of the drawings by increasing the numbers of the stones, and consequently of the beds in the shafts of the pillars.

"2. Imperfection of work in the beds of the stones, and impertinence and inattention in thickness of the mortar joints between them.

"3. The racking of the heavy walls which the pillars support, each 17 ft. long and 40 ft. high, disconnected at each end, and left entirely without lateral stay or support, caused by the violent gales of last autumn, and other like causes before incidentally referred to. Secondly, as to the liabilities involved, to which your resolution refers."

As regards the Architect.—I am clearly of opinion that in respect of constructive design, whether as shown by the drawings or described by specification, whether as to quality or description of material, the provisions made by him are in every respect sufficient for a good and durable construction.

"2nd. That the omission from the specification of all provision for temporary supports, especially under the circumstances under which this church was erected, was undoubtedly an oversight, but one that, had the work been intrusted to a contractor of ample means, tact, and experience, would probably have been met by his own provision for temporary insurance.

"3rd. That having made careful drawings, showing the exact number of stones to be placed in each pillar, he should have required the contractor so to execute them, and not have allowed any deviation from his instructions.

"4th. That although thereby his responsibility was shared, and in part removed, he should not have allowed the contract to be framed as to invest the committee with equal authority to his own in respect of approval and direction of the work, nor should he have submitted, except under written protest, to the instructions which he was not to visit and inspect progress of work, unless he was sent by you.

As regards the Contractor.—I am of opinion that he has incurred responsibility, in, in consequence of the drawings, with a larger number of stones, and consequently of beds, than are shown by the drawings.

"2nd. By insufficient care in working the stones, and in forming perfect beds between them of sufficient thickness; and

"3rd. By neglecting to take any precaution whatever for securing the arcade walls during erection, he being bound by contract to make good any damage arising from 'storm or tempest,' and to deliver up the building when complete, 'free from all flaws, cracks, settlements, or other defects.'

And I am further and clearly of opinion that the defects which have occurred result from the deviations from the duty of a builder, and consequently that, excepting on the second point as regards architect's liability, he alone is responsible for making the good."

He gives reasons, however, for considering that it would be hard and perhaps unjust to require the builder to do it at his own cost.

IRONSTONE IN OXFORDSHIRE.

THERE has recently sprung up, near the village of Adderbury, Oxfordshire, a new industry which promises to give employment to a number of men, and to benefit all those who are connected with it. A stratum of ironstone has been discovered on the estate of Mr. William Chamberlin, of Adderbury House. For many years past it has been thought that ironstone was to be found in this district; but it is only recently that systematic efforts have been made to test the ore, and find a market for it. This has now been done. The Adderbury Ironstone Company are the lessees of the mineral, and pay a royalty to the proprietor.

This valuable deposit occurs on certain rising ground, which overlooks the pleasant valley of the Cherwell, and is distant about a mile and a quarter from the Oxford Canal and the Great Western Railway. A tramway has been laid from the quarry to the canal and the railway, and the trucks, which contain 35 cwt. each, run down an inclined plane part of the way. On the level they are drawn by horses. By means of simple contrivances familiar to those who are conversant with mining operations, each wagon is weighed, and its contents afterwards emptied either into boats or into trucks, to be conveyed to various districts in Wales, and also to Wexbury, Dalton, Bilston, and other places.

The deposit is found about a yard beneath the surface, and its depth varies from 12 ft. to 14 ft. The ore, it is said, contains from 38 to 45 per cent. of iron, and the limestone mixed with it greatly facilitates the smelting process.

There are supposed to be 150 acres, on Mr. Chamberlin's property, containing this mineral. 100,000 tons have been raised already; and each acre produces 40,000 tons. Therefore, at the present rate of consumption (52,000 tons a year), the existing supply will not soon be exhausted.

Underneath the iron stone, there is found a bed of blue clay from 14 ft. to 16 ft. deep.

It took three years to persuade the smelters to have anything to do with this ore; but their prejudices were at length overcome, and the supply from this quarter, although on the increase, is at present unequal to the demand.

At Steeple Ashton, King's Sutton, Over Worton, and the Compton Hills (the last-mentioned place is about a mile and a half from the Fenny Compton Station, Great Western Railway), ironstone has been found; but the land carriage in some instances has proved so expensive as seriously to interfere with the work of raising it except at a loss. In other instances its depth beneath the surface has formed a great obstacle to its successful manipulation.

Immense quantities of this ore have, within the last few years, been found in Cleveland. We learn that the iron-bearing area in the Tees district is spread over 140 square miles. In one portion of the area (that containing first-class stone, yielding about 81 per cent.) the deposit is 27,000 tons per acre. In the portion of the field consisting of second-class stone it produces 18,000 tons per acre, and the yield is under 23 per cent. The quantity available in all, in Cleveland, is estimated at 4,600 millions of tons. The present production is about five million tons per annum, at which rate it would last 900 years. But the Durham coaling coal, used for smelting it, will probably be exhausted sooner.

The Cleveland iron district is, at present, one of the most active in the kingdom. The towns of Darlington, Stockton-on-Tees, Middlesbrough, and the two Hartlepoons, have benefited greatly by the new industry, and an immense amount of capital is employed in its various branches. Iron shipbuilding, and the construction of railways all over the world, have increased the demand for iron. This country appears to have an unlimited supply of the raw material, and coal is still abundant. The landowners in Oxfordshire, Northamptonshire, and other counties, possess, no doubt, in many instances below the surface of their estates, treasures more valuable than the rents of their farms. They would do well to test their capabilities in this respect under intelligent operators. It is understood that there are other lands in the valley of the Cherwell, besides those already mentioned, which contain valuable iron strata, and some of these are close to roads and canals. It may be added that the men employed at this new industry at Adderbury are the labourers of the district.

THE IMPROVEMENTS OF THE SERPENTINE.

A PRELIMINARY meeting of gentlemen interested in this question, and which originated with the standing committee for promoting an improvement in the condition of the Serpentine appointed some time past at a public meeting presided over by Lord Harrowby, was held at the British Hotel, Cockspur-street, Dr. Aldis, medical officer of St. George's, Hanover-square, in the chair. Mr. J. Lilwall, the acting secretary, read a letter from Dr. Druitt, in which he said—"It is clear, *prima facie*, that the mud should be removed. No dependence can be placed on any attempt to bury or cover it, and if it remains it will be a contamination to the pure water that covers it and a danger to bathers." After a somewhat lengthy discussion of the general question, a series of resolutions bearing on it in its sanitary aspect, and also with regard to the general safety of bathers, was, on the motion of Dr. Tilt, seconded by Mr. T. Barry Hill, carried, together with an expression of thanks to the Government for having undertaken a work which had been unsuccessfully urged on successive administrations during the past twenty years.

On Tuesday last an influential deputation waited on Mr. Ayrton, to induce him to remove the whole of the mud, and to lessen the depth of water. The Chief Commissioner, however, declined to do either. He said the conclusion he arrived at was that nothing had been said by the deputation to induce him to alter the course commenced by his predecessor. The specification was to make the bottom and depth satisfactory, and also of a proper slope. That specification had been agreed to by his predecessor, and it was his (Mr. Ayrton's) duty to follow what he had sanctioned, unless any cogent reason could be shown to the contrary.

Mr. Lilwall, referring to Mr. Ayrton's statement, that he was only carrying out the plans of his predecessors, observed that the history of

the Serpentine itself afforded a striking precedent for the Chief Commissioner modifying the arrangement of his predecessor if necessary, and mentioned that a few years ago one commissioner obtained a vote of 17,000l. for carrying out a process of purifying the water by means of filtration, when his successor, the following session, had the courage to reverse that decision, for which he obtained universal praise.

The deputation were not particularly pleased with their reception.

SINKING CAISSON FOR EAST RIVER BRIDGE, NEW YORK.

The first step of progress in the actual building of the East River Bridge may be said to have been taken upon the occasion of the caisson, which goes to form the foundation for the stone pier of the bridge upon the Brooklyn side, being placed in position, and lowered into its final resting-place. The caisson was towed to Dock-street by steamers. Among those present, were Messrs. William C. Kingsley, Superintendent of Construction; Colonel W. A. Roebling, Engineer-in-Chief; Horatio Allen, Consulting Engineer; C. C. Martin, Assistant Engineer; Colonel Paine, Assistant Engineer and Constructor; Dr. S. R. Rule, Inspector; and T. C. Douglass, Master Mason.

The work was done under the general supervision of Mr. Henry C. Murphy, President of the East River Bridge Company, and Mr. John A. Roebling, Chief Engineer of the same.

The caisson is 170 ft. long, 102 ft. wide, and 18 ft. deep. The material of which it is made is yellow pine, filled in with concrete, one floor rising above the other. Its weight is 2,800 tons, and taking into consideration that over 3,000,500 ft. of oak and pine lumber were used in its construction, it may be very correctly described as a huge oblong mass of timber. Ten feet more of timber are to be laid on top, after which the mason-work will be begun. In the meantime, iron pipes with ladders inside will be sunk, which will enable men, by the aid of an air-pump, to descend and dig. As fast as the mason-work is laid, the caisson will sink, until it is completely embedded in the earth, where it will probably remain for centuries. Building operations will soon be commenced. There will be three gangs of 175 men each employed to go down the pipes. They will excavate within the caisson until it is by this process sunk from 30 ft. to 50 ft. deeper than at present.

KIDDERMINSTER NEW INFIRMARY.

THE memorial stone of this new edifice has been laid. The new building will occupy an elevated and healthy site on the top of a very steep bank in Mill-street, adjoining the Bridge-north-road, just outside the town. The general arrangement of the main building will be that of a central block of three stories, containing the principal entrance and staircase, committee and operating rooms, matron's and surgeon's residences, and other rooms and offices forming the administrative department. The wards, of which there are four for six beds each, will be in two stories, and extend, the men's on the right and the women's on the left-hand side of the centre building, in the same general line, and they will terminate by small gables projecting towards the front, which will contain the baths and lavatories for the use of the wards. These latter will give more than 1,733 cubic feet of space to each patient; they are lighted with windows to the front, and smaller windows near the ceiling at the back, to allow a thorough current of air to be obtained when desired. A general system of ventilation has, however, been devised, consisting of warm flues for extracting vitiated air, and inlets for admitting fresh, either warmed or not at pleasure. At the outer ends of the wards on each floor will be small rooms or enclosed balconies, with large windows for opening in fine weather for the use of convalescents. The closets will be separated from the wards by lobbies, with openings at each end, to create a cross current, thereby preventing the entrance of impure air to the wards. This is further guarded against by screens enclosing the doors of the lobbies. Between the wards and administrative centre block will be placed the nurses' rooms and conveniences. The dispensary will be attached to the end of the infirmary nearest the town, and will have large waiting, dispensing, and consulting rooms, &c. Behind the centre of the main building, and detached

from it except by a passage of communication, is the kitchen department, containing the usual kitchen offices, with yard and outbuildings, and the washhouse and drying closet, with laundry and linen-rooms on the upper story, which will also comprise the sleeping-rooms for servants. Behind all is the fever ward, separated by a considerable distance from the other buildings. It consists of wards for males and females, each for two beds, with the requisite nurses' rooms and offices.

The style of the architecture is Gothic, with simple details of an early character. The walls are built with ordinary red bricks and occasional bands of blue, the facing being of picked bricks laid in dark mortar. Dressings of Bath stone have been sparingly used. The roofs will be covered with red and grey tiles. The principal entrance is by a porch in the centre of the front, with moulded stone arch and jambs. Over the gable which surmounts the arch will be a canted oriel window, with a gable above terminating in a finial and vane. The windows throughout the building will be of lofty proportion, and grouped in pairs and triplets, those of the ground-floor having pointed arches of brick with stone moulded transoms, the line of which will be continued by a flat band of stone throughout the building. The windows of the central block have stone dressings. The roof of the centre building will be hipped, and have a cornice of moulded bricks. The straight line of each ward is broken by a chimney stack, corbelled out from the wall, and resting on a central buttress. The fever ward, kitchen buildings, and dispensary are all to be carried out to harmonise with the main building.

The contract for the building may be put down at 7,000l.; etceteras, 1,000l.; land, 1,000l.; total, about 9,000l.; towards which 7,500l. have been promised. It is estimated that in two years 1,000l. more will be required, making in all 10,000l. The architect is Mr. J. G. Bland, of Birmingham.

ISLINGTON.

THE third section of Mr. Howitt's "Northern Heights of London," noticed by us recently, is devoted to Islington. Lysons thinks the ancient name Iseldune or Isendune means the Hill of Iron, because various chalybeate springs are found in this neighbourhood. But Mr. Sharon Turner derives it from Iseldune, or the down of the Yssel, supposed to be the original name of the river of Wells, which fell into the Fleet River. When Doomsday Book was compiled part of the parish was arable, part common pasture, and the rest consisted of woodland, oak, and beech, affording pannage for sixty swine. The population was then twenty-seven persons and their families. Some think there was a church there from Saxon times. As Macaulay tells us, even in the time of Charles II. Islington was almost a solitude, and poets loved to contrast its silence and repose with the din and turmoil of London. Evelyn tells us that after the Great Fire the fields about Islington were crowded with the thousands of people who fled from the burning city. In the reign of Elizabeth, Gerard, the herbalist, used to frequent those fields to collect the herbs and flowers that he needed. In the fields between Islington and Finsbury archers used to exercise. Fitzstephen (temp. Hen. II.) tells us that in the afternoons the youths of the city used to go out into the fields, and practise the ball and other games. In 1365 Edward III. proclaimed that the citizens should practise the bow, forbidding them to waste their time "in throwing stones, handball, football, or cock-fighting, or other such vain shows." Henry VIII. allowed the Master of the Ordnance to shoot at butts and at the popinjay. He compelled every man to furnish his son, at the age of seven, with a bow and two arrows. The art declined, though James I. and Charles I. made efforts to establish it. Islington was always famous for dairies, and Londoners liked to see the milkmaids milking the cows in the fields, and drink milk fresh from the cow. They had a great idea of the healthiness of the place, and often resorted there for lodgings. There were entrenchments here in the seventeenth century; for about 1642 the London Militia marched out, and made intrenched camps at different roads leading from the north towards the City, to defend the metropolis from the invasion of the king and the cavaliers.

At the back of Islington were ducking-ponds,—not, as might at first be supposed, for ducking scolds, but where Londoners went with dogs and

hunted down ducks procured for the purpose. There was one of these ponds in Mayfair in 1743. The Islington ponds are described as descending in succession from Liverpool-road to Lady Huntingdon's Chapel, Esmouth-street, Spa-fields. The burial-ground of the chapel was at that time a pond.

For the New River, by which the north of London is supplied with pure water, we are indebted to Sir Hugh Middleton. He was a native of Denbigh, North Wales, his father being governor of Denbigh Castle during the reigns of Edward VI., Mary, and Elizabeth. Hugh became a goldsmith in London, but obtained a great deal of money by mines in Wales. Respecting the water scheme, his object was to conduct the fine water of the springs of the Chadwell and the Amwell, near Ware, in Hertfordshire, to the metropolis. The works were commenced in 1608 under great difficulties. The distance was about thirty-eight miles, deep cuttings had to be made, and over valleys the water was carried in wooden aqueducts. The funds became exhausted, and the people of London, who were to derive such benefit from the scheme, would not subscribe. James I., however, advanced money to the amount of half the total expenditure, and the work was finished in 1613, in five years and five months from the commencement, at a cost of 500,000l. It did not succeed for some time, and for eighteen years produced no dividend. In 1622 Hugh Middleton was made a baronet, which honour he richly deserved. Besides this, he gained a great quantity of land from the sea at Brading Haven, in the Isle of Wight, and also discovered and worked profitably a rich silver mine in the county of Cardigan. The shares in the New River were at first at 7,000l. each, but soon fell almost to nil. But within the last few years shares have sold for 20,000l. Sir Hugh died poor, and Lady Middleton had a pension of 20l. from the Goldsmiths' Company.

Islington contains six districts:—St. John of Jerusalem, Upper Barnsbury, Lower Barnsbury, Canonbury, the Prebend, and Highbury, or Newington Barrow.

Highbury was famous for the springs which used to supply the City before the making of the New River. The manor of Highbury, formerly called Tollington,—was granted by the Conqueror to one Ranulf, and the manorial rights were valued in Doomsday at 40s. per annum. The Manor House was a favourite summer retreat of the priors of St. John of Jerusalem. Jack Straw demolished it for them in Wat Tyler's rebellion.

Highbury Barn,—originally a farm belonging to the Manor House,—was a small ale and cake house. Barn was the word applied by milk-dealers to a farm or dairy. Highbury Barn soon became a tavern, with tea-gardens, and was much increased about 1780. Mr. Willoughby about that time added a hop-plantation and brewery, and prepared public dinners for corporate bodies, public charities, &c.: 800 people have sat down in the Barn to a hot dinner together, on which occasion seventy geese were seen roasting at one fire. Highbury Barn now comprises an hotel, public gardens, a regularly licensed hotel, and dancing-saloon.

Canonbury House, or Tower, was the country residence of Sir John Spencer, an alderman and clothworker of London, who was lord mayor in 1594. He was reputed the richest commoner of his time, and his town residence was Crosby Hall, the fine old house on the east side of Bishopsgate-street, which had been built by Sir John Crosby, and was for some time the residence of the Duke of Gloucester, afterwards Richard III. Canonbury House was very extensive, and had a tower, part of which yet remains. It was built on this spot for the prior of the canons of St. Bartholomew, and rebuilt by William Bolton, the last prior but one, who died in 1532. Several years ago, his rebus (a bolt in a tan) was to be seen in various parts of the house. A fine view could be obtained from the top of the tower. Sir John Spencer enlarged and beautified the place. In a pamphlet called "The Vanity of the Lives and Passions of Men," 1651, we read that in Queen Elizabeth's days a pirate of Dunkirk laid a plot, with twelve others, to carry away Sir John Spencer, as he came to his house; and if they had, 50,000l. would not have ransomed him. But Sir John stayed in London that night, and so escaped. Sir John had one child, who was to inherit his vast wealth (said to be 800,000l.), and she loved Lord William Compton, Lord President of Wales, who eloped with her; and her father said he would cut her off with a shilling. Queen Elizabeth was favour-

able to the match, and invited Sir John to stand sponsor with her to the first child of a young couple abandoned by their father. Sir John did so, and found that he had adopted *his own grandson*. Sir John died in 1609, and Lord Compton lost his senses by reason of the vastness of his wealth, but eventually recovered them.

It is said that Goldsmith wrote the "Deserted Village," "The Traveller," and part of "The Vicar of Wakefield" in Canonbury Tower. Washington Irving visited the house for this reason, and says, "I was shown the very apartment, and it was a relic of the original style of the castle, with panelled wainscot and Gothic windows. I was pleased with the air of antiquity, and its having been the residence of poor Goldy."

On the south side of Newington Green the old mansion of the Mildmay family stood, now converted into several dwellings. Sir Henry Mildmay, in the reign of Charles I., obtained this house, with park, gardens, &c., with his wife, the daughter of Alderman Halliday. Sir Henry signed the unfortunate monarch's death-warrant, and his property was therefore forfeited at the Restoration, except this of Newington-green, which had been settled on his daughter, by the alderman. Sir Henry's brother Anthony was on the opposite side in the civil war, and was so much attached to Charles that he attended him on the scaffold.

At the corner of the green was an old house, which, tradition says, used to be occupied by Henry VIII. Henry Algernon Percy, the unfortunate Earl of Northumberland, lived here, and being attached to Anne Boleyn before Henry saw her, incurred the monarch's severe displeasure. Henry, therefore, made him marry Lady Mary Talbot, daughter of the Earl of Shrewsbury. Anne never forgave Wolsey for his part in this, and she afterwards doubtless caused his ruin. The man whom Henry sent to arrest the cardinal at his palace of Cawood, Yorkshire, was Henry Percy, Earl of Northumberland. Henry VIII. afterwards had the brutality to make the earl one of Anne's judges, but he was taken ill in court, and died soon after.

According to tradition, the Old Queen's Head, on the Green, was the residence of Lord Treasurer Burleigh when Queen Elizabeth was here. It has been supposed that Sir Walter Raleigh converted this house into an inn. This old house was pulled down in 1820. The Pied Bull public-house is said to have been the residence of Sir Walter Raleigh, but has undergone many alterations. In the "Life of Sir Walter," by Oldys and Birch, it is stated that the tenant at that time affirmed that his landlord possessed the account-books proving that the house did belong to that distinguished nobleman.

The old church at Islington is supposed to have been built about 1483. Sir Nicholas Kempe, member of the High Commission Court under Charles I., was buried here. The new church was built early in the eighteenth century. Thomas Cooke, the miser, of Pentonville, is buried here. He left about 127,205*l.* to various charitable institutions.

Mrs. Olivia Serres, who claimed to be the granddaughter of the Duke of Cumberland, brother of George III., was baptised here September 6th, 1821, aged 49. She managed to impose on the Duke of Kent, who allowed her and her daughter 400*l.* a year. She appeared in a court several times to enforce her claims, but repeatedly contradicted herself, and proved herself an impostor.

The Priory of St. John of Jerusalem, founded by the Knights Hospitaliers, was situated in Clerkenwell; but only an archway remains. The knights rose from small beginnings. After the taking of Jerusalem, in 1099, by Godfrey de Bouillon, they offered themselves as "servants of the poor, servants of the Hospital of Jerusalem;" but they soon obtained great wealth, and resembled the Templars. John Bristel is said to have founded the Priory of St. John in Clerkenwell about 1100. The Prior had precedence of all the lay barons in Parliament, and chief power over all the preceptors and lesser barons of the order throughout England. In 1240 the Knights Hospitaliers possessed 19,000 lordships or manors in different parts of Christendom. Somerset, the Protector, in the reign of Edward VI., blew up the church of the Priory at Clerkenwell with gunpowder, and used the stone to build his palace in the Strand.

The earliest historical event connected with Islington noticed by Mr. Howitt is the battle fought between the Romans and British, under

Queen Boadicea, when, according to Roman writers, 80,000 Britons were put to the sword. During the reign of Edward I. the Snowdon barons accompanied Llewellyn to London, and were quartered at Islington; but they were much disgusted with the conduct of the Londoners, who followed them in crowds, staring at their garb. They left, declaring they would never again visit Islington except as conquerors.

Henry VI. was brought through Islington a captive, on his way to the Tower. For twelve months, after the battle of Hexham, he had wandered from castle to castle, in Westmoreland, Yorkshire, and Lancashire. At Bolton Hall, Yorkshire, he left his boot, spoon, and glove, and was betrayed at Waddington Hall, by Calow, a monk, of Abingdon. At Islington Warwick met him, and ordered the spectators to show no respect to him. In 1557 some Protestants assembled at the "Saracen's Head," Islington (under pretence of seeing a play acted), were arrested by the Vice-Chamberlain of Mary's household, and committed to prison. Of these five were burnt; one at Smithfield, and four in one fire at Islington. The Earl of Essex, in time of Queen Elizabeth, when he set out to occupy the post of Lord-Lieutenant of Ireland, passed through Islington, attended by a splendid retinue of noblemen and gentlemen on horseback. In 1641, Charles I., on his return from Scotland, passed through Islington with the Queen, Prince of Wales, and Duke of York, attended by a splendid cavalcade. The next time he entered London it was as a prisoner.

Copenhagen House and Fields were so called, because the King of Denmark here paid a visit to his brother-in-law, James I. The house became a great tea-house and resort of the Londoners to play at skittles and Dutch pins. A great portion of the fields is now occupied by the New Cattle Market. Mr. Perkins, of Bletchingley, Surrey, impressed with the cruelty and inconvenience of driving cattle through the crowded streets of London, projected and built a new cattle-market, near Ball's-pond, at a cost of 100,000*l.* This was commenced in 1833, and completed in 1836. The concern was not, however, successful in a pecuniary point of view, and was extinguished by Act of Parliament, to make way for a market in Copenhagen fields. The corporation of London purchased 75 acres of the fields, and converted them into the present New Cattle Market, opened in 1855.

Mr. Howitt concludes his book with biographical particulars respecting remarkable persons who have lived in the parish of Islington.

John Lord Berners, the translator of "Froissart," proprietor of the manor of Bernersbury, or Bernersbury, lived here. His aunt was the celebrated Dame Juliana Berners, author of the famous "Treatise on Hawking," printed in 1481. She was prioress of Sopewell Nunnery, Herts, and is stated to have been living in 1460. Hollingshead says:—"She wrote also a book of the laws of arms and knowledge apperteyning to heralds." Her works were printed at the abbey of St. Albans, on which the nunnery of Sopewell was dependent. Fuller ranks Lord Berners as the fourth literary nobleman in England, his predecessors being Lord Cobham, Epsforth, Earl of Worcester, and Lord Rivers. Lord Berners sat in the eleventh parliament, with Henry VII., and was in great favour with Henry VIII. Besides "Froissart," he translated several other works. He died in 1532, and his title became extinct.

De Fos was educated at the Nonconformist seminary here for four years, and this was all the education he ever had. He wrote some political pamphlets and tracts on political economy, and then hit on the conception of "Robinson Crusoe," which has made his name immortal.

Thomas Topham, a man possessed of immense strength, was born at Islington. At the age of twenty-four he became the host of the Red Lion, near the old hospital of St. Luke. Here he exhibited his strength by pulling against a horse. Dr. Desaguliers saw him perform the following feats:—

By the strength of his fingers he rolled up a very strong and huge pewter dish of the hardest metal. He broke seven or eight pieces of a tobacco-pipe by the force of his middle finger, having laid them on his first and third finger. He took an iron poker, about a yard long and three inches round, and struck upon his left arm, between the elbow and the wrist, as though he had no feeling, till he bent the poker to nearly a right angle. With such another poker, holding the ends of it in his hands, and the middle of it

at the back of his neck, he brought both ends of it together before him; and, what was yet more difficult, he pulled it almost straight again. He broke a rope of two inches circumference, though, in consequence of his awkward manner, he was obliged to exert four times the strength that was necessary. He lifted a rolling stone of 800 lb. weight with his hands only, standing in a frame above it, and taking hold of a chain that was fastened to it.

A print in Kirby's "Wonderful Museum," 1803, represents Topham performing the feat of lifting three hogsheads of water, weighing 1,831 lb., by means of a wooden stage, on which he stood over the hogsheads. This he performed publicly in Cold-bath-fields, May 28, 1741, before Admiral Vernon and thousands of spectators.

Mrs. Forster, the granddaughter of Milton, kept a chandler's shop, at Lower Holloway, for some years, and died at Islington May 9th, 1754, aged 66. She was the last of the family of the author of "Paradise Lost." In 1750 "Comus" was represented at Drury Lane, with a new prologue by Dr. Johnson, spoken by Garrick, for her benefit, which produced 130*l.* Mr. Howitt says she knew little of her grandfather, and that little was not good. She told of his harshness to his daughters, and his refusal to have them taught to write.

Alexander Cruden, author of the "Concordance," lived at Islington. He was actually insane, "but with a harmless though sometimes rather intrusive insanity." He was the second son of Mr. William Cruden, a merchant of Aberdeen, and was born 1701. He became a private tutor in London, and afterwards a corrector of the press and a bookseller. His shop was under the Royal Exchange. He began the "Concordance" in 1733. He dedicated the work to Queen Caroline, but as she died before the publication he suffered severe loss. He was several times put in a madhouse, but his insanity never showed itself in his works. He worked hard to improve the condition of the prisoners in Newgate, and actually succeeded by incessant application to the Earl of Halifax, the Secretary of State, in getting the sentence of one Richard Potter, who was convicted of uttering a seaman's will knowing it to be forged, commuted to transportation. He died November 1st, 1770, in the 69th year of his age.

J. P., Jun.

ANCIENT HOUSE IN TREVES.

THE house of which we give an engraving is a good example of German Domestic architecture of the fourteenth century, and shows several peculiarities which are only to be met with in Treves and its neighbourhood. Of these the most remarkable are, firstly, the position of the chimney, in the middle of the gable, projecting forwards upon an elaborately ornamented corbel; and, secondly, the plaster decoration with which the whole front is ornamented. Of the first, the examples in Treves are very numerous, and the corbels upon which the chimneys are supported are in many cases very elaborate and beautiful, though nearly always of the same character,—that is, adorned with tracery resembling the head of a two or three light window.

Of the second peculiarity, the plaster decoration, this is one of the few examples left, and is certainly the only one in which the whole scheme of the decoration can be clearly ascertained. It will be seen from our illustration that the general design represents a vine climbing over the upper portion of the house. Where the branches divide is a large foliated crown; and a little lower is a graceful figure of a woman bearing a pitcher, probably the remains of some sacred subject,—perhaps the woman at the well of Samaria; but as all the other figures have been entirely obliterated, it is now impossible to decide. This plaster ornamentation was evidently cut with some sharp tool; none of it shows the slightest marks of casting. It is in very low relief, the most projecting portions are not raised more than $\frac{1}{2}$ in. from the surface of the wall. It is quite different from our old English "parquetting," as the ornament here is raised, not sunk. A somewhat similar style of decoration may be noticed upon one or two old houses at Faversham, in Kent, and Saffron Walden, in Essex; though in all these cases it is at least two centuries and a half later in date than the example in Treves.

Another remarkable feature about this house at Treves is the wooden angle niche with statue, with the remains of the doors with which it was originally shut up at certain times. Slight traces of ancient colouring still exist upon the doors



ANCIENT HOUSE IN TREVES.

and niche, but the figure of the Madonna has been vilely daubed with red and blue within the last few years.

ST. JUDE'S CHURCH, SOUTH KENSINGTON.

THE erection of a large church has been commenced in Collingham-road, a new way leading from Cromwell-road, through "Boltone," to the Fulham-road, the whole distance being through two of Captain Gunter's estates, by whom the site for the church has been given. This new road, having been formed to communicate with Cromwell-road, is raised considerably above the land adjoining it, and the foundations of the church are necessarily much below it. To utilise the work thus necessitated, a lecture-room, 76 ft. long by 27 ft. wide and 12 ft. high, with retiring-rooms, has been formed under the eastern end of the building.

The church includes a nave and side aisles, 103 ft. long and 49 ft. 3 in. wide; a peculiarly broad transept, adding 57 ft. 6 in. by 13 ft. 6 in. on each side, and making the whole width across 76 ft. 3 in.; chancel and sub-chancel, 28 ft. long,

and a spacious organ-chamber open to the west and south, over the vestry. There are entrance-porches to the ground-floor and to the galleries at the west end, and next the transept at each side, as well as an enclosure to the main west entrance, a portion of this enclosure being used as a baptistery. The divisions between the nave, aisles, and transepts are formed with iron columns, 20 ft. in height, carrying brick and stone arches. The height to the underside of boarding under ridge of main roof is 54 ft. 6 in.

The interior will be faced with marble, with coloured bricks in strings and arches. The roofs will be open, stained and varnished; the seats of deal; the stalls in sub-chancel of oak. Both church and lecture-room are to be heated by means of Garney stoves in chambers beneath the porches.

The exterior is being executed in Kentish rag, with Box Ground stone to doors, windows, water-tables, and strings. The church is estimated to accommodate, on the floor and in shallow galleries in the transept and at west end, about 1,600 persons; the amount of the contract, taken by Messrs. Myers & Sons, who are now proceeding rapidly with the works, is 11,300*l.*, which includes fitting up the lecture-room, but is exclusive of the

tower, pulpit, font, and organ. Messrs. George & Henry Godwin, of Brompton, are the architects. We give a view of the exterior from the north-west. The plan of the church is somewhat peculiar, and will have the effect of bringing a large proportion of the congregation into the neighbourhood of the officiating minister, a matter of some consequence in a building of this size. The promoter of the undertaking is the Rev. J. A. Aston, of Elvaston-place, South Kensington. The Rev. R. W. Forrest, of the Lock Chapel, is to be the first incumbent; and Mr. John D. Allcroft, of Porchester-terrace, is treasurer of the building fund. Subscriptions are being sought, and we believe that the priority in choice of sittings will be regulated according to the scale of donations. A site for a parsonage-house has been obtained in the dress-ground that will surround the church; and the building of this, under the direction of the same architects, will be commenced after the church is finished.

The road is called after Capt. Gunter's Yorkshire estate, and another, the Wetherby-road, after the name of his house and the town it adjoins. A fine neighbourhood will doubtless soon spring up around the new church.



ST. JUDE'S CHURCH, ON THE EARL'S COURT ESTATE, SOUTH KENSINGTON.
MESSRS. GEORGE & HENRY GODWIN, ARCHITECTS.

THE PROPER DRAINAGE OF TOWNS.

SIR.—As uncleanness of houses and streets, and the emission of noxious gases into the atmosphere thereof, are productive of disease and mortality, in proportion to the intensity of the uncleanness and the noxiousness of the gases, so whatever is done to prevent or reduce uncleanness, and the escape of foul gases into the air, tends to maintain the air in a pure state, and to prevent or reduce disease and mortality. This applies as well to ventilation as to drainage.

From the earliest times a wrong system has been pursued in regard to the drainage of our cities and towns; and, consequent upon our desire to remedy the evil handed down to us through our forefathers' ignorance of sanitary science, we have been endeavouring, during the last twenty years, to improve the drainage of the metropolis, as well as of towns throughout the country. But, unfortunately, by following too much in the old groove, the so-called improvements that have been effected are at best but confused and inefficient works.

All experience proves that the only true principle upon which cities and towns can be drained so as to preserve the subsoil, the atmosphere, and the natural streams from pollution, is that the rainfall should be kept separate from the sewage, and discharged into the rivers, and that the sewage should be kept separate from the rainfall, and used at a distance in the country for fertilising the land.

This principle, which the writer enunciated twenty-one years ago as the only true one to be adopted for town drainage, is fast fruitifying. Persons who then denied its cogency now see that the old drainage works, as well as the drainage works which have recently been executed, are inefficient; that they are palliatives, and do not prevent the pollution of the subsoil, the air, and the streams; that, in fact, it is as great an error to admit filthy drainage into the drains and sewers that discharge surface water into the streams and rivers, as it was to retain excreta and liquid refuse in cesspools and cesspool-sewers at the back and front of the houses.

The difference between the noxiousness of an uncovered sewer, and of one that is covered, is only in degree. Both pollute the atmosphere by the gases which escape from the decomposing deposit and sewage currents, the one directly from the exposed surface, the other from the unexposed surface by the openings in the communicating drains. There are at least *two millions* and a half of inlets to the drains and sewers under the houses and streets of the metropolis. Each house and each street has its respective inlets; and through very many of these streams of foul gases are continually escaping into and polluting the stratum of air respired by the inhabitants. It is a fact that not only the filth that deposits in the drains and sewers, but the sewage itself while running in them, gives off offensive emanations. These, by escaping through the inlets into the houses and streets, do not produce specific disease, if they cannot fail to aggravate or intensify disease, or at least to lower the general tone of health.

Next, therefore, to open sewers and cesspools, the existing system of sewerage is the most effectual that could be devised for distributing the noxious sewage gases among the people. It may be likened to an enormous collender which, while the liquid is passing down, the vapour beneath is passing up, and escaping into the air by the regurgitation. It is true that many of the inlets to the drains in the houses, and some in the streets, are trapped; but a vast number are not trapped, and through these, as well as through very many that are supposed to be trapped, the drains and the sewers are ventilated by currents of air constantly passing into, along, and out of them; that is, the pernicious gases generated in the drains and sewers are being continually forced out by the greater pressure of the cooler and heavier external air acting on the lesser pressure of the warmer and lighter internal air.

What has been done, in regard to flushing, trapping, putting down drains and sewers of improved forms, and intercepting the sewage from the Thames in front of London, and pouring it into the river again a few miles lower down, is not a thoroughly complete and permanent remedy, but the doctoring of an incurably vicious system. In truth, the combination of surface and house drainage into one set of drains and sewers discharging into the natural streams and the river is utterly incompatible with a sanitary atmosphere. This

public boards and the public should be taught to understand. The root of the evil—the cause of poisoned streams, the cause of poisoned air, the cause of smells, the cause of sickness, and the cause of high death-rates—is the mixing of the two kinds of drainage in one set of drains and sewers. So long as this is done, so long will it produce evil. It is an enemy that has never been subdued, and never can be, but by separating the two drainages.

Twenty years ago it was thought that the street refuse should be washed every morning, by the stand-pipe and hose, down the gullies into the sewers, and thence by flushing into the river. Persistence in this idea has done more than any thing else to perpetuate the combined system of drainage. The inherent fault of this system is, that it requires the sewers to be so large as to accommodate the rainfall, while they ought to be as small as possible, in order to concentrate the sewage (which is very much less in quantity) so as to give it scouring power to prevent the matter in suspension from depositing therein. They also, by exposing large surfaces of the sewage to the air, promote its decomposition, and the generation of noxious gases, which small pipes, receiving nothing but sewage, would do only to the extent of the surfaces exposed. Large-sized sewers therefore necessitate as auxiliaries large currents of water, to prevent the sewage from depositing, and also flushing appliances and men to remove the deposit. Hence these requirements in themselves prove in a measure that the combined system is wrong.

The idea of washing the street-refuse down the sewers looks well in theory, but would be very wrong in practice—first, because much of the heavy matters would deposit and cake on the sewer bottoms, making them wide and flat if they were not so already, which flushing without raking would not remove; and second, because the sewage currents, with the heavy matters carried by them into the reservoirs and the river, would not only pollute the river, but deposit on its sides and bed as well. All this is now in operation, except that the streets are not cleaned by the stand-pipe and hose. If they were so cleaned, they would keep so only until the traffic commenced, and would remain wet, not only for hours each day, but, when the atmosphere was very humid, for days together, which would be very objectionable. What now really takes place is this: the streets are left alone from two to six days and more at a time, when, if they are dry, the refuse is swept, and, if they are wet, the mud is scraped into heaps, and afterwards carted away. Practically, the streets are not cleaned until they become strewed, or entirely covered, with dirt or slop, when it is swept into heaps, and carted away. This is the normal condition of the main streets of traffic. This system of waiting for the dirt or slop to accumulate before it is swept up and removed is like the old practice of waiting for the sewage to deposit in the sewers until it choked the house-drains.

During the intervals of cleansing, in fine weather, clouds of triturated granite and horse-droppings are wafted into the houses, smothering everything, and into the eyes and mouths of the wayfarers, blinding and choking them; and in wet weather, sheets of greasy mud cover the streets, which the traffic scatters over the pavement, rendering walking on them, owing to the greasiness of the mud, a kind of retrograde progression; and over the passengers, covering their clothes, hands, and faces. When it rains heavily, rills of slimy liquid meander from the watersheds of the roads and footways into the gutters, whence the currents, gathering strength, sweep the sand and other matters down the gullies into the sewers and river, causing the mischief as before described. As this now takes place, the evil would be far greater, if the street refuse were to be washed every morning down the sewers as proposed.

The true use of sewers is to drain the surface of the rain falling upon it, and the land or subsoil of the rain-water percolating into it. The surface-water from the roofs, areas, and yards of the houses, and from the streets and roads, could be made, by careful scavenging (not the slow, slovenly way in which it is now intermittently performed), to flow off comparatively clean. Local boards and vestries should constantly employ men and boys, or the able-bodied poor, to sweep up and remove the dirt and mud as produced by the traffic, and the offensive matters as dropped by the horses. Receptacles should also be made near the gullies for intercepting the detritus when it rains, instead of

allowing it to be carried into the sewers, and thence, by the reservoirs, into the river. The receptacles should be cleaned out at least every other day,—not once a week, once a fortnight, once a month, or not at all, as now obtains.

But this work would be better done, and cheaper, by a well-organised body, to be called, "The Metropolitan Street Cleansing Brigade," consisting of about 2,000 steady, diligent men and lads to be employed every day (Sundays excepted) from morning till night in sweeping up and removing the dirt and horse-droppings in the streets. In some streets it would suffice to sweep them once, in others twice, and in others thrice a day, according to the traffic. In the main thoroughfares the sweeping should be continuous from morning till night. For instance, six men and six lads distributed along Oxford-street and High Holborn, from the Marble Arch to Holborn-bars, with a man, horse, and cart picking up the dirt, would keep that extent of main street, with the side streets, in a thoroughly clean condition. The thousands of tons of street refuse which now pass into the sewers and the river, could, by collecting it thus, be sent, at small cost, into the country by the railways, for the farmers to top-dress their land.

As by this system little or no dirt would be allowed to remain in the streets, so would there be but very little slop in wet weather, and but little dust in dry weather; and therefore fewer slop and water carts would be required. The saving by this, together with the saving by keeping the street debris out of the sewers and river, and the revenue that would probably be derived from the sale of the manure, would go far to pay the wages of the brigade. In any case, however, a small rate of one half-penny in the pound on all the property of the metropolis, would produce sufficient revenue to defray its expenses. In the event of a heavy fall of snow occurring, the brigade could be called out at once to remove it from the main streets, so that the traffic may not be impeded.

The existing system of house drains and sewers of the metropolis should be used only for carrying off the rain falling on the surface, and the water percolating into the land or subsoil; and the reservoirs at the outfalls should be used for precipitating the silt, sand, and rubbish that would be brought into them by the sewers when in flood, before the water is permitted to flow into the river. This would save the river from pollution and its bed from silting up, both of which now go on, and will continue to do so, entailing a large annual expenditure to remove the deposit, while the present system prevails. The deposit in the reservoirs could be spread on the adjacent marshes so as to raise the land to the level of the river embankments.

What is called the main drainage has produced no useful result, so far as London is concerned, beyond the removal of the sewage from the part of the river running through London. By making the outfall in another part of the river lower down, where the sewage still oscillates with the tides, the same mischief is going on as before. It was stated by the engineer who designed the work that "the flow of the sewage into the river at this part would not create a nuisance," and that "the sewage would not deposit in the river, because the heavier matters would deposit in the reservoirs, and the lighter portions would not precipitate when discharged into, and exposed to the action of, the tides." But these statements are not borne out by the results.

The sewage of cities and towns should be collected and carried away, so that the noxious gases generated by it should be discharged above the stratum of the atmosphere in which the people live and breathe. This could be done by laying down a system of main piping along the back or front of the houses separate from the surface water-sewers, with branch pipes laid to the kitchen and scullery sinks and the water-closets in the houses, separate from the surface water-drains. As these main and branch pipes would never be quite full of sewage, the space unoccupied by the sewage would be occupied by the gases emanating from the sewage. Hence, to prevent the effluvia from escaping into the houses, all the inlets should be provided with syphon pipes under them; and ventilating pipes, unconnected with the rain-pipes, should be continued from the sewage-pipes above the house-tops, and as far from the attic windows as possible, or connected with special ventilating shafts carried high in the air.

In the metropolis it would be neither difficult nor expensive to lay down a separate system of

sewage mains with branch pipes as proposed, as every many of the former could be laid along the existing sewers, and most of the latter into the houses by going just under the basement flooring, as the sewage-sinks and the water-closets are generally above the floor level.

Such a state of cleanliness of surface, and purity of air and of streams, would follow from the full adoption of the separate system, as are unknown and unattainable by the combined system. The only argument yet offered in favour of the latter method of drainage as against the former is, that while the latter requires only one set of drains and sewers, the former would require two sets, which would double the expense. A system, therefore, that poisons the air and the natural streams, is to be preferred, because it is cheap, to a system that would keep the air and the streams pure and sweet because it is dear. But it is not a fact that the separate system would cost much more than the other. In no fair argument based on reason and science, can the combined system be defended.

JOHN PHILLIPS.

THE NEW SURVEYOR-ASSISTANT.

In reply to Mr. B. Hope, who asked in the House of Commons if the First Commissioner of Works had created a new office of "Surveyor-Assistant of Works," Mr. Ayrton stated that the question of the hon. member was founded upon some misconception. No new office had been created, but, in consequence of the increase of duties thrown upon the Metropolitan Board of Works, it had become necessary to appoint an additional assistant-surveyor. He had divested himself of the patronage of the office, and had requested the subordinates in the department to appear before the Civil Service Commissioners for the purpose of ascertaining who was most fit for the vacant office. He was sorry to say that the Civil Service Commissioners did not report in favour of any one of the applicants. He then communicated with a society which was commonly supposed to represent the architectural profession; but the secretary replied that they had nothing to do with it. He therefore had advertised in the newspapers in the usual way, and a number of gentlemen had applied, who would go before the Civil Service Commissioners in order to ascertain which of them was most qualified for the office.

OFFICIAL ARCHITECTURE AND SPELLING.

Sir,—The applications for the post of Assistant-Surveyor of Works to Mr. Ayrton must apparently have been numerous, since it has proved justifiable, and of course "economical," to cause the official letter to be printed, a copy of which I inclose you herewith, and from which you will find that, while the "duties of the appointment are to design and superintend the execution of new buildings and additions to or alterations of existing buildings," the gifted Assistant-Surveyor "should also be capable of making technical reports properly composed and spelt." If such are to be the duties and qualifications of the Assistant-Surveyor, what may not be expected from the Surveyor—the full-blown official?

The whole document is so rich that you may perhaps see fit to print it *in extenso*, and thereby convey to all whom it may concern a summary of that class of "knowledge" which, we are told, "the candidates require." In all humility I should have fancied it was Mr. Ayrton who "required" the class of knowledge which it should be the function of his "Assistant-Surveyor" to place at his command.

Trusting the "reign of terror" in H.M.'s Office of Works, &c., may soon pass away, even although never to be forgotten, I am, Sir,

A SNAPPER-UP OF UNCONSIDERED TRIFLES.

P.S.—I should add that I have ventured to underline a few words not underlined in the original document.

"H.M. Office of Works, &c., London, S.W.

24th June, 1870.

Sir,—I am directed by the First Commissioner of Her Majesty's Works, &c., to acknowledge the receipt of your application in reference to the vacant appointment of Assistant-Surveyor of Works in this department, and I am to inform you that candidates for the office will be required to enter into a competition, which will be conducted by the Civil Service Commissioners.

The duties of the appointment are to design and superintend the execution of new buildings and additions to or alterations of existing buildings, and to superintend and

be responsible for the repair and maintenance of buildings. The candidates require a knowledge of the strength of all building materials, their nature, and the principles and methods of applying them to building purposes, the prices of materials and the value of labour upon them. They should understand architectural drawing, and how to make working plans and specifications, to take out quantities and estimate work to be done, the measurement of work executed, and abstracting and bringing it to bill in detail. They should also be capable of making technical reports properly composed and spelt.

The person to be selected must not be less than thirty years of age, nor more than forty. Due inquiries will be made as to his character and trustworthiness.

Candidates for the appointment should present themselves for examination at the offices of the Civil Service Commission, Cannon-row, Westminster, at ten o'clock a.m. on the 6th July proximo.

I am, Sir, your obedient servant,

(Signed)

GEORGE RUSSELL, Secretary."

THE TRADES MOVEMENT.

Hartlepool.—In consequence of the decision of their masters to reduce the hours of weekly labour from 59 to 56 hours, the whole of the joiners employed by Messrs. Lander & Mollanby, as also those of Messrs. Thomas Walker & Co., two firms in the sawn timber trade at West Hartlepool, have carried out their threatened resolution to turn out, and their example has been followed by most of the joiners employed by Mr. J. Tasker and Mr. Brown, of Stockton, &c., in the same town.

Folkestone.—The carpenters and joiners of this town have been in agitation against a reduction of the weekly wages paid to them. For the last four years, some of them have been paid 5s. 6d. per day, and recently the 6d. had been struck off. The masters declined to give way, and the men accepted the 30s.

Arbitration Boards in the Building Trade.—The arbitration Board formed last year at Bristol, in connexion with the carpenters and joiners' branch of the trade, with the view of amicably settling any disputes that might arise, has proved of much use, according to the local *Times*. The umpire, Mr. Lewis Fry, gave it as his opinion that, although the questions which have come before it have not been of great difficulty or very general importance, the Board has been the means of promoting amicable feeling and preventing misunderstanding. The masters and men have lately held meetings to fill up vacancies in the Board.

Murderous Attack on a Non-Unionist.—An attack, by some of the notorious Sheffield savages, has been made upon a non-unionist, employed by Messrs. Newton, Chambers, & Co., Thorncliffe, near Sheffield. He was assailed by four men, kicked in a most brutal manner, and then thrown into a ditch. After this a large stone was dropped on his head, scalping him, and rendering him insensible. A fatal termination to his sufferings is considered inevitable.

MASTERS AND MEN IN LIVERPOOL.

An interesting case of arbitration was decided last week, in Liverpool, by the arbitrator, Mr. E. Whitley, ex-mayor, a gentleman deservedly esteemed. The award is just published.

A master cabinet-maker in the town employed a number of society men, and by rules agreed upon in 1866 three months' notice of any change in them was to be given on either side, and there was to be no piecework. The great hotel belonging to the London and North-Western Railway in Lime-street is approaching completion, and tenders for furnishing it have been requested from various tradesmen in the town. Mr. Abbott, the employer in question, called his men together to consult with them as to what prices ought to be charged for such work, for doing which the leaders of the society said he had violated the rules. During his absence from town, the foreman engaged a non-society man. The society men employed obstructed him, and refused to assist him up with his chest. On Mr. Abbott's return, he discharged the society men in a body, and engaged non-society men. Then followed the usual picketing and annoyance, and eventually it was submitted to arbitration. The award is:—

1. That the employer was justified in consulting his men. To hold the contrary would be productive of the greatest injury to both parties, in destroying confidence, and driving away trade.
2. The right to employ non-society men with society men cannot be denied. At the same time, and in the present case, the master had no right to require all his men to quit the society as a condition of remaining with him; and as compensation for their dismissal the arbitrator awards

the fourteen men 3l. each, to be paid them by their late employer, and each party to bear his own costs of the reference.

Standing out in pleasant contrast to the above, was the annual excursion of the firm of Haigh & Co., builders and contractors, of Liverpool, on Saturday last. About 200 workmen, with their wives, together with the heads of the firm, and a number of architects and others, who were invited guests, started from Lime-street by special train on a visit to the Duke of Devonshire's Palace at Chatsworth. Here, on arrival, they refreshed themselves, when they found the whole of the magnificent house and grounds thrown open for their inspection. The weather was delightfully fine, and the numerous tradesmen present had a fine opportunity of criticizing the various portions of the building and furniture, together with the paintings, sculpture, and books for which the place is celebrated. In the grounds a great number indulged in a dance to the music of a band of juveniles, which accompanied them from Liverpool. Towards evening, they were all got together on a sloping green sward, and a photograph was taken of the party. Then a speech was made by the head of the firm, Mr. Haigh, in which he alluded in highly complimentary terms to some of their foremen, Mr. Thomas Blair, and, on behalf of all present, he handed him a gold watch, chain, and appendages, of the value of 40l. The watch bears the inscription, "Presented, at Chatsworth, to Mr. Thomas Blair, foreman to Messrs. Haigh & Co., on their fourth annual excursion, by the firm, their workmen, and a few friends, as a token of respect and esteem, July 2nd, 1870."

STRIKE AT HOLLOWAY.

Sir,—Kindly insert in your next impression that the workmen employed at the stabling in erection for the London General Omnibus Company, Limited, did not strike against the contractors, but against the clerk of works, who has now been removed by the architect.

WILLIAM CHOP FRANK, General Foreman on the Works (For Messrs. Langmaid & Way, Contractors).

HOUSE OF COMMONS.

Thames Embankment.—The Chancellor of the Exchequer declined, in answer to Mr. Beresford Hope, to appropriate any portion of the Thames Embankment to the purposes of a natural history museum. Such an appropriation would deprive the ratepayers of a large portion of the land which was to be laid out as public gardens.

The Embankment at Chelsea.—Sir Charles Dilke asked the honourable member for Bath when the Metropolitan Board of Works will proceed with the Embankment of the Thames at Chelsea, pursuant to the Act passed in the last session of Parliament, and if it had yet been determined whether the Embankment should be faced with brick or granite. Sir William Titton replied that the Embankment referred to was a very large work, about a mile in length, and was intended to carry with it the main sewer. The whole cost would be about 250,000l. A Bill passed in 1858 authorising the construction of the work; but unluckily the clause authorising the Metropolitan Board of Works to borrow money for the purpose was struck out. The consequence was that they could not go on with the work. In July, 1869, however, a Bill was passed enabling the Metropolitan Board to borrow money, and as soon as that was obtained it was taken in hand, and some progress had already been made. Great difficulties had, however, been met with in the purchase of the property where the work was to be constructed, and in the adjustment of water right along the river. As to the work itself, it would be faced with millstone grit, so that there would be a stone wall facing the river instead of brick. He hoped that before the expiration of two years the work would be thoroughly completed.

New Refreshment Rooms for the House.—Mr. Ayrton promised Mr. Bentinck that as soon as the committee appointed to improve the internal arrangements of the House could come to terms with the Black Rod Committee of the House of Lords, a plan which he (Mr. Ayrton) had submitted to the former committee, would be carried out, and the new refreshment rooms erected. The carrying out of the recommendations of the committee of last session would have entailed an expense of 24,000l. The plan now before the committee had been prepared by an officer of the department of works.

Metropolitan Sewage.—In reply to Mr. J. Howard, Mr. Ayrton said that the company established some years ago for utilising the sewage on the northern side of the Thames for irrigation purposes had done little beyond receiving the money of the public. The company should, of course, bear its own loss. The Metropolitan Board were endeavouring to deal with the subject, and no doubt the company would be compelled to fulfil its obligations. The question of sewage as regarded the metropolis was an enormous one, and would have to be dealt with by the local authorities.

The New Home and Colonial Offices and Parliament-street.—In reply to questions, Mr. Ayrton said, the building of the new Home and Colonial Offices would be proceeded with as soon as the Government had given the necessary sanction to the plan. The decision did not rest with him. The plan and estimates were now under consideration, and he expected that a decision would be come to in a very few days. With respect to the progress in purchasing the houses, for which the sanction of Parliament had been given, it was not for the purpose of improving Parliament-street, a duty which must be left to local authority. The houses were to be purchased for the site of the Home and Colonial offices. They would not be pulled down till the actual necessity arose.

OPENING OF NEW SCHOOLS FOR SEAMEN'S CHILDREN.

At Wellclose-square, in the east of London, new schools for the children of seamen and others, in connexion with St. Paul's Church, Dock-street, Whitechapel, were opened by the Prince and Princess of Wales, on the 30th ult. The schools occupy the centre of the square. The site was, until lately, for nearly 200 years, occupied by the church for Danish seamen, and was the property of the crown of Denmark. The cost of building is 4,890*l.*, and fittings and other charges about 600*l.*, making the total 5,490*l.* The contributions received or promised from the public in aid of this work amount to 3,400*l.*

The new school will accommodate, for training and instruction, about 600 children,—150 boys and 150 girls,—besides 300 infant school children. The style is Gothic, and the building has a tower in which is a first-class clock, by Mr. Joseph Fairer, of Bond-street, with illuminated dials, and all the best modern improvements. There are residences for two masters and two mistresses, and a covered recreation ground. The architects of the edifice were Messrs. Grestorex & Co. The Prince and Princess were addressed on the occasion of the opening by the vicar of St. Paul's, Dock-street, the Rev. D. Grestorex.

METROPOLITAN APPROACHES.—LAW COURTS AND NORTH.

Sir,—In the *Builder* of June 25th appeared an article defining the line of a proposed new street from Norfolk-street, in the Strand, to North London, cutting through Holywell and Wyck Streets, Clare Market, and Portugal-street, into the west side of Lincoln's-inn-fields, and thence by a curve, through Gate-street, into High Holborn, to some point between Kingsgate-street and Southampton-row (King-street, as we knew it in our early days). I would venture to suggest what I think a much better line, and less costly.

I would start from the Embankment, taking down Strand-lane (chiefly brothels), leaving King's College-buildings to form the western line of the new street; St. Mary's Church and Newcastle-street (wide) would face the opening thus made. At the upper end of this street I would cut through the fork made by the junction of Houghton-street and Stanhope-street, through Clare Market, Duke-street (skirting the Roman Catholic Chapel, but not infringing upon it), the stables and back slums, at the rear of the western side of Lincoln's-inn-fields, into Great Queen-street, facing Little Queen-street.

From here the route to Camden Town, Hampstead, and Highgate, passing the great railways and clearing stations, would be almost as the crow flies, with the thoroughfare ready made, except so far as to the cost of removing some cigar shops and night houses at the north end of, and to widen, Little Queen-street, and one or two respectable tradesmen's houses forming the corner into Holborn (one only, I think).

It is renowned in the neighbourhood that the

lawyers on the west side of Lincoln's-inn-fields would object to their roadway as the line.

Another most convenient public road to relieve the present, and add considerably to the value of my proposed road, would be to take down the west side of Great Tarn-street, and alter the footway (not a road), into the width of, and in line with, Newman's-row, making it a road for carriages. This would serve as a great relief to the locality, for although there are many courts and passages in High Holborn, there is no direct street to the Strand between Chancery-lane and Drury-lane, and on Monday afternoon, we had a painful proof of the necessity of some additional outlets when our great thoroughfare was blocked for repaving, and the passage of carriages shunted by the police into such few narrow streets as are beyond either of these boundaries.

I will leave the estimate of cost to a more skilled man; but I cannot but think that the cutting through Gate-street and High Holborn, to form a curve to Southampton-row, would be found much more expensive than the line I have suggested, and certainly would not be so direct from north to south. The only difficulty that I can see, and which would apply to both plans, is whether the Duke of Bedford could be induced to remove the bar or gate in Upper Woburn-place.

E. B.

MAGISTRATES AND LOCAL GOVERNMENT ACTS.

Sir,—Permit me to bring under your notice what I conceive to be an anomaly in the administration of justice in certain cases under the Local Government Acts, and having special reference to builders as a class.

Proceedings are frequently taken before the magistrates for alleged breaches of building and other by-laws, and the anomaly I allude to is this: it often happens in this borough (Portsmouth) that such cases are decided by the mayor, and two or three aldermen, also magistrates—that is, the chairman, and two or three members of the Local Government Board—the very body which has laid the information. The consequence is, that the magistrates must indorse the opinion they held in the committee-room of the Local Board, or stultify themselves by holding a contrary one on the bench upon a recapitulation of the evidence, which is, of course, that of their own officers, whom they are bound to uphold; and the defendant feels that he only responds to the summons as an expenditure of time and money to find a judgment already passed, confirmed.

I do not for one moment wish it to be inferred that the prosecutions are unnecessary, or the decisions unfair. I do not complain of individuals, but of the system under which such a state of things can exist, and which tends to frustrate the objects aimed at by the Health of Towns Acts by provoking evasions of the law.

A BUILDER.

** These observations deserve consideration.

BARNES'S HOME, HEATON.

The foundation-stone has been laid of the new industrial school at Heaton Mersey, to be known as Barnes's Home.

The school will be carried on in connexion with the Ardwick Industrial Schools, and will be capable of accommodating 200 children. Mr. Robert Barnes, who has long been a friend of the Ardwick Schools, has undertaken to bear the whole expense of building and furnishing the new schools and the purchase of a few acres of land adjoining, which will be made use of for gardening and farming purposes. The total cost will be about 12,000*l.* The new schools will be erected on an elevated plot of land on the Bank Hall estate. It will be in the Gothic style. The total frontage will be 156 ft., and the depth 242 ft. The central part of the building will be three stories high, with side wings two stories high, built of brick with stone dressing. The principal feature in the front elevation of the central part of the building is a tower with chamber for the reception of a clock having a dial on four sides, surmounted with a slated spire, the total height of which will be 111 ft. The principal entrance will be under the clock-tower, leading to a hall, thence to a corridor running right and left the full length of the building. There will be accommodation for 200 boys, with resident masters, assistants, servants, and residence for the governor and matron. The ground

plan contains two schoolrooms, each 40 ft. by 24 ft., designed as wings, series of class-rooms, and masters' rooms; the chapel and dining-hall, 60 ft. by 35 ft., and 23 ft. high, at the end of which are the school kitchen, cooking apparatus, bakehouse, and boiler-house, situated in the centre of the playground, leaving a wide space between the right and left wing for the recreation of the children. The building will be heated by means of steam pipes. At the back of the school premises are the farm buildings. The contractors are Messrs. Thomas Clay & Sons, of Manchester and Andenshaw; and Mr. Henry Pinchbeck, of Manchester, is the architect, under whose direction and supervision the work will be carried out.

PRESERVATION OF CAST-IRON WATER-PIPES.

In 1858 the cast-iron pipes carrying the Cochituate water from Boston to South Boston, were treated with a preparation from coal tar, known as Dr. Smith's process, and the result has been so favorable, according to the *Scientific American*, that it has been permanently adopted by the Cochituate Water Board, and by the managers of other waterworks throughout the States, where the material used for pipe is cast-iron. The pipes laid in 1858 were taken up and examined, after ten years' use, and were found nearly free from rust or other serious accretions. The varnish or pitch is made from coal tar, distilled until all the naphtha is removed, the material deodorized, and the pitch reduced to about the consistency of wax or very thick molasses. The pitch must be heated to 300 deg. Fah. during the dipping. Fresh pitch must be frequently added, and at least 8 per cent. of heavy linseed oil with the pitch. Each casting is kept immersed from thirty to forty-five minutes, or until it attains the temperature of 300 deg. Fah. The coating must be tenacious when cold, and not brittle, nor disposed to scale off.

THE SOUTH SIDE OF THE THAMES.

Sir,—One leisure day I resolved to explore the Southern Embankment. I passed the magnificent hospital (or rather half a dozen linked), and found the Embankment terminate in a miserable cow-shed, and there end in smoke, from a number of conical craters,—i.e., pottery volcanoes belching forth volumes of sulphurous vapour, enough to choke a black. There are some eligible sites to let for bacon-smokers, haddock-dryers, blacking-makers, or for a sweeps' asylum. Gas-works seem to thrive here,—three on this side and two on the opposite shore. The South-Western Railway runs through the gas-works over the retorts, and within a few feet of the huge gasometers. If trains halt here, passengers get it hot and strong, and must not make light of it. Next to one gas-yard I observed a firework manufactory cheek by jowl, also a glass-blower's fiery-furnace shaft within a few feet of receivers. In this odoriferous region, soap-boilers, candle-makers, bone-crushers, manure-dealers, varnish-burners, and chemical works abound. It is well St. Thomas's Hospital is near; the poisoned poor will not have far to stagger. The hospital governors seem to anticipate hosts of patients by the number and extent of noble buildings. While commending their institution and intentions, may their expectations be not realised.

R. T.

FREE PUBLIC LIBRARIES.

Sir,—I am very glad to see the subject of free public libraries so ably urged by my fellow craftsman, a lord of the linen apvon, "Jack Plane." It is constantly said, and with truth, that the metropolis of this kingdom lags behind even the third or fourth rate towns in the adoption of any improvement. Why this is so, is somewhat difficult to prove; but it is, I think, likely to remain so until the great unwieldy aggregation shall be resolved into manageable sections, in which the individual shall not be lost in the multitude as now, but shall feel, as a soldier in a great army feels, that his services and abilities are necessary to the successful advancement of the whole. When such a time comes, we shall have free public libraries in London supported by the rate-payers, but, in my opinion, not till then. Let no one hope, however, to get the assistance of the shopkeeping class as a body towards such an object. Evidence is not wanting that they have

out-voted in many places those whose minds have been bent upon their establishment. The opposition is in every case made by that class, while all others cheerfully support the proposition. Nor do they partake of the feast even when it is provided for them. During the last two years my lot has been cast in Liverpool. I have been a constant reader at the Free Public Library there, and I confidently affirm that if readers of all other classes were excluded, the benches would be empty.

Let not my brothers in London lose heart, however: rather let them "Pray, that come it may, as come it will, for 'that,'" and show to the obstructors in an unmistakable manner that they abundantly employ the means they now possess for their intellectual and moral elevation, so shall they be better able to appreciate the boon when it comes. E. G.

THE LIGHT AND AIR QUESTION.

ADAMSON V. GATTY.

The plaintiffs in this case (before Vice-Chancellor Sir W. M. James), Messrs. Adamson & Wagh, were owners, as joint tenants, of a large warehouse at the corner of York-street and Velvet-street, Manchester, and the bill was filed against Mr. Gatty, the owner of a neighbouring warehouse, for an injunction to restrain him from erecting a warehouse or building upon his premises in such a manner as to darken or obstruct the free access of light to the windows of the plaintiffs' warehouse, as such access was enjoyed previously to the taking down of the buildings and erections which formerly stood on the defendant's ground opposite to the plaintiffs' warehouse.

The evidence went on to show that the former building on the defendant's ground was 30 ft. high, and 60 ft. away from the plaintiffs' premises, whereas the new building was about 65 ft. high and only 40 ft. away from the plaintiffs' warehouse. It was contended that the plaintiffs had a right to the same amount of light which they had always enjoyed.

The Vice-Chancellor said he entirely dissented from the theory that the plaintiffs had a right to the exact amount of light which had always come to their premises, as if they had an absolute property in the light. The plaintiffs' right to light was an easement over his neighbour's property for the enjoyment of his own house, but this court would not interfere on behalf of this right, except where a court of law would give substantial damages for the injury sustained. It was necessary for the plaintiffs to show that there was a deprivation of and an interference with his enjoyment of his house. Suppose a man had a coal-cellar, and half the light was taken away by an adjoining building, still there would be no ground for complaint if there was sufficient light left for the use to which the cellar was applied. There must be a substantial interference with the plaintiffs' enjoyment. In this case, it appeared from the evidence, that the table on which the plaintiff exhibited his goods received as much light now as it did before, and there was no evidence to show that the rest of the room was rendered unfit for the purpose to which it was applied, which seemed to be the storing of the goods. Under these circumstances he should not interfere to prevent the defendant from continuing the erection of his building; but there might be a case, when the lighting was computed, for compensation. He should, therefore, refuse the injunction, and the plaintiffs could apply at a later period if they could prove substantial injury.

ARCHITECTS' CHARGES.

An action, Farrall v. Vincent, to recover 30*l.* 17*s.*, balance of account for plans and superintending buildings at Sherborne, has been tried at the Somerset County Court, Yeovil. Plaintiff is Mr. C. E. Farrall, late of Sherborne, architect and surveyor; and the defendant is Mr. J. Vincent, innkeeper, of that place.

Plaintiff said he was first requested by the defendant to make a plan of a cottage, for which he charged 1*l.* 1*s.* He also prepared a plan of a new house for defendant, to be laid before the Board of Health; but, as defendant could not come to terms with them for the said and that would be given up, he was requested to make more plans. The agreement was that he was to have 6 per cent. upon the outlay, which was to include his charge for drawings and superintendence. When the work had progressed as far as the arches of the first-floor windows, there was an arrangement with Mr. Dugby's agents that the building should be put back, so as to improve the appearance of the entrance to the town from the railway station. Defendant asked him to let him know the amount of his account. He sent in a bill for 2*l.* 3 per cent. on the amount of the contract, as that was the usual charge for preparing the drawings, and charged 1*l.* a week for the time he had superintended the building—seven weeks. No objection was made to his charges. He was then requested to prepare a revised plan for the building, and it had since been erected in accordance with that plan by Messrs. Cairnes & Cross, of Sherborne, builders. His present claim was 30*l.* 17*s.*, but that included money paid for stamps and other things. He did not know how defendant arrived at the amount paid into court (11*l.* 1*s.*). His valuation had never been objected to, nor did he know that the account had been settled since he left Sherborne. He had received 50*l.* on account, in addition to the amount now claimed.

Mr. George R. Crickmay, architect and surveyor, Weymouth, as a witness for plaintiff, said the charges were less than usual. The charges on the various plans were referred to at some length.

Mr. C. E. Benson, architect and surveyor, Yeovil, said he charges made in plaintiff's bill were very reasonable. He considered that plaintiff was perfectly justified in

charging for the time occupied in superintending the work (as he had to be present all day, in consequence of the erection on old foundations), which was afterwards stopped, instead of simply charging 2*l.* per cent. on the amount expended. The first part of the work was the most important, and required the most careful supervision.

Mr. Thomas Farrall, architect and surveyor, Sherborne, said he considered that his brother was perfectly justified in charging for the time he expended in superintending the building, as the foundations required unusual attention. Mr. George Cross, builder, and defendant asked him, last week, to take 189*l.* to settle his claim for 31*l.* He had since received 110*l.* in notes and a bill for 105*l.* He did not know how defendant arrived at the amount offered; but he believed he had consulted Mr. Chant, builder, Yeovil. There was a forfeit of about 60*l.* on the contract, as the work was not finished at the proper time. He took this into account; and, as defendant threatened to let the matter go to the assessors, he took the amount offered, in order to get a settlement. Mr. Farrall was at the building nearly all day long during the erection of the first house on the old foundation.

Mr. Cairnes gave similar evidence. For defendant, Mr. Joseph K. Chant, builder and surveyor, Yeovil, said he considered the charges rather high. It was an extraordinary thing for an architect to charge for time and to act as clerk of the works. He thought 6 per cent. ample payment for plaintiff's trouble.

Plaintiff produced a letter, in which defendant had admitted several items of the account, and promised payment. The Judge allowed 5*l.* as a sufficient sum for superintending the work, and deducted 15*l.* from the charges for preparing plans. Judgment for 37*l.* 2*s.* and costs.

CATHEDRAL ORGANS.

SIR.—I quite agree with the objection made to cutting up Salisbury organ. With reference to your comment, it is one thing to divide an ordinary parish-church organ into two halves (in All Saints', Liverpool, that was done in order to get a "Decani & Cantoris" organ to play antiphonally with the choir), but it is another thing to split up a great organ such as they are now placing in our cathedrals into several parts, and plant them up and down the place in the way Mr. Scott proposes, as far as I understand him. If you were sitting in one of the stalls in a cathedral, it would not improve your devotions to find a big pedal-pipe suddenly exploding close behind you, and then to hear the next note some 30 ft. off, opposite you, and the treble-pipes at the same time singing out from the triforium! It would not do, I assure you; and if I were organist at a cathedral, I would raise heaven and earth before I would let my organ be treated so. S.

TENDERS.

SIR.—The following will interest a great many of your readers, as showing one of the causes of the wide tenders often seen in builders' contracts. I, with six others, was asked to give a price for house, stable, and greenhouse, a few miles from town; lithographed quantities being supplied to each of us, and at the appointed time the party (called in your list of tenders an architect) opened the different estimates when they showed a difference of 220*l.* in about 1,600*l.* The estimate of the lowest bidder was accepted, since which it has turned out that the accepted one and another were selected as the desirable parties to have the job; and their lithographed quantities showed 220*l.* difference, and the work was very handsomely treated to 32 rods. I should be glad if you would state at the bottom of this letter, in your next issue, whether there is any way in which the parties could be made to pay for our wasted energy and for their dishonest conduct to all concerned, besides exposing them to scorn. ONE OF THE FOUR.

* * Surely our correspondent must be in error. The transaction seems so stupid, as well as wrong. Have the quantities since been checked?—ED.

SAFE!

A PLEASANT word that is—the certainty of it worth any money—a dangerous word when belief in it is entertained without good grounds. Safes that are unsafe are common enough; safes that really are safe are much less so. Mr. Streeter, of Conduit-street, has done his best to obtain one that is safe; and Messrs. Chatwood, who erected it, have guaranteed, under a heavy penalty, that by no portable appliance can an opening large enough to give admission, be operated in either side of their safe in less than forty-eight hours; in front in not less than a week; and the concrete would take at least some twenty-four hours to work through. So that a burglar would have to be at work at the weakest point seventy-two hours, unobserved, before entrance was possible. The size of the safe is remarkable, the length being 15 ft., width 9 ft., height 9 ft. 6 in., and the door is 18 in. in thickness. The safe is not only securely bedded in concrete, and so built into the premises as to be proof against a long amount of burglars' labours, but the whole is enclosed in a cistern of pneumatic chambers, the air in which presses upon and sustains a column of coloured water in a gauge-tube placed outside in full view. This envelope, which is the invention of Mr. Tobin, well known

in connexion with the Polytechnic Institution, gives warning of any operations in progress, and affords the means of detecting the precise portion under attack. The total weight of the safe is more than 50 tons. We are disposed to think Mr. Streeter may say—Safe!

GLASS WALLS.

AMONG the novelties in garden arrangements Mr. Beard, of Bury St. Edmunds, has recently patented a system of erecting walls of glass. These walls are formed of grooved T iron. Stands of the required height, are fixed at four or five feet apart into a foundation of brickwork, stone, or blocks of wood, and bound together at the top by a coping which projects 3 in. on each side. Into the grooves rough plate glass is placed, being held in position by a packing of felt, the slabs being butt-jointed; and thus, when the coping is put on, the work is complete. Nothing can be more simple than the arrangement and construction of these walls, and they are unexceptionable in point of appearance. They are open to objections, but may be useful under some circumstances.

CHURCH-BUILDING NEWS.

Maidenhead.—The dedication of the tower of St. Luke's Church, Maidenhead, has taken place. The completion of this spacious church, which was consecrated by the present Bishop of Winchester (then Bishop of Oxford) on Thursday, August 23rd, 1866, was thus appropriately consummated. The church is built in the Early English style of architecture, the material being freestone, from Charlbury, Oxfordshire. The dressing is of Box-ground Bath stone on the exterior, and Corsham Down stone in the interior. Mr. G. R. Clarke, of London, is the architect, and Mr. Griffiths, of Eldersfield, Worcester, the builder. The entire cost has been 3,500*l.* The tower is built to correspond with the church in the style of the thirteenth century. It consists of a ground floor open to the church, a ringing-loft, clock-stage, and belfry. The latter has two lancet lights, with louvres on each of the four sides, and is surmounted by an enriched and corbelled cornice, and a pointed slate roof similar to those frequently seen in Normandy and other parts of France. The contract was 1,200*l.*, and has been carried out by Mr. Price, of Maidenhead.

Lydeard St. Lawrence.—The work of church restoration in Somersetshire has remarkably progressed of late. The parish church of Lydeard St. Lawrence (a village about seven or eight miles from Taunton) has been styled in past times the "cathedral of West Somerset;" and its restoration and reparation may therefore be considered as of considerable importance. The restoration was commenced in September, 1869, under designs by Mr. E. C. Giles, architect, London; a contract of 1,160*l.* being taken by Mr. S. Shewbrooks, builder, Taunton. This amount, however, has been exceeded in consequence of new roofs being required instead of repairs to the old, and the sum at present expended is 1,400*l.* The new roofs are of open deal timbers stained, and covered with slate; the floors and benches throughout the church are also new, and the abolition of the ancient high square box-pews has materially increased the sitting accommodation. A gallery, which blocked up the western window and hid the arch of the tower, has also been removed. The arcade dividing the nave and north aisle having been thrust out of upright by the weight of the old roofs, has been taken down and rebuilt. The parapets and other masonry on the exterior of the church have been repaired. The pillars have been cleaned of limewash, and the walls fresh plastered a dark stone colour. The stone tracery of the windows is being restored, and glazed in diamond-shaped panes of cathedral-tinted glass. In the body of the church most of the old carved oak bench-ends and some framing which is also carved have been preserved and re-used; the new seats and framing being constructed of deal and oak. The channel floor is laid with encaustic tiles. There are several important items of restoration which cannot be carried into a further sum of 400*l.* or 500*l.* be raised. Chief of these is the tower, at present covered with a coating of rough-oast, which it is desired to remove and properly point the stonework; and the belfry is also in a dangerous state. One of the bells fell down about

twelve months ago and was smashed. The two porches—which form a distinctive feature of the building—require repairs. The design also included the building of a new vestry on the south side of the chancel.

Middlesbro'.—The foundation-stone of a new church, to be erected in Middlesbro', from plans by Messrs. Austin & Johnson, of Newcastle, has been laid. The site is in Newport-road, and the edifice, estimated to cost 5,000*l.*, will have accommodation for 500 persons.

Camberwell, Surrey.—A new church (St. James's) has been erected in the Knatchbull-road, at Camberwell, and was consecrated by the Bishop of Winchester on the 27th June. The style of the church is the Geometrical. The walling is of Kentish rag dropped coursed work, with quoins, windows, and decorations of Bath stone. The church consists of a nave, 50 ft. high, to ridge of roof, 30 ft. in width, and 88 ft. in length; north and south aisles, 15 ft. wide, and small north and south transepts. The vestry on the south side of the chancel is large, being intended for meetings and classes, and the organ-chamber on the north side is of similar dimensions. The chancel is 24 ft. in width and 30 ft. in length, with an apsidal termination, and is lighted by five two-light traceried windows. The nave arcade is composed of five moulded arches, carried on circular stone shafts, and the clearestory consists of a series of circular windows, filled in with tracery. The roofs are of deal throughout, left in its natural state. The chancel and passages of the church are paved with tiles. The font and pulpit are both of Oaken stone, the latter being richly carved. The tower, 65 ft. high, is surmounted by a spire, 75 ft. high, of wrought Bath stone. It stands on the north side of the church, and is built against the aisle wall, the lower part being used as a porch. The church is designed to accommodate 780 persons on the floor, exclusive of chancel. The building is lighted by standards, 12 ft. high, placed in the centre of each of the nave arches, and in the transept and chancel. The church has been built, and the whole cost thereof borne, by Mr. James L. Minet; the builders were Messrs. Dove Brothers, of Islington; and the architect Mr. George Low, of Basinghall-street. The hot-water apparatus was by Mr. T. Wontner Smith; the carving, well executed, by Herley & Abbey; the gas-lighting by Mr. Cowan; and the organ by Messrs. Walker & Sons. The entire cost of the building was about 7,500*l.*

Survey-square, Old Kent-road.—The church of All Saints, Newington, was destroyed by fire on the 27th of April, 1869. The cause of the fire was never ascertained. It has now been restored in its former style; and, through liberal donations, the tower and spire have been completed as originally contemplated. The vestry has been considerably enlarged, and an organ has been erected by Messrs. Bevington & Son. The church is in the Decorated style, and consists of a nave, north and south aisles, chancel (at the side aisles for organ and vestry or robing-room), tower, and lofty spire, at the west end of the north aisle. The lower portion of the tower forms the principal entrance. The nave is 80 ft. long, 33 ft. wide, and 48 ft. high, lighted by seven clearestory windows. The north and south aisles are 13 ft. wide; the chancel is 32 ft. deep, 22 ft. wide, and 39 ft. high; the tower and spire are 116 ft. high. Mr. Downs was the builder, and Mr. R. Parris the architect. The cost of rebuilding, including the spire and fittings, has been 4,900*l.* towards which about 4,700*l.* have been obtained from insurance and subscriptions. A wall to enclose the site is said to be needed; this, it is estimated, will cost 500*l.*, so that 700*l.* are still required to complete the restoration. The church contains 800 sittings, all of which are free and unappropriated. The district has a population of 8,000 persons, who are generally poor. The edifice has been consecrated and opened for divine service.

Cradley, near Great Malvern.—Last year Cradley Church chancel was rebuilt by the rector, at a cost of over 1,000*l.* That part of the work was done under the direction of Mr. Scott, of London, the new work being in the Decorated style. Following the example, the neighbouring gentry, parishioners, and friends resolved to take the nave in hand. Mr. Perkins was engaged as architect, and Messrs. Collins & Cullis, of Tewkesbury, were the builders. The church was at that time a mere oblong, consisting of chancel, nave, and western tower, without aisles or chapel. The structure is of unusual dimensions, the nave alone being 80 ft. long. It was determined to rebuild the nave, and to

add a new aisle on its north side. This has been done, and six arches now separate the new aisle from the nave, the arches being supported by pillars with moulded capitals. The new work is in the Decorated style, and the old windows of that period, as also old materials, have been made available. A roof of timber has been placed on the nave—a tie-beam roof, on the Decorated principle. The only demarcation between the nave and the chancel is the elevation of the nave roof a little above that of the chancel, and there is also a screen of open timber work, with an arch above of the same material. The old south doorway is of Norman work; and a new porch has been added to the north side. This porch is of stone, and is connected with the hot-air chamber (which is partly underground) for warming the church, on Haden's hot-air principle. Sandstone from Omberley has been used in this restoration, with also some Cradley stone. The total cost was about 2,000*l.* The number of sittings in the church has now been increased to 400. The family of the late Mr. Webb, of Cradley, propose to place a stained-glass window to his memory in the east end of the chancel. Mr. Yapp, of the Halesden, has undertaken to erect at his sole expense a porch on the south side of the church. The edifice has been re-opened.

Lincoln.—The new church of St. Peter and St. Margaret, which has been just completed in Eastgate by Messrs. Otter & Binns, of Lincoln, from designs by Mr. Arthur W. Blomfield, architect, has been consecrated. The edifice contains sitting accommodation for 500 persons. It consists of a nave and north aisle, chancel, organ-chamber, and vestry, with south-west porches, a wagon-headed roof to the chancel, and seats of stained pine. The style is First Pointed, of a simple character. The interior is lighted by three large windows on the south side, two at the west end of the nave, and a stained-glass window at the east end. This window, which is of the Early English period of architecture, contains, on a ruby ground, seven subjects in the three main lights, namely, "The triumphal Entry into Jerusalem," "The Betrayal," "The Lord's Supper," "The Crucifixion," "The Entombment," "The Resurrection," and "The Ascension." The three circular and foliated openings above contain the emblems, the double and interlaced triangle, the Lamb and Banner, and the Dove. The glass was done by Messrs. Ward & Hughes. The edifice is built of Lincoln stone, rock-faced, with dressings of Bath stone; the interior walls plastered, with Bath stone quoins and dressings. A hot-water apparatus in a chamber beneath the vestry supplies warmth. The reredos is of mosaic decoration. The contract for the building, exclusive of the reredos and east window, which are private gifts, is within the architect's estimate of 2,500*l.*

Books Received.

Fraser's Magazine for July contains papers on "The Water we should not Drink," signed W. M. Higgins; on "Telegraph Time"; on the "Greatest Sea Wave ever known," signed R. A. Proctor; on the "Science of Religion," by Professor Max Müller; and various other interesting papers. In that on Water the researches of Dr. Frankland, Dr. Angus Smith, and others, are translated into household phrase for unscientific readers. The *modus operandi* of telegraph time at Greenwich is explained in the paper on Telegraph Time. The sea wave spoken of by Mr. Proctor is that of 1868. — "The Railway Problem, 1870: a Series of Papers" edited by Major-General John Hill, Royal Artillery. London: Hicks & Co." In this series of papers the power of railways and their evils, how to make railways pay, railway reform, railway management, their acquisition gratis by the State, the railways of the future, and the railway league, are all separately treated of. In the paper on the railways of the future, the extension of branchlets on the little Festiniog railway scale, and the easy conversion of light railway trunks into road vans by a method of changing wheels, are treated of. — "Board of Works for the Westminster District: Report of the Street-cleaning and Sanitary Committee on the Lighting of the District. Metchem, Parliament-street." In this report the better lighting by gas of such places as Whitehall, Parliament-street, the Broad Sanctuary, Victoria-street, Kensington-road, and Exhibition-road is rightly recommended.

Miscellanea.

Archaeological Tour.—A number of members of the Durham and Northumberland Architectural and Archaeological Society have been on a tour through a portion of their district, which is well known to be rich in antiquarian remains. The party, among whom were Dr. Bruce and Canon Greenwell, went to Low Row Station from Newcastle, and were met there by Mr. Chas. Ferguson and others from Carlisle, who conducted them to Naworth Castle, the *entree* of which had been granted by the proprietor. Having, under the guidance of Mr. George Howard, inspected the objects of interest with which the castle abounds, the company were entertained with a paper by Mr. Ferguson, giving an historical and descriptive account of the ancient fortress. From thence they proceeded to Lanercost Abbey, the history and architectural features of which were explained in a paper read by Mr. C. Ferguson, and the joint production of that gentleman and his brother, Mr. R. Ferguson. The company then drove to the Roman encampment, Birdswald, the history and leading features of which were explained by Dr. Bruce, and from thence to Gilsland, where most of them remained for the night. Next day portions of the Roman wall in the same neighbourhood were to be visited, under the guidance of Dr. Bruce.

Social Science Association.—The arrangements for the congress, to be held in Newcastle next September, are proceeding very favourably. Great interest in its success is manifested by the leading inhabitants of the town. Amongst the special questions to be discussed in the various sections are these:—Education Department—1. The education of miners' children; 2. Amalgamation of schools; 3. Grading of schools so as to place the highest education within the reach of the greatest number; 4. Education in science. These subjects are provisional, on the Education Bill passing. Health Department—1. What is the best method of disposing of sewage and animal excreta? 2. What modifications are desirable in the existing sanitary laws and administration with a view to make them compulsory instead of permissive? 3. What legislative measures ought to be taken to remedy the adulteration of food? Economy of Trade Department—1. Partnerships of industry. 2. Is it desirable that the railways should become the property of the State? 3. Merchant Shipping Code. 4. By what means may a better distribution of labour in England be effected? 5. Courts of arbitration between employers and employed. 6. Colonization as a part of the policy of the State.

Railway under Carnarvon Castle.—The London and North-Western Railway Company have added another link to their system by connecting the Carnarvon line with the Cambrian and Llanberis railways, thus opening up for railway traffic the Welsh slate quarries, and completing a direct communication with the Great Western system in South Wales. This junction has been effected by making a line directly through the ancient borough of Carnarvon. Mr. Baker, engineer of the London and North-Western Railway Company, has done this in a very complete manner, but antiquaries who have learned to reverence the birth-place of the first Prince of Wales will probably be shocked to learn that the difficulties of the undertaking were such that the engineer has been compelled to drive shafts through the shale rock upon which the foundations of Carnarvon Castle stand. The works, though only one mile and a half in extent, are very heavy throughout, and where not tunnelled have retaining walls 10 ft. thick and 50 ft. high. The completion of the connexion was celebrated on Tuesday.

The Working Men's Club Union.—The dramatic performance at St. George's Hall, by Sir Charles Young and other amateurs, ladies as well as gentlemen, which was recently postponed in consequence of serious illness in the families of two of the company, will positively take place on Wednesday, the 13th inst. Mrs. Hermann Vezin has kindly undertaken to play *Lady Montreville*, in Lord Lytton's drama of "The Rightful Heir." The performance is on behalf of the funds of a society which is doing much towards ameliorating the habits and promoting the interests of the working classes of this country—"The Working Men's Club and Institute Union."

Window Gardening.—The annual show of the Society for Promoting Window Gardening has been held in Great Dean's-yard, Westminster. The operations of this society extend over the united parishes of St. Margaret and St. John, Westminster, and from this district, with its narrow streets and close courts, was collected a large number of plants—fuchsias, geraniums, and others; the first-named being the most numerous. General prizes were awarded in two classes:—1st, to working men or women for fuchsias, for geraniums, and for other plants; 2nd, to children in parochial, national, infant, Sunday, and ragged schools for the same divisions. The prizes consisted of medals and money. Besides these there were local prizes appropriated to each district, and in this division a third class was added, namely, the parish work-houses. Some exhibitors had chosen plants of an unusual character for window gardening: one exhibited a plant of ivy trained into a scroll pattern; another sent a Virginian creeper; a third had cultivated a large green bulbous-rooted plant with broad leaves and a spike of green flowers, more curious than beautiful. It is notable that only one sent a rose. On the whole, however, the display was considered to be much superior to those of former years. The Earl of Shaftesbury distributed the prizes.

Gloucester Cathedral.—Some months ago the Freemasons of Gloucestershire expressed a wish to undertake the restoration of some distinct portion of the Gloucester Cathedral, and it was suggested that they should provide the new rood, at a cost then estimated at 600*l*. A committee was appointed by the Provincial Grand Lodge; the 600*l*. were raised; and at a recent meeting it was ordered that a communication should be made to the dean to the effect that "the Freemasons are prepared with the 600*l*., the amount which they were led to believe the restoration of the rood would cost, and are most anxious to undertake that work; but that the committee do not believe it possible to obtain a larger subscription." The cost of the rood, as designed by Mr. Gilbert Scott, is expected to be about 2,000*l*.

New Streets in connexion with the Holborn Viaduct.—A new street in connexion with the Holborn Viaduct has been opened for traffic. It runs from St. Sepulchre's Church on the Viaduct, and over the London, Chatham, and Dover Railway into the Farringdon-road. The entire length of this street is about 600 ft., with a carriage-way of 30 ft., and two footways of 10 ft. each; the gradient is in 45. Another new street which is in course of formation from the Holborn-circus to Fleet-street, and the footway on that part of the eastern portion of it leading from Holborn-circus to Shoe-lane, has also been opened to the public. The width of this street and of the pavements will be the same as in the other case.

A Big Nuisance.—The *Rock* says an architect has issued a pamphlet, in which he states his desire to build an immense national mausoleum. [No doubt.] The building is to contain space for the interment of 2,000,000 bodies. The style is to be Gothic; and for size and magnificence St. Paul's and St. Peter's at Rome will be [no; would be] to this new building as dwarfs are to a giant! The time has gone by for entertaining such a preposterous notion as thus boxing up 2,000,000 bodies.

Railway Traffic Receipts.—The traffic receipts of railways in the United Kingdom for the week ending June 13, amounted, on 13,766 miles, to 531,854*l*., and for the corresponding week in 1869, on 13,679 miles, to 792,680*l*., showing an increase of 187 miles, and of 39,304*l*. The gross receipts on fourteen of the principal railways in the United Kingdom amounted for the week, on 10,007 miles, to 685,439*l*., and for the corresponding week last year, on 9,865 miles, to 656,017*l*., showing an increase of 142 miles and of 29,122*l*.

Worcester Cathedral Restoration.—A fortnight ago it was stated that Mr. Gilbert Scott's revised estimate for completing the work amounted to 15,000*l*., and that Lord Dudley offered 5,000*l*., and the Dean and Chapter 2,000*l*., leaving 8,000*l*. to be raised by the public of the diocese of Worcester. Of that amount 5,500*l*. have already been promised.

St. Pancras.—Mr. Henry Hewitt Bridgman has been appointed by the vestry assistant surveyor to the northern district. Another assistant surveyor is to be appointed.

Workmen's International Exhibition, 1870.—The honorary secretaries have sent a letter to the *Times*, announcing that her Majesty has consented to become patroness of the Exhibition, which is about to be opened at the Agricultural Hall, Islington, and asking those willing to assist for the loan of shrubs and flowers, offering to award certificates of merit for first-class plants. The exhibition is to be opened on Saturday, the 16th inst., by the Prince of Wales for her Majesty.

Property Sale, Malvern.—Messrs. Bentley & Hill, of Worcester, offered for sale three lots of a freehold and tithe-free building site, situate near Church-street, in the centre of the town, and adjoining the Gentlemen's Club. The restrictions of the land of the Grange Estate, of which this land is a portion, prevented the land being sold. The reserve price was 6*l*. 6*d*. per yard, and the bidding reached only 5*s*. 9*d*. per yard. No shops or public resort of any kind can be erected on the Grange Estate.

The New Landing Pier, Douglas, Isle of Man.—This structure, the cost of which has been nearly 50,000*l*., having been completed to a certain extent, has been opened for the landing and embarkation of passengers. The pier, which is 1,080 ft. long, 50 ft. wide, and has 20 ft. depth of water at low-water, spring tides, is constructed of concrete blocks, from designs by Mr. Coode, C.E., and has been carried out under the superintendence of Mr. Powell, C.E.

Accidents.—On Saturday, at the iron-foundry of Messrs. Fawcett & Preston, Liverpool, two travelling cranes, employed to remove a heavy "condenser," about 7½ tons weight, gave way, and brought down men with it from a height of 20 ft. One man was killed on the spot, another died on Saturday, and a third on Sunday. Nine others were also seriously injured.

League against Strikes.—The delegates of more than a hundred societies of Roman Catholic workmen of Germany, Holland, Switzerland, and Hungary, in a meeting at Cologne, have adopted a resolution by which they invite the members of the various associations to which they belong not to take part in any strike.

Timber Yards in Towns.—The recent fire in a timber-yard at the East end of London will again lead disinterested people to consider whether or not some judicious legislation, with a view to prevent the piling up of inflammable materials in positions threatening the public safety, is necessary.

"Up in a Balloon, Boy!"—A New Orleans inventor proposes to avoid over-crowding in great cities by suspending wooden houses in the air to balloons, which could be chained to the earth! The absurdity of the thing is so supreme that it becomes amusing.

Value of Land at Turnham-green.—Fourteen lots of Mr. Whittingham's sale by auction, at the Roebuck Inn, on the 29th ult., having frontages to the London-road, at Turnham-green, and near to the railway station, were sold for 2,436*l*., being at the rate of 5,340*l*. per acre.

"Indian Public Works."—Sir Bartle Frere's interesting paper, read some short time ago before the East-India Association, was discussed in the Room of the Society of Arts, on Wednesday last.

"Charta Perfecta."—Messrs. Jenner & Knowsley have sent us two or three quires of note-paper under this title, at various prices, and it seems particularly good. Thank you, Messrs. Jenner & Knowsley.

The Corinth Canal.—It is stated that the company for cutting the Corinth Canal has finally been established, with a capital of 564,000 drachmas (1,700,000*l*.).

Taunton Local Board of Health.—Mr. James H. Smith has been elected surveyor to this Board.

Paving.—A machine for paving has been invented in France, which will lessen the labour, it is said, of a very laborious occupation.

Manchester Abattoir Competition.—We hear that the three premiums have been awarded to three Manchester architects.

Mr. John W. Papworth, Architect.—We hear with extreme regret of the death of this gentleman, after a long and painful illness.

The Bruce Monument.—Mr. George Cruikshank has completed his model, and we will take an early opportunity to look at it.

TENDERS.

For the erection of new Congregational church and lecture-hall, Stamford-hill, Mr. T. Chaffield Clarke, architect. Quantities supplied by Mr. B. H. Wilson:—

Arford & Waller	£14,387 0 0
Kilby	13,480 0 0
Brown	13,370 0 0
Ashby & Sons	13,110 0 0
Corder	13,002 0 0
Higgs	12,657 0 0
Brown & Robinson	12,560 0 0
Scriveners & White	12,525 0 0
Dove, Brothers	12,325 0 0
Brass	12,299 0 0
Myers	12,298 0 0
King & Son	12,278 0 0

For building house on plot 15, Kensington High-street Improvement (exclusive of party-walls), for Mr. James Broadbridge, Mr. J. Nash House, architect:—

Chamberlain, Brothers	£1,315 0 0
Macey	1,287 0 0
Peery	1,147 0 0
Cooke & Green	1,141 0 0
Cowland	1,130 0 0
Langmead & Way	1,125 0 0
Simpson	1,123 0 0
Temple & Foster	1,123 0 0
Scriveners & White	1,078 0 0

For the erection of a villa residence at Cardiff, Mr. W. D. Hine, architect and surveyor:—

Senge	£700 0 0
Smith & Pring	600 0 0
Shepton	591 0 0
Price (accepted)	67 0 0

For Norwich Lunatic Asylum, Mr. R. M. Phipson, architect:—

Peery	£264,653 4 7
Myers & Sons	47,265 0 0
Gibbs	43,999 0 0
Downing	39,280 0 0
Young & Skipton	35,193 0 0

For building a house and shop in the Camberwell New-road, for Mr. Peck:—

Shayley & Webster	£68 0 0
Tarrant	647 0 0
Clarke	642 0 0
Brown (accepted)	642 0 0
Ross	421 0 0
Barrett	311 0 0

For mansion and offices, near Leatherhead, Surrey, for Mr. W. Lea. Mr. T. Royce Lysaght, architect:—

Keeble	£20,223 0 0
L'Anson	8,912 0 0
Gannon & Sons	8,858 0 0
Holland & Haenen	8,846 0 0
Mansfield & Price	5,784 0 0
Philips & Son	5,607 0 0
Trollope	5,603 0 0
Shearson	5,534 0 0
Nightingale	5,010 0 0
Peery & Co.	5,417 0 0
Higgs	5,370 0 0
Simpson	5,333 0 0
Corder	5,263 0 0
Hill & Sons	5,148 0 0
Brass	7,729 0 0
Batchelor	7,459 0 0

For works at Hill-side, Crickwood, in discharging live houses, for Mr. J. Westwood, Manor House, Dulwich. Mr. Frank E. Thicke, architect:—

Foster	£3,873 0 0
Gannon	3,791 0 0
Macey	3,709 0 0
Merritt & Ashby	3,331 0 0
C. A. Bailey	3,263 0 0

For additions to the Union Workhouse, Easby, near Sandwich, Kent, Mr. T. R. Knightley, architect:—

Crab & Vaughan	£2,709 0 0
Nightingale	5,541 0 0
Wilson	5,200 0 0
Matthews	5,111 0 0
Stoddart	5,011 0 0
Guthrie	4,961 4 8
Blime & Wise	4,801 0 0
Vignore	4,855 10 0
Coleman	4,711 10 0
W. Odorik	4,640 0 0
Cotton & Davis	4,644 0 0
Dowl, Dove, & Co.	4,763 0 0
Stoddart	4,620 0 0
Capt. Chamberlain	4,658 17 9
Richardson	4,580 0 0
Aldcock & Lee	4,497 0 0

For fur shops, with fronts complete, at Kingsland-green, for the North London Railway Company, Mr. L. H. Horne, architect:—

Sewell & Son	£2,847 0 0
Mark	2,787 0 0
Crab & Vaughan	2,767 0 0
Kelly, Brothers	2,643 0 0
Scriveners & White	2,678 0 0
Watts	2,568 0 0
Hill, Kedah, & Wilson	2,550 0 0
Wicks, Bangs, & Co. (accepted)	2,528 0 0

For roads and excavation at St. Pancras School, Levenson Wood, architect:—

Killingback & Hadley	£1,391 0 0
Mans	1,272 0 0
Nigmore	1,270 0 0
Nicholson & Goddard	1,150 0 0
Cole	833 0 0
Young	719 0 0

For the wood fittings (including those for the dining-hall, chapel, and board-room building) at the new work-house, Upper Holloway, for the Board of Guardians, St. Mary, Islington, Mr. R. H. Burden, architect:—

Nutt (accepted)	£3,725 0 0
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For the gas fittings to the above:—

Faraday & Son (accepted)	£556 0 0
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 estimates, &c. draughtsmen. First-class testimonials.—Address,

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The Builder.

VOL. XXVIII.—No. 1432.

Chatham Dockyard Extension.

FOURTEEN years ago certain public works were commenced at Chatham, with a view to the ultimate extension

of the Government Dockyard. The work that was then done, the enclosure of a marsh with a stone-faced embankment, was executed by a limited number of convicts, and the progress was slow. The progressive changes that have occurred in the construction of ships of war have continued to force the subject of increased dockyard accommodation upon the attention of Parliament and the Admiralty. We had reached the anomalous condition of having a number of huge ironclad leviathans in commission, with scarcely a dock into which they could be received for fitting and repair. The practice of fitting vessels in the stream has long been abandoned in connexion with the mercantile marine, as attended with increased risk, difficulty, delay, and expense, as prejudicial to the service, and demoralising to the men and crews engaged in such operations. With regard to the Royal Navy, however, the revolution in the character and construction of ships has not been accompanied, as it should have been, by a corresponding change in the character of the accommodation for their fitting and repair, and such first-raters as the *Hercules*, the *Monarch*, and the *Warrior*, have been furnished with their boilers and engines, while moored in the Medway, or other tidal waters, subject to the disadvantages of employing floating derricks, to swing weights of from 40 tons to 50 tons, in situations where they are exposed to the disturbing action of both wind and tide. In 1861 a select committee of the House of Commons was appointed to inquire and report concerning a proposed extension of Chatham Dockyard. The witnesses examined made out a strong case of the loss and inconvenience involved by the unsatisfactory and inadequate provision existing for the fitting and repair of ships, even in time of peace, and of the peril and disaster which such inadequate provision must inevitably involve in the event of a maritime war, when the country that can first repair its ships damaged in action doubles its force; one ship with proper dock and basin accommodation being equal to two possessed by another power which has not provided such accommodation. The Select Committee made a strong report as to the need of increased accommodation for fitting out ships of war, and for repairing the engines and making good defects of such ships. The Committee reported that the existing basin and dock accommodation is wholly unequal to the task of maintaining the existing navy in repair, even in time of peace. In the event of a war, there would be, of course, a much larger number of ships in commission, greater wear and tear, apart from casualties in action, and consequently increased need of inspection and repair. They recommended the extension of Chatham Dockyard, because the situation removed it from the danger of being shelled by hostile ships of war, and the Medway is capable of complete protection by fortifications. The extension of a

conveniently situated existing dockyard would also, they reported, be a better and more economical mode of attaining the object in view than the creation of a new establishment. It may be further mentioned in evidence, that the facilities for fitting out ships of war rapidly and safely by other powers are incomparably superior to those afforded by the naval establishments of this country; that France has at Toulon, Cherbourg, and Brest, 260 acres of floating basin, with ample wharf accommodation; whereas the United Kingdom has only 41 acres in all; some of the basins having neither width of entrance nor depth of water sufficient for our first-class ships. Colonel Greene, at that time the director of works at the Admiralty, laid a plan of dockyard extension at Chatham and estimates before the select committee; but these may be supposed to have got into the Circumlocution Office, as no action was taken upon them. In 1865, when Colonel Clarke, R.E., C.B., had succeeded Colonel Greene as director of works, that gentleman presented a plan and estimates, upon which action was at last taken energetically. The plans of Colonel Clarke were a modification, and different in several important respects, from those of Colonel Greene. They were alike, however in their main features; and, as regards the execution of the work, each estimated the cost on the assumption that convict labour should be taken advantage of to the utmost possible extent. Contracts were entered into with Messrs. Gabrielli in 1866, and in 1867 the works were energetically commenced by the contractors, the amount of convict labour on works included, as well as not in the contract, was from that time largely increased. Since then great progress has been made, and the works will richly repay a visit by professional men and students of engineering.

On Saturday last, on the invitation of Colonel Clarke, director of the works, they were visited by Mr. C. Vignoles, F.R.S., president of the Institution of Civil Engineers, and a number of members of the council, members, and students of the Institution. The party left London by the 10-30 express train from Victoria Station, and, on arriving at Chatham, were at once conveyed to the dockyard extension works in about a dozen vehicles, which waited their arrival. Nothing very remarkable was to be seen in the course of the drive from the station to the dockyard, excepting, perhaps, the singular treatment to which a row of trees which border the footwalk opposite the Marine Barracks is being subjected. The footway is at a considerable height above the carriage-road, and the authorities have made a clean steep slope from the one to the other, which is very neatly faced with concrete, and closely pointed round the trunks of the young trees; these look green and vigorous now, but are likely, it may be supposed, to yield up their lives ere many years elapse, rather than submit to such unnatural treatment or military rule.

On arriving at the grounds added to the dockyard, on which the works are being carried out, the visitors were first conducted to the Gantries where the dressed granite is stored that is to be employed in the construction of two graving docks, to which comparatively little has been done as yet. The blocks are of very large size, and are dressed to perfection. The granite used is from three sources,—from the Jersey Granite Company, Cornish granite from Freeman Bros., and a portion of French granite from Brest. Of the three the Jersey contains the larger proportion of quartz, and is consequently the hardest. The French granite does not differ much from the others, either in quality or price, freight and all outgoings taken into account.

It may be proper before proceeding further to recall the situation of the Dockyard Extension Works. From Gillingham on the Medway the channel describes an irregular curve in a north-

westerly direction, and again turns round in a course almost due south, and passes the old dockyard. Before the extension works were commenced, St. Mary's Creek flowed across this tongue of land from opposite Upnor Old Castle to Gillingham. The creek had a marsh on each side, the portion between it and the Medway, St. Mary's Island, being laid under water at spring-tides. The island, valueless unless embanked, was purchased by the Admiralty some fourteen years ago for 80l.; its area is about 150 acres. The new works include the inclosure of St. Mary's Island and portions of the banks of the Medway to the south of the two ends of the creek, by a stone-faced embankment for the greater part, and by a river wall built on piles for the remainder. The embankment and wall, which have been executed entirely by convicts, are about two miles in length, and a good example of water engineering. The principal works, for which the inclosure was an essential preliminary, are a repairing basin, with an area of twenty-one acres, having an entrance 80 ft. wide from the Medway, in the Chatham Reach; intermediate, and communicating with this basin, there will be a factory basin of twenty acres area; and beyond that, with a communication between it and the factory basin, a fitting-out basin of thirty-three acres area, with a river entrance and a pair of locks adjoining it, at Gillingham. The three basins follow the general direction of St. Mary's Creek, which has reduced the excavation work by about a third, compared with what it would have been if the three had been made rigidly in line. The side walls of the repairing and factory basins are straight, but form an obtuse angle the one with the other. The fitting-out basin is nearly in line, for part of its length, with the inner or factory basin, but in its course turns off at an angle in the opposite direction from that at the ends of the other two basins. The basins occupy a somewhat relative position across St. Mary's Island, in the Medway, to that of the West India Docks across the Isle of Dogs, in the Thames. The width of the tongue of land, from the entrance of the repairing basin to the other mouth of the Creek, at Gillingham, is rather more than a mile: the width across the Isle of Dogs is rather less. Although the area of the island is about 150 acres, the whole area of the extension works is about 380 acres. On the completion of the greater part of the embankment the work of excavation was vigorously proceeded with. For conveyance of the stiff innumerable tramways were laid in all directions. The clay taken out that was suitable for brickmaking was applied to that purpose: the remainder was tipped as spoil upon St. Mary's Island, or on the south bank of the Creek, where the ground needed making up. A large surface of good firm ground has thus been laid, ready for the erection of factories, sheds, and workshops. On St. Mary's Island extensive brickfields have been in operation for several years, the whole of the bricks hitherto used on the works having been made by the convicts. A large proportion of the clay for brickmaking is taken from the basins, a portion comes from Barham, and the sand from Aylesford. Six of the brickmaking machines of Porter & Co., of Calisle, are on the ground. The imported material for brickmaking, the blocks of granite and Portland stone, and all other materials, indeed, are unloaded at jetties erected for the purpose, and conveyed in trucks to the parts of the works where they may be respectively required. At the beginning of this year there were thirty-five millions of bricks in stock; so that the brickmaking operations have been relaxed, and the brickmakers have, in many instances, been put to brick-setting.

The repairing basin and two of the four graving-docks to be provided on its south side are nearly completed; the entrances to the other two graving-docks and the communication

between the repairing and the factory basins are also in a very forward state. The entrance to the repairing basin from Chatham Reach is nearly complete, almost all that remains to be done, before the removal of the coffer dam, being to finish the grooves for the caissons. All the entrances to basins and graving-docks, and the communications between the basins, will be by caissons, not by dock-gates. The bottom of the repairing dock has been levelled, excepting comparatively narrow strips round the foot of the walls. The bottom is of the stuff that was found when the proper level was reached. It is firm, and not likely, as would seem, to rise on the water being admitted; if the *Serpentine* had such a bottom, instead of the gravel-veneered soluble mud Mr. Ayrton proposes to leave in it, it would probably satisfy all parties interested. The graving-docks are notable examples of solid work. The natural foundation is a bed of firm gravel, on which a layer of concrete is laid; a mass of brickwork is superimposed, and over all is laid the floor, of heavy, closely-fitted blocks of granite. The copestones of the basin walls are of heavy granite blocks throughout. The factory basin, originally contracted for, but the contract for which has been surrendered as we understand, is being excavated, and the walls built entirely by convicts, and excellent work they are making of the walls. They are, where the gravel can be reached, founded upon it by a layer of concrete of from 18 ft. 6 in. to 20 ft. broad. The walls batter 1 in 9 on the inside, and with the outside batter are reduced from 20 ft. in thickness at the bottom, to 8 ft. at the top. They are concreted in pockets, with alternating bands of brickwork across the whole thickness of the wall. The adhesion between the brickwork and the concrete, we were informed, is perfect. The basin walls are faced on the inside, from a little under the water-line, with Portland stone, with a granite coping over all. Bollards, of cast-iron, about 2 ft. square, with the corners rounded off, have been set in the counterforts along the north wall of the factory basin. Cranes have also been provided, of about 6 ft. diameter, that are a credit to the workmen who built them, whether bond or free. The bollards are 9 ft. long, and are let in, for nearly two-thirds of their length into the building. A great deal of work has been done in excavation and building for the factory basin, but much still remains to be done as the boom of the steam-hammer, and the rattle of the riveter, be heard in the basin or its neighbourhood. Very little has been done towards the formation of the fitting-out basin. The portion of St. Mary's Creek that it is to absorb, remains *in puris naturalibus*, excepting, indeed, that the stream of water from the west has been cut off, and that, on the north side, about 600 yards of the basin wall have been erected. This short length is apparently designed to serve as part of a dam, which is to be carried out to the Medway and round in front of the entrance to the basin, to Gillingham, thus enclosing the area in which the fitting-basin works are to be carried on. At Gillingham the engineers have a troublesome piece of work in hand in the construction of a public wharf, in exchange for one that they had to appropriate at the mouth of the creek. They were unable to find holding-ground for piles for the foundations, but have at last conquered the difficulty by tipping material into the water, until it has reached a firm bottom, and given them a solid embankment upon which to operate.

Colonel Clarke hopes to be able to admit the water to the repairing basin, and to have the two graving-docks ready for use in April next, and to have the factory basin completed about December, 1871. The completion of the works will probably occupy six or seven years more.

Before the inspection was completed, Colonel Clarke hospitably entertained the visitors—about 150 in number—at an excellent luncheon provided in the spacious mould-room.

After a few toasts appropriate to the occasion had been given and acknowledged, the inspection was resumed. The visitors were conducted first to a point at which the convicts were employed in mixing the concrete, and pitching it down a height of about 40 ft. to the gravel at the bottom, to form the foundation. The basin walls are in many places about 40 ft. high from the gravel upon which the concrete is laid to the top of the coping. Generally the gravel is met with at a depth of from 45 ft. to 52 ft. from the surface. The strata, downwards, are, for the greater part (on the unmade ground) mud, peat, greasy silt, gravel, clay, chalk. It is remark-

able that the lines of demarcation between the clay and the chalk are almost as clean and clearly marked as the black border on a sheet of note-paper; there is no intermixture. Where the gravel is too deep to be reached, the walls are founded on piles driven into the gravel.

The three basins will have, in common, a depth of 33 ft. of water at spring, and 30 ft. at neap tides. The graving docks are 456 ft. long at the coping, 416 ft. on the blocks; they are 80 ft. wide at the entrance, and will have 31 ft. 6 in. of water over the sills at high water spring tides.

There are at present 1,377 convicts employed upon the works, and 232 free men in connexion with them. These men are under the direction of the Admiralty, and their officers, in conjunction with the prison governor and his subordinates. In addition to these, the contractors have 760 men employed. The convicts are employed in very various kinds of work, the greater number of them in excavating and building, others in brickmaking, waggon-hauling, others as carpenters and smiths, in making and repairing waggons, tools, and plant, about fifty driving horses, of which a large number are employed, in addition to eight locomotive engines; some are plate-laying, others attending at points; a number are making Portland cement. The bricks made on the ground are a little rough, but they are hard and sound, and admirably fitted for the work in which they are used.

The convicts, whatever their previous demerits may have been, appear well entitled, generally, to credit for their tractability and industry, as displayed on these works. The rapidity with which they adapt themselves to the work is surprising. Excellent masons and carpenters can, in many instances, be made out of professional thieves in three months. The fact is, that the convicts are cleverer men than many of the ordinary labourers. The gangs are attended by their warders and assistant-warders, who are armed with cutlasses. In addition to these, men of the Convict Guard, armed with carbines and bayonets, are stationed at various parts of the works. They are paraded in going and returning from work, and marched in squads, each accompanied by a warder. We were glad to notice a considerable number of the prisoners with red facings to their frocks, which indicate good conduct, but unhappily we noticed as many "black-birds"—men with a black leg to their breeches—working in iron, their offence having been striking an officer. The "canary-birds" are distinguished by a yellow leg; their offence has been the attempt to escape. The daily life of the convicts is occupied thus—Rise, wash, clean cells, &c., at 5 a.m.; breakfast at 5.45; attend morning prayers at 6.15; muster for work at 6.30; dine at 12.15; resume work at 1.15 till 6.10; cleaning shoes, shaving, bathing, reading in cells, evening instruction, letter-writing, 6.40 till 7.45; taking down hammocks, 7.45 till 8; at 8 into hammocks to "sleep the sleep of the just." The mustering, parading, and marching subtract a considerable portion from the clear working day; and, if the truth must be told, the worthies who have to wear mud-boots, notwithstanding that none of them are embarrassed with a redundancy of calf, are far from rapid in making their toilet on arrival at the working ground. Workers and their work, however, at Chatham Dockyard are both exceedingly interesting to observe and study.

Our thanks are due for the communicative courtesy of Colonel Clarke, Colonel Pasley, Mr. Bernays, and other gentlemen in charge of the works.

WORKMEN'S INTERNATIONAL EXHIBITION.

THE QUEEN'S VISIT.

ON Monday last, while the ears of half Europe were strained—the expression is hardly metaphorical—to catch the shrill challenge of the French trumpet, or the hoarse reply of the Prussian ordinance, Queen Victoria was unostentatiously engaged in riveting another link between the palace and the cottage,—between the throne of Alfred, and its solid basis on the forge, the anvil, and the bench.

Being unable personally to open the Workmen's International Exhibition,—a function which the Prince of Wales will, we believe, discharge, this Saturday,—the Queen graciously signified her intention to visit the Agricultural Hall, in which the objects exhibited were in course of arrange-

ment. Nothing could be more welcome than the intimation,—nothing more simple, and, therefore, nothing in better taste, than the visit. Industrial Islington and Clerkenwell seemed unaware of the honour intended. An hour before Her Majesty's arrival, not a scrap of bunting, not an extra idler, not a portly policeman, was to be seen in the quiet streets that give access to the large building. A little after ten, four or five mounted policemen, and about four times that number on foot, drew up in line in the back yard of the Hall, by the gateway which affords entrance for the carts, and vans, and bulky packing-cases, that bring the materials of the Exhibition. At a few minutes after half-past ten the gates opened, the sound of a hearty cheer from the extempore crowd outside rang through the building, and a carriage and pair drove in through the yard, pulling up under the gallery, within the Hall itself. A knot of some two or three dozen gentlemen was in attendance on the spot. Within the Hall were only exhibitors, or persons in some way connected with the enterprise. A line of workmen, in fustian jackets and white aprons, whom it was unnecessary to admonish to uncover, stood opposite. A graceful young lady, then a younger sister—daughters of England in the proudest, as well as in the simplest sense of the term—alighted. The organ pealed out "God save the Queen," and then a Lady in mourning stepped on the floor, bowing repeatedly and earnestly to those who welcomed her.

The scene—as so often is the case on similar occasions—had so shaped itself that it might have been arranged by a painter or by a novelist. The Hall is very far from full—much of what has been received is not unpacked, and the committee are yet able to invite good exhibits from *bona fide* contributors. The comparatively empty space through which the royal party leisurely passed, had the effect of bringing the Queen, as it were, eminently into direct intercourse with the few representatives of her people who had the privilege of being present. The treasured lion of Scotland, and the three red guardians of the English field, were emblazoned in the banner which fell over the front of the gallery by the point of arrival. Ireland was as invisible in the quarters as, we fear, she is in the Exhibition.* A glass case full of those glorious fabrics of Indian skill which Dr. Forbes Watson has done so much to introduce to the English manufacturers, appropriately faced the door. In the centre of the Hall, to the left, was a marble statue of Garibaldi,—a well-executed figure, and a good likeness,—raising a very life-like hand, and dressed in the red shirt, knotted bandana, loose trousers, Wellington boots, and slinging sabre, so familiar to the memories of 1861. Opposite this great favourite of the working classes of this country, was a well-carved pulpit—the work of a journeyman, who has laboured on it since Christmas. Behind that, along the axis of the Hall, was a spinning-wheel. The pulpit and the spinning-wheel—the evidence of the community of interest which is awakening, for the first time in history, between the artisans of England and those of the Continent—the Queen of England walking through the midst of the workmen, none the less reverent that they had been too busily employed to put on their Sunday clothes—an earl's son, the president of the committee on one side of her, and the working secretary, straw hat in hand, on the other, followed by the little group of the two princesses, the Marchioness of Ely, two or three gentlemen of the Court, and the Executive Committee of the Exhibition,—all this told of effort, and of effort which cannot prove unsuccessful, to supply the defects of our national habits, and to lay, deeper than before, the foundations of our national welfare.

Among the objects which the Queen inspected with the most evident interest was a model of a safety apparatus for preventing one class of colliery and mining accidents, namely, those which arise from the over-winding and consequent breaking of the rope. The model is only on a small scale; but the applicability of the system is stated to have been satisfactorily tested. The ready and anxious sympathy evinced by Queen Victoria for the wives and children of miners, who have been suddenly summoned from their work by one of those fearful blasts which ought not to be regarded as mere "accidents," has endeared the Queen to

* Belfast presents an honourable exception; we hope there will be others.

the population of the "black country," and recovered freshly to the memory of those who saw her Majesty pause before the model.

Near to the safety apparatus was one of the most interesting objects which the invitation to exhibit has yet attracted. It is a reflecting telescope, of 10 ft. focus, and 13 in. diameter of reflector, made entirely, and that within eighteen months, by Mr. Bush, a baker, of Nottingham, who carries on the daily business of his very fatiguing trade. Mr. Bush had the satisfaction of explaining his workmanship to the Queen. He has adopted most of the recent improvements, together with some of his own,—such as the construction of a honeycomb cast-iron bed, or diaphragm, to support the reflector, and to prevent that bending or buckling of the surface which is so readily effected, and that with such unpleasant optical results. Mr. Bush has made two reflectors, one of which is of the usual speculum metal, ground by himself (which is in the instrument, and which is remarkable for the purity and intensity of the light which it reflects), and one of glass, also parabolically ground, on which it is intended to deposit a surface of silver. The telescope is in what is called a cradle frame, bolted together with longitudinal wrought-iron bolts, passing through wrought-iron distance tubes and circular distance pieces. The segment which attaches the trunnion, or axis of movement, resembles the cylinder of a locomotive. The instrument is equatorially mounted, and is to be moved by clockwork. A prism of Munich glass catches the object reflected, and refracts it to the eyepiece. The division of the brass arch is also the handiwork of Mr. Bush, who has made his own lathes, grinding apparatus, and dividing apparatus. Without claiming the extreme (and practically unnecessary) finish of the instruments of such makers as Messrs. Troughton & Simms, Mr. Bush's reflector seems to us to be much what such an optical instrument ought to be. It is an honour to the maker, and a just source of pride to the town of Nottingham.

The third article which most evidently arrested the advance of the Royal party was a noble ebony cabinet, inlaid with Florentine mosaic, encrusted with lapis lazuli, and ornamented with statues and reliefs in silver gilt, which is said to have come from Florence. Italy, indeed, has come to the fore in this Exhibition. From whatever cause it may arise, the Italian exhibitors are the first in the field: first in time, which is much, and which is especially novel for Italy; first in quantity, so far as we can at present judge; and first, in not a few instances, in excellence. Nor is it Florence alone that sends her marbles, and alabaster, and mosaic. Naples sends her characteristic work in coral and in lava; Rome her shell cameos—those nearest imitations of the precious onyx reliefs of the ancients; Sorrento sends the well-known marquetry and perforated woodwork of the brothers Gargiulo; Genoa sends her silver and gold filigree; Venice her opal and aventurine, and ruby-tinted glass. The marble of Carrara is represented in numerous statues,—a bust of King Victor Emanuel at the head of the trophy; a blind Cupid feeling his way, a very pleasing subject; and several other sculptures, deserving more detailed mention than can now be afforded. We must not, however, omit the life-size statues by Cavalier Pandrino. To the one of Garibaldi we have already alluded. Another represents Cavour, and a third Lord Palmerston. The sculptor has been beaten by the frock-coat and the necktie; he has given them faithfully, but without that idealisation which alone can make such attire tolerable in marble.

While speaking of sculpture we may mention the reproduction, in sandstone, of one of the most original (and repulsive) of the characters of Mr. Dickens, the ill-conditioned dwarf, Quilp. No detailed account of the Exhibition can yet be given. The catalogue is not printed as we write. Indeed, we are speaking of a time five days antecedent to the proposed date of opening, and every one knows how such matters are usually left for a race against time; yet we cannot but think that the workmen of this country are far from being, as a rule, at all aware of what a very praiseworthy effort has been made by the Executive Committee to enable them to help themselves. The English workman is far too proud to be patronised. Nothing affronts him more than to pat him on the back. The pith and sinew of the old English stock are in his limbs, and he has a spirit of self-reliance which is eminently insular. But, with all

that, he knows, and he is daily more fully aware that he wants, very much in order to enable him to race with the workmen of many Continental states. There is much that statesmen, and philanthropists, and directors of museums, are doing, more or less directly, to aid him. But, after all, there is nothing like self-help. To afford a scope and a theatre for this seems to have been the object of the Executive Committee. As such, it has been fully appreciated abroad,—it wants to be better known at home. Anything more unlike a job on the one hand, or a piece of patronising display on the other, than we have hit upon, almost casually, at Islington, it is not possible to conceive. We hope that this will be fully understood throughout the length and the breadth of the country, and that the vacant space which is now available will be filled.

Attention must be called to one feature in this Exhibition, which is its especial boast. Among English localities, Birmingham and Sheffield are the first in the field—the former with a beautiful case of electro-plate, the latter with knives, dirks, scissors, and other articles. In these cases are fixed printed cards, on which are detailed the several processes which are resorted to before each object is complete—designing, modelling, casting, embossing, engraving, and so on; and to each of these is affixed the name of the workman actually engaged. Each artificer, it may be said, signs his own work. The true spirit of industrial art is thus brought into direct opposition to the mere greed of trade. The maker comes into the field, to assert his identity, which the seller is but too content to smother. It is a new application of the old principle to which the municipal grandeur of the Middle Ages is due. It is the sound moral rule of *sum cuique*. It is the application of the co-operative system to industry. Nor do we doubt that in the application of the principle lies the best hope of our future industrial welfare.

We have omitted to glance at one table which, containing nothing that is ornamental, may well escape any eye but that of a workman; and yet it is one of the most important individual features of the Exhibition. It is a table covered with scraps of iron. There is a plate some half inch or three-quarter inch thick, doubled in four, like a sheet of note-paper. By its side is a small bar, drawn out into an endless corkscrew at one end, and hammered into a sort of knife at the other. The worm was twisted while hot, the blade was hammered when cold. Every specimen displays unusual malleability or ductility in this ordinarily stubborn material. Two or three lumps of coarse grey metal—being neither more nor less than fragments of the famous "Seely's pigs" (or, as they ought rather to be called, the *Builder's* pigs, since we first drew attention to their wasteful use in the pathways at Portsmouth)—lie close by. By the application of a chemical agent in the puddling-furnace, the coarse, poor metal has been converted into that of fine-grained texture. Knowing what we do of the race which Russia is about, sooner or later, to run with this country in the manufacture of iron, we direct especial attention to this discovery of Sir Antonio Brady. Of great interest, too, is the collection of copies (models and drawings) sent by the Industrial School of Amsterdam, established to aid technical education.

The King of Italy sends a couple of iron clads to convey his workmen, and to do honour to the working man's fair. The King of Denmark does the same. The King of Wurttemberg follows the example. It is understood that some effort is to be made to show an English welcome to the working men thus royally conveyed to our shores. We hope the appeal will be fully responded to. We trust that the great and generous body of English workmen, understanding now for the first time what is actually going on at Islington, will come forward to strengthen the hands of the committee, to fill the Hall with specimens of handiwork, and to welcome their brothers of Italy, Denmark, Germany, France, Holland, and other countries not only with the hospitality of hosts, but with the closer than free-masonic grip of brothers.

Royal Visit to Reading.—Messrs. Alfred Mills & Sons ask us to mention that the Masonic arch at the Station Gates, Friar-street, and the triumphal arch at the Grammar School were designed and produced by them.

THE LATE MR. J. W. PAPWORTH.

JOHN WOODY PAPWORTH, the eldest of the three children of the late John Buonarroti Papworth, architect to the King of Wurttemberg, was born on the 4th of March, 1820, in Bath-place, New-road, Marylebone.

He completed his education at the University School in Gower-street, and about 1836 entered more strictly into professional pursuits under his father, in whose office and at whose right hand he remained until the retirement of the latter into the country early in 1847, and whose death occurred 16th of June in the same year. In 1837, when the then Government desired to establish the "Government School of Design" for the promotion of art manufactures, the arrangements were left in Mr. Papworth's hands, who received the appointment of "Director"; and his son assisted him greatly in fitting up the rooms at Somerset House, then just vacated by the Royal Academy of Arts, and in obtaining the collection of casts, books, and other works of art necessary for the purpose. On the opening of the school he was appointed Secretary to the Council, but retired when his father resigned his appointment at about the end of the first twelve months. During succeeding years he worked on the various designs required from the office by the late Mr. James Morrison, for his seats at Fonthill and Basilston; by Mr. William Leaf, at Streatham; by Mr. Alexander Murray, at Cally, Kirkcubrightshire; for Lord Lucon in Hanover-square; and by other of his father's clients, including the residence in Clapham Park for Mr. J. E. B. Stevenson, the design and superintendence of which were almost all his own.

During this period he made several designs for the ornamental manufacture known as Austin's (now Seeley's) Artificial Stone; and for many of the manufacturers introduced through the establishment of the school above mentioned. He designed the monument to the memory of Thomas Hardy erected in Bushill-fields Cemetery by his friend Mr. Alexander Galloway, and others; made the drawings for a "Holborn Valley Viaduct" for the late Mr. John Galloway, C.E.; assisting him also in mapping and levelling a proposed line of railway through North and South Wales, during the autumn of the year 1845, so life in schemes of the same nature.

In 1838 he received the silver Isis medal of the Society for the Encouragement of Arts, for a design for a park entrance; and in 1840 the gold Isis medal for a design for a naval monument in commemoration of England's heroes and successes; and in 1845 the "Stock Medalion for the best design for a Town and County Hall." This is probably the last one that was given under the bequest of Mr. John Stock, 1781.

On the 1st of May, 1839, he was admitted a student of the Royal Academy of Arts in Trafalgar-square, and was an unsuccessful competitor on two occasions for the gold medal for architecture of that institution. His drawings for these projects are elaborate specimens of design. From this period for nearly twenty years he was a constant exhibitor at the annual exhibitions of that institution.

In 1841 he was elected an Associate, in 1846 a Fellow, and served on the council on one or two occasions, of the Institute of British Architects, with which society he maintained an intimate connexion and active interest, not limited by his severe illness in later years. In 1842 he obtained the Soane Medallion (the third one that had been given) for a design in "Restoration of Crosby-place, London," to which was annexed a purse of ten guineas, presented by Miss Hackett: the drawings, together with a manuscript history and description of this well-known residence of former days, are in the collection of the Institute. The plan was engraved in 1844 in Mr. Hammon's account of the building, with a high encomium "upon the careful and particular survey of the existing vaults and buildings" made by Mr. Papworth. In 1843 he gained the Institute Medal of Merit for an essay "On Synchronism in Architecture," and the Institute Medal in 1847 for the best essay "On the Adaptation and Modification of the Orders of the Greeks by the Romans and Moderns." This was the last of the series of medals gained by him.

With the pen ever in his hand, and "fine art" with "ornamental decoration" in his thoughts, he was always jotting down the results of his studies in notes or lectures. For Weale's "Quarterly Papers on Architecture" he contributed to the first volume in 1844 a paper on "Artistic Ecclesiastical Decoration," as exhibi-

bited in a collection of designs made at Rome about the middle of the last century, for a chapel at Lisbon, being a volume of sketches with estimates for the execution of the several parts; and, with his brother Wyatt, published "Specimens of Decoration in the Italian Style," the plates being etched by themselves. He read at the Institute in May, 1848, "Notes in Illustration of some Drawings of Prænestæ, Ancient and Modern," when presenting them to that society. His study of Egyptian antiquities was evidenced by his lecture on two nights in 1849, explanatory of the "Features of the Connection between the Architecture and Chronology of Egypt," with an Account of the highly-valued Work by J. B. Leenwe "On the Chronology of Egypt illustrated by its Monuments," then just published; and it was at this period that he formed his collection of ancient and modern coins, working and being assisted in both studies by a kindred mind, that of the late James Morant Lockyer, F.R.S.B.A.

During this latter period Mr. Papworth executed a difficult work in placing a new roof over the side premises of the Argyll Rooms in Windmill-street; received a certificate of competency to act as district surveyor from the official referees under the former Building Act; and made the several designs for the extensive project submitted by the late Mr. John Galloway, C.E., for providing London with cattle-markets and abattoirs, and gave evidence before the late Professor Hosking, who had been appointed to report upon the scheme. Many designs were made by Mr. Papworth for glass, terra-cotta, pottery, paper-hangings, and other art manufactures for the proposed "Exhibition of the Industry of all Nations, 1861," inclusive of a design for a carpet, to be worked in worsted-work by 150 ladies of Great Britain; this was effected, and the carpet was subsequently graciously accepted by Her Majesty. Mr. Papworth was himself also an exhibitor of various designs for art manufactures, and received a bronze medal for services. He assisted the editor of the *Illustrated London News* in obtaining representations of works exhibited, and in illustrating them for that periodical; and in order that a notice should be recorded in the annals of the Institute concerning this important Exhibition, he prepared a paper, being "Considerations upon some of the Productions connected with Architecture in the Exhibition of 1861," which occupied two evenings in the delivery. Again, in 1865, he visited at Paris the Exposition des Produits d'Industrie, and recorded his notes for a similar intent upon the professional works, materials, and drawings submitted therein. During this visit he obtained an introduction to M. Adolphe Lance. The chief topic of conversation was "A Diploma in Architecture," when M. Lance requested him to present to the Institute a copy of his essay on the subject, hoping also that he would be able to introduce it for discussion at one of the meetings. The address of Mr. (now Sir William) Tite, M.P., having, in November, urged the institution of an examination and of its necessary result, a diploma, Mr. Papworth read "An Abridgement of M. Lance's Essay, with Remarks and Suggestions." A discussion followed on a subsequent evening, when a "Memorial from the Architectural Association" was read, urging the desire of the younger members for the establishment of an examination. Little was done until 1860, when the Association a second time asked the Council to institute a voluntary architectural examination. A committee was appointed to investigate the subject; Mr. Papworth, acting as its secretary, gave considerable attention to it, together with the late Mr. Arthur Ashpitel and others. He urged the desirability of the diploma on several occasions, assisted in the formation of the papers, and of the examinations, acting as moderator upon two occasions, and once (1866) as examiner. He felt deeply of late years the coldness with which the scheme was received by the succeeding younger members of the profession, and the desire evinced for "rewards" to be granted to those who passed such an examination. He mainly assisted in getting up a course of lectures for the benefit of the students intending to present themselves, and on every occasion warmly supported the scheme. He also gave much attention in committee to Mr. G. G. Scott's proposal for a "school for artistic architectural education," but which from various causes laid dormant until the present year. He served till lately on the board of examiners under the Metropolitan Buildings Act, 1855; being active, with others, in the preparation of the questions,

and in the examination of those who presented themselves.

During this period he designed and superintended the Albert Institution, Gravel-lane, for the Rev. Joseph Brown, the rector of the parish of St. Anne's, Blackfriars, receiving a silver trowel from his hands on its completion. He also designed a large mansion for Mr. Walter Mellor, to have been erected at Cricklewood; alterations to a house in St. James's-square, now pulled down; additions to a house at Epping, for Mr. Richard Rothwell; and at Streatham-hill, for Mr. Harold Turner, with other works of similar character; besides several projects for a summer palace which were submitted to the Pacha of Egypt. The last of many successes in competitions was, in conjunction with his brother, for the additions to the Guildhall, Courts of Justice, and Assembly-room, at Cambridge, in 1859, for which they gained the second prize.

In 1854, he explained at a meeting of the Institute his theory of the construction of domes, differing entirely in principle from those put forward by other authors; it has been adopted by Mr. James Fergusson, in his "Handbook of Architecture."

Two papers read at the Institute in 1857 and 1862 must be noticed as exhibiting the bent of his studies at the period, namely, "Beauty in Architecture, and its Alliance with the Past," and "An Aesthetic Principle in Decoration;" a third one, read January 15th, 1866, "On the Roofs of Hypæthral Temples at Egina and Bassæ," was an important attempt to clear up the mystery as to the mode of lighting those ancient structures. This was, perhaps, his last attendance at the meetings; for he was then suffering under the disease which eventually proved his death. Two or three years previously he had sprained his right foot, and otherwise injured it. Probably, careful attention to his health might have prevented any fatal termination; but, surveying a property on a bitterly cold winter's day, and returning home benumbed, gangrene of the same foot gradually set in. For two years he was confined entirely to the bed, and was only enabled, during the following two years, to ride, or to walk about on crutches. At Christmas last, while his friends were hoping that the healing of his foot had been effected, the left one likewise gave way. The consequent confinement proved too much for his injured health. For some weeks he gradually sank, and expired, without pain, on the evening of the 6th of the present month, in the fifty-first year of his age. He was buried in the new ground of the Highgate Cemetery, on Saturday last.

In the year 1847, having, as Mr. Papworth considered, some unemployed hours, he commenced the formation of an "Ordinary of British Armorial" for his own private use. The labour in cutting up, sorting, and re-arranging into divisions, subjects, and heads, pasting down, &c., was carried on by him most unremittingly, but with little assistance from others, and that only in the preliminary work, which extended over about four to five years. The existence of this enormous manuscript having transpired, and its utility having been proved by constant reference to it, Mr. Walford, Mr. Albert Way, and several other eminent lovers of heraldry and archaeology, proposed to him that it should be published for public benefit. Even then several of their friends doubted the fact of the existence of such a work prepared by a single individual, and could only be convinced of its completion by the sight of the drawers full of the prepared sheets, and by a pleasurable consultation of its efficiency. Acting under the advice of these friends, who obtained for him a list of subscribers, he copied some twenty other lists of "coats of arms" of recognised authority, interspersing them with his arranged material, and commenced the printing of the work in parts, of which fourteen had appeared at the time when ill health prevented his giving any further attention to it. About three-fifths have been completed. Some of his friends attribute Mr. Papworth's loss of health mainly to the close application given by him to the careful revision of the proof-sheets—a care which was often gratefully acknowledged in letters from subscribers and others.

In 1853 the brothers published together an octavo work on "Museums, Libraries, and Picture Galleries, Public and Private," availing themselves of the advantages of the "Public Libraries Act," which had been passed in 1850.

Another literary undertaking that engrossed much of his attention preceded from the found-

ing of the Architectural Publication Society in 1848 by his brother, Mr. Wyatt Papworth. Besides writing annually the descriptions to the *Illustrations*, he translated the old German work by Roritzer "On the Geometric Principles of Drawing a Pinnacle," &c., which appeared in one of the earliest parts of the text. From the commencement of the "Dictionary of Architecture" to the latest moment, he gave to the preparation of most of the articles all the information of which he was possessed; and in the careful revision of the proof-sheets, all the research, however elaborate, which he considered they required, whether as to a fact or to a date. Even so lately as the middle of June last, he obtained the kind assistance of Mr. J. B. Waring in consulting a scarce work in the British Museum Library for correcting an error which appeared to him to have escaped the observation of all previous writers.

His facility in reading Greek and Latin, as well as most of the modern languages, was very great. His skill in architectural drawing and artistic colouring; his knowledge of the arts and sciences; his intimate acquaintance with the history and practice of his profession, and all matters connected therewith, rendered him a mine of information to all those who sought his advice or opinion upon such and similar matters; and to them it was always given in the most liberal and generous manner, for selfishness formed no part of his character. His friends ever appreciated his warm heart and kindly feelings. His predilection for the pen rather than for the pencil was noticeable at a very early age, for when yet an infant he considered it time to commence earning his own living, and set to work to write a preface to his proposed life of Julius Cæsar. His mind was ever on the stretch for information, and showed its capabilities in great facility of research and investigation, and for doing all things in the best possible manner; his thoroughness in work was always appreciated; a slovenly system did not suit him. His memory was very tenacious of what he read, although a very quick reader; and his great flow of spirits and patient endurance of pain enabled him to withstand for years the effects of the deplorable complaint under which he so long suffered.

NEW POOR-LAW OFFICES, GATESHEAD.

THE foundation-stone of the future Poor-law and Registration Offices, Gateshead, has been laid by the Chairman of the local Board of Guardians. The proposed structure will be in the Italian style of architecture, from plans prepared by Mr. T. Gibson, architect, Newcastle. The site selected upon which to raise the erection is at the junction of Prince Consort-road and Walker-terrace with the Hexham-road. There will be a frontage of 80 ft. in Prince Consort-road, and 48 ft. in the Hexham-road, with two flats, ground and upper.

The principal entrance will be in Prince Consort-road, and will consist of a portico and a spacious lobby, the latter of which will lead into a hall, from which the staircase to the upper portion of the building will ascend. On the ground flat, to the left of the entrance, will be the apartments designed for the relieving committee, relieving officers, and male and female waiting-rooms. On the right hand will be the registrar's office, clerk's office, muniment-room, and waiting-room. Behind all these will be yards and other conveniences. Entrance is also obtained to the clerk's office by a side door from Hexham-road. The first floor is divided into the board-room,—35 ft. in length, 19 ft. broad, and 13 ft. high,—clerk's offices, committee-room, waiting-room, and sundry apartments for the use of the porter. The contractors are Messrs. T. & R. Lamb, who have engaged to complete the structure for £2,620.

THE ADMEASUREMENT OF SKY IN CASES OF LIGHT.

WHEN a new building is erected so as to cut off an appreciable amount of light from a window of some adjoining tenement, the loss of light occasioned thereby is a frequent subject of dispute in the law courts; consequently it is of great importance that an accurate mode of measuring such loss should be in the hands of surveyors, who are called in to give their evidence in such cases. One method lately introduced is

as follows:—The sky-surface seen from an unobscured window is supposed to be represented by an equally illuminated quarter-sphere, divided into a number of segments by circles of latitude and longitude, and the value of the light from each segment as seen from the window, which is supposed to be at the centre of the sphere, is calculated for every 10° each way, and figured on a table. When it is required to find how much light is cut off from the window by any proposed building, its vertical and horizontal distances therefrom, together with the angle which a line drawn from it to the window makes with the face of the wall containing the window, enable us to find the number of segments of sky-surface which are obscured; and by addition of the calculated values, as shown by the tables, to compare the loss of light with that which the window enjoyed before the erection of the said building.

A paper on this subject has recently been read at the Institute of British Architects, by Mr. E. Wyndham Tarn, M.A., showing how the values of the light from various parts of the sky may be calculated, as he believes, with the greatest accuracy by aid of trigonometry and the integral calculus; the light being supposed to be partly cut off by the thickness of the walls on each side, and at top of the window, so that the quantity obtained from the parts of the sky-surface on the extreme right and left, and also near the zenith, is very small, and the first 10° of surface are entirely neglected.

Also, since the light on the sides and near the zenith enters the window obliquely, the quantity from those parts is diminished as their distance from the meridian or horizon increases. We have also to take into consideration that the areas of the several zones of 10° in width diminish as we pass from horizon to zenith. The following table (Table 1) shows the relative values of light entering a vertical window from different parts of the surface of the sky, on the hypothesis of the light being equally diffused throughout the whole area of the sphere.

The hypothesis upon which this table is based, namely, that the light from the sky is equal for equal areas in every part, although a convenient one to adopt for calculation, and the one generally assumed by surveyors, is far from being physically correct, as

the light obtained from a given area of sky surface near the zenith is always brighter than for the same area near the horizon. This can be shown by experiment, and has also been demonstrated by Mr. Tarn, in his paper "On the relative Illuminating Powers of different Portions of the Sky-surface," published in the *Builder*, December 15th, 1866; in which he shows that the illuminating power of equal areas of the sky-surface varies as the sine of the altitude. Upon this principle the second table has been constructed, showing the relative values of light entering a vertical window from different parts of the sky-surface, on the supposition of a variable diffusion of light.

In these tables only one-half of the quarter-sphere is indicated, since the other half on the opposite side of the "meridian" will have exactly the same values. The numbers in the column marked "Value of each Zone," are simply obtained by adding together all the figures given in the other columns in the same horizontal line: so that when a whole zone is obscured, the loss of light is shown without any calculation. The total at the bottom of the column is the sum of all the numbers in the table, and represents the entire unobscured light from the half of the sky-surface. As an example, we will suppose that a new building obscures the whole of the three lower zones of the half-surface, or 30° from the horizon, together with 40° horizontal, or 4 segments, measured from the meridian of the next zone, with 20° horizontal, or 2 segments of the next zone, measured from 10° to 30°. The calculation is as follows, taking Table 2:—

1st zone.....	104
2nd ".....	294.6
3rd ".....	397.3
4 segments of 4th zone.....	88
	82
	75
	64
Segment of 5th zone 10° to 20°	74
Do. 20° to 30°	67
	1246

1246 : 2100 :: 3 : 5, nearly.

So that 3-5ths of the light from half the sky-surface, or 3-10ths of that from the whole surface, is obscured by the proposed erection.

TABLE 1.—Illuminating Power of Sky-surface uniform throughout.

Value of each Zone.	0	Z	E	N	I	T	H	0	0
54.4 10°	11	10.4	9.4	8	6.6	5	3	1	0
171 20°	35.5	33.3	30	26	21	15.4	10.6	3.2	0
335.6 30°	68.4	61	58	50	41	29.5	18.5	6.2	0
514 40°	111	104	94	81	63	48	30	10	0
718.1 50°	163	143	130	111.5	91	66	39.6	14	0
914 60°	195	180	163	141	114	83	62	17	0
1085 70°	223	208	188	162	133	96	60	20	0
1177 80°	240	225	204	175	143	104	63	21	0
6005 Total.	10°	16°	20°	30°	40°	50°	60°	70°	80° 90°

TABLE 2.—Illuminating Power of Sky-surface varies as the SINE of the Altitude.

Value of each Zone.	0	Z	E	N	I	T	H	0	0
54.4 10°	11	10.4	9.4	8	6.6	5	3	1	0
107.5 20°	32.6	30.5	28	24	19.4	14	9	3	0
273.3 30°	61	62	47	41	33.3	24	15	5	0
587.9 40°	79	74	67	58	47	34.4	21.5	7	0
431 50°	88	82	75	64	52	38	24	8	0
397.3 60°	61	76	69	59	48	31	22	7.3	0
291.6 70°	60	66	51	44	36	26	10.3	5.3	0
174 80°	21	20	18	15	13	9	6	2	0
2100 Total.	0°	16°	20°	30°	40°	50°	60°	70°	80° 90°

MANCHESTER ABATTOIR COMPETITION.

In February last the Corporation of Manchester offered three premiums of 150*l.*, 100*l.*, and 75*l.* for the three best designs for abattoirs and a carcass market proposed to be erected by the Markets Committee on a site between Water-street and the River Medlock. The results of this offer were to be seen last week in the Town-hall at Manchester, where a large number of designs submitted in competition were publicly exhibited. In a building of this class of course practical considerations are nearly everything, and against any tendency to attempts at architectural effect the committee guarded themselves in their "instructions" by the caution that "a plain brick elevation only is required." Glancing over the plans, then, in connexion with the instructions put forth, we must at once say unreservedly that there was a great deal of very bad planning evident among the drawings sent in; many of the plans having been devised without evidence of any adequate realisation of their actual working capabilities, so to speak, or of the objects to be kept in view in regard to the practical relation of the abattoirs to the market; viz., the provision for ingress of animals to the abattoirs, of rapid and convenient transference of carcasses from the latter to the market, and of ingress and egress of buyers to and from the market; these three branches of traffic, of course, requiring to be kept clear from mutual interference. Some of the competitors appear to have gone to work on their plans with a sort of indefinite idea that everybody will of their own accord keep out of everybody's way; and, could they see their own plans under operation, would very soon discover that "blocks" would occur, on a heavy market-day, in every direction; in one plan, and that one of the most carefully drawn and finished, the principal entrance avenue for animals actually crosses, at right angles, the only service transit between the abattoirs and the market. The plan of the site, we may mention, may be roughly described as a square, adjoined by a parallelogram of about half the area of the square. This conformation of the site has not unnaturally suggested to a majority of the competitors the main distribution of their plan; a considerable proportion of the plans showing the abattoirs and their appurtenances arranged symmetrically over the square portion of the area, and the market occupying the parallelogram. The disadvantage of this is that (in most of the plans so treated) the service from the abattoirs to the market is all concentrated at one point, and the route from the furthest of them to the market is long and circuitous, especially as in most of these plans the abattoirs are arranged in square blocks rather than in parallel rows.

In the two plans, signed "Utility" and "John Bull," to which the first and second premiums respectively have been awarded, this drawback has been avoided. In both these the market runs along a considerable portion of the Water-street front, occupying more than the length of the parallelogram, and less than its width; and behind the market, in a parallel row, are ranged the principal abattoirs, divided from it by an avenue, each abattoir having its own lair or pen in the rear for the reception of the live stock previously to slaughtering. The market is thus kept sufficiently apart from the abattoir department; and in the "Utility" plan a series of hanging-rails, with sliding tackle, is provided, crossing the avenue from each abattoir to a corresponding entrance through the boundary wall of the market; so that from all the abattoirs so placed the carcasses can be slung straight across into the market, with, as the author remarks, a great saving, both of time and the possible injury to the meat in a longer transit. The rest of the public abattoirs are ranged at one end of the market, and those which fill up the rest of the square area are intended for retail butchers, who do not require to use the market. The system of drainage in this plan is to have no drain carried from within the slaughter-houses or pens, but to make all these with a good fall to a continuous channel running along each side of the avenues which divide the buildings, and drained at proper intervals. This arrangement will save expense in drain-pipes and possible stoppages at junctions; whether it will insure the places being kept as clean as if each had a separate drain may be doubted. The walls of the abattoirs are to be lined with white glazed bricks, the best finish, probably, which could be given them to insure cleanliness; and

ventilation appears to be well provided for. The design makes no attempt at architectural effect, except in so far as pointed arches and voussairs of different coloured bricks may be said to constitute this; but its appearance is sensible and purpose-like, and the building looks like what it is, without any pretence at being more than it is. This plan, of which Mr. Darbyshire, of Manchester, is the author, is, we understand, to be carried out; and it is satisfactory to be able to say that, on the whole, the first and second premiated designs appear to us to be, as regards practical and working merit, certainly the two best in the room. Whether the second premium design ("John Bull"), by Mr. Salomons, is not, in some respects, the best of the two may be doubted. One point it shows which we did not see in any of the others—a separate passage for diseased animals from the entrance (where they are supposed to be examined and condemned by the inspector) to the special abattoir set apart for them. Considering the highly contagious nature of some of the diseases to which cattle are subject, this is not unimportant; but in many of the plans, though the separated lair and abattoir required by the "instructions" are provided, they cannot be reached except by a circuitous route through the greater part of the premises. The second premium design is more ornate than the first, but also more expensive, the architect's rough estimate for the two being 16,000*l.* and 26,000*l.* respectively; and it appears from the local paper that the discrepancy of the estimates occasioned some remark on the part of the town council in deciding on the plans, but the city surveyor having examined them, and concluding that the plan of Mr. Darbyshire could be executed at "something near" the estimated cost, it was accepted. It is also stated that this plan was selected as the best by the sub-committee, the committee, and the butchers, before the estimated cost was known.

Among other plans exhibited, that of "Veritas" is very elaborately got up, and shows great attention to mechanical minutiae for facilitating operations, including a self-acting junction for transferring a load of meat from the main carrying rails in the avenues of communication on to branch rails running into the market, which, so far as we could make it out from a model and the author's not very concise explanation, seems ingenious, but a little too complicated for everyday use by rough hands. The plan in general is, however, unsatisfactory, the lines of intercommunication not being very well laid out, crossing the site where they should run longitudinally. "Nil nisi Bonum" (does this mean "nothing but bone"?) is a very finely got up set of drawings, showing the market occupying the chief portion of the square area, as a glass-covered central hall, of which a capital interior perspective view is given; but the author for this effect sacrifices ground as well as compactness and accessibility of plan; and as the market in this case is not for a miscellaneous crowd of buyers, but merely a depot for the supply of wholesale dealers in meat, the effect is not of so much importance as to counterbalance the loss of room involved to obtain it. The author gives an alternative plan, showing the abattoirs occupying the centre area and the market the parallelogram, but the first plan is evidently his favourite. In the plan marked "Carnival," the market is divided into two long and not very wide areas, each flanked by its row of abattoirs; this would be a good working plan as between the abattoirs and the market, but not so good as between the market and the buyers, for whom it would certainly be more convenient to have the market in one wide area, besides the additional facilities for ventilation in the market when so placed as to have one or more side adjoining the outer boundary of the buildings. The design signed "Barabas" shows a more architectural effect in the exterior perspective than most of the competitors have attempted; and among others that are worthy of notice are "Devant si je puis" and "Nor" nor" east"; the latter (by Mr. Curzon), a very symmetrical plan, one of those showing the abattoirs and market quite separate on the site, but with better provision for intercommunication and transit than in some others of which the general distribution is similar.

Among other provisions required in the instructions issued by the committee are a separate pig slaughter-house and piggery, a boiling-house, residences for inspector and porter, assembly-room for the men employed in the abattoir, committee-room, &c. A shed is pro-

vided for the storage of blood, which it is proposed to contract with a company to take for chemical and manuring purposes. All these requirements appear to have been provided for in most of the plans. "A Competitor" writes to draw our attention to the "singular coincidence," by which all the premiums have fallen to Manchester architects. The people of Manchester have certainly shown a disposition, in competitions and otherwise, to favour the architects of their own city. This is not, however, altogether an unnamable weakness; and we have heard complaints from provincial towns of equal importance with Manchester, of prejudices far more unreasonable in an opposite direction, inasmuch that to be a "native," was enough to destroy all an architect's chances of favour from the corporation or citizens of his own town. With regard to the present case, it must be remembered that in a competition where practical considerations are of the first importance, architects living in the locality have necessarily, in their knowledge of the local details and customs, an advantage over strangers, who must count upon this in entering into such a competition. With regard to the third premium, we certainly do not see why the plans marked "Concilio et Labore" (a *tu* favourite motto with competitors), by Messrs. Pennington & Bridgen, should have been preferred to two or three others that are in the room: the plan is rather wasteful of space, and its practical working is not very clearly indicated. But with reference to the two first premiums, we must say, after examining most of the other plans, that we do not see how the council could have come to any other decision, considering the designs, as they doubtless did, purely on their practical merits; and we think the architects of these two plans have fairly earned their place in the competition.

THE VICTORIA EMBANKMENT.

GRAT efforts were made by the officers of the Metropolitan Board to have all things fittingly arranged for the opening of the northern embankment of the Thames by her Majesty the Queen on Wednesday last, and in a very short time they certainly did wonders. Indisposition unfortunately prevented the Queen from being present, but His Royal Highness the Prince of Wales and the Princess Louise represented her Majesty, and the whole affair passed off well, the arrangements being admirable.

Using official data, we may remind our readers that the Victoria Embankment, extending from Westminster Bridge to Blackfriars, is about a mile and a quarter in length; the total area of the land reclaimed from the river being 37½ acres, of which 19 acres are occupied by carriage and foot ways; 7½ acres have, under the Act of Parliament, been conveyed to the Crown, the Societies of the Inner and Middle Temples, and other adjacent landowners; and about 8 acres are to be devoted to the use of the public, as ornamental grounds. The Templars are restricted from building over their portion of the reclaimed ground.

The main roadway is 100 ft. in width throughout, and is divided into a central carriage-way, 64 ft. in width, with two footways; that on the land side being 16 ft. wide, and that on the river side 20 ft., along which is planted a row of trees at intervals 20 ft. apart.

The first Thames Embankment Act contemplated a solid embankment and roadway, 100 ft. in width, as far eastward only as the end of the Temple Gardens, the roadway thence to Chatham-place being reduced to 70 ft. in width, and carried on arches under which the river could flow to the existing wharfs. Subsequently,

however, the Metropolitan Board of Works obtained power to form this roadway of the full width of 100 ft., and on a solid embankment all the way to Blackfriars.

The approaches to the road as now defined will be from Westminster and Blackfriars Bridges, and from Whitehall-place, Villiers, Norfolk, Surrey, and Arundel Streets. An approach on a viaduct from Lancaster-place, Waterloo-bridge, passing through the ornamental grounds in front of the Adelphi, was provided for in the original Act; but this has since been abandoned with the sanction of Parliament.

As soon as the railway works are sufficiently advanced to admit of it, the main roadway from Westminster to Blackfriars will be extended to the Mansion House, thus forming one grand thoroughfare between the Houses of Parliament and the centre of the City.

The level of the roadway generally is 4 ft. above Trinity high water, except at the two extremities where it rises to Westminster and Blackfriars Bridges to an extreme height of about 20 ft. above high water.

Within the Embankment wall, and forming a portion of its structure is placed the Low Level Intercepting Sewer, which is an integral portion of the Main Drainage scheme, and above it is a subway for gas and water pipes, the dimensions of the subway being 7 ft. 6 in. in height, and 9 ft. in width; and the diameter of the sewer varying from 7 ft. 9 in. to 8 ft. 3 in. These are both situate under the footway next the river.

In connexion with the steam-boat pier at Westminster Bridge, a subway has been formed under the road to communicate with the subway previously formed under Bridge-street, which will afford an underground thoroughfare for foot passengers between the Houses of Parliament, the Metropolitan District Railway Station, the steam-boat pier, and the footways in Bridge-street, and those on the river and land sides of the Embankment roadway.

The Metropolitan District Railway, which, in consequence of its intimate connexion with them must be alluded to in any description of the Embankment Works, enters the land reclaimed by the Embankment at the Offices of the Board of Control near Westminster Bridge, and passes under the public road as far as Charing-cross Station, the roof of which rises above the surface, and is enclosed by screen walls of brickwork.

The contract for the construction of the Embankment wall between Westminster and Waterloo Bridges was let to Mr. Furness; of its continuation to the eastern end of the Temple, to Mr. Riton; and of the remainder, thence to Chatham-place, to Mr. Webster, whose contract includes also the formation of the roadway throughout. The total cost of the works, when completed, is estimated at 1,200,000*l.*; and of the purchase of property and compensations at 450,000*l.* The whole of the works have been executed under the direction of Mr. J. W. Bazalgette, the Engineer of the Board, who has been ably assisted in the superintendence of their execution by the resident engineers, Messrs. Lovick and Cooper. The purchase of property and settlements of compensation have been under the charge of Mr. G. Vallentyne, the Superintending Architect of the Board; and the ornamental grounds are being laid out under the superintendence of Mr. A. McKelzie.

We shall have opportunities for more special observations hereafter.

THE DICTIONARY OF ARCHITECTURE.

ARCHITECTURAL PUBLICATION SOCIETY.

The annual general meeting of the subscribers was held on Thursday, July 7th, at the Royal Institute of British Architects, Mr. C. C. Nelson in the chair.

Mr. Arthur Cates, before reading the report, announced the death of Mr. J. W. Papworth, as a loss which was practically irreparable.

According to the report, to complete the text of the Dictionary, it was estimated that about 2,600*l.* would suffice, and to secure this amount 160 new subscribers for complete sets, at 15*l.* 15*s.* each, were required. Of this number ninety-five have actually paid the whole or part of the subscription, seventeen others have undertaken to do so, and forty-eight only now remain to be obtained.

The balance-sheets show that all debts and liabilities which had accrued up to Lady-day last have been fully discharged, and that there is a

* The following is a list of the several plans which were sent in for competition, together with the estimates:—*"Devant si je puis,"* 65,381*l.*; *"Labore et Concilio,"* 53,971*l.*; *"Barabas,"* 60,000*l.*; *"Front de Reuil,"* 46,880*l.*; *"Nor" nor" East,"* 48,270*l.*; *"Carnival,"* 40,000*l.*; *"Ad Rem,"* 39,000*l.*; *"Economy,"* 38,000*l.*; *"Lancaster,"* 37,000*l.*; *"Veritas,"* 31,000*l.*; *"Alpha,"* 30,000*l.*; *"A,"* 30,000*l.*; *"Nil Nisi Bonum,"* 23,800*l.*; *"Spero,"* No. 2, 28,600*l.*; *"John Bull,"* Mr. E. Salomons, 27,000*l.*; *"Spero,"* 27,000*l.*; *"Front de Reuil,"* No. 2, Pennington & Bridgen, 26,377*l.*; *"True as Steel,"* 26,000*l.*; *"Industry,"* 26,000*l.*; *"Volero,"* 23,800*l.*; *"Credo,"* 23,500*l.*; *"Bull's Head,"* 23,400*l.*; *"Anchor,"* 22,161*l.*; *"Cave Taurum,"* 21,000*l.*; *"Quinta in Numero,"* 20,21,000*l.*; *"J. D.,"* 20,880*l.*; *"H,"* 18,800*l.*; *"Hope,"* 18,000*l.*; *"Concilio et Labore,"* 16,800*l.*; *"In all Labour there is Profit,"* 16,000*l.*; *"Utility,"* Mr. A. Darbyshire, 16,000*l.*

We have received a letter questioning the selection on the ground that a proper building cannot be erected for the sum named by the selected competitor. We do not think it necessary to print it.

cash balance of 1,165*l.* 14*s.* 8*d.* in hand, and available towards the completion of the Dictionary; also, a further sum of 446*l.* 11*s.* 6*d.* will be gradually received by instalments, thus providing a total sum of 1,612*l.* 6*s.* 2*d.* to advance the text towards completion. To provide the further funds required, sixty-five copies remain available, which, when all subscribed for, will produce 1,023*l.* 15*s.*, which, it is calculated, will be sufficient to meet the further expenditure required.

It is of considerable importance that these few remaining copies should be appropriated with as little delay as possible; and the interest of every member is so involved in the thorough success of the work which has now so far favourably progressed, that the committee may with confidence anticipate that it will soon be possible to report that all the past years' works are out of print.

A considerable portion of the letter M has been printed off; the remainder is in type.

The Chairman having expressed his opinion that a very satisfactory state of affairs had been placed before the meeting, moved the adoption of the report and balance-sheet, which was carried.

Mr. Cates said it would be highly satisfactory if, in the course of the next year, the required number of forty additional subscribers could be obtained; and he thought they ought reasonably to be able to do that. At the time the completion of the Dictionary was uncertain, no doubt gentlemen felt a delicacy in asking their friends to put down fifteen guineas; but that was now entirely removed by the recent arrangements. He added there had been in the first instance a strong expression on the part of Sir W. Tite that his (Mr. Cates's) views were too sanguine; but they were very greatly indebted to him, for he had given most important assistance in many ways, and very much of the present success was to be attributed to his encouragement and support.

A special vote of thanks was given to the hon. secretary, for his active exertions on behalf of the society.

FIRES IN LONDON AND PARIS.

"There's a providence in it all," said Sam.
"Of course there is," said his father, with a nod of grave approval; "what would become of the undertakers without it, Sammy?"

WHAT a fund, not only of merriment, but of philosophical truth, is there in the many pithy observations of the two Wellers! They have become as much a British institution as the sale of commissions in the army, or next presentations in the church, and are as familiar to Englishmen as railway accidents, paupers or poor-rates, or as any fire-brigade man in helmet and hose, the like of whom is unknown out of the British isles. Now, we are not about to venture on a word of disparagement against any sorts or conditions of men, neither paupers nor curates, nor soldiers, nor firemen, nor any of the good things Englishmen cling to, and would do battle for in the face of the most "earnest" Government that could possibly sit at St. Stephen's. We believe in Samuel Weller's reflection, and would fain agree with Alexander Pope that whatever is, is right; for surely, if there were no paupers, what would become of the Poor-law Board? If there were no fires, what would be the use of firemen? And these last are worthy of sympathy from the least enthusiastic breast,—the honest fellows who are to be seen at all hours rushing through the London streets to the old familiar cry of "Fire!" so familiar that the man of business, hurrying along, hardly bestows a glance at the galloping horses, and the man of pleasure saunters calmly on, while a tragedy, enacted within stones' throw of him, is accomplished in a shorter time than is required to announce it in the papers under the usual formula; so familiar that policemen and bystanders, at the first alarm, take their respective positions with an aptitude and precision savouring almost of military discipline; so familiar, that the "upper ten" have at last made a fashion of it, and nobility comes in at the death, in quite a sportsmanlike manner, bewitching the world with noble firemanship.

It is the writer's fate to be numbered amongst those who inhabit a better built and more sumptuous capital, yet, nevertheless, yearn for the unswerving streets of smoky London, revisiting them daily in the columns of the *Times*. They tell a melancholy tale—those columns—of fires and suffocation, destruction of property, and its heavy train of ills. In spite of the most

powerful fire-engines in the world; in spite of an admirably organised fire-brigade, the members of which are chosen for their intelligence and courage; in spite of the most adequate professional aid always at hand, and much amateur assistance given from many quarters, lives are periodically lost; men, women, and children are burnt to death or suffocated, unable to effect their escape from burning timbers, amongst which many firemen fall victims to the bravery and self-forgetfulness which distinguish the whole body. Their deaths are registered in due course, and the most satisfactory reports are drawn up, the tendency of which is generally to prove that everybody did his duty, and that nobody is to blame. But this can hardly be the opinion of men who know anything about building and the working of other Building Acts besides that of the metropolis, which, if we mistake not, was compiled by one or two clever lawyers who had read for the subject. Those who have thought about this constantly-recurring destruction of life and property in London are vain enough to believe that something must be radically wrong, and that somebody should be made responsible for it; and, if any, most assuredly the architects. But the profession are able to reply that they build fire-proof constructions when their clients will permit them to incur the necessary expense, and that they are responsible for these. The question is, however, whether a client should possess the right to build anything in a great city but a *bona-fide* fire-proof construction, and we add this qualification because more than one presumed fire-proof building in London has already succumbed to the flames. Here, in Paris, architects do not ask their clients whether they will have wood or iron floors to their houses, but build as experience and the acknowledged custom of the country propel them, and as the law directs. A French architect is responsible during ten years after completion for any errors or omissions in the works entrusted to his care; he is able to sue the contractors; but the client first sues him, and the brunt of the battle is generally borne by himself. In days when the insertion of the thin end of the wedge was a more difficult operation than at present, the Rev. Sydney Smith was wont to advocate the sacrifice of a bishop as the fittest preparative for reform, and we are sanguine enough to believe that the consumption by fire of a president or honorary secretary of the Institute would conduce to an amelioration in the present system of building practised by London architects, especially if the responsibilities of the latter were a little more defined by the Legislature, and the penalties attached to their calling a little more accentuated.

In Paris, a calamity like that known as a London fire is not of frequent occurrence; at least, we seldom read of such a thing, and still less seldom see it. But it is averred that there is no publicity in France,—a great mistake; for there is now so much publicity that even private life is hourly sacrificed to it. Besides which, a sensational piece of intelligence is quite as much appreciated by the Paris journals as by any *Daily Telegraph* or *Lloyd's Weekly Messenger*, and the story of a disastrous fire could be made, under skilful treatment, quite as telling as a wholesale butchery at Pantin or Denham. We repeat, that a house gutted by fire from basement to roof is a very rare sight in Paris; and, of late years, it may safely be asserted, a chimney on fire is the worst that happens to alarm the inhabitants of the new quarters of the city. Fires, though, do occur in many parts of the French capital, and were the houses built on the same model as those in London, the loss of life would be enormous, seeing that every Paris house contains on an average what would be considered in England six households, of more or less importance, not to mention stray lodgers in the roof or upper floor, and shops, stables, and coach-houses on the ground story. Every day accidents necessarily happen from the carelessness of one or the drunkenness of another; while the numberless flues required for the many houses contained, as it were, within one house, the *coloris* with its ramifications of hot-air pipes, the ever-hot *fourneau* on every floor, the muslin curtains hanging to every window, the silk and chintz which cover the walls of the better-class apartments, all contribute to the risk of destruction by fire,—destruction, however, which seldom spreads beyond the limits of the apartment in which the fire occurs, as many instances suffice to prove.

Perhaps the secret, or rather the principal

reason why there are so few really "disastrous fires" in Paris is to be attributed to the extensive use of plaster in the interior of all habitations. Plaster, besides being employed for all purposes to which lime and hair are applied in England, is used in the construction of doors, roofs, and staircases: these are *howells* in plaster,—an operation little known beyond the walls of Paris. It is performed in the following manner:—The iron joists are fixed in the walls at a distance of 2 ft., or a little more, apart, and connected by iron bars, about half an inch square, hooked to the joists and laid consequently at right angles to them on a level with the bottom flange. On these bars, which are placed also about 2 ft. apart, long thin slips of iron, about three in number, are loosely arranged between the joists, and parallel to them. Here the smith's work ends, and that of the *maçon* commences. Planks are temporarily attached to the under part of the floor, close against each other, forming, as it were, the ceiling of the room below. Rubble or hollow bricks or *plâtras* are then thrown on these planks until the whole space between the joists is filled throughout their entire height; liquid plaster is then run on, and soon finds its way between the rubble, binding it together and forming a homogeneous mass: so quickly does the plaster set, that in twenty-four hours the planks can be removed, and the ceiling and cornice completed. To fix the parquet, small oak sleepers are required; these are laid upon the joists at equal distances, and set in plaster; the oak flooring is then nailed upon them.

Although the fronts of Paris houses are built of stone—and this is compulsory in the principal thoroughfares—staircase walls, when the stairs are of wood, and the rest of the work of similarly cheap construction, are sometimes built in *pan de bois*; but this strange contradiction is counteracted by the use of plaster. In such walls, and indeed in all framed partitions, the spaces between the rough oak posts, which are of enormous scantling, and covered with large nails, are filled up with *plâtras*, that is, blocks of old brick or plaster emanating from the demolitions of old buildings, and the whole is run and coated with plaster so effectually as to render it often difficult to ascertain whether a wall so built be of brick or wood. A wooden roof is treated on the same principle; purlins and any cross pieces of wood are enveloped in plaster, and this coating has saved, in our own limited experience, more than one roof from destruction. Besides the extensive use of plaster by every branch of the building trade, Paris may be said to enjoy its enviable immunity from fire by the universal employment of iron in the construction of floors; the substitution of oak for deal in almost all carpenters' and joiners' work; and last, though certainly not least, the custom of paving all kitchens, no matter on what floor of the house they may be found, all subordinate rooms, passages, and servants' bedrooms with earthen tiles, though of the commonest description.

To judge from the numberless fire-insurance speculations, fire-engines of every description, fire-escapes, more or less complicated, and the elaborate organisation of the fire-brigade, the British mind has, after a long and bitter experience, come to regard fires as part of the business of a great city,—a necessary misfortune out of which it is as well to derive as much good as it is possible to obtain out of evil. Londoners have acquired a morbid belief that fires are inevitable, and that to fall by an element which was created to destroy is only a natural consequence of human existence. It must be within the recollection of many that the *Times* correspondent, at the last Paris International Exhibition, terrified the Londoners by an appalling description of the wooden or rather pasteboard partitions which were being constructed by the exhibitors of every nation, and was thereby instrumental in burdening that over-costly martyr, the British taxpayer, with the cost of stupendous iron doors to guard those picture galleries, which were said, let us hope erroneously, to contain the best examples of British art of that period, while the masterpieces of the modern French school were defended from the public and from fire by a woollen cord, thrown across the doorway, remaining thus, night and day, under the care of policemen and *pompiers*. The English authorities were, no doubt, right, though the French can hardly be said to have been wrong, each country viewing fires after its own fashion; to the former they are circumstances of every-day occurrence;

to the latter, accidents which are more easily averted by well-drilled and intelligent sentinels than extinguished by the skill and bravery of the most experienced firemen. The long story of London fires would lead almost to the supposition that as the facilities for saving life are perfected the number of fires increases; but herein lies a question to be answered by those more experienced than ourselves in the principles which serve to govern large communities: suffice it that it is an axiom of constitutional rule that a Government should do nothing for its children except at the very last extremity, when abstention would become a crime. The honest poor are thus driven to become paupers because only as paupers are they entitled to relief, and London is "protected" from fire only when the fire has betrayed itself, and the duty of putting it out becomes a public obligation.

Who, that watched the Parisian firemen at their ceaseless rounds in the Great Exhibition building of 1867 will doubt the excellence of their training and the working of a system which is founded on prevention rather than cure. The *pompier* is not the sturdy individual whose jolly features glisten as brightly as the helmet which covers them at so many a London fire. He does not command the respect of his countrymen; the fair sex neglect him, and, though sought after by an inferior order of *bonnes*, he is subject to the derision of small boys, and slightly regarded by the great society of domestics at large. His *pompes*, too, are not of a class likely to inspire respect amongst London firemen. No prancing steeds drag them at full gallop through crowds of busy people, to the imminent hazard of human life; while in country towns a procession of *pompiers*, attended by their *pompes*, is remembered with a smile, and elicits the oft-expressed hope that they may never be put to the test. Whatever credit is due to French firemen,—and Paris is under great obligations to them,—is owing to their vigilance; and an inspection of the great theatres and large public buildings, when full to overflowing, will bear out this assertion. Though Parisians are ignorant of those brightly-painted machines which cause so much delight to incipient youth in the English capital, though they possess no colossal fire-escapes to astonish the untravelled at all hours of the night, they, nevertheless, sleep undisturbedly, because, with them, "disastrous fires" are rare. They are content with the zeal of their firemen, but trust, with a higher wisdom, to the good materials employed in the construction of their houses, and the skill with which they are manipulated by the trained workmen of a regenerate city.

WILLIAM H. WHITE.

WHO VOLUNTEERS FOR PALESTINE?

We are glad to hear that the committee of the Palestine Exploration Society have been discussing the desirability of having an architectural draughtsman as assistant to the engineers who conduct the operations at Jerusalem and elsewhere in the Holy Land. It is felt that the technical illustrations of buildings and constructions have been hitherto inadequately rendered. What they want is a young man well versed in his art, who should be able to make illustrations equal to those in the Count de Vogüé's charming works, and be able to discriminate between the different styles. He should be a fit companion in subordination to his chief. With the limited means at the disposal of the committee, little more could be offered him than would meet the expense of his outfit and support while abroad. His main remuneration would be found in the experience he would there acquire, and the advantage of visiting foreign parts, and a certain reputation and connexion resulting from being associated with such an enterprise. At the same time he must be a young man well taught in his art; of amiable and obliging disposition; earnest, enterprising, of steady habits; and ready to work hard; above all, a gentleman. There must be several young men in the profession, sufficiently able, enterprising, and independent in their means, who would join such a project if the opportunity were offered them. Who volunteers for the new crusade? We are not in a position at this moment to say that such an appointment as we have alluded to will positively be made, but it seems more than probable, and the appearance of a likely volunteer on the scene would tend materially to bring about a realisation of the scheme.

AN OPPORTUNITY FOR ARCHITECTURAL STUDENTS.

Mr. E. SHARPE, of Lancaster, has arranged to give a series of lectures to the members of the Architectural Association and others, at Lincoln, and on its neighbouring churches, during the last week in August. His object is to promote the practical study of the history of architectural art in England throughout the four centuries of its finest development, and he invites all who desire to have assistance in their endeavours to know how to see and study, and to record, describe, and draw what they see, to attend this meeting.

All pupils, therefore, of any practising architect in connexion with the Institute, Architectural Association, or provincial professional associations, will be freely admitted to those lectures and excursions, for which Mr. Sharpe is now making the necessary preparations at Lincoln.

We recommend such of our student readers as can conveniently manage it to take advantage of this offer on the part of one who is a thorough master of his subject.

THE NEW CHURCH AT ROATH, SOUTH WALES.

A NEW church has been erected and opened for divine service at Roath, at the cost of the Marquis of Bute. It is built on the site of the old edifice. The new church is in the Early Geometrical style. Its plan is a Latin cross, the chancel pointing eastward, and the nave, of course, to the west, with a north and south transept, and in connexion with the latter there is a chancel aisle and vestry. The manseum of the old church, in which several of the ancestors of Lord Bute are interred, is preserved near the north transept. The church is built of New-bridge stone in thin courses, with Bath stone dressings. The roof is of small green Bangor slates, supplied by Mr. Owen Davies, slate merchant, Cardiff. Each apex of the roof is surmounted with an ornamental carved cross. It is intended to complete the structure with a tower and spire, in the former of which a peal of bells will be placed. This is not yet commenced; but an estimate of the cost of construction has been given to Lord Bute, and it is now under consideration. The church has two entrance doors, the principal one being at the southern side, approached by a porch, and leading into the southern transept; the second is at the west, and leading into the nave. The porch is ornamental. It has an open roof of stained wood, with circular arches and moulded ribs alternately, and a wooden cornice is supported by stone corbels. It is lighted by a two-light window.

The church is provided with sittings for 400 persons. The seats are all open, and of pitch pine stained and varnished. It is laid with a wooden flooring, except in the aisles of the nave and transepts, which are paved with plain black and red tiles. The walls inside are lined with white Tynmawr and blue Staffordshire bricks, and ornamented in bands, and with different designs, worked in with blue and the Bute red bricks. The nave and transepts are covered by an open timbered roof, the principals having moulded arched ribs, and being supported by carved corbels and capitals, and columns of Bridgend stone. Running around the walls just underneath the roof is a battlemented cornice with open tracery work above.

In the centre of the church the roof rises to the belfry floor, and the ceiling is octagonal in shape, and of wood, divided into a number of panels, with moulded ribs and carved bosses. The tower will rise above this, and will be supported by four arches which now span the nave, transepts, and chancel. The chancel arch is composed of five moulded ribs of alabaster, Radyr, and Bridgend stone in alternation. This arch is supported on double capitals, between which are columns of Bridgend stone, and the two upper ribs rest upon carved corbels. The arch spanning the nave is of similar design and construction. The arches of the transepts are plainer; except for the varied colours of the stone, and the moulding and carving. This portion—the body of the church—is lighted as follows:—At the end of the nave is a large four-light window, with moulded tracery at the head. There are two single-light windows at the north side, and one piercing the south wall. In each transept there is a large two-light window, with a rose-light above, surrounded by circular

hexagonal tracery. These windows are filled with stained glass of a diaper pattern, supplied by Sanders & Co., of London. It is intended to light the church at night by means of a large gas chandelier suspended in the centre of the building, and in addition there will be two burners placed in the chancel. The church will be warmed with hot-air flues by means of the patented apparatus of Mr. Perrot, of Bolton.

The chancel is divided from the nave by a screen, pierced with moulded panels of a cinquefoil pattern. The chancel is paved with ornamental tessellated pavement, supplied by Mr. W. Godwin, of Lurgardine. The chancel walls to the height of 9 ft. are lined with alabaster (all of which, with the exception of a small quantity from Staffordshire, was brought from Penarth), which is varied with stone from the Radyr quarry and the Forest of Dean. Above this the walls are of the same nature as those already described, except that they are ornamented in red and blue brick, with crosses in diamond panels. The chancel roof is of stained wood, arched, and divided into twenty-four panels, with moulded ribs and carved boxes at the intersections. A plain battlemented cornice runs all round. The stalls for choristers are of pitch pine, moulded and carved. The chancel aisle is divided from the chancel by a screen of six moulded and carved arches, composed of alabaster and Radyr stone, with columns of Bridgend and Mansfield stone, the capitals and bases being of a white lias from the neighbourhood of Stratford-on-Avon. Above the screen rise two arches, supported in the centre by a large octagonal column, with carved capitals, of Bridgend stone. The space on the south side of the chancel screen is intended for the organ-chamber. The chancel is lighted by a large east window, which it is expected will eventually be filled with painted glass by Lord Bute; it is a five-light window, with tracery of the Early Geometrical style at the upper part, and above this rises an arch, the vousoirs of which are turned with black and red bricks alternately.

The old church was razed to the ground some two or three years ago, and the erection of the new one commenced early in February, 1869. The whole of the work in connexion with its construction has been done by Mr. T. Williams, of Cardiff. Mr. J. T. Merson was clerk of works. The carving is from the hands of Messrs. E. Clark & Son, of Llandaff, who executed the sculpture work at Llandaff Cathedral. The total cost at present incurred in the erection of the church is about 6,000l. The architect was Mr. John Pritchard, of Llandaff, diocesan architect. Mr. Williams carried on the restoration of Llandaff Cathedral, and has recently completed two churches in London, and another in Yarmouth, besides several other large works in progress.

NORTHERN NOOKS.

THE CASTLE AND VILLAGE OF DOUNE.

We must confess that it is getting every day more and more difficult for the poor artist or the wandering antiquary to pick up anything new in the course of his journeyings to and fro. We do not speak of the Continent in this case, although that is bad enough in these days of "excursionists." We never hear of or see a band of this modern peripatetic institution within 100 yards of our vicinity without unconsciously repeating Pope's famous and most expressive couplet:—

"Intrepid then o'er seas and lands they flew;
Europe they saw—and Europe saw them too!"

It was an excellent joke of Charles Lever when asked on one occasion by an Italian lady of rank who those curious English tourists were who saw going about the country in such equivocal guise, to answer, "Madam, they are unfortunate people rather affected in their brain, who are travelling for the benefit of their health under the charge of a keeper!"

Wandering some weeks ago through that picturesque region of the Scottish Highlands which is known to the Sassenach by the name of "the Trossachs," we cast anchor for two or three days at the village of Doune, which is situated in that neighbourhood, and lying on the verge of the south-west borders of Perthshire. Some notes we then made may bear to be written out,—more particularly since it was the only spot in the district that her Majesty did not overtake during the course of her Trossachian tour.

Of the village itself, however, we have very little to say that would interest architecto-

tural readers. It is the property, we may state, at least in greater part, of the Earl of Moray; and is beautifully situated on the banks of the Highland river Teith. Doubtless, it is very pretty, particularly if seen from a neighbouring eminence; but, at the same time, it is very polluted, as most of these northern villages are. Nothing is more wonderful, in our estimation, than the simple fact of how long the spirit of progress is in reaching such romantic watering places. Sanitary science there is almost unknown or recognisable. There are, no doubt, a few decent shops and houses in the main street; but as a general rule the cottages are miserably small, low roofed, and heavily thatched. They have no water supply excepting that which is derived from the contaminated river; or, worse still, surface water drawn from a soil of privies and ashpits by means of street wells; no drains but those which consist of stagnant open ditches along the sides of the village footpaths. As to anything of the shape of a water-closet, you might as well seek, as Diogenes did with his lantern, through the streets of Athens for an honest man! Such a sanitary innovation would seem to be a convenience and a necessity far beyond the requirements or even the conception of the primitive inhabitants. For these reasons among others it is that people who often leave the town for the pure air of the country, or at least in quest of the pure air of what Milton described as "the villages and farms," may find themselves miserably disappointed and mistaken. They will get a change of air in all probability; but whether it be a change for the better is a question we may leave for the present unanswered. Something was said to us in extension about the great difficulty of getting building fens—a circumstance which seems to be an inherent defect in all the systems of Scottish entails; but more readily given, whether the knowledge of how to build healthy houses would be consequently forthcoming or put in practice. Such is not the case in larger towns in Scotland. Even the slender scavenger-work of the place is done by a very poor and underpaid official of the Poor-Law Board of the county; and the public works of the town are all repaired and kept in working order by voluntary subscription!

The village of Doune, which was at one time famous for the manufacture of pistols, sprang, skene-dhus, and other implements and accoutrements, much in demand by the warlike Highlanders, was direct beyond the region of Loch Katrine, and the pass of Lenny. No vestige of this trade remains. Even its once celebrated cattle-markets have been swallowed up by Falkirk trysties and railway transit. The great source of employment for its inhabitants is now found in the colossal cotton-works of Deanston, which have been the foundation, we were told, of several Glasgow fortunes. Towards these works we pass the river by crossing that ancient "Brigg of Teith" immortal in story, since it was erected—as the original inscription on the south parapet signifies,—at the sole cost of a tailor, one Robert Spittal, at the request of Margaret Tudor, the Queen of James IV., anno Domini 1535.

A good deal of fun has been made, at the expense of the shade of the said Robert Spittal, concerning this bridge: but let us compare this useful "foundation," and its chivalrous origin with the loose and indiscriminate method of endowing useless hospitals, which is still the fashion in Scotland, and we may then be prepared to place "Her Majesty's tailor" in rather a high niche among the list of public benefactors.*

Although Doune contains one of the best specimens of the enormous barn-like Presbyterian village churches which are so thickly spread all over Scotland; and although it is still the largest "town" in the district, it is not itself a parish. Kilnaddock [? the Church of St. Maddock] is the original and still the legal name and designation of the parish. The church, indeed, has long been in ruins; but the churchyard to which we made a pilgrimage, still lies about two miles westward from Doune, on the road to Callander, in a picturesque but lonely situation, overlooking the banks of the Cambusburn. We seldom have seen so solitary and deserted a cemetery. Smith, of Deanston, the founder of the cotton-mills, and the inventor

of subsoil ploughing, lies buried here; and Cupples, the amiable and warm-hearted clergyman of the district, reposes near the deserted and hoary ruins of the ancient church, under a neat marble tombstone, containing a touching and appropriate epitaph, which is due, we suspect, to the filial affection of his son George (the author of "The Green Hand"); and there are numerous old and curiously-carved horizontal slabs, with half-obliterated inscriptions, which record the virtues of the "Fenars of Doune," for the last two or three centuries. Smith's epitaph runs thus:—"The grave of James Smith of Deanston, who died on the 10th of June, 1850, *ætat* 60. A man of science; an affectionate and beloved friend; and a kind and benevolent master." In addition to this, we are told, on the lintel of the tomb, which is enclosed with strong iron railings, that this burial-place was erected by James Smith, in the year 1838; that it is 10 ft. wide and 15 ft. long, and possessed of four layers.

To return, however. Our principal object, as we have said, in visiting Doune was to bestow such examination as we could afford to give to the remains of its celebrated castle. We do not suppose that we can add much to the formidable stock of lore respecting it; but a few personal observations may be allowed. It is certainly the most picturesque ruin of a castle, to our taste, in the whole of Scotland.

In the first place, we may easily discover that it is of great antiquity. It is obviously a mistake to suppose that it was founded by the Duke of Albany, as we are constantly told, in the early part of the fifteenth century. Sir Walter Scott, who was, of course, in many cases compelled to sacrifice historical accuracy to that splendid combination of the romantic and the picturesque which characterises his writings, seems to be the author of this belief. In one of his notes to "Waverley" he tells us that "Murdoch, Duke of Albany, the founder of this stately pile, was beheaded on the Castle-hill of Stirling, from which it was possible he might see the towers of Doune, the monument of his fallen greatness;" but this statement is not altogether accurate.

No doubt this Duke of Albany (created 1398) must have added greatly to the size of the castle, must have strengthened its fortifications and improved its architecture. But its original foundation is more probably due to one of the ancient earls or thanes of Menteith, the first of whom had that title conferred upon him in the year 1057. This view is supported by the fact that Doune lies in the centre of the Celtic district of Menteith, and it is therefore not improbable, in our opinion, that this ancient castle dates from the eleventh century.

An examination of the lower courses of the external walls shows us that these are all 10 ft. thick; indeed, in some places,—particularly overhanging the impetuous river Teith, which, at one time, may have washed round the embankment, the masonry is 12 ft. thick, and is chiefly composed of nearly every point of rough irregular and ill-built rubble, which contrasts with the regularly-built, hammer-dressed, and compact cornices above. The latter masonry also possesses all the solid features of squared and hewn quoins and lintels, which belong to the feudal architecture of a later age. In fact, there are evidences of various kinds of mason work, and, what is more, of different kinds of sandstone.

A good deal of importance has been attached to its site, which is well selected; and is even at this day extremely secure and commanding. Doune Castle stands upon a triangular promontory formed by the junction with the river Teith of the pretty mountain stream (now sadly diminished in volume) named, as we have mentioned, the Ardoch. It is thus inaccessible from two sides of its walls, while the remaining ground had obviously been entrenched, and the walls protected by a deep moat. Secure natural sites of this sort were seldom selected by the Norman nobility in Scotland, and were always the resort of the native chieftains of a former age. The Castle of Edinburgh, which is unquestionably built on a Celtic site, was considered impregnable before the invention of cannon. But look, on the other hand, at Caerlaverock, in Dumfriesshire, which is exposed on every side by land, and is also easily accessible through the shores of the Solway by sea! Indeed, the site itself, and its name, is at once suggestive of a very ancient period of warfare,—a period in which hill forts of the rudest construction con-

stituted alike the nucleus of the future fortress and the feudal castle.

The Castle of Doune, as its present remains indicate, consists of a compact quadrangle, about 106 ft. square. According to Mr. Billings, "the bastioned square tower of the fifteenth century is the ruling feature of the edifice; but the buildings are of various ages, and among them are circular staircase towers and remains of the angular turrets of the beginning of the seventeenth century." The square tower at the north-east corner is 80 ft. high, and still exhibits the crow-stepped gables which supported the roof. Of course, the entire roof is gone,—more than a hundred years ago. It has never been distinguished by any florid architectural decoration, such as we see in Stirling Castle, or in the interior quadrangle of Orickton, in Mid Lothian. A place of strength it has always been,—a strong fortress, in fact, at the immediate base of the Grampian Hills, and therefore of great strategic importance. Nevertheless it also possesses a certain air of departed grandeur and extinguished royalty, painfully recalled to our recollection by the flagstaff on the tower, which still, we believe, on some occasions displays the Royal Standard to the northern breeze.

The bartizans of the curtain and towers are still admirably preserved. One of the old grim gargoyles still projects on the northern front. The gateway, as well as the principal window openings, are constructed with very flat Gothic arches, although there are noble specimens of arches in the eastern flank of the tower. Curious narrow, oblique slits for shot-holes and the admission of light also line the staircase; and it is easy to observe, by a study of the masonry of the south-west wall, that it has been more than once effectually breached with cannon—most probably during the wars of the Commonwealth. The entrance is by an arched gateway on the northern front of the great tower; and the portcullis is still preserved. The portcullis is a curious example of interlaced and welded iron bars. Valuable lessons in iron construction and design are lying, unsought for and unheeded, in some of our rudest and most ancient buildings.

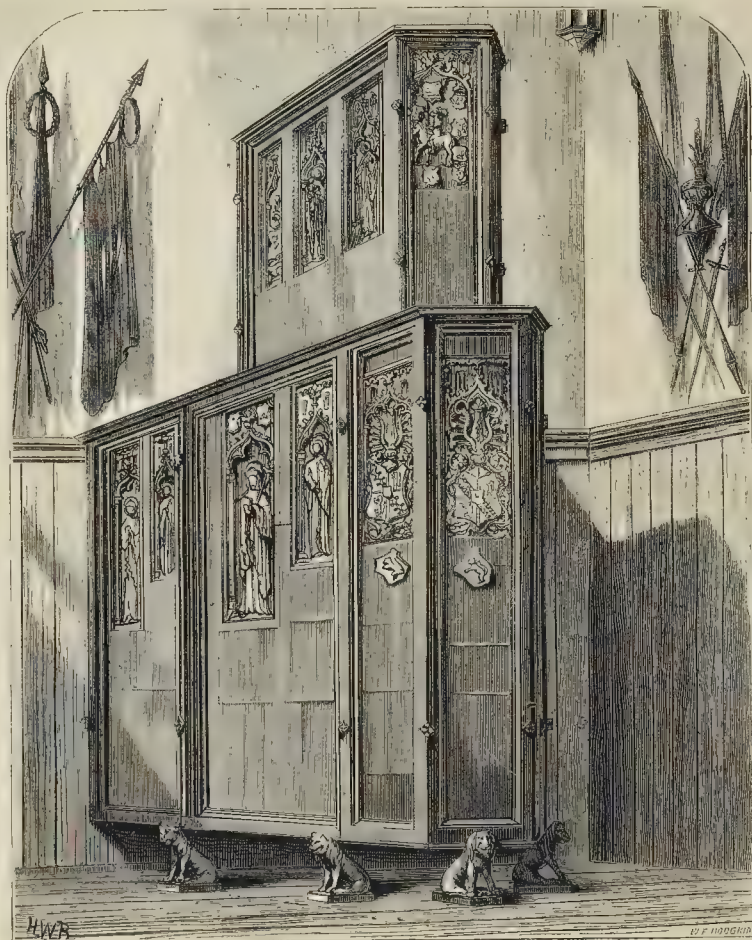
Inside of the gateway, on the right hand, is the old guard-house, which, by a dark entrance, is connected with a dungeon, designated the "Black Hole." This, it is clear, must have been for soldiers. On the left hand is the warder's apartment, which is also connected with an inner chamber, entitled the "Thief's Hole." This, we think, must have been intended for Highland caterans, or cattle-lifters. The remains of the great dining-hall, whose wooden rafters, we were assured, were built into certain stables and cow-houses of the neighbouring hamlet, measure 63 ft. in length by 26 ft. in breadth; and the great kitchen chimney is still to be seen, stretching from one side of the apartment to the other, immediately underneath the hall, suggestive of the days of oxen roasted whole, and of lambs spitted like grouse or blackcock! The baronial hall, where the lords and ladies held their state, is situated in the first story of the tower, a narrow staircase from which leads to the battlements. From this elevated point may be obtained an extensive survey of the surrounding country; and here, if he think proper, the visitor may get poetical or romantic! Here he may think of the ignoble treachery of the Duke of Albany, the chivalry of James IV., the sorrows of Queen Mary, the fate of the Regent Moray, and the adventures of "bonnie Prince Charlie," with all of which its history is identified. But the exquisite beauty of the scene and the grim ruins of the old castle itself will probably for the moment occupy his mind, to the exclusion of all other subjects:—

"Among thy woods grey turrets rear
Their heads in solitary splendour:
They braved the wrecks of many a year,
And only piecemeal yet surrender,
Though all their lords have bow'd to fate
And pass'd and left them desolate!"

This beautiful stanza, which occurs in a forgotten ode to "Scottish Freedom," written by Dr. Moir, the "Delta" of *Blackwood's Magazine*, some thirty years ago, precisely suggests the sentiment with which all students of nature and art, of whatsoever style, grade, or denomination, should view the ruins of the ancient and royal Castle of Doune.

It only remains to add that Lord Moray, to his infinite credit, is exceedingly careful of the castle; and his deputy, Mr. Macdonald, is not only an excellent archaeologist, but a celebrated salmon-fisher. This gentleman resides in a

* This ancient bridge, we observed, has recently been widened and repaired by the road trustees, under the direction of Messrs. D. & T. Stevenson, C.E., of Edinburgh. The roadway beyond still needs additional railing on the crest of the embankment.



ANCIENT CAST-IRON STOVE.—FIFTEENTH CENTURY.

very neat cottage hard by the gigantic sycamores of the ancient avenue, and the only inhabitants of the old castle that we could discover during our visit were a couple of milch cows browsing peacefully on the rich grass of its spacious court-yard.

ANCIENT CAST-IRON STOVE, COBURG.

THE stove which is the subject of our illustration is remarkable not only for its design, but more especially for the material in which it is executed. We have examined it most carefully, and there cannot be the least doubt that it is cast iron, and probably the earliest example in existence of the use of that metal. The casting is all of the very roughest description, and no attempt has been made to remove the marks of the castings. The same panels are used several times over, and in places where they did not exactly fit, they have been cut down in rather a barbarous manner. The figures are in slight relief, and the whole design is treated more like wood than metal. It is probable that the matrices were carved in wood. The intelligent custodian of the castle informed us

that the date of this stove was known to be 1472. We were unable to find any date ourselves, but this would answer to the style of ornamentation displayed in the canopies and other details. The arms displayed upon the stove are those of the house of Coburg, and are finely treated; in fact, they are by far the best portions of the whole work. The saints represented on various portions of the stove are the Virgin and Child, St. John the Evangelist, and St. Sebald (?). This singular relic of the Middle Ages stands in a hall scarcely less remarkable than itself. It is a perfect Mediaeval "Rittersaal," with a beautiful carved wooden roof, and is quite full of ancient armour.

THE NEW CHARTER-HOUSE SCHOOLS.

WE give this week a view of the New Charter-house School buildings now in course of erection on a most suitable site, of some sixty acres in extent, at Godalming, in Surrey, recently purchased.

The present schools, built for the Charter-house, at the time of their foundation early in the seventeenth century, are, on completion of the

new works, to become the property of the Merchant Taylors' School: so that they will continue to be used for educational purposes as heretofore.

In the foundation establishment, accommodation is provided for sixty boys, for two assistant masters, for a matron, and maniple. To this portion of the building are attached the school library and a common room for the masters.

The head master's and second master's houses have each been arranged for the convenience of fifty boys, and each is provided with private rooms for an assistant master and a matron.

The boys' dormitories are partitioned off into cubicles, only one boy occupying each; and there are in both houses private studies for the elder boys. The plan has been arranged so that additional masters' houses, dining-hall, &c., can be erected at a future time.

The chapel is designed to accommodate 400 boys, and the families of the masters and their servants. The houses and school buildings are connected with each other by open cloisters.

The building is faced with the rag stone found on the estate, part of the green sand formation. The dressings are of Bath stone.

The architect is Mr. P. C. Hardwick; and the contractors are Messrs. Lucas, Brothers.



THE NEW CHARTERHOUSE SCHOOLS, GODALMING, SURREY.—MR. P. C. HARDY, ARCHT.

F. HENRISSON.

TABLE DECORATIONS.

At the last *fête* in the Botanic Gardens, in the Regent's Park, the table decorations sent in competition for the gold medal offered by H. R. H. the Princess Mary of Teck, attracted much attention. The gold medal was awarded to Miss E. Blair, 10, Spencer-road, New Wandsworth. It was graceful, but chiefly noticed for the idea it exhibited of concealing the pots of growing plants beneath the table, and of the plants growing in the midst of the other decorations. One of the second prizes was conspicuous from the plants of the centre ornament being arranged and blended with a handsome coral ornament. The plan of inserting flower-pots under the tables, so that only the flowers growing in them are visible, is one not at all likely to become general, necessitating, as it would, the cutting of tables and table-cloths; nor is it desirable that it should; in fact, it is a mistake.

On one of the tables was a large glass centre-piece, consisting of three receptacles for flowers, one above the other, the top one being filled with green, a small fountain springing in the midst, and casting tiny jets upon it; the lower ones consisted entirely of green leaves and white flowers. Two other equally large glass-stands, with white and green in the centre, had branches coming from the second glass, on which hung white glass tubes, with flowers in them, vibrating at every footfall.

A huge block of ice springing up from the midst of green ferns was in the centre of another table, surrounded by glasses, with one flower in each. This is a dangerous device. We have seen a lump of ice so placed descend into a fair lady's lap.

A centre-piece, filled with water-lilies and ferns, was as effective and in as perfect taste as any design displayed. This was exhibited by Mrs. Walter Fawcett, of Westbourne-street, Hyde Park, who has before now shown her artistic skill in similar competitions at the Horticultural Gardens. This work of hers at the Botanical certainly deserved a prize.

ARBITRATION v. STRIKES.

THE striking events which have taken place in Liverpool during the past two years are likely to leave a salutary effect upon the actors in them. The proverb "Once bit, twice shy," seems applicable. Both employers and employed have suffered so much, that all branches of the building trade, except the masons, are desirous of adopting a more rational plan than fighting it out whenever a difference arises. To this end it is proposed on both sides to establish a public court of conciliation and arbitration, whose decisions shall be final, and binding on all; and the chairman of the Master Builders' Association has been requested by representatives of the joiners, house-painters, bricklayers, plasterers, and plumbers to convene a mass meeting, for the purpose of forming such a court. It is to be hoped that by that time the masons will see the necessity of joining their brethren.

CORN EXCHANGE, MARK-LANE, COMPETITION.

AFTER nearly three months' deliberation on the part of the committee of the Corn Exchange, the award has been made. Thirteen designs were sent in by as many different architects in response to invitations addressed to them. Of these, the design of Mr. Stock, of Duke-street, London Bridge, has been selected; that of Messrs. Robert Hesketh and Thomas Henry Watson, of No. 7, Royal Exchange, and 9, Nottingham-place, London, has taken the second place; and Mr. Croesland's the third.

We have already given the names of the architects invited to compete, and some correspondence, on the part of one of them who declined to send in under the conditions proposed.

The committee having peremptorily refused admittance to any representative of the press, we give no account of the designs submitted. We had particulars before us last week, written by one connected with the affair, but of course declined to make use of them. When the competitors were examining the ground, one of the reporters, we are told, said,—"I know who will get it; the architect who proposes to pull down the whole of the buildings in Seething-lane, and who does not mind how much money is to be

spent—he must go in for something bold to astonish them."

Whether or not this prediction has been fulfilled, we cannot say: committees, who take refuge in secrecy, necessarily expose themselves to damaging inferences.

THE COMING INTERNATIONAL EXHIBITION.

OUR art-workmen and manufacturers who are to be moved only by money considerations, if such there be, must look about them. We learn from a report made to the Belgian Commission by M. Corr-Vandermaeren that the delegate of the French Commission, with the hope that his countrymen will take a large share in these annual exhibitions, has secured a very considerable space in the Exhibition of 1871. But besides this,—and this is the remarkable innovation,—he has succeeded in obtaining authority to construct, at the expense of France, a spacious annex, which will cost, it is said, from 250,000 to 300,000 francs. This structure, separated from the principal building, is to be placed, by means of a gallery, in direct communication with the French departments. It is intended to receive, being put there for their sale, all the objects which the French exhibitors should wish to send there,—with this one stipulation, that the productions be of the same nature with those which shall appear in the place itself of the Exhibition. Every object sold during the day may be delivered to the purchaser the same evening, after the doors are closed; it must, however, be replaced by an article of the same kind the next day, before the Exhibition is opened. The exhibitors themselves are alone to be there for the sale of their productions in the annex. The English Commission has not only granted the authority solicited, but it has resolved to take measures to make it general, by according it to other countries who may wish to follow their example. The annex will become the free storehouse, where every industry in its turn will find a sure means of giving activity to and developing the sale of its productions, by opening relations with all the countries where English commerce is to be met with. M. Corr said afterwards, he had assured himself, with pleasure, that a great part of the iron employed in building the palace at South Kensington, will be of Belgian manufacture.

NEW STREET FROM THE STRAND TO HOLBORN.

THE line of street from Norfolk-street by the west side of Lincoln's-inn-fields, suggested in the *Builder* of the 25th ult., has been objected to by a correspondent, "E. B.," who points out another, as he says, and a much better line, viz., from the Embankment through Strand-lane, across the Strand by Newcastle-street, thence through Clare Market in line to Little Queen-street, and so across Holborn to King-street, there taking up, by a circuit, my line to the North-Western Railway.

Had "E. B." taken a view down Strand-lane, he must have seen that it was but 7 ft. wide, and turned off eastwards, at an angle of 20 ft. from the Strand; and that to have an issue on the Embankment, clear of King's College, five or six houses must be taken down at that end of Surrey-street; and also that if the line of Newcastle-street were made continuous, it must cut down more than one half of King's College, issuing at Somerset House, the terrace whereof must shoulder in the embankment angle of his new street. But, in fact, there could be no opening for it, as the lofty central portion of the College, together with the lower end of Surrey-street range, closes the line, and shuts off all the river view.

Across the Strand there is a curvature in Newcastle-street, which is only 30 ft. wide in the mean, besides that for about 150 yards there is a rise of 1 ft. in 20 ft. of its gradient. His proposed line might be cut from the junction of Stanhope and Houghton streets to Little Queen-street, in a straight line; but thence again, as a look at the Ordnance map will discover, there is a deviation by an angle exceeding 10 ft. from the north-west direction of Seymour-street and Woburn-place, at the point of incidence (Vernon-place).

The plan of new street given on the 25th ult. is at least a direct line; Norfolk-street and the west side of Lincoln's-inn are fine thoroughfares and ready to hand, and their propinquity to the

new Law Courts, the Temple, and the old Inn ranges, to which it would give direct access, would appear to make it more desirable than a narrow and tortuous line of streets, like those of "E. B.," which are 100 yards farther off!

As to the question of expense, the "E. B." line of demolition from Newcastle-street to Little Queen-street would be longer by above 150 yards, and therefore more expensive, than the first proposed line, which would utilise Norfolk-street and Lincoln's-inn-fields. The purliens about Clare-market might be much the same cost in either case, but, if at all practicable, the down line by Strand-lane must involve a disproportionate amount of outlay; for in fact it must have issue in Surrey-street to the Embankment.

"E. B." is mistaken as to the curve in a line drawn from Gate-street to Southampton-row. The line is drawn direct to Vernon-place. It is not, however, essential to the establishment of free intercourse between the Strand and Holborn that the proposed line should be carried further northward on its first inception. Long-acre, Great Queen-street, the theatres, and all that irregular network of streets between Covent-garden and Lincoln's-inn-fields must be at once relieved by such an open route; and the existing mass of dull shambles would follow in due course in the march of improvement.

THE SEWAGE QUESTION.

Sewage Utilisation.—The two bills for utilising the sewage of the towns of Blackburn, in Lancashire, with a population of 80,000, and of Reading, in Berkshire, of 30,000, which have been introduced by the respective corporations, have been passed by committees of the House of Lords. The Bills empower the corporations to purchase large tracts of land on which to utilise the sewage by irrigation, and were keenly opposed in the Commons as well as in the Lords. A very long string of witnesses appeared against them, but the evidence in support of the disposal of sewage in the manner proposed was deemed conclusive.

The New Sewerage Works at Hatfield.—The new sewerage works constructed in compliance with the requirements of the River Lee Conservancy Act, have been publicly opened. The works have been carried out under the direction of Mr. T. W. Grindley, engineer to the Corporation of Hertford, the cost of them being defrayed by rates, levied on the inhabitants of the Hatfield Drainage District. The Marquis of Salisbury, who will now take possession of the works, has agreed to keep them in repair for twenty-five years, on condition that the sewage is to be deposited on his land at Billett Common, to which place it will be conveyed by gravitation.

The Metropolitan Board and the Sewage Question.—Sir John Thwaites and about twenty-four members of the Metropolitan Board of Works have paid an official visit to Leamington, accompanied by Mr. Keats, the consulting chemist of the Board, for the purpose of inspecting what is called the "A B C," or alum, blood, clay, carbon, &c., system of treating town sewage. Sir John and the deputation were conducted through the sewage works by Messrs. Sillars, the resident directors of the Native Guano Company, and were accompanied by Mr. S. U. Jones, the chairman of the Leamington Board. The mode in which the "A B C" compound is mixed with the sewage was explained, the effect it has on the suspended matter in the sewage exhibited, and samples of the effluent water, after passing through the subsiding canals and a large sand and charcoal filter, were shown to the deputation. Specimens of the native guano extracted from the sewage were also exhibited, and particulars were given of its fertilising effects when applied to different crops. Messrs. Sillars, in reply to a proposal from Sir John Thwaites, stated on behalf of the Native Guano Company that they should be glad to allow an experienced chemist selected by the Board to have the supervision of the works for a fixed period, so as to afford the Board an opportunity of practically testing the system. Sir John intimated that in all probability this offer to subject the works to an independent and rigorous test would be accepted by the Board at an early date. We should have supposed the quantity of blood required for the metropolitan sewage to be utterly impracticable, but we observe, from *Land and Water*, that the quantity requisite (?) is something wonderfully homoeopathic;—one part blood to 1,250,000 sewage water! Perhaps the power of the blood

goes on increasing as it becomes infinitesimally less in quantity! A few more letters of the alphabet, however, should be added to the "A B C" since, according to the same authority, "for purifying the Hastings sewage, the following ingredients are used at a rough average, in the twenty-four hours: 80 cwt. of clay, 12 cwt. of alum, 14 lb. of blood, 28 lb. of sulphate of magnesia, 28 lb. of sulphate of lime, 28 lb. of animal charcoal, including a little sulphate of alumina, sulphate of iron, &c."

THE THAMES EMBANKMENT SITE.

ON a motion for going into committee of supply, on Friday, Mr. W. H. Smith moved that an address be presented to her Majesty, praying that she would be pleased to direct that no buildings be erected on that portion of the Thames Embankment which is reserved to the Crown, and which has been reclaimed from the river at the cost of the ratepayers of the metropolis. The hon. gentleman urged that as the ratepayers of the metropolis had paid for reclaiming the land on the north bank of the Thames it would be unjust for the Government to seize it in order to erect upon it some public buildings. The land was required for purposes of health and recreation by the public, and he appealed to the Government not to be so unjust as to deprive them of it.

The motion was seconded by Lord Enfield, and warmly supported by Mr. Baillie Cochrane.

The Chancellor of the Exchequer contended that the two acres and one-third were the absolute property of the Crown as trustees for the nation at large, and that if the ratepayers of London wished to keep it for their own recreation, all they had to do was to pay down 150,000*l.*, which was the estimated value of it.

Mr. Beresford-Hope and others also supported the motion.

Mr. Gladstone, in a very emphatic speech, insisted that the address was in flat contradiction to the law; and that if the House were to agree to the motion it would not be competent to her Majesty to issue the proposed direction. The object of the member for Westminster was tantamount to asking the Crown (which had only a life interest in the property) to give up land worth 150,000*l.* for an ornamental garden, for the maintenance of which a further demand would have to be made. He warned the House how it came to a decision which would form a dangerous precedent hereafter.

The debate was continued by Mr. Locke, Lord J. Manners, Mr. Cowper-Temple, and others; and the House became clamorous for a division, when the motion was carried against the Government by 156 to 106.

FALL OF A GRAND STAND AT CARLISLE.

WHILE the Cumberland Plate was being run for upon Carlisle race-course, a serious accident happened, resulting in more or less injury to a large number of people. Upon the rising ground, at the end of the straight part of the course, where the horses always finish the races, an enterprising speculator had erected a temporary wooden grand stand for the accommodation of any of the spectators who might choose to pay two-pence per head per race. It was 42 ft. long, and had upon it about twelve or thirteen steps, the depth from front to back being about 12 ft. or 13 ft.; it would stand about 7 ft. high in front, and 14 ft. or 15 ft. high at the back; and it was calculated to hold above 400 people. The weight of the spectators during the excitement of the race made the stand sway from its perpendicular position, and in a moment the whole structure fell with a loud crash, all the 400 people upon it falling with it. The number of people wounded and lamed by the accident is large, but many of them were taken away from the ground at once by their friends, or removed into tents.

The proprietor of the stand, says the local Journal, was Mr. John Little, coal agent, Bush Brown, in this city, who had employed a man named Hogg to construct it for him according to a plan furnished. The timber seems to have been strong enough for the purpose, the supporting pillars being 10-in. logs, and the supports 3 in. thick; but it had two radical defects. The main pillars had not been sunk far enough into the ground, they having only been inserted 2 ft. deep, and what was really the fatal defect—there were not proper "stays" put in, so that

although there was strength enough to sustain a weight brought perpendicularly to bear upon the stand, yet when the structure began to sway, there was nothing to check it. Probably the wall against which the stand was placed helped to make the fall lighter; but the severity of the crash may be judged of from the fact that many of the thick supporting beams were torn asunder.

ARCHITECTURAL ASSOCIATION.

THE members of the Architectural Association and their friends dined on Saturday, the 2nd inst., at the Talbot Hotel, Richmond, Mr. Laoy W. Ridge in the chair. It was stated that the society now numbers over 700 members. Mr. J. D. Mathews, who has served the Association as honorary secretary for seven years past, has been elected one of the vice-presidents; and Mr. Thomas Henry Watson president, for the next year.

M. DE LESSEPS.

THIS gentleman has every reason to be satisfied with his visit to this country at the invitation of the Liverpool merchants. Since he came to London he has been fetted in various ways. On Monday in last week he was present at a banquet at the Duke of Sutherland's house, where his health was given by Mr. Gladstone. On Wednesday he was entertained by the Lord Mayor at the Mansion-house, where he made a graceful return for the awkward hostility of England to the canal by saying that although "the glory of making it belonged to France, the duty of maintaining it would be with England, who now pays, indeed, four-fifths of the dues." The City authorities are doing him further honour, and the Prince of Wales, as president of the Society of Arts, has presented him with the Society's gold medal, which the Prince said he had stipulated should be placed by himself in the hands of M. Lesseps. There has also been a fête at the Crystal Palace in his honour; and we learn from Ceylon that the idea of a substantial testimonial to him has been originated there, and will probably be seconded at Bombay. He will also be decorated, it is said, with the Victorian Order of the Star of India.

ARCHITECTS' CHARGES AND PROPERTY IN PLANS.

THE case, Eddy v. M'Gowan, has been tried in the Court of Exchequer, Guildhall, London, before the Lord Chief Baron and a judicial panel.

Mr. T. C. Eddy, of Durham, the plaintiff, is an architect, and the Rev. E. M'Gowan, the defendant, employed him in the preparation of plans, &c., for several churches and a parsonage. Defendant had paid 5*l.* on account and lodged 100*l.* in court, disputing his liability for the remainder of the claim.

Mr. Seymour stated the plaintiff's case.—His client was instructed by the defendant to prepare designs and specifications, and to obtain tenders for a church to cost about 2,000*l.*, and did so. When the tenders came in, however, the defendant, according to the witness, determined to build two smaller churches instead, and this first church was abandoned. For his services plaintiff charged 3 per cent., being as per scale of charges of the Institute, and his fee formed the first item of his bill. Plaintiff then prepared designs for the second church, which was built, at a cost of 900*l.*, and for this he charged the usual commission, 5 per cent. He also prepared designs for two other churches not yet built, for which he made no charge whatever. The remainder of the account, as regards the churches, was made up of travelling expenses, stationery, postage, &c. He also prepared designs and got tenders for a parsonage to cost about 3,000*l.*, for which defendant hoped to obtain a grant from the Ecclesiastical Commissioners, and the drawings and specifications were sent to and duly approved by them with that view. When the tenders came in, defendant refused to allow plaintiff to proceed with the work, alleging certain neglect on his part as to the church, and demanded plaintiff's drawings and his account. Plaintiff gave up his account, charging 3 per cent. and expenses, as before, also surveyor's fees, but declined to surrender his drawings, as contrary to usage. Defendant refused to pay the account, disputing the correctness of the charges as to the churches, and denying his liability as to the parsonage altogether. He also refused a reference offered by plaintiff, and had a copy of the account printed for circulation among the clergy of the district.

Mr. T. C. Eddy, the plaintiff, was examined at length by Mr. Bruce and cross examined by Mr. Aspinall, and gave evidence in detail to the circumstances of the case.

Mr. W. Fogarty, architect, examined by Mr. Bruce as to the usage of the profession, said, the ordinary charge is 5 per cent. for full service, besides travelling and other incidental expenses. Should the work be abandoned before tenders are received, the charge is 24 per cent.; if tenders are received, 3 per cent. The surveyor for taking out quantities is usually paid by the builder who gets the work; but if the work be abandoned he is paid directly by the employer. In every case the drawings are the property of the architect.

Cross examined by Mr. Aspinall.—In abandoned work the client has no right to the plans; they would be no use to him. In the case of a client dismissing an architect in order to employ some other, unless it was done by consent, he considered the plans should not be given up further. It was unusual and irregular for a client to dismiss an

architect till his whole work was done. The general rule is that the drawings are kept by the architect.

Mr. J. P. Seddon, hon. secretary of the Royal Institute of British Architects, and called by Mr. Bruce, gave similar evidence to that of the last witness. He would consider it most unjust for an architect to have to give up his plans, to be carried out by some one else, possibly to the detriment of his reputation. The usage of the profession is set forth by the published scale of the Institute.

Mr. Aspinall stated the defendant's case.—As to the first church, he said, his client never wanted a north aisle to it at all, and before the tenders came in he had countermanded them. He therefore should not be charged commission on the north aisle, nor for getting tenders, as by the printed rule the tenders should have been procured in order to entitle the architect to the half per cent. for them. The item for the second church, which had been built at a cost of 900*l.*, his client did not dispute; it was all that had been built on all the plans for which this enormous sum of 24*l.* was charged. The travelling expenses, advertising, &c., were excessive. His client had distinctly advised plaintiff that he should look to the Commissioners, and not to defendant, for payment. His offer to pay was on condition that the plans be given up to him, which plaintiff refused to do; and, in fact, plaintiff expected to be paid without giving anything in return.

Chief Baron.—This seems to be entering on the question as recently agitated between the public and the architect of the Houses of Parliament.

Mr. Aspinall.—Not exactly, my lord; for there the work was finished, and the plans done with; but here the work was not done, and my client could do nothing without the plans.

Mr. Bruce.—It is really the same question, my lord; for if the client is not entitled to the plans when he pays 25 per cent., how can he expect them when he pays only 3 or 5?

Chief Baron.—I shall not enter on that question here, but give the defendant leave, in case of a verdict against him on this item, to move to have the verdict reduced, or a nonsuit entered, as the case may be, should he be able to show cause before the full court. Had I known that the result of the case sooner, I would have ordered it to be referred.

The Rev. E. M'Gowan was then examined in support of the case stated by his counsel. He had declined to proceed with the parsonage because the cost slightly exceeded the proposed grant, and he was dissatisfied with Mr. Eddy.

Mr. Sydney Smirke, E.A., examined.—It was the usual custom, he said, for the architect to retain the drawings; but in case of work abandoned, he thought the client had a right to them; also, if another architect were employed to superintend, as for works at a distance, as in the colonies, he thought the drawings should be given up to him.

Chief Baron.—Never mind about the works in the colonies; tell us what is the custom in a case of this kind, and in my own practice have acted accordingly. I never charged for stationery.

Cross-examined.—I know the rules of the Institute. Seddon attended their meetings. Had never subscribed any resolution to the contrary effect of the evidence given.

Mr. Aspinall addressed the jury for the defendant. His client, he said, had never authorised the north aisle, nor getting tenders for the first church. He was in no way responsible for the parsonage plans, which were to be paid for by the Commissioners.

Mr. Bruce replied for the plaintiff. He was sure the jury would be indignant at the defence set up as regards the parsonage, since it was clear, from the correspondence between the plaintiff and the Commissioners, that he knew the latter would not be liable. The rest of the claim had been fully proved.

The Chief Baron then charged the jury. He did not see how he could give any answer but to the first item. It was clear the north aisle had been shown on all the plans, and the defendant must have known of it. In getting tenders, if they thought these had been countermanded in time, they would disallow the half per cent. for this about 10*l.*; if not, they should allow it. He thought the travelling expenses also proved. The first item of the plaintiff's case was controverted by Mr. Smirke; it was but a small one. As respected the parsonage, it was hardly to be believed that Mr. Eddy would have done all this work without knowing who was to pay him. The Commissioners could not be called on to do so, and the defendant must have known this. If defendant had not dismissed the plaintiff, the work might have gone on, and he (the Chief Baron) hoped it would yet go on, as it appeared that the plans had been satisfactory both to defendant and the Commissioners. In the meantime they were called on to decide whether the defendant was liable or not, and certainly nobody else was. The surveyor's item could hardly be questioned, as the defendant himself, by not employing a builder, had prevented those fees from being paid in the usual way. The plaintiff, by not charging for several plans, had shown no disposition to be grasping towards defendant.

The jury almost at once returned a verdict for plaintiff for 100*l.*, beyond amount paid into court,—being 10*l.* less than the full amount of the claim, leave being given to defendant to move the full court to reduce the amount, should it be of opinion that plaintiff was not justified in retaining the plans of the parsonage.—(Communicated.)

PREMIUMS AWARDED BY THE INSTITUTION OF CIVIL ENGINEERS.

THE council of the Institution of Civil Engineers have awarded the following premiums:

1. A Telford Medal, and a Telford Premium, in books, to E. Dobson, for paper on "The Public Works of the Province of Canterbury, New Zealand."

2. A Watt Medal, and a Telford Premium, in books, to R. Price Williams, for paper on "The Maintenance and Renewal of Railway Rolling Stock."

3. A Watt Medal, and a Telford Premium, in books, to J. Thornhill Harrison, for paper on "The Statistics of Railway Income and Expenditure."

4. A Watt Medal, and a Telford Premium, in books, to T. Sopwith, jun., for paper on "The Dressing of Lead Ores."

5. A Telford Medal, and a Telford Premium, in books, to J. Douglas, for paper on "The Wolf Rock Lighthouse."

6. A Watt Medal, and a Telford Premium, in books, to

G. Berkley, for "Observations on the Strength of Iron and Steel, and on the Design of Parts of Structures which consist of those Materials."

7. A Watt Medal, and a Telford Premium, in books, to E. A. Cowper, for paper on "Recent Improvements in Regenerative Hot Blast Stoves for Blast Furnaces."

8. A Telford Premium, in books, to John Grantham, for paper on "Ocean Steam Navigation."

9. A Telford Premium, in books, to D. Makinson Fox, for "Description of the Line and Works of the Sao Paulo Railway in the Empire of Brazil."

11. The Manby Premium, in books, to Emerson Bainbridge, for paper on "Coal Mining in Deep Workings."

The council have likewise awarded prizes to students of the Institution for papers.

TADCASTER WORKHOUSE COMPETITION.

SIR,—Can any of your readers inform me whether the Tadcaster Board of Guardians have come to a decision in reference to the new workhouse? Designs were to be submitted to them the latter end of March last. Surely three months are more than sufficient to decide this competition in.

COMPETITOR.

ARCHITECTURAL TEACHING AT THE ROYAL ACADEMY.

THE Royal Academy have decided to entirely remodel their Architectural School. Owing to want of space, the Academy have hitherto been prevented appreciating any special room exclusively for the teaching of architecture; but the removal to Burlington House has enabled them to build a class-room, 40 ft. by 81 ft., fitted up specially for that purpose. Mr. Phénix Spiers, a young architect of activity and intelligence, has been appointed the master of this class; and he has been instructed to proceed to Paris (where he originally received his professional education) to make himself thoroughly acquainted with the present system of teaching adopted at the Ecole des Beaux Arts, not, certainly with any view to the rigid adoption of that system, but because it is the oldest and most completely developed school of architecture in Europe. An account of the system pursued there we have given on more than one occasion. The new arrangements at Burlington House will be ready for the opening of the coming winter season.

It is not very generally known, even in the profession, that the Royal Academy possess a collection of architectural casts which may safely be pronounced the finest classical collection of that nature in Europe; and no inconsiderable addition has been recently made to it of Medieval art-ornamentation. Owing to the unfortunately cramped accommodation in Trafalgar-square and other circumstances, these stores have never been made properly available; but the Royal Academy appear to have lost no time in remedying this evil in their new building. On a future occasion, we trust we shall be enabled to make known the whole course of study which it is intended to lay down for the instruction of students in architecture at the Royal Academy, and to make such suggestions as may seem desirable with a view to give it the greatest possible efficiency.

WATER-SUPPLY OF LINCOLN.

SIR,—Referring to the article on the "Condition of Lincoln," in your issue of June 11, the collic rock with which the table-land is capped is about 80 ft. thick, the lowest bed is incrustated with oxide of iron, beneath which lies a deposit of ferruginous earth about 9 ft. thick, of a dark neutral tint, thickly interspersed with nodules of iron ore, pyrites, fossil shells, and petrified wood, the *advers* of which when exposed for some time to the weather gradually changes in colour to a reddish ochraceous brown, owing to the action of the atmosphere upon the mineral salts it contains. Under this deposit lie the upper shales of the lias. The collic is traversed by main fissures, from 9 ft. to 12 ft. apart, trending south-easterly, also by cracks intersecting these in irregular directions. Rain falling upon the table-land speedily penetrates the collic, and is intercepted by the impervious lias beneath, and (wherever a shaft is sunk into the ferruginous deposit water is obtained, the maximum depth being the surface of the lias. The supply can be increased by headings driven across the main fissures: this is contrary to the practice of the local well-sinkers, who prefer to follow the line of a fissure or "loss" as they term it, thereby saving the labour of cutting one side of the

heading, but only extracting the contents of one fissure instead of several.

Wherever these main fissures crop out on the hill-side, a flow of water is the result, the quantity of which depends upon the size of the collic and the state of the weather. Hence some people say the wells are fed from the Trent, because when that river is high the wells are full; but the Trent flows through the marls of the new red sandstone at a far lower level than the Lincoln collic. The rise and fall of both is owing to the same natural causes, and they have no connexion whatever with each other. The escarpment of the lias is covered with herbage, and has a peculiarly undulating appearance, caused by landlips at some former time.

The natural supply of water in the lower part of Lincoln is similar to that on the table-land, except that the medium of filtration instead of rock is alluvial sand, into which headings cannot be driven.

The artificial supply of water is in the hands of a company, who have a large lake or reservoir about two miles distant, whence the water flows to their works, where it is filtered and pumped into the city. The water company have on several occasions increased their buildings, the power of their pumping engines, and the number of their filter-beds, to meet the growth of the population, and they are now about to obtain additional powers for further accommodation to the public.

A LINCOLN HOUSEHOLIER.

MERTON, SURREY.

ON Monday last the foundation stone for the new National Schools at Merton, was laid by the Lord Bishop of Winchester. The new schools are the gift of the late Mr. Richard Thornton, of Cannon-hill, in the parish of Merton, who bequeathed 10,000*l.* for that purpose; they are intended to take the place of the present schools, which have become totally inadequate to meet the requirements of the parish.

The plan comprises boys', girls', and infants' school-rooms, with class-rooms attached to each; and also residences for a master and two mistresses.

The works are being carried out by Messrs. E. B. Gammon & Sons, the contractors, under the superintendence of Messrs. Aldridge & Willis, architects, of John-street, Bedford-row, whose designs were selected in a limited competition. The amount of the contract, exclusive of school fittings, is 2,550*l.*

THE PROPOSED NEW WORKS AT THE HOUSES OF PARLIAMENT.

SIR,—As you have described the steps proposed to be taken at the Houses of Parliament for providing new refreshment-rooms, may I ask you to be kind enough to publish the enclosed letters, which are necessary to enable your readers fully to understand the subject?

I should not venture to make this request if these letters had not been excluded from the papers lately promised to the House of Commons on the subject. Readers of Mr. Russell's letter without the context would perhaps hardly suppose it an answer to one on public business with which I had been officially intrusted by the present Government.

EDWARD M. BARRY.

"21, Abingdon-street, 22nd June, 1870.

SIR,—My attention has been drawn to a plan for new refreshment-rooms and a new conference-room, which is stated to have been prepared by Captain Galton, and appears to have been founded on a plan of mine, which, after several years of study and negotiation, had been approved by committees of both Houses of Parliament, as per reports enclosed.

This plan was forwarded by me to the Office of Works, last year, and laid before the committee of the House of Commons by the then First Commissioner of Works, and gave evidence upon it by his request. After the committee had agreed on its report, the First Commissioner informed me that the general feeling of the committee was that detailed plans and estimates should be prepared in the recess, in order that at the commencement of the session of 1870 the House should have an opportunity of considering what should be done. He stated to me his intention of instructing me accordingly, and handed to me the plan, requesting me to retain it pending the receipt of such instructions. As three months were required, as reported by the committee, for the preparation of the drawings, quantities, and estimates, in order that no time should be lost, I proceeded at once to take all the necessary measurements, and to begin the preparation of the working drawings for the whole design and for improvements in the ladies' gallery, being in daily expectation of receiving my official instructions. As, however, I have not been in any way further consulted in the matter I was led to expect, I now return herewith the plan originally forwarded, with my letter of July 26th, 1869, and returned to me by Mr. Layard.

You will perceive that it bears an official mark, "with 3856-69" which, I presume, refers to the date of its original receipt by the Board in 1869.

I should add, that in February last it was applied to on the part of the Marquis of Lansdowne for a copy of the plan; and, understanding that he required it for the public service, I at once prepared and supplied a copy, on the supposition that the Government still intended me to carry out my design. The copy was sent to his Lordship at the Treasury.

It has been with some surprise that I have observed that the plan recently laid before the Committee, and now submitted to the House, has apparently been copied in principle from my original plan, without any mention to the Committee of the circumstance. It is right, however, to say, that it contains the following arrangements, which are deviations from my proposals:—

1. A greater interference is proposed with the architecture of the waiting-hall than I had felt justified in advising. 2. The proposed serving-room is placed in one of the main corridors, and is unprovided with any external light or air. 3. The kitchen is placed in a different position, and is narrower and lower than I considered necessary. 4. The public entrance to the new Conference or Committee Room is by an ascent of five steps, succeeded immediately by a descent of five more. 5. The light of the ground-floor windows on the east side of the Peers' Inner Court is affected by columns placed in front of them, to carry a projection above of 71 ft. in width.

I may add that I informed the committee of last session that there had been no time to prepare accurate estimates; and that the amounts I had named to them for the several works, which referred to a much larger scheme than is now proposed, were only to be regarded as covering estimates which could not possibly be exceeded; and that I had every confidence that the work could be done for a less outlay, if carried out by tender, in the usual way. I may also state that this confidence has been fully justified by the more detailed calculations which I prepared last year, in anticipation of receiving the expected instructions.

I am, &c. (Signed) EDWARD M. BARRY.

George Russell, Esq.,

"H. M. Office of Works, &c., 29th June, 1870. Sir,—I am directed by the First Commissioner of Her Majesty's Works, &c., to acknowledge the receipt of your letter of the 22nd inst. and its inclosures, relative to certain plans for alterations in the refreshment-rooms at the Houses of Parliament; and to state that, without admitting the accuracy of your remarks, the First Commissioner declines to enter into any discussion with you respecting the proceedings of this Office. I am, &c. (Signed) GEORGE RUSSELL, Secretary.

E. M. Barry, Esq., R.A."

TENDERS.

SIR,—In your last week's issue there appeared a letter signed "One of the Four" purporting to expose what he considers a job in the conduct of a competition for the erection of a house "a few miles from town."

The whole history lies in a nutshell. The quantities were badly printed. Some of the figures were indistinct, and an ingenious person, with an eye ready to pick holes in other men's coats, might quite as easily make out 33 rods as 22 rods.

Another of the Four. In that case such "quantities" should not have been sent out.—E.N.

CHURCH-BUILDING NEWS.

Towdnack.—The *Cornish Telegraph* states that the old church of Towdnack has been restored. The chief works effected by the restoration are the erection of new roofs throughout the building; the insertion of new windows; together with other restorations of the fabric of the church. The nave and aisle have new deal seats; the chancel is fitted with new screens and oak stalls; the pavements throughout the church are new; that to the chancel has ecanastic and other coloured tiles, with patterns in Portland stone. The architect, from whose design the work has been carried out, is Mr. John D. Sedding, of Bristol and Penzance; and the builders are Messrs. Bone & Son, of Liskeard.

Bampton.—The works at the church here are rapidly approaching completion. Mr. Bartlett has nearly finished his contract, and all remaining to be done inside is the seating, which is contracted for by Mr. Cowley, of Oxford, and the finishing the heating apparatus, partly laid some time since by Messrs. Bacon & Co., of London. Outside the church there yet remains considerable work to be done. The churchyard needs and must receive attention.

Shalford.—At a meeting of the parishioners it has been resolved thoroughly to restore the church, provided a sufficient sum of money be raised for the purpose. The chancel arch is to receive immediate attention, funds for its restoration having been already promised.

Newbury.—St. Dennis's, Stanford Dingley, has been re-opened for divine service, after a restoration, carried out by Messrs. Dove, Brothers, of Islington. The church consists of a chancel, nave, and aisles, with a small wooden tower. The only entrance is by a porch on the south side. Two new windows have been inserted in the south aisle. Four new buttresses support the north aisle. The outside walls have been newly faced with flints and Bath stone dressings, with the exception of the chancel. The church has been re-seated with benches of stained deal.

The chancel is paved with Gresley's tiles. The roof has been laid open, the materials being stained deal. The arches, with the piers in nave and chancel have been restored. While the work of renovation was proceeding, it was discovered that the edifice was decorated throughout with some wall paintings, portions of which are preserved. On the wall over the nave-arch is one supposed to be a representation of the Last Judgment. Above the arch in the north aisle is a painting of a sainted king, holding the sceptre and three arrows. On one of the pillars is a representation of Moses, with the decalogue. There are other signs of the antiquity of this church. The work occupied about three months, and the contract amounted to 700*l*.

Hinton Martel.—The Church of St. John the Evangelist, at the village of Hinton Martel, has been opened by the Bishop of Salisbury. The old church, dating, some parts of it, back to the fourteenth century, being very much dilapidated, was pulled down, and the new edifice occupies its site. In rebuilding it was determined to preserve such features of the old edifice as were fit and proper, and consequently the new church assimilates in style and character to that of the latter part of the fourteenth century. In length the structure is about 73 ft., by 34 ft. in average breadth. The exterior walls are built of flint, with bands of local green stone. The new windows, doorways, and dressings of Box-ground stone; the roofs covered with tiles and ornamental ridges. The edifice has a nave with north aisle only, and chancel with north chancel aisle, from which a vestry is screened off. The tower (Norman) is at the west end of the nave. The accommodation now provided is for 253, of which fifty-five sittings are set apart under the tower and west end of the nave for the school children. Internally, the walls are lined with white bricks, with bands of red brick, the Bath stone dressings being varied by brown and green stone. The walls are built hollow, so as to exclude damp. The nave is separated from its aisle by an arcade of four arches of Bath stone, moulded and springing from octagonal piers. The roofs are of open deal timbers, stained, and plastered between the rafters. The chancel has a richly moulded chancel arch springing from trefoil shafts. The floor is formed of Minton's tiles, the sacristy being laid with Minton's encaustic tiles. The carvings were executed in part by Mr. Bolt, but principally, that is the foliage work on the corbels, by Mr. Weaver, of Worcester. The chancel seats are of pitch pine. The benches in the nave and aisles are of deal, stained and varnished. A stained glass window has been inserted in the tower by Mr. G. H. C. Burt. It is divided into panels, with life-size figures of Faith, Hope, and Charity. The original drawings for the church were prepared by the late Mr. John Hicks, of Dorchester, but the work has been carried out under the superintendence of Mr. G. R. Crickmay, of Weymouth; Mr. A. H. Green, of Bedford, being the builder. The carving executed on the communion-table is the work of an amateur artist, Mr. E. Dacombe.

Nottingham.—The foundation stone of the new church of St. Andrew, on the Mansfield-road, has been laid. The site is just opposite the Church Cemetery lodge. The situation is commanding, and the tower and spire will be conspicuous objects. The plan of the edifice is cruciform, having a nave, north and south aisles, transepts, organ-chamber, and vestry. The entire length will be 130 ft. by 62 ft. broad. The cost of the building, including boundary walls and all necessary fittings, will probably be about 4,800*l*. The cost of architect's fees, the land, clerk of the works, and other items, will swell the total up to about 5,680*l*. Towards this sum donations have been promised to the amount of 3,272*l*, leaving a deficiency of at least 1,750*l*. The style of the structures will be Early French Gothic. The church was designed by Mr. William Knight, architect, and is being carried out under his superintendence. Mr. Haughton is the clerk of the works; and Messrs. R. Dennett & Co. (the builders of All Saints' Church), are the contractors.

Albury.—The parish church of St. Peter and St. Paul, in the village of Albury, has recently undergone extensive alterations, and as in the extension of the chancel the altar was moved, a re-consecration was necessary. This ceremony has been performed by the Bishop of Winchester. The arched head of the west door has been filled in with herring-bone brickwork, the nave has been furnished with open seats of red pine, and the vestibule of the church panelled with the same sort of wood. The centre, and two

side passages, are paved with Maw's encaustic tiles. The entire length of one side of the church is free, as is the south transept, both on the floor and in the gallery. The pulpit is by Mr. Earp, from a design by Mr. A. W. Blomfield, and consists of a red Mansfield base, with Caen stone frame, in which are alabaster panels filled with marbles of various colours. The whole is surmounted by a carved moulding. This pulpit is the gift of Lady Rokewood Gage. The chancel, which is separated by an oak screen from the nave, is ascended by three steps, and filled with oak benches for the accommodation of the choir. The encaustic tiles herein are the gift of the Duchess of Northumberland. The reredos is by Salvati, of Venice, and is the gift of Earl Percy. The organ in the chancel is of great compass, and was given by subscription, and built by Messrs. Gray & Davison, of London. A corona, the work of Messrs. Hardman, was presented to the church by the Rev. L. O. Bigg. The corbels and capitals are carved with emblematical subjects, noticeable among which is the holly, the badge of the Drummond family, by a member of which (the late Mr. Henry Drummond, M.P.), the church was originally built, and by his son-in-law, the Duke of Northumberland. The five windows in the chancel are the work of Mrs. Drummond, youngest daughter of Lady Rokewood Gage. Among them are the Crucifixion and the Adoration of the Magi. There is some glass in the nave from Mr. A. Gibbs, of Bedford-square. The church is slated with green and chocolate Bangor slates. The iron crosses on the transepts and west end of the nave were done by Mr. Poulter, of Albury. The architect was Mr. Blomfield; the contractor, Mr. B. Inkpen, of Abinger; the clerk of the works, Mr. Reavell; and the foreman, Mr. Puttock, of Shere. The alterations in the church have been accompanied by a considerable addition to the churchyard, the land for which has been kindly given by the Duke of Northumberland. The enclosing wall was built by a subscription among the parishioners.

SCHOOL-BUILDING NEWS.

London.—New schools in connexion with the parish of St. Michael's, Chester-square, London, have been formally opened by the Marquis of Westminster. The buildings have been erected in Ebury-square, on a site forming part of the Grosvenor estate, given for the purpose by the late marquis, and were designed by Mr. Thomas Cundy. The schools are built to accommodate 700 children, and there are three houses for the teachers. The marquis, at the opening ceremony, alluding to the changes in the neighbourhood, remarked that during his lifetime, even, the whole district had been built upon. His father was born in a villa upon the site of which the Millbank Penitentiary was now erected, and among the ditches there, he and his brother (Lord Ebury) used to shoot snipes. There was also a remarkable place in those days called "Jenny's Whim," a kind of tea-garden, which, they were told, "great numbers of people from London, both gay and sentimental," used to frequent, and where, if he was not mistaken, the gay were always in an enormous majority. That part was then a suburb of London. The parish now contained 10,000 people, and the population would soon be increased through the erection of a number of model lodging-houses, to which he desired to give the greatest possible encouragement. It was intended to continue Ebury-square up to Ebury-street, and to throw open the adjacent ground to the poorer classes. The plot of ground to the west of the schools would remain open to be available if required, and would only, at present, be affected by the erection of a drinking fountain, which his mother intended as a memorial of his father.

Constantinople to be Rebuilt by an Irishman.

You will be pleased to hear that steps are being taken to repair the loss caused by the recent tremendous conflagration at Pera, and that Mr. Quin, a native of the Queen's County, but for some years established as a contractor in the metropolis, has undertaken, in conjunction with some Belgian friends, to send out a staff of men, with ample plant, including sawing machines, to rebuild the portion of Stamboul destroyed by the late fire.—*London Correspondent of "Freeman."*—We are sorry to hear of another destructive fire in Stamboul.

FROM IRELAND.

Castlerock.—The new church at Castlerock, says the *Belfast Newsletter*, has been opened for divine service. The building is in the Early English style of architecture, and consists of nave, with apsidal chancel, north and south transepts, organ-chamber, robing-room, &c. Black stone, which is peculiar to the locality, has been extensively employed in the work; but this is relieved by broad bands of white Glasgow stone. A tower, in which it is intended to place one or two bells, rises from the north-west angle, and the spire is carried to a height of 95 ft., surmounted by a vane. The chancel is enriched by stained-glass windows, at the expense of Lady Bruce. A Caen stone pulpit has been presented to the congregation by Sir John Musgrave, bart., one of the members of the Clothworkers' Company. The building will accommodate about 200 persons. It is heated by means of a hot-water apparatus, procured from Messrs. Musgrave, Brothers, of Belfast. The pews and roofs are open, and of stained Memel. An organ has been procured for the church. The instrument cost about 300*l*, and was built by Messrs. Gray & Davison, of London. The entire cost of the church and fittings, as they now stand, amounts to about 3,000*l*. This sum does not include the parsonage that has been erected on an adjoining plot of ground. Sir H. H. Bruce, bart., gave the site free for ever, and the Baronet and Lady Bruce were also contributors to the building fund. The Clothworkers' Company, the Bishop of Derry, and others, also assisted. Mr. F. W. Porter, architect to the Clothworkers' Company, London, prepared the plans of the church; and, under the superintendence of Mr. William Hunter, architect to the Church Commissioners, they have been carried out by Messrs. George & Robert Ferguson, builders, Derry.

Books Received.

On the Application of Cast and Wrought Iron to Building Purposes. By SIR WILLIAM FAIRBAIRN, Bart., C.E., F.R.S., &c. Fourth edition, with additions. London: Longmans, Green, & Co. 1870.

In this new edition of a standard work there is a considerable amount of new matter, including a careful revision of the third edition, and an enlargement of the work. It now contains an experimental inquiry into the durability of wrought-iron beams and girders, the influence of the force of impact, and a long series of changes of variable loads affecting their ultimate powers of resistance. These researches are of high importance, when considered as a safeguard to the amount of load or strain to which beams or girders are usually subjected. In this edition there will also be found experimental researches on the properties of steel and homogeneous iron, to which the architect and engineer may safely refer; and as these investigations have reference to a material which may ultimately take the place of iron where security and strength are required, the author states that he has no hesitation in submitting it to the consideration of his readers. In an appendix is given a series of experiments on timber trussed beams, showing the comparative value between wood and iron in that form. It shows the principle on which wood and iron trussed beams should be constructed.

VARIORUM.

"The French Mind; or, Psychological Outline of the French Intellect and Character, for the Use of Students of French Literature." By Robert Harvey, B's L. London: Trübner. This essay forms an interesting introductory chapter to a work entitled "The Masterpieces of French Drama translated and critically examined." The essay on the same subject, which it may be recollected appeared in the *Builder*, was written by a gentleman of the same family as the author of the essay under notice. "Report upon the Influence of the Sewage Irrigation Works at Beddington on the Health of the Inhabitants of the Neighbourhood." By Baldwin Latham, C.E. Croydon: J. W. Ward. The medical officer of the Beddington district, Mr. W. E. Cresny, having reported to the Croydon Local Board that four deaths from fever in a house in the Beddington district, and other cases

of fever, were attributable to emanations from the sewage irrigation farm there. Mr. Latham, the engineer to the Board, has investigated the case as regards the state of the sewage, cesspools, water, &c., and points attention to what he considers the true cause. He shows that the whole of the district requires immediate and urgent sanitary attention, as the sewer authorities have greatly neglected its sanitary requirements. Mr. Latham denies that the irrigation of sewage has had anything to do with the production of the fever.—*The Court Suburb Magazine*, edited by Miss Aikin Kortright, and which is now in its second volume, contains two poetical works above the usual run of such contributions; one by the Editor, in memory of Edward Julius Kuntze, a promising sculptor of New York, who was in England a few years ago, and will be remembered by some of our readers; the other, titled "Love's Counsel," by Miss Blanche Medhurst,—a charming conceit.

Miscellaneous.

Cumberland and Westmorland Archaeological Society.—A meeting of the members of this society has been held in Maryport. The chair was taken by Mr. J. P. Senhouse, of Netherhall. Mr. C. J. Ferguson called attention to a portion of the Roman wall near Pike-hill, between Lancroft and Birdswald. He suggested that the society should pay for the diversion of a road over the place in order to procure the remains. Dr. Bruce said that, so far as he could judge, the place referred to was the site of a *Milo Castle*; and further, it was a castle of considerable interest. There were three altars, one of which was at Lancroft and two at Rockcliffe. It was desirable, therefore, to keep the site. The members and their friends, under the guidance of Dr. Bruce, proceeded to visit the Roman camp, and he field, not far distant from it, where the recent valuable find of Roman altars was made. The party next proceeded to Netherhall, the seat of Mr. J. P. Senhouse, near to which a pavilion was erected. At the front of the pavilion the whole of the altars recently discovered were placed, and numbered in the order of the finding. After the visitors had examined these interesting and valuable relics of a by-gone age, Dr. Bruce read a paper concerning them. He said that ever before probably were the antiquaries of his district able to rejoice over such a sudden acquisition of treasure as they had before them to-day. Within a brief space, not less than seventeen altars had been exhumed on a spot of ground outside the camp of Maryport, and all of these, with a single exception, bear inscriptions which are distinctly legible. The newly-discovered altars, however, excepting that they apply us with the name of *Marcus Maenius* (gripped, do not furnish us with a date, but he would venture to suggest that the latest belongs to the reign of Antoninus Pius. He thought, moreover, that they were buried in the lot where they had been found long before the abandonment of Britain by the Romans. The lot lies at the distance of about 350 yards from the Roman camp, which overlooks the modern town of Maryport in a northerly direction. The altars had been clustered together in a space somewhat circular in its character, and of about 60 ft. in diameter. After referring to the pits in which the altars were found; the persons by whom they were there placed; the inscriptions upon them; their form; and by whom they were erected, Dr. Bruce said on one important point these altars failed to give the information antiquaries had long desired,—that, what was the Roman name of the camp of Maryport. The members of the Society were entertained at luncheon by Mr. and Mrs. Senhouse, after which it was arranged, according to the programme, that they were to drive to Parnate and Doreby, where a paper upon the Roman road from Maryport to Parnate, by the late Mr. F. L. B. Dykes, was to be read, and the faces of the road pointed out.

St. Nicholas's Church (for Mariners), Mauritius.—On Ascension Day, May 26th, the day after his official landing in Mauritius, the Duke of Edinburgh was present at the opening of a new Mariners' Church. St. Nicholas's church, Port Louis, is erected on the extremity of a jetty, from a design furnished by Bishop Atterbury, at a cost of about £1,800. For many years, an old hulk had served both as a church and as a residence for the seamen's chaplain.

Four Men Suffocated in a Gas Tube.—At the North Staffordshire Coal and Iron Company's Works, Talke, Staffordshire, near the pit in which eighty men were killed by an explosion between three and four years ago, four men have been suffocated in a tube used to carry waste gas from the blast furnaces to the furnace boilers. The tube is 50 yards long, and 4 ft. 6 in. in diameter. It had been cleaned and repaired except some trifling matter, which three of them went down to do prior to the resumption of work. They were missed half an hour after they went, and search was made for them everywhere except in the tube, the last place thought of. The fourth had gone into the tube in search of the others, and was also missed. The three men who first went in were found lying as if asleep in the middle of the tube, and the last, who was also dead, was five or six yards from the entrance. The tube is placed horizontally, and has an entrance at each end, besides several holes in the plates along the sides. An air tube is alongside to supply fresh air to the tube, and there is also a shaft by which a strong current of air could be drawn through the tube, and all the gas taken away. Both these appliances were easily commanded, and if the men had been careful, they would not have met such horrible deaths.

The Countess of Huntingdon's College, Cheshunt.—The memorial-stone of a new building to be erected in celebration of the centenary year of this college, has been laid by the Earl of Shaftesbury. The building which forms the first portion of work contemplated by the committee consists of a rectangular block 121 ft. long, 26 ft. deep, and 3 stories high, having slightly projected wings at each end. On the ground floor are two lecture-rooms and six students' rooms, all entered from a corridor stretching behind. On the first and second floors are ten students' rooms each. At the west end of this range of building is the tower, containing on the ground floor the main entrance, and above two students' rooms. Behind this entrance are a lobby and the principal staircase. There is also to be a secondary staircase at the east end. The students' rooms will average 16 ft. by 11 ft. The work will be executed in brickwork with Bath stone strings, arches, pilasters, and other enrichments. The architects are Messrs. Landers & Bedells, of London; and the builders Messrs. Dove Brothers.

Newspapers and Advertisements.—In the Sheriff's Court, Mr. Blacklock, of Georgiana-street, Camden-town, summoned Mr. Edward Lloyd, proprietor of *Lloyd's Newspaper*, for damages for not inserting an advertisement correctly. The advertisement in question related to the sale of a house, and plaintiff averred that he had sustained a loss by "16 years' lease" being printed instead of "18." The defence set up was that the utmost care was taken to ensure the correctness of all advertisements, but that in the present instance it was impossible to determine whether the figure was a six or an eight. Mr. Commissioner Kerr, after inspecting the original copy, was of the same opinion, and at once gave a verdict for defendant, with costs. Advertisers should be careful how they write their advertisements, and reflect on the trouble and waste of time illegible writing causes.

Manchester.—The work at the new Town-hall is progressing favourably, the walls being now 3 ft. or 4 ft. above ground, and the masonry and execution admirable so far. The stone used is from Spinkwell,—a remarkably hard and close-grained sandstone. Will Mr. Waterhouse accept a suggestion? It is that the octagonal lantern on the tower should be raised. On the working drawing now on the ground the lantern, even in elevation, looks somewhat low and heavy in proportion, and, of course, in perspective, will appear more so. The comparatively bold detail of the Town-hall will, we fear, reduce Mr. Worthington's Albert Memorial adjoining to the appearance of an architectural toy, though a pretty one.—On the 6th of August the new park at Manchester is to be formally opened,—an occasion which appears to be considered of some interest by the inhabitants.

The Stone Trade.—We understand that at present this trade is very brisk in Yorkshire, large orders being in hand for both home and export. The most remarkable order is one for a very large quantity of stone for Peru, a considerable portion of which is being supplied from this neighbourhood.

Accidents.—At the inquest held on the bodies of the three men who were killed by the fall of a travelling-crane at the foundry of Messrs. Fawcett & Preston, Liverpool, and reported in the *Builder* last week, it was shown that the accident was caused by the parting of a cast-iron shoe fixed at the end of one of the longitudinal beams, for the purpose of trussing it up. A flaw was discovered in the casting; but whether it was an old one, or recent, could not be ascertained. The jury returned a verdict of "accidental death." In such a case as the above, where enormous strains are occasionally placed on moving parts, to be afterwards removed and left standing, a change in the molecular condition of the metal takes place, and it would be advisable to substitute steel instead of cast iron.

Hereford Congress; British Archaeological Association.—The programme runs thus:—Monday, September 5th, Address of the President, Examination of Antiquities in the City of Hereford, the Black Friars, Coningsby Almshouses, the Museum, Inaugural Dinner; Tuesday, Examination of Hereford Cathedral, Afternoon Excursion to Kenchester (Magon), and Credenhill; Wednesday, Excursion to Kilpeck, Abbey Dore, Rowstone, Grosmont Castle and Church; Thursday, Excursion to Leominster, and thence by carriages to Morkland and Stretford, Dillwyn and Weobley; Friday, Excursion to Llanthony Abbey; Saturday, to Ledbury, Easton, Wall Hills, and the Herefordshire Beacon.

Great Increase of Fever in Liverpool.—The rapid increase of fever in Liverpool has created a feeling of alarm in the minds of the members of the select vestry of the town. It was reported last week that the parish fever Hospital was overcrowded, there being twenty-three cases in it more than it was fit to accommodate; and that during the week one of the paid and thirteen of the assistant nurses had been struck down by fever. The *Gazetteer* reported that if it went on increasing, as it was likely to do, very large arrangements would have to be made in order to meet the unusual increase of cases.

Hexagonal Maps.—A simple scheme for easy identification of and reference to localities in maps has been invented by Mr. John Leighton, and was exhibited at the Institute *seven* and the *conversations* of Sir E. Sabine. It consists merely in the hexagonalisation, if we may so call it, of the map, each hexagon representing a mile in extent, beginning with a central hexagon, and adding series to series round about it till the map is covered. By means of numbers and colours, or other indications on the map and on the street lamps, localities and distances could easily be ascertained.

The London Working Men's Clubs.—The Marquis of Salisbury has kindly given permission to the various metropolitan working men's clubs and institutes to make their annual excursion this year to the grounds of Hatfield Park. The Marquis has also consented to grant the visitors the privilege of admission to his mansion and private gardens,—the visit to the mansion to take place at the commencement of the day's proceedings. The excursion will be on Monday, the 8th of August.

Window Gardening.—On Wednesday evening, the Duchess of Sutherland presided at an interesting ceremony, and distributed some seventy prizes to parishioners of St. Philip's, Clerkenwell, in the schoolroom, Anwell-street, Pentonville. These prizes were awarded for success in window gardening, and in industrial employments at home in leisure hours; an exhibition of window plants, and of the products of this industry, having been held in the schoolroom. These local exhibitions do much to maintain that love of home which it is highly desirable should be encouraged among the poor.

The Rockery in Finsbury Park.—A writer in the *Gardeners' Magazine* condemns the waste of money incurred in carting and cementing together the heap of kiln-refuse in Finsbury Park, dignified with the name of rockery. "It is much to be regretted that this park, which has been designed and laid out in such a tasteful manner, should be disfigured by what is nothing more nor less than a heap of mere refuse from the brick-kiln."

Proposed Science College for Norwich and Norfolk.—A committee has been formed for the purpose of making the necessary arrangements for calling a large city meeting to consider this important question.

Edited by WILLIAM YOUNG, Architect
 London: LONGMANS, GREEN, & Co. Paternoster-row.

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The Builder.

VOL. XXVIII.—No. 1433.

The Stature and Bulk of Man in the
British Isles.



HAT is the average height of an Englishman? Only people who know nothing of the details involved in the consideration of this question will, probably, reply to it. What is the average height of a Scotsman or of an Irishman? The same difficulty in giving a satisfactory answer will be felt in the case of these queries, too. It may be urged that these are questions of trivial consequence, and therefore not worth while either to ask or answer. But this would be an erroneous view. A knowledge of the average stature of the able-bodied men of these islands

could govern the regulations relating to recruiting in the army. It would enable us to determine, also, whether, as a nation, we do not require more physical training than we get; enable us to keep our place among other nations as the possessors of strength, size, and physical energies; and it would enable us too, to judge, if not now, at some future time, whether what we consider evil agencies, such as overcrowding in towns, working in confined spaces, the immoderate use of tobacco and alcohol, &c., have any appreciable influence upon stature. The president of the Anthropological Society, Dr. Beddoe, has recently been at the pains to endeavour to ascertain the stature and bulk of the men, between twenty-three years of age and forty, in the British Isles, and the result of his observations has been printed in the *Memoirs of the Society*. He fixed upon the limits of age mentioned, because at the age of twenty-three a man is believed to have attained his full stature, and at that of fifty to enter into the period of the decline of life. His investigation involved a great labour and a persevering persistence, and was opposed, in some instances, by the most serious prejudices. In Scotland, for instance, proprietors thought it waste of workmen's time to allow them to be measured, and fishermen and others were superstitiously afraid of the ceremony. In Ireland, some Tipperary "boys" actually ran away on the application being made to them. In Wales there was an impression at the proposition involved ultimate shipment to foreign parts; and in England there was a quaint stupidity to contend against. The plan drawn by Dr. Beddoe was to forward to country owners and other scientifically-educated persons, willing to take a little trouble for the interests of science, a formula to be filled up, requiring name, age, birthplace, occupation, height, weight, and colour of eyes, of as many men between the ages mentioned as each could

examine. More wholesale statistics also helped out his researches, such as those furnishing the stature, bulk, &c., of the inmates in our county lunatic asylums, and the official recruiting statistics of the War Office. His object for asking for names was to ascertain the extent of migrations that have taken place since they became general, as of Welsh into Liverpool, Highlanders into Glasgow, Cornishmen into Devon, &c.

The mass of information gained is of the most curious description; indeed, to look over it is like looking into an immense crowd, and taking down the personal particulars and individual history of every one in it. It is so minute, and at the same time so diffuse; so concrete and yet so separate and scattered, that we can only refer readers interested in the subject to it. The commentary made by Dr. Beddoe upon the facts he has gathered together, is, however, so lucid and ingenious, that we must give an outline of it. He divides England and Wales into five districts, based upon the character of the industrial pursuits of the inhabitants, one being manufacturing, another mining, a third rural, a fourth more strictly agricultural, the fifth being the metropolis. Scotland forms a sixth district. This is his general summary for Great Britain:

Occupations.	Number.	Average Stature, ft. in.	Average Weight, lb.
Miscellaneous out-door...	174	5 7.54	142.11
Clerks, &c.	242	5 7.28	136.74
Masons, &c.	100	5 7.13	139.12
Labourers.....	634	5 7.11	149.38
Ironworkers.....	269	5 7.11	140.22
Woodworkers.....	250	5 7.08	137.07
Bakers.....	34	5 6.91	142.36
Miners.....	67	5 6.91	136.21
Tailors and shoemakers	135	5 6.89	134.49
Miscellaneous, in-door...	335	5 6.77	132.53
Grooms.....	101	5 6.67	138.72

When the individuals yielding these figures are sifted into their respective districts, the average height and bulk of the various workers comes out differently. Without going through all the occupations, we may explain that in the Sussex group the labourers stand next in height to those engaged in miscellaneous out-door occupations; while in Kent these last fall below clerks, miners, labourers, wood-workers, those engaged in miscellaneous indoor occupations, and even grooms. Again, in Kent the thirty iron-workers measured are nearly at the bottom of the list, as far as stature is concerned, whilst in Lancashire and Yorkshire the forty-nine representatives of that industry head it. These differences are explained by various suggestions. The iron-workers are to some extent picked men, because in some processes so much exertion and endurance of heat are required that none but strong youths adopt that branch of industry. In some counties, where the agricultural labourer is ill paid, the tall young men enlist, and so reduce the average height of those left on the soil; and in the neighbourhood of the metropolis there is a special opening for strong tall men from the surrounding districts as railway porters, draymen, excavators, &c.

The lunatic and criminal returns show the curious fact that lunatics and criminals are on the average shorter than sane and honest men; also that dark eyes and black or very dark hair are more common among lunatics than in the general population. Scottish criminals are taller than Scottish lunatics and English criminals; and these last are below the average lunatic in stature and weight. Town-bred criminals are strikingly inferior to country-born criminals.

The private returns are, however, of a more pleasant interest; and the unravellings of the respective influences of race, soil, climate, and mode of life are very suggestive. Roughly speaking, says the president of the Anthropological Society, after ascertaining his figures, the natives of Scotland and of the north and north-east of England exceed in stature those of Wales and of the south and west of England; exceptions existing, notably, in the people of some of the large towns and of some of the Hebrides in

the northern division, and in those of Cornwall and the Scilly Islands in the south. The Highlanders are tall and bulky. The Lowlanders of the ancient Norse district of Caithness, considered by former observers as the finest peasantry in Britain, come out in this scrutiny as no bigger than their neighbours. The Edinburgh and Glasgow townsmen are considerably smaller. The tallest men in Britain are found in Galloway, and the heaviest in Berwickshire. The Borderers equal or surpass the average both in Scotland and England in both respects. The Danish counties, Lincolnshire, Nottinghamshire, Derbyshire, and Leicestershire, excluding the manufacturing towns, produce men rather high in stature. Norfolk can boast of both stature and weight, especially in the Danish settlement of Flegg. Suffolk can boast of weight only. The Isle of Ely produces tall men; but the southern part of Cambridge, like the south-midland counties generally, can show but an undersized population. The native Londoner stands very low in the scale of stature.

In the matter of weight, too, there is some peculiar information. Some Irish statistics show a remarkable uniformity in the several classes of returns relating to the weight of Irish peasants and labourers, which uniformity can only be attributed to the absence of corpulent persons. The average weight of an Irish peasant may be estimated at 138 lb. The average weight of an Englishman is calculated at 145 lb.; and that of Scotsmen at 10 lb. higher.

Foreign observations brought to bear upon these show that the 380 Gloucestershire men examined by Dr. Beddoe and his friends average exactly the same height, and as nearly as possible the same weight, as the average adult inhabitants of Brussels. And the average adult of 40 Frenchmen, ascertained by Tenon, in 1783, is found to leave considerably less difference in favour of the southern Englishman than might be supposed from the popular belief in the superiority of the latter. The author accounts for the grounds of this prejudice by showing that it was British and French, or foreign, soldiers that were generally compared; and as the Continental regulations admit men of much less height into the army than ours do, it will be seen that those in our ranks will appear to represent a larger race. In France only 77 per 1,000 are excluded by size from enlisting. In Northamptonshire 210 per 1,000 are excluded because they are less than the regulation height of 5 ft. 5 in. In other counties there is a larger proportion; and in Herefordshire 417 persons out of every 1,000 are ineligible for want of sufficient stature to come up to the present regimental idea of a soldier. Twenty Icelanders, weighed and measured for the purpose of this inquiry, yielded an average stature of 5 ft. 8.5 in., and weight of 156 lb.

Looking at the facts in a comprehensive light, Dr. Beddoe finds a certain degree of conformity with the expectations a study of the various races and their settlements would naturally suggest. Wherever we know, from historical, topographical, or linguistic evidence, that the Scandinavian element is strong, we find stature decidedly high. Even an almost solitary exception in the island of Lewis can be accounted for in the presence of an aboriginal substratum of population of Finnish type. Where there are Teutonic characteristics stature is low and weight high in proportion. The tall stature in some spots in Kent is accounted for by the presence of Jutes and Frisians. The same tall, large, red-haired people who occupied the Grampians in Agricola's time, do so at the present day, the author finds, without appreciable change. A remnant of the northern Kymri is located to the west of Clydesdale and in Upper Galloway; and the same race, with a cross of the Teutonic element, abides still among the Cheviots and in Allendale, in South Northumberland; a tall

people, with light hair, dark eyes, and moderate weight. The Cornish men maintain the large stature for which they have been celebrated for some centuries. The Welsh when crossed with English blood increase in size, if we are to take as a guarantee of this statement the fact that Welshmen with English names average 1.3 in. in height more than those with Welsh surnames. The average stature of fair-haired people, in Britain generally, is higher than that of dark-haired men. Dark-haired men with light eyes are taller than others in Mull, Kenmore, Mar, and Leemahagow. The county of Leicester is the only important exception to the rule of full height associated with fair complexion in the south of Britain, except Harpenden, in Herts, the Scilly Islands, and, perhaps, the author throws in doubtfully, Cornwall.

The supposition that climate influences stature is unsupported. We might infer that a northern position and a somewhat rigorous climate operated favourably perhaps, as Dr. Beddoe says, by natural selection; but we are met with the exception of the high stature in Cornwall. Differences of elevation seem to be also without consequences; except in the matter of cornulence, which does not occur at high levels.

But diet is found to have considerable consequences. The absence of luxuries, such as butcher's meat and fermented drinks, does not exercise the least deleterious effect upon either stature or bulk; but absolute scantiness of food does. Dr. Beddoe thinks Cornwall may owe its exceptional position chiefly to its constant and good supply of food, ensured by its fisheries, and by its long prosperous mining industry. Where the stature is greatest milk and meal appear to have furnished the staple food of the district in other parts of the country; and where white bread is eaten, and there is but a limited supply of milk, as in the large towns, stature declines.

To sum up, the author finds that the stature of man in the large towns of Britain is proved to be considerably below the standard of the nation; and believes it possible that such degradation is hereditary and progressive. In Brussels it is the reverse of this, for there the inhabitants at the age of nineteen were found by M. Quetelet and Villermé, rather taller than those of the surrounding country. Every cause that is likely to have conducted to this deterioration is examined by Dr. Beddoe, and duly weighed, and many vouchers of the facts are added. For instance, thirty natives of Bristol, employed by Messrs. Derham, Brothers, yielded an average stature of 5 ft. 4.90 in., and weight of 125.67 lb.; while another thirty men born in Somersetshire, and employed there by the same firm, and at the same occupation, yielded an average of 5 ft. 6.74 in., and 134 lb. The importance of these truths consists in the fact that wherever a race attains its maximum of physical development, it contains its maximum of ability and energy. We quote Dr. Beddoe:—"Thus the inhabitant of Oude or the Punjab is as superior in courage and energy to the puny Bengali, as he is in bodily conformation. And, to come nearer home, I have shown that Scotland in general, Northumberland, Cumberland, parts of Yorkshire, &c., and Cornwall are the portions of Great Britain which produce the finest and largest men. I think it will be acknowledged that they also yield more than their share of ability and energy for the national benefit."

The stature and bulk of the Irish are also investigated with similar precision, minuteness, and comprehensiveness. But a cursory glance is insufficient for the subject; we shall be doing the reader most service in referring him to Dr. Beddoe's singular report.

THE PROTECTION OF COMMONS AND FORESTS FROM ENCROACHMENT.

The attention of the House of Commons has been thrice called, during the session, to a question which yearly assumes more serious proportions. It is that of the state of the Royal forests and other crown lands, and, incidentally, of the common-land throughout the country. This portion of the hereditary property of the Crown has gradually fallen into an anomalous and unsatisfactory state. In the early days of the feudal system, when the population of the country was sparse, and the habits and occupations of all classes of society were far other than is the case at present, the maintenance of chases or forests formed a necessary part of royal and of seigniorial state. Destruction of beasts of prey, or hunting of beasts of chase, originally formed

an integral part of the self-defence of human society. Man had to fight hand to hand with his fanged, or tusked, or horned competitor, for the means of sustenance afforded by nature. As man got the better of the beasts, mainly by the exercise of the art of the builder, which enabled him to defend his home, to protect his flocks and herds, and finally to shelter his crops from the waste of predatory animals, and from the fury of the elements, the old warfare for life sank into a kind of semi-military pastime, serviceable to the commonwealth, but not demanding the service of the *arrière ban* of the nation. Thus it naturally fell into the hands of the fighting and ruling class, of *l'homme qui bast et conseille*. And thus, as the land of the Conquest was parcelled out, and as the feudal system gradually took root, and developed in form, the royal forest-rights assumed such ample and definite proportions that, at the expiration of eight hundred years from the Norman invasion 89,000 acres of land, constituting the New Forest, remain, in one portion of England alone, subject to all sorts of ancient feudal rights. Conflicting, undefined, and questionable claims are urged on the different portions of this wide area—claims similar to that by the mutual compromise of which we have recently seen the greater part of the ancient forest of Epping has been parcelled out and devoured. These claims comprise forest rights, rights to grow or to fell timber, rights to the soil, common rights of pasture, turbary rights to cut turf and to dig peat for the consumption of every ancient chimney, manorial rights, and what not: the upshot of the whole being that, as no part of the forest land belongs in absolute property to any owner, the greater part remains practically waste and unproductive; the net return which the Crown receives from the large estate being about two shillings and three pence per acre, or something like a twentieth part of the average rental of the country, which is about 43s. per acre.

It is obvious that such a state of things can be only one of transition. Thus we have seen that the "settlement" of Epping Forest has been very rapidly taking place during the last century. The Crown, from some inexplicable cause, was then reluctant to interfere. The freeholders failed to elect a second verderer, so that the forest customs could not be enforced by the single surviving holder of that ancient office. The commoners were too poor, or too dispersed, or too indifferent, to come forward; so that the lords of the manor or other encroachers have disfigured and appropriated the greater part of that noble and beautiful district.

From all parts of the country complaints are heard on this subject. In one instance it is the neglect to enforce Crown rights that is objected to; the result being the gradual extinction of the commoners. In another instance it is the undue straining of the claims of the sovereign and of the lord of the manor that is the grievance. Everywhere it is the public that suffers.

It is evident that the law needs revision in this matter. The ancient *raison d'être* of a royal chase has long since ceased to exist. It is time that all claims and jurisdictions that spring out of this decrepit law should be brought into practical accord with the existing rights and duties of property. Assuming that, in many instances, there is a threefold claim to a sort of ownership or right of partial use of these Crown lands, each of these claimants or co-proprietors would be benefited by the adjustment of the estate in such a manner that an area, or the value of an area, corresponding as closely as could be ascertained to the value of each several right, should be allotted, free of all other charges, to each party, in lieu of his more general and ill-defined claim.

There are many indications of the necessity of dealing with this important subject as a whole. Our population averages 258 persons to the square mile; but our great cities and towns contain half the inhabitants of the country. London alone contains one-eighth of the total population of England. The rate of metropolitan extension is such as to swallow up 122 square miles of country in about 39 years. The increase of some of our manufacturing centres has been far more rapid, within certain limits, than that of London itself. Thus the value of all ornamental land, especially in the immediate vicinity of cities, is yearly increasing, and the difficulty of arriving at a readily accepted comparison increases with an equal speed.

The subject is one which can only be adequately dealt with by Government. Not that we would wish to discourage any private mem-

bers of Parliament from attempting to remedy some of the evils attendant on the present state of the case. On the contrary, we hold that such exertion gives a just claim on the public gratitude to the member who devotes his energies to the task. But in order wisely, swiftly, economically, and satisfactorily to deal with the entire subject, there is, it seems to us, one course which it is best to follow.

A short Act of Parliament should be passed to empower a commission or court of circuit to visit each spot that comes under the designation of Royal forest, chase, common, or other land in which commoners have a joint interest with the Crown or with lords of the manors. The exact statements which these Commissioners would prepare, accompanied with proper maps, or rather with proper references to the Ordnance map, would form the materials for subsequent legislation. Any trouble of this kind, however, would be obviated in no small measure by authorizing the Commissioners to act as arbitrators, and in all cases where the assent of all parties could be obtained, to direct a division of the estate in such a manner as would be fair and equitable; the preservation of open places of public resort in the neighbourhood of all towns being one of the main features to be borne in mind.

The ordinary expedient of a Royal Commission, if we judge from recent experience, would afford but a tardy and cumbrous mode of dealing with this pressing question. A small but practical body of men, sitting as a court of inquiry, and moving from spot to spot, with defined powers up to a certain limit, and with the duty imposed on them of bringing all involved difficulties before the Legislature in a state freed from doubt as to the nature of the facts, would avoid all the cumber of the ordinary method of collecting information from witnesses summoned to Westminster. An engineer, an architect or surveyor, and a barrister would form a homogeneous court, able to deal with each aspect under which the subject-matter of the inquiry would naturally present itself. In smaller and less important localities, village greens, and the like, the Commission might have the power to delegate competent men to draw up the map and the explanatory reference, reserving the power of arbitration either to the Commission or to special sub-commissioners.

In many cases, where opposition to what would soon shape itself into the normal mode of procedure might appear to be frivolous or vexatious, the Commissioners might have the power to make a provisional award, such award to become definite or binding within a certain time unless appealed against. This appeal might take one of two forms,—either that of a petition to the House of Commons, in which case a Ministerial explanation would be requisite in order to support the award; or that of a motion before a judge, who would be, by the Act suggested, empowered to hear the case without jury, and either to confirm the award of the Commissioners, or to suspend it and direct a revision.

We should thus obtain, in a practical, rapid, and inexpensive manner, a sort of Domesday book of all those parcels of land in which the poor man has a vested interest, which is at once daily evaporating, in point of fact, at the very same time that it is daily becoming more important if we regard the progress of population.

Secondly, coincidently with the preparation of this valuable survey, encroachment would be checked, waste prevented, and collision rendered impossible. The common ground once laid down on the Commissioners' map could be identified at any moment, and no amount of encroachment or of illegal tenure should be allowed to val against this *prima facie* evidence. That benefit it may be said, regards the future alone. But the future has a right to demand that justice to our hands; and the future, in this matter, presses very closely on the present.

Had a survey of common or partially common land been made at the beginning of this century, the acreage would have amounted to a far higher figure than in the year 1870. Let the survey be deferred till 1880, and the area will have perceptibly shrunk within its present proportions curtailed as in many instances they are.

Thirdly, the Commission might be the means of laying to rest much ill-feeling, of saving much dispute and much cost, and of effecting benefit to the country by a series of friendly arbitrations, the result of which, once effected, would be permanently recorded on the survey.

Lastly, with reference to any of those large

and more important cases in which further legislation might be called for, the Commission would have prepared all the materials for such legislation. The special rights or claims, for example, of the tithary rights, the grazing rights, the timber rights, and the rights of chase in the New Forest, would be distinctly defined, both as to the local area which they severally affected, and as to the persons to whom they appertained. The analogy of custom in various districts would shed light on the true principles on which interests should be proportioned and compensated. The whole matter might be brought within the grasp of any one who would devote a few hours to the perusal of the reports of the Commissioners.

It is clear that the country is becoming awake to the importance of the subject. Epping is not the only forest where encroachment has to be resisted. London is not the only city of which the inhabitants need to look jealously after their open spaces. The important point is, to grasp the great principle which is at stake, and to legislate, once for all, for ourselves and for posterity. We have no right to allow those localities of high ancient custom devoted to the common welfare to be diverted from this use, on the ground that the mode in which they are now conducive to the public advantage is not the same that existed a century ago. We must have our parks and commons for the people. We buy them where they do not exist; shall we allow them to be diverted from their original design, and gobbled up by private greediness, where they only require care and culture?

THE CONDITION OF DUBLIN.

HAVING already this year given a picture of the social and sanitary life of northern parishes across the borders, we will now dash in a background by a passing view of Life by the Liffey. The Irish capital is a singular city in several respects. Whether we view Dublin historically, nationally, socially, or commercially, there are lights and shades of character that no tint of colouring can portray, or gift or power of language give adequate expression to. The *Civitas* of Ptolemy, or the *Bally-ath-Chath* of the Celts, is a very paradox to herself, and equally a puzzle to the alien. Dublin is at once Danish and Norman, Celtic and Anglo-Saxon, and the local, indigenous and hereditary Dubliner of race, feeling, and fancy, forms the smallest element of the living population on the Liffey. Leaving the ethnological inquiry in abeyance, we will direct our attention to other matters calling for more direct attention, and opening into subjects of vital importance to man's real and that of the empire at large. As the commercial prosperity of a nation depends upon the growth of its cities and the enterprise of its citizens, social comfort must co-exist and sanitary law be respected, or else collapse or decadence in national wealth and public morals will ensue.

Civilisation means intellect, prosperity, life,—not life in its mere vulgar acceptance, but a well-ordered health, infusing life individually and collectively, existing for all mankind alike. Dirt and disease are the very antipodes of civilisation, and prosperity, if it can be said to exist amidst this state of things, must possess but a mushroom existence.

Dublin, for many years during the present century, retrograded in everything that constituted a prosperous city. Of late, in some branches of manufacturing and commercial enterprise, she has made a slow advance. Favourable but short-lived reactions during the last quarter of a century have taken place in the Irish capital; but owing to unlucky accidents, in part political and in part revolutionary, distrust has been engendered, and consequent inaction is to be found in every department of trade. At the time, and by one native party, Government was credited with Dublin's decline and Dublin's neglect; and on another occasion the cause was charged to the want of enterprise and lack of common public spirit exhibited by the merchants and traders of Dublin themselves. A careful inquiry, and personal visit and examination into Dublin's present and past state enable us to shift the charges and dispassionately dispose of the arguments. We are ready to admit, because we cannot deny it, that the Government was never inclined to be so lavish in the distribution of moneys for the carrying out of public works in Ireland, or in the Irish capital, as she has been in London. Probably there is no sane man who

carefully thinks over the matter for a moment will wonder why this reluctance to expend Government capital in Ireland has been shown. Without giving it any partisan or political complexion, more than what must of necessity attach itself to it, the case of Ireland for the last thirty years explains and justifies it to the English mind at least.

But here, let us ask before proceeding further, how is it that Dublin neglected to do for itself what Glasgow, without Government aid, has done for itself, or what even Irish Belfast has done, and is at present doing, for itself, in manufacturing and commercial enterprise? Here is a nut to crack, and the noisy disputant who will successfully crack it and digest its kernel will have an answer that will require more than the logic of Locke, or the logic and sophistries of Whately, to overturn. On the threshold of our subject we will illustrate a case in point, which naturally is embraced in our article.

Dublin requires a new bridge over the Liffey, and the widening or remodelling of the present Carlisle Bridge. She also requires that her once noble river, but now foul and open sewer, which flows through her midst, should be purified and prevented from generating disease. On whom devolves, or should devolve, this city improvement? Naturally, one would say, that the corporation of a city are its chief custodians, and that municipal councils are the local parliaments who should govern and improve, as well as collect local revenues. Municipal councils were never intended to be merely rate-levying and tax-collecting jantas. The very spirit of their formation forbids the supposition. They were first founded and established for a more wide and beneficent range of duties, and the sooner they are taught their special duties, and held amenable to the public will, the sooner will the towns and cities they are destroying, instead of governing, manifest a marked improvement. Had the Dublin corporation done their duty and put their shoulders to the wheel years since, the public scandal now existing in the Irish capital had never been heard of, and the empire would have been spared the childish plea and shameful confession that "the corporation has no funds, and are unable to build a bridge or even clean the Liffey." The old corporation of Dublin, which existed before 1841, bad and blameable as it was in many respects, was superior to the present in the conservatism of the city. The old corporation was charged with being a rotten and a corrupt one; but let us ask what inviolate corporation of the present so-called "reformed corporation" will stand out from amongst his brethren in the Dublin Council, and say, "My hands are clean; I can cast the first stone." Is it not a fact patent to every sensible Dublin citizen that the Dublin Corporation has been for years a bear-garden, a political sporting-shop, an arena of public partisans and sectarian strife, where the battle of political cliques has been fought, instead of the battle of thorough and authoritative and progressive municipal government?

This has been one of the reasons why the improvement of "the second city in the empire" has been retarded, and the sanitary condition of Dublin is so deplorable and reprehensible. Let us ask, what have been the great public projects carried out by the Corporation of Dublin for the last quarter of a century? With the exception of the waterworks, the Varty scheme of Sir John Gray—a decided improvement and a boon to the citizens—certainly, with this exception, the rest of the labours of the municipal council has been very small indeed. What public statues have been erected by their action, of which they can claim the entire credit of the suggestion or completion? What new streets have they constructed, independent of private aid and action? What parks have they opened, squares have they laid out, and what is the number of public fountains they have put up or restored—for there are old Dublin fountains that might be restored? The single pump, the gift of a Dublin citizen, has, in its free use for the public, conferred more blessings and perpetuated more lasting health and joy around the north of Dublin during its existence than even the Varty reservoir. The clear crystal waters of this celebrated spring, inexhaustible and untaxed, existed and exists for the public benefit: it is a privilege that jealousy has not crimped nor sniffling fashion filched away; and may it continue to be as it has been for generations, a blessing.

If the local authorities, as represented in the Town Council, are asked to do what is necessary

and what ought to be done, the reply vouchsafed is that there are no funds available, or it is "under consideration." We are aware ourselves of crying evils requiring a remedy that have been "under consideration" in the Dublin Corporation for the last quarter of a century, and they are no nearer commencement now than then, judging from appearances. It is a fact that the citizens have been for years over-taxed, and that no end of fruitless and frittering deputations have been sent to London, to the utter waste of public money, and, we are almost tempted to say, for no other reason than to afford some folks an opportunity to "lionise" at the public expense.

Time and money have been frittered away on the part of the Dublin Corporation for years, in vain, childish, and senseless appeals for aid to the Government to carry out certain works, and the said works could be carried out with a little exertion and co-operation on the part of the Corporation, had the matter been properly placed before the public in its right light.

Dublin is a city that any corporation ought to be proud to govern, and, if governed with proper municipal spirit, might be for ever a peerless capital, an architectural joy, and a sanitary haven; but, alas! sycofancy, subserviency, snobbishness, and sloth, not on the part of the public at large, but on the part of their municipal tax-masters, have dragged down Dublin nearly to the seedy and slovenly condition of a Slattern of Cities. These are hard words perhaps to write, but they are written to gratify no pique or whim, but written with the honest hope that they may be the means of stimulating a little more vigorous public spirit into the public boards of Dublin, and of moving them to new and fresh efforts towards the improvement of their city.

The public buildings of Dublin, erected during the last century and early in the present, are architectural gems in their way. Sunshine and shower, hurricane and hailstorm, have swept around their granite base, and whistled in wild and weird dirges through their still scintillating columns and balustrades. The lights and shades of Nature's colouring are limned in exquisite contrast, and the storied stones of many of these grand old structures and city mansions speak forth to us in a language at once vehement, pathetic, and wistful mournfully gay; but we must pass them by, and drown the burning recollections of the past in the stern and pressing duties of the present. Oh! Dublin, why have your own sons trampled you down and emasculated you? and why do they still look on, like jabbering Jews, bartering over your body for the price of a dissection instead of a resuscitation?

At the weekly meetings of almost every other corporation or local board in the empire, the matters discussed are of a progressive nature,—something relating to the widening or constructing of new streets, the opening of sewers, the utilisation of sewage, the projecting of a practical system of drainage, the construction of new bridges and thoroughfares for facilitating the public traffic; but, nine times out of every twelve, the matter of dispute in the City Hall is some religious or party bone of contention, and a party battle for some petty privilege, or in support of some arrogant claim.

How long, let us ask, does it take to erect in Dublin a public statue? Nearly a quarter of a century since a man who was deemed great among his countrymen, and who was honoured by them only as a saint or a king would be. This popular man died. After his burial, a subscription was raised to perpetuate his fame by a monument in the capital of Ireland; but in the Irish capital, with the exception of the mortuary pillar tower that rises above his tomb, no public statue has yet been erected. True, his figure, sculptured in colossal proportions, is to be seen in the Royal Exchange (now City Hall); but it must be remembered that this was the work of Hogan, the sculptor, during the tribune's lifetime. There is talk enough, goodness knows, about the statue, its artist, and its intended site, but it is not yet erected.

And here is the subject of Carlisle Bridge, and its rebuilding or remodelling. The vacillating Council who, we are sorry to say, municipally misgovern Dublin, cannot be pushed into action over the matter. That a bridge requires to be built to afford more space and freedom for public traffic, admits of no question. If funds cannot be raised without difficulty, why the present structure can be widened, and a very good design has been submitted to that end. We will say this, that if it is ever contemplated to pass

back the shipping in the river below the Custom House and construct another bridge across the Liffey opposite Beresford-place (or nearly on a line with Gardiner-street), then in that case we are inclined to believe that the present Carlisle Bridge, if widened properly and thoroughly, and rendered more ornamental than it is, would answer all purposes.

The necessities of the growing northern district of Dublin, even though that growth is slow, will yet demand the construction of a new bridge to span the Liffey, beside or beyond the Custom House. Let this subject get consideration; for ourselves, we have given it some thought, and we are fully convinced that a bridge further down the river will only be a question of time.

Now, as to the purification of the Liffey, this is a matter that requires instant attention. Numerous plans have been submitted, and some soft heads have gone bewildered in contact with them. At low water, the effluvium arising from the bed of the river, the whole extent from King's Bridge to Carlisle Bridge, is at times sickening and intolerable. Had there been a public prosecutor in Dublin his duty would have clearly been to take immediate action against the corporation in the interest of the health and lives of the citizens. The case of Anne Loughnam, already alluded to by us, would not have been the only one, and it would not have remained for that poor woman to exert her weak power to recover damage for wilful neglect, by which a corporate body were collectively adjudged as the murderers of her husband. Along the lines of the Dublin quays at the present hour there are many poor householders suffering from the effect of a thick pestilential and foul malaria, always arising from the bed of the river, and constantly fed by the feculent sewers which are daily pouring their putrescence in liquid and solid matter into it north and south.

Any system of purification which has been proposed, no matter how short it might fall of the required ends, would be a relief; but between the advocates on one side in favour of their own hobby and that of their friends, and the opponents on the other side, in favour of theirs, the Liffey is seething and sinking deeper into the condition of a chronic sepsis.

It is difficult for serious and sober sanitary reformers to discuss, with common respect, some of the plans proposed for improving the foul condition of the Liffey. One or two proposals deserve consideration, but there are others which, if not utterly ridiculous, are at least of no practical use. To put up sluice-gates at the arches of each of the bridges to keep up a depth of water, at low tide, intended to drown the smell, while preserving the accumulated filth in the bed of the river, is surely not the way to purify the river. Added to this, this canal-like lock system of damming up and damming in the city sewage in the river, would only seemingly stifle one evil to the creation hereafter of a much greater one.

This sluice-gate barrier system would also spoil the appearance of the river, and materially injure its even navigable continuity; and it is much to be deplored that the navigable capacity of the river upwards is not and has never been improved, notwithstanding that plans were submitted several times, several years since, by experienced engineers.

Paving the bed of the river by a system of inclined planes, to give the mud and sewage a downward sweep to its centre, is equally an impracticable, useless, and utopian experiment. We do not mean to say that this plan could not be carried out, at a great expense; but we do mean to say that if carried out, it would be money and labour thrown away.

Putting aside other plans, we boldly say there is no salvation for Dublin but a thorough system of parallel main drainage and intercepting sewers on both sides of the river. Until the river is saved from city sewage pollution, on its north and south banks, there can be no proper purification of the Liffey. The treatment of the sewage or its final distribution is another question for which more than one method can be adopted, as it so pleases those whose chief business it will be to carry it out with profit and advantage to the city and the country at large.

The Poddle river, rushing ever, and emptying hourly its avalanches of solid slime into the Liffey, in the most central part of the city, is a frightful picture to contemplate. What it was a quarter of a century since, "a mother of dead dogs," night soil, and butcher-shambles effluvia, is still, but twice multiplied in beastly enormity.

Is it possible that the corporate authorities of Dublin can pretend to an ignorance of this frightful cloaca of rolling filth, that passes but a few yards off, almost under their very noses, while sitting in their Town Councils? The effluvium of the Poddle wriggles up through the street sewers, and the malaria of the Liffey is daily wafted up Parliament-street to the City Hall, acting as a due monitor and an avenger of corporate negligence and imbecility.

North and south of the city there are districts that never see the light of a scavenger-cart, and the water-cart is only reserved for fashionable quarters, where noses are not composed of plebeian india-rubber, and broadcloth is preferred to corduroy. When the cleansing of the city was done by contract a few years ago—at a time, we mean, when it was well paid for—it was done well; but if it be true that the corporation does it now on more economical principles, on the old Hibernian principle of "Do it yourself and save the halfpenny," then we can understand why Grafton-street and Nassau-street on wet days are streets of a thousand pools, and why Sackville-street and Britain-street follow the bad suit.

THE BUSINESS OF LOCAL BOARDS.

THE generic term, "local board," may be taken to mean any town authority, whether it be a corporation under the Municipal Corporations Act, a Board of Improvement Commissioners under a special Act of Parliament, or a local Board acting under the authority and for the purpose of carrying out the provisions of one of the general Acts. These bodies are elected by the inhabitants for short terms of years, a portion being elected annually, to carry on the public business, and take a general charge of the public welfare. The number of members of a local Board does not bear any fixed ratio to the number of inhabitants of a town, but is fixed in various ways. In those towns which are incorporated under the Municipal Corporations Act there is a certain number appointed for each ward or division of the town. In towns not incorporated the number is fixed by the special Act, or by the general Act, which may have been adopted, so that in some small corporate towns we find as many members of the public body as there are in some other and much larger towns, and in some places even a greater number. An inconvenience, to say the least of it, results from this.

There are two methods of procedure, one or the other of which is adopted in every town. In some towns, perhaps in the greater number, committees are appointed from the general body to carry on special parts of the public business, as, for instance, the care of the highways; the drainage; the sanitary condition of the dwellings; the waterworks or the gasworks, if any; the improvements of the town, in respect of opening up new thoroughfares or widening and improving existing streets; and sometimes for general purposes that cannot be brought under any special name; and these committees report their proceedings from time to time to the general body, who meet only occasionally. In other towns the business is done by the whole body (except on some rare occasions, when it may be convenient to appoint a committee for a temporary purpose), who meet at regular intervals, generally once a month, to receive the reports of the officers, who have in the mean time carried out what instructions they may have received at the previous Board meetings, and done any work of emergency. The work of the officers is thus brought prominently under the notice of all the members of the Board, and if their services deserve favourable recognition, it is widely spread; or, otherwise, so are their faults; which is in either case an advantage to both the local Board and its officers.

The usual staff in towns of moderate size consists of a town clerk or law clerk; an engineer or surveyor (the terms being synonymous in either case, and only variable by local circumstances); a medical officer of health and a sanitary inspector, each with such assistance as may be required; also a treasurer, and a clerk for the general purpose of accounts, who, in small towns, is often also the collector. In large towns the staff is more elaborate.

Now, in those towns where the system of working by committees is adopted, it is often found that a few of the members of the Board are appointed, presumably because of their superior knowledge or position, upon more than one committee; and, as experience has shown that a

committee gets through its business with more satisfaction when the number of members is limited to a few than when it consists of many, this system necessarily throws out of actual co-operation many members of the general body, who only know what is going on from the reports of the committee, made from time to time at long intervals. This constitutes the inconvenience above mentioned. Committees do not report their whole proceedings to the Board, even when they report at all; but, except on such occasions as require them first to procure the sanction of the general body, they order works to be done on their own authority; and, indeed, unless they were to do so, the business could not be carried on; for to have to report all their proceedings to the general body before anything could be done would prove so cumbersome as to be impracticable. Thus many members of local boards find themselves elected by their townsmen to take part in carrying on the public business who have no opportunity to take such part. The consequence is a jealousy of these members of what the committees may be doing, and a disposition to carp at, and find fault with, whatever may be done, without calmly weighing the matter as to whether it is right or wrong, whether for or against the welfare of the town; and if this were all, it might be a small matter; but in cases where the committees ask the sanction of the general body to proposals that they may have agreed to recommend, the grumbling of these non-contents is followed by adverse votes, which often prevent the carrying out of real improvements that would prove economical and highly advantageous to the town—a result of the exclusion of the opponents from any actual co-operation in the proposals. Under this system an injustice is done to the officers by confining an intimate knowledge of their qualifications, whether for or against themselves, to a few members of the Board, which is a disadvantage to both parties.

But there is another inconvenience in this eclectic system. The outsiders, being jealous of the action of those appointed on the committees, agitate the question among themselves, and by dint of opposition to everything brought forward so disgust some of those elected, that they become careless, at the next nomination of committees-men, whether they are appointed or not, and thus they open a way for outsiders to be appointed in their stead. These new men have all the business of the situation to learn; are ignorant of what has been the custom and the practice of former committees; and, to show some justification for their appointment, proceed to want everything done in some fanciful and impracticable way of their own. They thus obstruct the proper business of the committees, and cause some of its members to refuse to attend, get into difficulties, which their want of knowledge of the business of the situation prevents their getting out of; and, in short, make a very undesirable commotion in the town. This they render like, as showing in their townsmen, who, indeed, care very little more about the matter than to laugh at it, that they have done something, however unwise it may have been.

Now it seems but reasonable that those who are fit and proper persons to be elected to the Board at all are fit to be appointed on committees; and if, instead of picking and choosing (where there is, after all, but small room for choice amongst the members) every member of the Board were to be appointed, whether he will or not, on several committees (if the committee system is to be adopted at all) there would be more harmonious action, and the quarrels and waste of time at Board meetings, arising from the jealousy of outsiders, would be done away with—at least, so far as they are due to this cause. It requires an apprenticeship to carry on public business with effect, and by admitting the novices to places on committees, they would in course of time learn their own deficiencies and appreciate the difficulties that former committees may have had to contend with, of which these new members were probably wholly ignorant while they were outside the pale.

It may be unfair to say so much against an existing state of things without suggesting a more complete remedy, and therefore it may be as well to say that experience seems to show that public bodies of this kind should act in a body, except for temporary purposes, and not in detail by committees. They thus all become equally responsible; and if it be inkome to some to attend so often, it only has the effect of weeding out those who had better not have been elected at all; and if a little more pressure

were put upon members of local Boards to compel their attendance at meetings, it would soon be publicly seen who are the fittest persons to represent the interests of the town. And that consideration reduces the question to this conclusion, that a small body acting together and in concert is much more effective than a numerous body, of whose members it is left to do the business of the whole. And if that be so, then the number of members of the local Boards in some towns requires revision; for it is quite certain that in some the number is so large and disproportionate to the business to be done, that one-half of them are in the others' way.

If a system of working by committees is to be continued, there should be this provision made compulsory—that the whole of the proceedings of the committee be reported to the Board; that is to say, that full and accurate minutes be made of the transactions of the committee and the minutes read at the Board meetings. Thus the Board would become acquainted with what had been brought before the committee, and would see how it had been dealt with. In this way committees could not, as they often do now, quietly shelve propositions made to them, and which never see the light.

It has often been remarked that owners of small house property and speculating builders are eager to get themselves elected to local Boards; and when there that they use their influence to prevent such sanitary measures as would require them to make outlay of money on such property, and to prevent bye-laws being made that would require houses to be built in such a manner as to insure their being healthy dwelling-places. There can be no doubt whatever that improvements in towns are greatly prevented by such people; and it would be a wholesome provision if they could be declared to be disqualified for election to local Boards.

Perhaps the Sanitary Commission, now sitting, might not consider this question wholly out of their province, inasmuch as any improvement in the constitution of local Boards will be tantamount to an improvement in the administration of all sanitary measures.

POMPEII AT SYDENHAM.

POMPEII, that wonderful portion of the antique world preserved for the enlightenment of the modern, has never been so well set forth for those who remain in England as it is now in the Crystal Palace. Signor Lozzati, an Italian artist, by means of *photoculpture* and glass, has reproduced, with marvellous fidelity, all the most important parts of the city as now exposed—the Forum, the street of tombs, the Villa of Diomedes, the house excavated in 1869, the public baths, and so on. To these succeed a number of views, showing assumed restorations, concerning which there may be of course different opinions; and then some scenes of Pompeian life, an eruption of Mount Vesuvius, suggesting the manner in which the city was buried in the year of Our Lord 79, and a panorama of the city. When we add that there are also models in relief of some of the houses, readers will be disposed to accept the assertion with which we commenced these observations.

At present an extra shilling is charged for viewing these remarkable illustrations, and anywhere else it would not be thought too much. At the Crystal Palace, however, people get so much for a shilling, that the extra charge seems relatively large, and we are very much disposed to think that if it were reduced to half, the visitors would be increased fourfold at least.

ENAMEL PAINTING ON PORCELAIN.

THE production of fine paintings on porcelain is attended with so much costly risk, and demands so much traditional knowledge, that the art has always been sparingly practised. In England at the present time very little high-class work is attempted. The colours employed are affected by heat each in a peculiar way, for which the artist has to allow, and after each firing, three or four being required, the picture is repainted, so that the last firing may leave the work as nearly a representation of the original as possible.

In Bamberg, Bavaria, Mr. Carl Schmidt has conducted for years past an establishment for the production of such works, and he has recently opened in Bond-street a depot for the sale of them. The specimens there certainly include works of high merit and deserve attention, as

the mere mention of some of the subjects will show. Thus we find "The Death of the Constable of Bourbon before Rome," after Fauconiere, by Meinel; "Albanese Girl," after Riedel, by Meinel; "Rape of the Sabines," after Rubens, by Zapf; "Columbus in Prison," after Wappers, by Zapf; "John Huss before his Death, at Worms," after Lessing, by Bauer; "Madonna," after Murillo, by Eckardt; "The Israelites at Babylon," after Bendemann, by F. Schmidt; "Titian's Daughter," after Titian, by Beets; "Charles IX. on the Eve of St. Bartholomew," after Wappers, by Vogther; "Art and Liberty," after Gallait, by Kieselwetter; "Rembrandt and his Wife," after Rembrandt, by Kieselwetter. The largest of these are on plates more than 2 ft. long, and most of them are executed with great skill and delicacy. Transcripts of fine works so produced cannot fade or decay, and, when dirty, may be cleaned with soap and water without fear of injury.

PRESERVATION OF WANDSWORTH COMMON.

ON Thursday, the 14th inst., the Lord Mayor presided at a large and influential meeting in the Mansion House, for the purpose of aiding in the collection of funds to meet the expense of trying the rights of the public to the enjoyment of an uninterrupted range over one of the few open spaces left round the metropolis.

Amongst those present were the Hon. Mr. Cowper-Temple, M.P.; Prof. Fawcett, M.P.; Mr. Eykyn, M.P.; Mr. A. Johnston, M.P.; Mr. Holmes, M.P.; Mr. E. F. Buxton, M.P.; and several members of the Commons Preservation Society. Letters expressing strong sympathy in the object of the meeting were read from the Bishop of Winchester, Mr. Spurgeon, Sir C. W. Dilke, M.P., and others.

Mr. Buckmaster gave a very full description of the various inclosures of portions of the common, from the commencement, about the year 1836, by the Southampton Railway Company, up to the present time, when only about half the common remains, and that is being continually parcelled out by speculating builders and others.

Mr. Cowper-Temple moved the first resolution, "That the preservation of Wandsworth-common as an open space is desirable in the interests of the people of London." He observed that for the preservation of common land in the neighbourhood of towns, there must be combined action on the part of individuals, and money must be provided for ascertaining and defending the rights of the public, whatever those rights might be. He said that some years ago there was a strong movement towards the inclosure of waste lands, and their conversion for agricultural purposes; and this was very well, and still highly desirable in the case of remote districts at a distance from populous places; but in the neighbourhood of such places, it was not a national benefit but a national misfortune when commons were reduced from their free and open state and made into private property,—and that not for the purpose of supplying food for the people, but of further extending the dreary waste of brick houses.

Mr. A. Johnston, in seconding the resolution, observed that very probably Lord Spencer had little to do with this matter of enclosing the common; that these things were generally arranged by the lawyers and surveyors, who took what they called a practical view, and only made it their business to get all they could.

Professor Fawcett moved the second resolution, expressing sympathy with the efforts now being made to secure the common for purposes of recreation. He said that he attributed great importance to the indirect as well as to the direct effects of the movement now on foot, inasmuch as it would be a gratifying proof that the public feeling has been aroused, and that henceforth the enclosure of commons in general would be watched with a narrow and scrutinising gaze, and we shall be able to say to any Government in power, that if they show the same indifference to such questions in the future as they have done in the past, they will not be doing their duty to the public, but inflicting on them an injury which no time can repair.

Mr. Holmes, M.P., moved the third resolution, that subscriptions be collected at the meeting and elsewhere in the City of London. He remarked that London now contained nearly 4,000,000 inhabitants, a great many of whom, coming into the City to business by day, returned to the vicinity of the commons to live,

and it was necessary to pay great regard to those open spaces which still remained.

Mr. Eykyn, in seconding the resolution, expressed a hope that litigation might be avoided, and that the subscriptions raised might be spent in beautifying the common.

A sum of 400*l.* was collected in the room.

ARCHITECTURAL EXCURSION IN LINCOLN.

WE may add to what we have already said on this excursion that detailed particulars may be had on application to Mr. John S. Quilter, 9, Conduit-street, London. Generally, the plan may be stated as follows:—On Monday, August the 22nd, the members will assemble in Lincoln, and in the afternoon an address will be given by Mr. Sharpe, in the Assembly-rooms, when he will direct attention to the principal object worthy of notice, and the best means of studying them, after which a general survey of the cathedral will be made. Tuesday will be spent in the cathedral and inspecting other buildings in Lincoln. On Wednesday an excursion will be made along a very interesting line of churches lying between Lincoln and Grantham. On Thursday another will be made to Sleaford and the neighbourhood. On Friday, after a visit to Boston, the party will proceed to Spalding, and, returning, visit a series of churches between the two towns. And Saturday will be occupied with a visit to Peterborough Cathedral, completing the sketches, comparing notes, and terminating the excursion. Special arrangements have been made to keep the expenses within the smallest limits: exclusive of railway fares, not yet settled, they will probably not exceed 3*l.*

TREES IN PARK AND KENSINGTON GARDENS.

SEEING the floral perfection of the Park borders, and the long flower-walk, it is hard to reconcile the mind to the utter neglect of the stately trees in the Park, and of the overcrowded and wasted condition of those in the Gardens. Long since it was shown in the *Builder* that the old foresters in the latter were suffering and decaying from too close proximity; many there are standing only 3 ft., 4 ft., and 5 ft. apart, with bare poles for 20 ft. or 30 ft., the branches interlacing, and annually crippling and deforming each other.

For effect, forest trees ought to have a wide range; and in rows, where so planted, ought to be at least 30 ft. apart; and the opposing range, if such there be, should be planted in alternation. Now, there are several vista ranges which stand at tolerably fair distance, and seem to flourish in the wilderness; but the principal extent of the Gardens is occupied by high, closely-packed trees without garniture, germinating only at the top. If the weakest and least promising of these were thinned out—say one in four,—the surviving standards would spread out and become healthy, and then the groves might be more frequently resorted to as a cheering promenade or sylvan refuge in hot weather.

Now, as to Hyde Park, where the arborage is more graceful, and where, being less packed together, sylvan grace is, in some degree, better maintained, a grievous mistake has been lately committed, in filling in the intervals with waste earth or mould round the stems, to a depth varying from 1 ft. to 5 ft., thus burying the root-collar of the tree, and assuring its, perhaps tardy, but certain decay.

In all cases where it is thought expedient to raise the surface, there ought to be a circle of large loose stones, or blocks, placed around the stem, in order to secure free access of air and moisture, so as not to choke the respiratory glands of the tree.

A view of the park borders, where the surface has been thus heaped out, will discover at least ten trees wholly defunct, and a score more in a state of gradual decline; and now that these open spaces have become, since their ornamentation, the resort of increasing numbers, a little care devoted by a competent arborist would amply repay the Commissioners, who have already done so much to gratify taste and to improve the health of sojourners in London.

As the metropolis extends, every tree and shrub in open park increases in value; and if, as in gardening, the vigour of plants is secured by thinning out; by a parity of reasoning, our old foresters may, by the same treatment, be induced with restored vigour.

THE SERPENTINE.

The Chief Commissioner has determined on removing, instead of covering over, the mud in the Serpentine. When the intention of covering it up and the great objection to this course were first pointed out in our pages, the importance of the advice was recognised by but few, and the truth of the assertion made was denied in several quarters. Gradually, however, the correctness of the information and wisdom of the advice became recognised, and will now be acted on. It is to be regretted that considerations of expense will be allowed to prevail against the desirability of lessening the depth of the water, so as to render the Serpentine a safe bathing-place. Its importance to the metropolis in this respect would justify any reasonable and well-applied expenditure. As a medium step, might not the southern half, say, of the bed be raised, bays or other indicators marking out where the extra depth would be found? We have for so many years on and off pointed to the evil conditions existing at the Serpentine, and the necessity for improvement, that we cannot quietly let the opportunity be lost for making a thoroughly good job of it.

ANNUAL INTERNATIONAL EXHIBITIONS.

APPOINTMENT OF JUDGES IN ART.

The Royal Academy has named the following gentlemen to act as judges for admitting works of art at the International Exhibition of 1871:—Mr. Elmore for painting, Mr. Calder Marshall for sculpture, and Mr. E. M. Barry for architecture. The Society of Painters in Water Colours has named Mr. Alfred W. Hunt; and the Society of British Artists, Mr. Clint. Other nominations have to be made. At a recent meeting of the committee for Section D (Specimens and Illustrations of Modes of Teaching Fine Art, Music, Natural History, and Physical Science), it was resolved that the committee be divided into four sub-sections. The following were named for the sub-section Fine Art:—John Bell; E. J. Boehm; H. A. Bowler; F. S. Cary; I. Gerstenberg; Solomon Hart, R.A.; F. Leighton, R.A.; Sir Coutts Lindsay, bart.; J. E. Millais, R.A.; E. Redgrave, R.A.; the President of the Royal Academy (Sir Francis Grant); Sir M. Digby Wyatt; Archbishop of York; Secretaries, H. A. Bowler; and R. Redgrave, R.A.

FALL OF A CORNICE IN NEWCASTLE.

A CORNICE accident has occurred at a large square block of new buildings now being erected in Gallowgate, Newcastle-upon-Tyne, opposite the end of Darn Creek, resulting in the death of a man and serious injury of a boy. The building is being erected for Mr. John Christie, printer and stationer, from plans by Mr. Alfred Swan, architect, Newcastle, and consists of a number of shops on the ground floor, with warehouses and offices above. It is of considerable height, being four stories above the cellar floor. The walls, which are about 1 ft. in thickness, are built of bricks, and ornamented with heavy stone facings. The walls were carried up to their entire height, and the cornice placed along the front. It was composed of two layers of fire-bricks, one projecting over the other, and capped with a flat table of stone, which was 1 ft. 7½ in. in depth. This stone projected from the main wall nearly 1 ft. 2 in., so that there could only be about 6 in. built into the wall. Above the stone was built a slightly overlapping fringe of brickwork, which caused the projection to be still larger. The workmen in putting it up are said to have expressed great doubt as to the wisdom of having the stone to project so much without properly securing it in the wall. When the crash came the men engaged on the building almost immediately missed one of their comrades, a bricklayer, who was known to have been engaged by himself at the top of the front scaffolding just before the accident occurred. A search was at once made for him amongst the rubbish, and after some of the heavy stones had been removed he was found dead beneath a heap of broken stones and bricks, with huge splinters of wood forced into portions of his body, and his head smashed in a frightful manner, with the brain protruding. Almost simultaneously it was discovered that a little boy, who had been passing at the time, was suffering from a broken leg, having been knocked down by a piece of wood from the scaffolding, which was broken up

along the entire face of the building. An outcry was raised when it became known that the accident had occurred from what was considered the faulty construction of the building. There is no contractor for the work, it seems, the workmen being engaged by the week under a foreman, who receives his instructions from the printer and stationer for whom the building is being erected, and who also purchases the materials required.

AN IMPERISHABLE HOTHOUSE.

From the recently-published list of patents it appears that Mr. W. P. Ayres has secured "Improvements in the Construction and Arrangement of Horticultural and other Buildings, or Erections, or Structures, and in the means and appliances for heating the same." These consist of roofs formed without sashes, sash-bars, putty, or paint, or any woodwork outside, and consequently no painting will at any time be required. Secondly, Mr. Ayres forms his floors, plant-stages, and side or partition walls in slabs of cement concrete, strengthened in a peculiar manner so as to bear any amount of pressure that may be placed upon them; and yet admit of being perforated for the air to circulate through them, panelled to hold water for evaporation, or the pots to stand in, or perforated and panelled. These slabs, it is said, can be manufactured of any required strength, and, consequently, are suitable for fire-proof floors, partition-walls, tabling, or shelving for shop, office, or warehouse fittings, or for any situations where slate or marble slabs have hitherto been used, with the advantage that they can be manufactured of any size, and in the place where they are required to be used; left rough for ordinary use; or be finished plain or in colours with the face of polished marble. Thirdly, Mr. Ayres introduces a new system of heating, dispensing with plunging or fermenting material for bottom heat, and substitutes a system by which a stream of air, moist or dry, is constantly passing through the centre of the earth containing the roots of the plant as well as around the sides of the pot. For glazing, Mr. Ayres uses flat glass of great strength and quality, jointed with transparent cement, or he may use glass turned up at the sides, or any other form of bent glass that he may find necessary for the purposes of his invention. The alleged advantages are,—economy in first construction, portability (when desired), and when manufactured in iron galvanised, a house so imperishable as to wear for a lifetime without further cost.

WATERWORKS.

For the Ashford waterworks two wells have been sunk at Henwood, about 100 yards distant from each other, the upper well being 22 ft. 6 in. deep, and the lower well 18 ft. 6 in. deep. These wells Mr. Hoad, of Worthing, engineer, has connected by a syphon apparatus, with strong 6 in. cast-iron pipes, so that the water in the upper well flows into the lower as fast as the latter is taken out, the two always standing at the same level. From the lower well the descent is not steep enough for the water to flow by gravitation down to the mill, and Mr. Hoad is carrying it there by another of his syphons of the same dimensions as that between the two wells, and laid at a depth from 9 ft. to 11 ft. 6 in. The two wells are supplied by two springs of considerable power, and quite independent of each other. Mr. Hoad has pumped out 140,000 gallons in ten hours; and expects 300,000 gallons per day. The water has been tested and found to be of excellent quality.

Mr. Bateman, the engineer, who designed the Witcombe reservoir works for the Gloucester water supply, has written to the authorities saying, that he is at a loss to know upon what principle to charge for his labour, but saying that in larger works he usually receives from 7½ per cent. to 10 per cent. on the outlay, and that he proposes in this instance to charge 10 per cent. on the gross outlay of nearly 11,000l., thus making his bill, with 129l. 8s. 10d. for travelling expenses, amount in the whole to 12,297l. 8s. 10d. This amount seems to have astonished the members of the Board, and it was resolved, after a conversation, that the question should be put aside for discussion in committee. A question also arose as to the contractors, Messrs. Ralph & Scott. They had left in the hands of the corporation 550l. as a security for the maintenance of the works for one year.

They now wrote that, needing money for carrying on another contract, they would be glad if the corporation would let them have 250l. of the security money. It was said that they had lost money by the contract, and that therefore they should be so far obliged. But others opposed any departure from the contract, and ultimately the application was refused.

A NEW OMNIBUS.

A MELBOURNE correspondent, in giving us an account of a new sort of street conveyance, says:—The scheme has attracted considerable attention here; and I have thought that you might like to publish it in your very useful Journal, which has a large circulation in these Australasian colonies. The plan will be patented both in Great Britain, France, and America. The great principle involved is the carriage of the load below the centre of gravity. The new style of conveyance has been recently patented by Mr. Dyer. Instead of the Passengers being inside the vehicle, as at present, they are all outside of it. There is no close box into which twelve human beings are stuffed to inhale each other's expirations and exhalations. There is no crushing up for a seat, or putting seven in a space intended for six, and not too large for five. All inconveniences are avoided by placing the passengers back to back, instead of face to face. The new omnibus has only one hind wheel, instead of two; and this one wheel, placed in the centre of the vehicle, does the work of the two now used. A light and elegant roof covers the two rows of seats, and reaches down in front far enough to shelter the passengers from rain or sun, but not far enough to obstruct their view of the opposite side of the street in which they are going. There are aprons also which draw up from the footboard, as a protection in wet weather. The vehicle is therefore much lower than the present omnibus, being only about 8 ft. in height. A passenger steps in and out at one effort from the street into his or her own separate place or division. The large wheel at the back is quite concealed, and revolves in a closed case or sheath, some 12 in. in width. The seats being on two sides and the end, and being comfortably padded at the back and cushioned, the vehicle will somewhat resemble that piece of furniture known as an ottoman, with arms to it and a roof overhead. There will be an immense economy in construction, as there are no doors, no glazing, no painting of sides, no internal panelling, and only three wheels, instead of four. The draught on the horses will be much lighter, as the friction will be diminished by one-fourth, at least. In addition to this, it is known that a wheel of large diameter is much easier to draw than one of small, so that there is no doubt but that the draught will be very largely lessened. The weight of the vehicle will not be more than two-thirds of the present one, and the cost also. The vehicle, nevertheless, is not adapted for bad weather.

SARNESFIELD CHURCH.

JOHN ABELL.

SARNESFIELD CHURCH has been restored and repaired. The work of restoration has been to remove the modern lath and plaster flat ceilings and whitewash, &c., throughout; to rake out and point the stonework; to take down and rebuild the shattered south wall of the sacristy, and insert therein a two-light window, three characteristic windows in the nave, a geometric three-light east window, and a trefoil-headed small window in the north wall of the chancel, with credence and piscina formed under the same. An archway is opened out between the nave and tower, giving increased effect as well as accommodation. The font has been removed and refixed on a new platform and base by the south door, and the gables throughout have been surmounted with stone copings, with appropriate crosses at their apex. The pulpit, at the north angle of the nave, is executed in Painswick stone, with marble inlaid emblematical medallions, and has a carved alabaster cornice. The reredos is of Painswick stone, with carved enriched cornice, and is fitted with marble emblematic reliefs and cross. The nave, the aisle, sacristy, and porch are paved partly with stone, relieved with Lugwardine tiles of three colours; the chancel and sacristum, gradually elevated to the height of five steps, are also paved with encaustic tiles from the Lugwardine works. The

seating in the nave and stalls in the chancel is fixed on raised platforms, with ventilating gratings under, arranged with easy slopes. The material used for these and the tower screen is pitch pine varnished. The roofs externally are covered with Broseley tiling, ridged with a specially made burnt clay ridge cresting. The apex of the porch is finished with a cross of the same material. The tower is similarly covered. The windows are filled with two tints of antique cathedral quarry glazing, relieved with blue and ruby border; in the east and credence window portions of subjects in ancient glass are preserved and re-adapted. The whole building is heated by a close fire-grate fixed in the sacristy, from which communicate flues down each passage, fed by fire and draft holes, covered with iron lids. The expenditure has amounted to £520*l.*, exclusive of about 30*l.* for necessary fittings, &c. The work has been executed by Mr. John Walker, of Hereford, builder, in accordance with drawings and specifications prepared by and under the immediate supervision of Mr. George Cowley Haddon, of Hereford and Great Malvern, architect.

The churchyard contains the tombstone of John Abell, the celebrated architect of the Market-houses of Hereford, Leominster, Kingston, Brecon, and Weobley, who died in the year 1694, aged 97. The stone displays his effigies, kneeling with those of his two wives, and the emblems of his profession, the rule, the compass, and the square. It was designed and sculptured by himself—the epitaph was also of his own composition, and runs thus—

"This craggy stone a covering
Is for an architect's bed;
That lofty building raised high
(yet now lays low his head)
His line and rule so death can
(clauses, are locked up in stone)
Build they who list or they who
(wist, for he can build no more)
His house of clay could hold no longer,
May Heaven's joy frame him a stronger.
In memory of John Abell (Architect)
who died in the year 1694 in the 97th year of his age
Pite ut vivas in vitam eternam."

"Restored by subscription in the year 1858."

The tomb, which stands on the right-hand side of the porch (on the left-hand of the visitor on entering), is of a very plain and unpretending appearance, and altogether unworthy of the dust that reposes below, considering the estimation in which Abell, in his day, was held as an architect. It consists of an ordinary erection of rough masonry, on which is imposed the "craggy stone" referred to. The sculpturings consist of very rude figures, such as one is accustomed to see in the earliest Norman examples.

CHURCHES NEAR LONDON.

St. Barnabas's Church, Grove-road, Bethnal-green.—This church, consecrated on the 2nd inst., consists of nave (56 ft. high to the ridge), north and south aisles, chancel, with organ-chamber and vestry on the north, and spacious baptistery on the south side; but the Orientation is not strictly correct, the site not permitting it. There is an entrance at the west end of the north aisle, but the principal one is under the tower, which stands out from the church at the south-west angle, and forms with the spire a prominent feature at the junction of Edmond and Grove roads. The style is Decorated, freely treated, and the materials brick and stone, the interior being ornamented with coloured bricks. The church, which seats about 900, and cost under 4,000*l.*, was built under the direction of Mr. Wigginton, architect.

Christ Church, South Hackney.—The foundation-stone of this church will be laid by Lord George Hamilton, M.P., on the 6th proximo. The contract has been taken by Messrs. Axford & Whillier at 4,875*l.*, under Mr. Wigginton, as architect.

St. Luke's, in the Parish of St. Paul, Deptford.—On Tuesday last, the foundation-stone of this church was laid, by Mr. W. J. Evelyn, on a site presented by that gentleman, in Evelyn-street, Lower-road, Deptford. The Bishop of Rochester, attended by many of the local clergy, assisted. The church is of thirteenth-century architecture in style, and is to be built of Kentish rag stone; Bath stone is used for the worked portions. A square tower, without spire, crosses the chancel, which abuts upon the road, with a circular apse. The colour, exteriorly, is sought to be relieved by narrow tile-bands at irregular intervals. Accommodation is provided for 1,000 persons; and the contract, including all fittings, has been taken by Messrs. Dove, Brothers, of

Jelington, at 5,287*l.* Mr. Thomas Henry Watson is the architect.

St. Benet's New Church, Stepney.—The arrangements for the re-erection of the demolished City Church of St. Benet, Gracechurch-street, have now been completed with the Ecclesiastical Commissioners. The commissioners have been enabled to provide out of the funds arising from the sale of the site and fabric of the old church a permanent endowment of 300*l.* per annum for the new benefice, and a sum of 6,000*l.* for building the new church. The order in council which authorised the removal of St. Benet's had directed that the church should be re-erected in Stepney, and a site purchased by the Bishop of London's Fund has been presented to the Ecclesiastical Commissioners for the purpose. It is situated on the Mile-end-road, in the north ward of the hamlet of Mile-end Old-town, between the almshouses of Bancroft's Hospital and the Jewish burial-ground, and within the ecclesiastical district or new parish of Trinity, Stepney. The Ecclesiastical Commissioners have given instructions to their architect, Mr. Ewan Christian, for the immediate preparation of plans for the new church. St. Benet's, Stepney, will be the first church re-erected under the provisions of the Union of Benefices Act.

St. Philip's Church, South Lambeth.—On the 13th inst., the Bishop of Winchester consecrated the new church of St. Philip, in Queen's-road, South Lambeth, near the York-road station, at Battersea Park. It is a handsome structure in the Decorated style, with tower, and is fitted with stained-glass windows throughout. The entire expense has been defrayed by Mr. Flower, of Furze Down, Tooting-common, the patron of the new church. Mr. James T. Knowles, inn., was the architect, and Messrs. Colls & Sons were, we believe, the builders. The cost of the church has been about 12,000*l.* We may be able to give some more detailed particulars hereafter.

COLSTON MEMORIAL WINDOW, REDCLIFF CHURCH.

The window which has been erected by subscription in the north transept of Redcliff Church, Bristol, in memory of the philanthropist Edward Colston, is intended generally to illustrate works of mercy, as having a direct bearing on the benevolent character of Colston. The window is of considerable height. The top and bottom tiers are entirely devoted to works of mercy, viz.:—top tier, "Receiving the Stranger," "Visiting the Prison," "Teaching the Ignorant," "Leading the Blind;" bottom tier, "Feeding the Hungry," "Giving Drink to the Thirsty," "Clothing the Naked," "Visiting the Sick;" while the centre tier represents the parable of the "Good Samaritan." In the larger tracery openings are introduced angels; and in the smaller openings, ornaments only; while the arms of Colston are placed at the base of the left-hand light in the lower tier of lights. It is inscribed, "Go and do thou likewise," on the left-hand side; and along the bottom, "In memory of Edward Colston. Erected by subscription, A.D. 1870."

The memorial is the work of Messrs. Clayton & Bell, who in other parts of the church also have set up some of their best work.

PRESCOT POLICE-STATION.

The new county police-offices and court-room for the district of Prescott, in Lancashire, has just been completed, and was opened on the 1st of July. The building is of gray brick, with red and white Woolton stone dressings, and is decorated to a small extent with coloured brick-work. The central portion is flanked with two circular turret pinnacles on square corbelled bases, and a machicolated parapet surmounts the whole front. The court-room is 40 ft. by 34 ft., with played ceiling, half-open timbered. In the rear is a second and smaller combined court and magistrates' room. The accommodation comprises houses for a married sergeant and constable; sleeping-rooms and day-rooms for four single constables; bath-room, and lavatory; large police-office, and offices for the superintendent; room for testing weights and measures; stable and coach-house; and four prisoners' cells, ventilated by separate shafts, and heated by hot water. The architects were Messrs. Reade & Goodison, of Liverpool; and the contractors, Messrs. Jones & Son, of the same town. The total cost, including land, will not exceed 3,400*l.*

ROYAL ARCHITECTURAL MUSEUM, WESTMINSTER.

The council wish the members of the museum to understand that it is now open free to them on the evenings of Tuesday, Thursday, and Saturday (the vacation months of August and September excepted), but that as the arrangement entails considerable expense in lighting, &c., its continuance will depend on the numbers attending. It is open to non-subscribers at a charge of 6d. each evening. The next session of the architectural art classes will commence in October. The council desire to form a small library at the museum, for the use of art-students and art-workmen studying there, and they have published a list of desirable books to suggest to friends what are wanted.

ST. PAUL'S NATIONAL SCHOOL, TOTTENHAM.

The foundation-stone of this girls' school was laid on the 14th inst. The site on which the buildings are to be erected consists of a plot of land on the south side of Park-road, with a frontage of 50 ft. and a depth of 223 ft. The plan adopted consists of a school-room, 45 ft. 3 in. by 20 ft., with a return at the southern end of 31 ft. 6 in. by 18 ft. In addition, a class-room is provided, 18 ft. by 12 ft. A porch, 12 ft. by 8 ft., with lavatory, will be provided, together with separate coal-cellar, ash-pit, and water-closets, with an ample playground in the rear. On the east side of the school there will be erected a residence for the mistress. The exterior is designed in the Gothic style, to accord with the church and parsonage, and will be erected in sound brickwork, with stone dressings, and relieved by red brick bands and arches. The front window, of Bath stone, will be of four lights, with traceried head and mullions, and relieving arch over. The work will be carried out by Mr. James Linsell, for the sum of 976*l.* 12s. The architect is Mr. Joseph James, of London, whose design was selected in competition with five or six others, principally on account of its overcoming the difficulties of the site.

DWELLINGS FOR FARM LABOURERS, WILTSHIRE.

We learn that the Marquis of Ailesbury is about to remodel a large number of dwellings on his estates at Savernake, in Wiltshire. The plans will be on various models. Each cottage will contain a living-room, scullery, and three bedrooms, with entrance-porch, pantry, wood-house, piggery, privy, cesspit, and ashpit. Each dwelling will have a hard and soft water supply, with washing-copper, pump, sink, and a fire-clay baking oven of an improved description. The living-rooms will be fitted with ranges, having ovens, and the bedrooms will have small cottage grates. Some of the cottages will have all their sleeping-rooms on the chamber-floor; while in others, one of the bedrooms will be arranged on the ground floor. The cottages will be built of a local red brick, made on his lordship's estates, relieved with dark grey bricks. The roofs will be covered with Staffordshire or Bridgwater tiles in bands and courses, finished with an ornamental crested ridge. The porches will have projecting roofs, supported on stone corbels and wooden brackets; and the dormer windows will also have projecting roofs. The cottages will be erected in pairs and groups. Mr. John Birch is the architect employed.

MONUMENTAL.

The Simpson Scottish Memorial.—At a meeting of the London committee, held at Stafford House, on July 11th, 1870, *inter alia*, it was proposed by Sir Robert Anstruther, seconded by Dr. Priestley, and carried unanimously,—"That in defence of the strongly expressed views of the Edinburgh committee, the London committee accede to their proposal of the erection of a hospital in Edinburgh for the diseases of women as a memorial of Simpson, but regard it as essential that its erection be in accordance with the most recently expressed views of the great professor; and they would suggest that the benefit of the memorial be extended to other cities, as London and Dublin, if the funds collected be sufficiently large." The erection of hospitals suitable for the relief of

suffering women, and where students could study this class of diseases, was long and earnestly desired by Sir James Simpson.

The Derby Memorial.—A meeting of the general committee of the Statue Fund was held on Wednesday last at the Carlton Club, the Earl of Harrowby in the chair. It was decided that Mr. Mathew Noble should be entrusted with the commission for executing a statue.

WORCESTER.

Diocesan Architectural Society.—The first excursion of this society for the present year has taken place. Several churches and interesting old houses in the southern part of the county were inspected. Nearly forty ladies and gentlemen assembled at the Upton-on-Severn railway station, and proceeded in carriages to the different objects of interest. At Eastington Hall, the party was received by Mr. E. G. Stone and Mr. J. Ellis, the former gentleman reading some notes, extracted from the register of Longdon, relating to the former possessors of the estate. At Longdon the vicar, the Rev. A. C. Lefroy, met the visitors, and the Rev. W. S. and Mrs. Symonds kindly entertained the excursionists at luncheon at Pendock Rectory. The intended visit to the Berrow was given up for want of time; and the rain, which had threatened all the morning, came down in such torrents during the inspection of Birmington Church and court, that it was thought advisable not to stop at Castleorton, but to return direct to the Upton station. The party returned to Worcester, *via* Malvern.

Model Dwellings Association.—The sixteenth annual meeting of the governors of this association has been held at the Guildhall, Worcester. Mr. G. W. Hastings presided. The general report and financial statement says:—"From the small balance in hand it will be obvious that no dividend can be declared. Your governors very much regret this result, but it is attributable to circumstances over which they have had no control." The chairman said the association was certainly not in a very flourishing condition, so far as a dividend was concerned, but he was glad to hear that the buildings had answered the purposes for which they were established, *viz.*, that of improving the health, decency, and comfort of the labouring classes in the city. It certainly appeared from the balance-sheet that there had been 50*l.* laid out for exceptional expenses; and presuming that in the ensuing year that would not occur again, he might infer that there would be a good balance at their next meeting. The report was unanimously adopted.

FLOOD.

A FLOOD of great severity, and causing much damage, swept the Bacup and Todmorden valleys on Saturday last. Rain of tropical volume brought down such quantities of flood water that the usual outlets were quite inadequate, and the swollen torrent rushed along with great depth and force, carrying before it every obstacle. Trees, rocks of tons weight, walls and bridges have been swept away, and very many valuable buildings destroyed. Two lives have been lost. The scene is a valley of desolation; the damage done is estimated at over 100,000*l.* The warning of what might be expected, given in our columns, was justified in a remarkable manner. We are informed that it led to the avoidance of, at any rate, one disaster.

NOTICE UNDER BUILDING ACT.

WARNING TO BUILDERS.

MR. HUNT, of 61, Rotherfield-street, was summoned to Clerkenwell Police court by Mr. Godwin, District Surveyor of South Islington, for neglecting to give two days' notice before erecting a certain building in a garden at the back of his residence. This was a workshop, partly of wood, and was discovered by the Surveyor. The same builder had done works at another house a short time back without giving notice as required by the Act.—Fined 20*s.*, and costs, 12*s.* 6*d.*

Last week, Mr. Lee, executing work for the London Parcels Company, in Midway-avenue, was summoned by the District Surveyor of South Islington, for neglecting to give the proper notice before commencing the work, namely, altering sundry windows into doorways

in a building about 90 ft. by 17 ft., and erecting a wooden pent-house in front of same about 60 ft. long.—The magistrate, Mr. Cooke, fined him 3*l.*, and costs, 12*s.* 6*d.*

Messrs. Varley, of Midway-avenue, were also summoned by the District Surveyor of South Islington, for neglecting to give notice prior to commencing a building on their premises, consisting of a wooden framework covered with corrugated iron, and partly sunk into the ground, for boiler of steam-engine, with a pipe-flue running into an ordinary flue of the party-wall adjoining.—Fined 40*s.*, and costs 12*s.* 6*d.*

OLYMPIC GAMES IN LONDON.

It would be not a little curious to consider, had but the world time for it, what would be done by the world of art in these modern times if all the old art and time-honoured "precedents" were to be suddenly blotted out from human memory and consequent art practice and practical usefulness; in other words, suppose our modern world of artists were in the precise position of the old Greek artists in the days of Pericles and Phidias, or, perhaps, still stranger, in the times of Homer and the "Juventus Mundi!" What would be done? What would our paintings and statues be like; and would there be any public buildings at all? Decorated they could not be, it is quite certain. Nothing can be more curious and instructive than to go back in thought to these old days, and looking out from thence, to glance at our modern ways of artistic work, and contrast the two—the old and ignorant, and the modern, and improved, and educated, and scientific. Never did this thought come on us so strongly as at the now so popular and, it is comforting to say it, fashionable horse-show, but a week or two back, in the Agricultural Hall. The old Greek, as everybody knows, was fond of horses, and could not do without them, and exhibited no small skill and genius in perpetuating their forms in marble and metal; and seems, indeed, to have made quite companions of them, so that wherever he moved they went with him. In the world-renowned Olympic Games, celebrated every four years, and on the origin and meaning of which there has been such a world of controversy, horses and horsemanship formed a necessary and integral part. These famous games were not peculiar to Greece, and founded there solely, but had their origin in the common humanity of the world everywhere. The Islington Horse-show is a fragment of the Olympic Games, and comes from the same universal source, *viz.*, that instinctive love and liking in the heart of everybody, whatever their station and degree of education may be, for the fine forms and movements of animal and human life. A few thoughts on the similitudes and the differences between the old Greek and new London games may be useful perhaps to some who have not considered art in this light.

First, a word on the old Olympic horse-show. The Olympic Games date back far beyond the written records of Greek history; their origin is lost, as might be expected, in the mists of the past. As soon as some naked warrior succeeded in subduing and riding a wild horse, there were, and must have been, Olympic Games and horse-shows, but of which there would be no written record. Iphitus, king of Elis, has always had the credit of restoring or reviving these famous games; and therefore it is but fair to help to perpetuate his name and honour his memory; for he it was who first reduced the whole festival into a regular and coherent system, and gave it, says a modern historian, "by the establishment of the Olympiad that principle of life and duration as enabled it to outlive the laws and customs, the liberty, and almost the religion of Greece." Passing by the religious aspect of these games—a subject not a little curious, and on which Mr. Gladstone dwells so fondly, and raises to a Bible level,—and the remarkable fact, that from the institution of a mere game or show the Greeks reckoned their very historical time, not by years, but Olympiads, or intervals of four years—for it is a hopeless business, says a modern German inquirer into Greek history, to try to understand it at all without perpetual reference to the games,—we may come at once to the more popular and intelligible part of this great subject—perhaps the greatest in the art of the future. The Olympic shows consisted mainly, in the order in which they were introduced into the Olympic stadium, of foot-races; of the *pala* or wrestling; of the pentathlon, which consisted of

leaping, running, quiting, darting, and wrestling; and of the horse and chariot races,—mere games, as he observed, having for their object nothing more than the finding out which was the best man and the best horse. These were the motives and objects equally in the Greek and London horse-shows; and it must be a matter of no small interest to find out, if possible, what advance we have made, science being our helper and guide, on the primitive and rude Greek idea of a horse and man show. Certainly we ought to have done this, considering the time that has elapsed since, and the progress that has been made, and the experience gained; but alas for the progressive nature of man, and the wonderful effects and influence of science! for, if we look at the visible remains of Greek life and ways, as seen in their art remains and sculpture, and painting on vases of those very Greek games, and others like them, and then compare it all with what has been going on during the past month at the Islington show, it will be manifest to the dullest that we have everything to learn. If some old Greek were to rise from his grave, and visit the modern horse-show, it would not be to learn, but to teach. Let us contrast them.

No subject can well be more interesting to artists than this, when it is considered that the real superiority of Greek art lay in the main in the fact that these games or shows of men and animals were the real inciting causes of their superlative sculpture; and in the fact that the models for it were found in them, and that there can be but little, if any doubt that the very finest specimens, both of men and animals, were collected together from all parts of Greece to contend for the prizes and honours offered. It would also seem, from the sculptures and vase paintings, to be a certain fact that every care and attention was bestowed on the necessary adjuncts, *i.e.*, on the chariots and weapons used in the games, and perhaps, most of all, on the dress of those who took part in them, and not least on the harness of the horses. No matter how fine the glorious form of the Greek man, even though he were actually half deified, according to Mr. Gladstone's theory of the Greek and Greek art, if he were dressed up and hidden in the hideous and ungainly costume of a modern stableman or fashionable groom. It could matter but little how fine the form of a noble horse if weighted and bound up in a ponderous saddle, almost as big round as the animal itself. No skill in driving, or fitness of action in the horses drawing the chariot could avail, if the said chariot be a lumbering railway van, or a tub on tall wheels, standing higher than the horses themselves. If the object of the annual show at the Agricultural Hall is to show fine animals and good riding and appropriate carriages, as we must suppose it to be,—*in fact*, a *living art show*—then is it indeed difficult to see how it can be worse managed than it is, or how so many incongruous things can be more unhappily brought together. In one thing we may be said to have an advantage over the Greek, and it is in the size of the horses. The Greek horses were rather ponies than horses, and were short and somewhat thickset; about the size, it would seem, of the two beautiful little cream-coloured ponies seen at Islington. Nothing could be finer in form or more graceful in movement, than some of the splendid animals brought together, and seen in healthy life and action at the Islington show. We are of course supposing that the object is not only to encourage the breeding of useful animals, but noble and beautiful ones as well, so that this annual show shall possess an artistic as well as mere utilitarian value. We may, then, fairly say that a number of fine and beautiful horses were seen together, fully equal to any that old Greece could muster at the Olympic Games, and horses as well worth the study of the artist and sculptor as any that Phidias ever saw and copied; and the question then comes, are the material and artificial accessories an advance on, or even equal to, those of the old Greek? They ought most surely to be better; for art may be defined to consist in the making artificial and useful things harmonise with Nature's own works. We must confine ourselves, by way of example, merely to two or three things in this very horse-show not a little remarkable, when contrasted with the old Greek way of doing the same things. Nothing could well be more painful than to witness the mere riding of these noble animals. Instead of, as in Greek days, the riding and guiding man on the back of the animal wearing some clothing consistent with the work he had to do, and easily admitting of

the various positions of the body and limbs necessarily consequent on riding at all, to say nothing of graceful and good riding, the multitude of lookers-on at the Islington show saw only a set of big, awkward, lumbering stablemen, how dressed it is needless to say, except that it would seem to be contrived to combine all that is unsightly and offensive. This is not simply a negative evil, but a positive one. Of the gentlemen riders, of whom one came to so sad an end,—and no wonder to those who saw how things are done,—it is but necessary to say that they are rather worse off than the aforesaid groups, consequent on the not-to-be-disturbed smartness of their dainty attire. Good and safe riding is impossible under such *quarantined* circumstances. Let the reader bear in mind that the great principle on which this annual horse-show is, or should be, based is, that of the encouragement of, and as showing to the public, the finest animals and the best riders, and the most suitable clothing for the purpose of good and safe and graceful riding. If the world ever was "wilted with noble horsemanship," it was in the time of Phidias and his Greeks; and the world may yet see, in the battered remains of the Greek frieze, how it was done,—the men fitted the horses, and the horses fitted the men, and the clothes fitted those who wore them, and were suitable for the purpose. It would seem impossible to over-estimate the importance and interest of this subject, from the certain fact that the great future of fine art must consist in the study and fair representation of actual living occurrences and ways of actual life; and that, before any progress can be made in art, reality must be worth the looking at,—for from reality must it be taken, and from it must it in its primitive origin spring. The finest art that England now possesses is this work of Phidias—little more than man and horse copying, how magnificently executed it is needless to say—the envy and utter despair of artists and sculptors all the civilised and academy world over.

It is obviously impossible, in so slight a notice of things artistic as they go on, to notice in detail all that calls for it; but, as a curious antiquarian matter, it may be noticed that none of the horsemen in the Phidian sculptures wear stirrups. This, in great part, accounts for the wonderfully graceful pose of the riders, the body naturally and without effort accommodating itself to the movements of the animal. What a pity it seems that those who make horse-riding a vocation do not study the Greek horsemen, and hence learn how to ride safely and well; and would it not be a good thing to have put up in a conspicuous place at next year's horse-show a series of panels from the Parthenon frieze by way of a practical lesson and book on how to ride a horse, and too, it may be added, how to hold the reins? The Greek riding was surely the very perfection and acme of horsemanship, but with poor dear scientific and improved John Bull, fresh from the stable or Hyde Park, it seems to consist in the formation of a rigid angle one side the reins, the other the straight stirrup leathers, and the other poised on the unyielding surface of the stiff saddle-seat. Nothing can possibly be worse or more ungraceful and awkward and dangerous. Surely we may learn something, if not all and everything, from the Greek of the days of Phidias; we may learn to ride, and to copy the rider and his horse afterwards on canvas, or in marble. Not a few lessons, too, may be got from studying the costume of the riders and the way in which it is worn, and the aspect of the young men and youths who ride the horses and drive the chariots; for they seem to have been selected for the work, as were the animals, and trained to the work, and to have been naturally fitted for it. It may be interesting and useful to remind the reader who has not thought much about art in this practical light, that what is meant by good riding and natural riding in Greek days may be seen best on the panels from the Parthenon frieze numbered 36, 38, 39, where the action of the youth to the left of the last panel, and immediately behind the foremost horseman, would seem to be the perfection of horsemanship and graceful action, and worth whole volumes as a study of "how to ride." Nos. 41, 42, 43, and 45 may be studied; and in No. 55 may be seen what to do with an unruly animal. The whole series of sculptured panels from Nos. 62 to 74 shows both horses and riders in almost every variety of attitude, for no two of them are alike, and evidences how it was that the old Greek came to be wilted with noble horsemanship. In slabs 26, 28, and 29, and in

80, 81, 82, and less perfectly in some others, so much being defaced, are seen the chariots and the posture of the drivers, and how to hold the reins. It will be observed that the chariots are small compared with our modern gigs and light dog-carts, so that the horses do not seem as if pushed on by the lumbering vehicle behind them, but draw it easily, and without effort. It would, we think, be difficult to name a subject, as far as art is anything in modernism, more interesting and important than this; for, when we recollect that Greek fine art, perfect as it was, sprang from what may be termed almost trifling amusements, such as games, and shows, and processions,—things half despised now-a-days, and which it is thought the improved world is growing out of,—it will be manifest that, to follow with any chance of success in Greek footsteps, we must fain do as the Greeks did, and consent to tolerate "shows," and endeavour to make the best of them, and to select the best animals, as was done at Islington, and the best men, which was not done, and a well-fitting material apparatus for the work. Before the year is over, everybody will be in harness, and in process of "educating," and doubtless a part of this education will consist in the understanding of old Greek history and ways of life and work; for what is education without it? Every ragged boy will have his Homer in his pocket; and Mr. Gladstone says it is the next book to the Bible, and wrote his "Juvénal Mundi" to prove it, and bring Homer into general and common use, and to thoroughly explain the old poet. But we would contend that any ignorant person seeing a Greek "horse-and-man show," even at Islington, would know more about Homer in half an hour than he could by reading all the learned books about him contained in all Germany and England together!

CHILDREN IN BRICKYARDS.

YEARS have passed since we first pointed out the hardships which children employed in brick-yards suffer, the evil condition to which they are exposed, and the demoralisation and physical degradation that follow. More recently, we again drew attention to the subject; and we are glad to find others doing so. Mr. G. Smith, of Leicester, has been moving earnestly, with a view to excite a feeling in behalf of children so employed. He says truly of brickyard workers in Leicestershire and Derbyshire in 1869,—“Some of the boys employed are about eight years old, and each one is engaged carrying from 40 lb. to 45 lb. weight of clay on his head, to the makers, for thirteen hours per day, traversing a distance of fourteen miles. The girls employed are between nine and ten years of age. They are not engaged carrying clay on their heads the whole of the day, but are partly occupied in taking bricks to the kiln. Some of the children are in a semi-nude state. Many of them in Derbyshire work what is called 'eight-hour shifts,' which, reckoning from twelve o'clock on Sunday night to twelve o'clock on the Saturday night following, make a weekly labour of seventy-two hours. To ascertain really what work these children have to do, we must suppose a brickmaker (not over quick in his operations) making 3,500 bricks per day. The distance the boy or girl has to travel with mould, which weighs 4½ lb., and bricks in it 10½ lb., one way, and back to the brickmaker with mould only, is, upon the average twelve yards. This multiplied by 3,500 makes the distance nearly twenty-four miles that each child has to walk, every day, carrying this weight with it.”

We feel strongly that girls should not be employed in brick and tile yards on any account, as the work is entirely unfit for them. To see the girls engaged in such works, and at such unreasonable hours, mixed up with boys of the roughest class, must convey to the mind some idea of the sort of wives, with such training, they will make, and the kind of influence they will eventually bring to bear on society.

“What I am anxious for,” says Mr. Smith, “and have been desiring from the first, is to have all brick-yards under Government inspection; and that on the plan roughly sketched out by me, and not under the Workshops Act, as it is at present in operation, which is a complete failure; from this fact, that the local authorities will not meddle with their neighbours' children, through which cause many times unpleasantness will occur. They think, and rightly too, it is a matter for the Government to take up, and not for them.”

What I am anxious to see brought about is a

better state of things in the brick-yards, with reference to the children's health, education, and character; and this can only be done in four ways:—1. Educate the children before going to work; 2. Do not allow them to commence work before twelve years of age; 3. Limit the hours of labour while at work; 4. Do not allow girls to be employed at brick and tile yards, the work being entirely unfit for them.”

It is to the improvement of the children in all directions that we must look if we would lessen disease and crime, and those in the brick-yards loudly call for immediate rescue.

PRIZES FOR CHURCH DECORATION; CRYSTAL PALACE.

IN June last the directors of the Crystal Palace Company invited an exhibition of church furniture and ecclesiastical art, and offered money prizes for the best floral and other devices and designs for the decoration of churches on festival occasions. Articles were invited under two sections: No. 1 comprised wrought and cast work in wood, metal, or plastic material, embroidery, vestments, and so on, for which no prizes were offered; while Section 2 was to consist principally of floral and other devices, ladies being specially invited to join in the competition; this also included the offer of prizes for reredoses fitted complete with table and appropriate decorations.

The response is much smaller and less satisfactory than was desired; the time given was short, and it is not easy to make such competitions widely known in the right quarters.

At the invitation of the directors, three gentlemen, namely, the Rev. F. G. Lee, Mr. Brett, and Mr. Godwin, examined the articles submitted, and have made the following awards:—

For reredos and table of carved oak, with decorations, the only example submitted, 10*l.* to Messrs. Cox & Son.

For door or window decoration (floral), 5*l.* to Miss Martha Boswell.

For painted texts, with floral embellishments, 4*l.* to Messrs. Cox; and 1*l.* to Mrs. Mary Bromfield.

For illuminated texts, 3*l.* to Messrs. Cox, and 2*l.* to Mr. S. B. Beal.

For floral device, 10*s.* to Miss Boswell.

For a pair of banners, 1*l.* to Mrs. Boulton.

For an illumination, 1*l.* to Mrs. Bellairs.

Praise is especially due to Miss Martha Boswell for her very tasteful inscription intended for the arched head of a door or window, formed with wheat, fruit, and flowers, on a background of straw.

Under Section 1, Messrs. Hart, Son, Peard, & Co., Messrs. Jones & Willis, Messrs. Pratt & Son, and a few other makers, have submitted a number of admirable specimens of metal work.

A bunch of lilies on a stem, apart from the question of design, shows considerable skill in the working of iron.

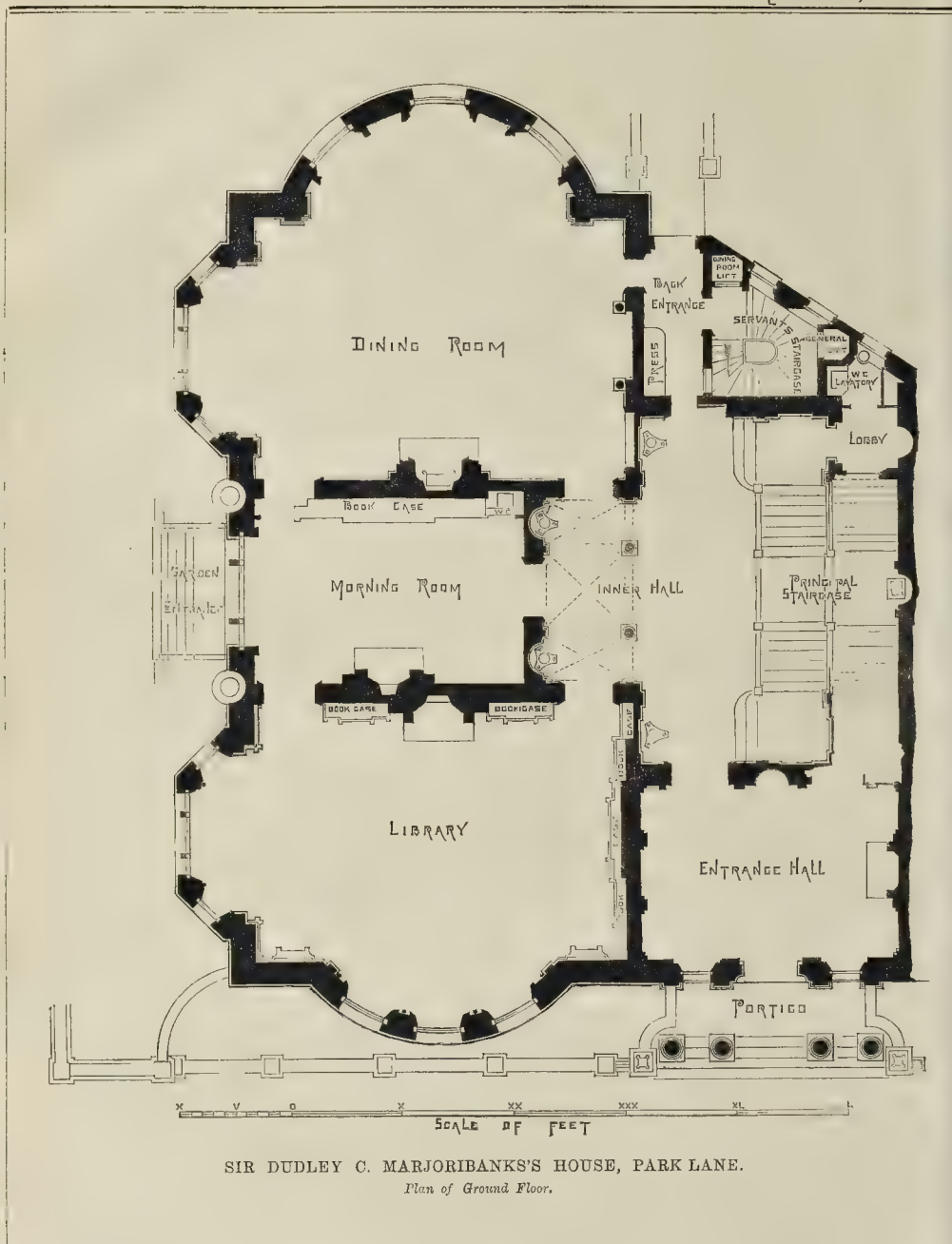
The collection is now open, and will be found in the Medieval Court, at the Tropical end of the building.

SIR DUDLEY COUTTS MARJORIBANKS'S NEW HOUSE, PARK LANE.

THE perspective view of this house, which is now very nearly complete, is taken from the park, opposite Brook-street.

The portico in Brook-street (the columns of which are of red granite) opens into an entrance-hall, 15 ft. 6 in. by 23 ft. 6 in., one door opening on to the principal staircase, 32 ft. by 23 ft. 6 in., the other communicating with the basement story. A groined loggia, 17 ft. by 8 ft., opening off the staircase, gives access to a library, 37 ft. by 27 ft., with two bow-windows; to a dining-room, 38 ft. by 32 ft., also with two bow-windows; and to an ante-room, 24 ft. by 15 ft. 6 in., opening on to a garden-terrace. Beyond the staircase is a sewing-room, with back staircase, coal and dinner lifts, strong-room, W.C., &c.

The staircase is of original design. It consists of double side-flights, landing on a broad space or gallery on the first floor, from which five doors open to an ante-room, 24 ft. by 15 ft. 6 in.; to a north drawing-room, 38 ft. by 32 ft.; to a south drawing-room, 37 ft. by 27 ft. (each having two bow-windows); to a bondoir, 22 ft. 6 in. by 19 ft.; and to the family and back staircase, communicating with the bedroom-floors. The staircase itself is of mahogany, the walls being lined with alabaster and with marbles of two or three different kinds, forming



plinth and dado. Above the drawing-room floor are three stories of bedrooms, consisting of six rooms on the second floor, six on the third floor, and six maid-servants' rooms on the upper floor, with bath-rooms, linen-closets, &c.

A stone staircase communicates with the spacious lead flat with which the upper story is covered, so as to give access for a large party in case of reviews and other displays in Hyde Park. The view from this flat is most extensive,—in fact, a complete panorama.

In the basement story there is a very complete set of kitchen and servants' offices, abun-

dantly lighted, and surrounded on three sides with a spacious area. A distinct building (though in communication with the basement story) stands in the garden, and faces Park-street. On the ground floor it consists of the tradesmen's entrance, a steward's office, and bedrooms for men-servants. On the upper or first floor a spacious and light billiard-room, 30 ft. by 23 ft., with a bay window to the park, 17 ft. by 7 ft., is provided. There is access to this room by a separate staircase, opening from the arcade, and thence into Park-lane by a colonnade.

The materials are red brick, of a deep, rich colour, and Portland stone.

The contractors for the structure were Messrs. J. & C. Panson. The decorative works, which are of a very elaborate character, have been done by Messrs. Wright & Mansfield; the marble, alabaster, and granite work, is by Messrs. Banks & Co.; and the ornamental ironwork, by Mr. Carlisle. The architect was Mr. Thomas Henry Wyatt; and the clerk of the works, Mr. Charles Long. The works have been about three years in progress. We need scarcely say the amount expended is large.



LONDON ARCHITECTURE: SIR DUDLEY C. MARJORIBANKS'S HOUSE, PARK LANE.—MR. T. H. WYATT, ARCHITECT.

HOME COLONIES FOR OUR WORKMEN.

Sir,—The *Builder* deserves, and it will receive, the thanks of every intelligent mind for its consistent efforts to promote the welfare and happiness of the great human family, but more especially of that portion of it usually known as the working class. Belonging as I do to that class, I feel that you have sounded the keynote of a remedy for many, if not most, of the ills to which we are subject, when you point out and enforce, in a manner which seems unanswerable, the desirability of establishing home colonies for our workers. I must confess that it has for a long time seemed to me to be a very great anomaly that a continual and increasing exodus of our producing class should be fostered and encouraged by people in high places.

I have looked on with something akin to alarm at the constant drain which is going on of some of our best and most industrious artisans, farmers, and labourers. These, who are for the most part clever, energetic, and thoughtful, go to help in a great degree to build up the fortunes of a rival country—a country possessed of resources such as are not to be found in any other country in the world; these, our countrymen, are induced, or are driven, as the case may be, to break up their homes, and leave their native land, by prepared to undergo almost any privation on the way so that they may have a prospect of future plenty, and at last end their days in peace, and with no fear of the workhouse looming in the distance.

This, to my mind, suicidal depletion of our best blood is going on at the present time at a greater rate than it has ever been known hitherto. It is the policy of Dr. Sangrado repeated, and will no doubt produce similar results. Living as I do in Liverpool, the point of departure of the greatest number of emigrants from these kingdoms, I have had ample opportunity of criticising and noting the appearance and character of those who leave us, and they seem to me, in most cases, to be those who have in the past most profited by our working men's colleges, our mechanics' institutes, and our science and art instruction, and who only want, what in the result they are almost sure to get, the means and opportunity to distinguish themselves in arts, in arms, or in conduct. I have said that the exodus of our people at this time is immense. Let me prove that by quoting the Government returns of those who have left Liverpool for the United States and Canada during the quarter ending the 30th of June last, and in ships sailing under the Act. The number of English people who went to the United States during the three months was 23,764; of Scots, 1,947; of Irish, 14,852, or a total of 40,563. To Canada went 8,218 English; 2 Scots; 106 Irish, or 8,326 altogether. These make a grand total of nearly 50,000 of the inhabitants of these islands who have left this one port alone, to crowd the cities and till the prairies of that great western land. The whole of these people are for ever lost to this country. With the excessive import duties upon all goods introduced into the States, they no longer consume any of our productions. The protection of native industry is a radical part of the creed of the American, and is carried out almost to prohibition. But, in spite of all, the immigrant prospers. How does he do it? The acquisition of a piece of land is his saviour. There is the grand secret of his prosperity. But at what a sacrifice! Before he can call that land his own, he must renounce his allegiance to his mother country, and swear fealty to his adopted country. And to this only a very small minority object. They feel that their mother country has been in many cases a harsh and unkind mother to them, and they have no compunction in allowing a step-mother to supply her place.

Of late years Britain has been a kinder mother to her poorer children than formerly, but much remains to be done. The poor must possess the land together with the rich. The tendency of all modern improvements has been the other way—the poor have been improved off the face of the land altogether. Such must no longer be, or Britain will sink in the scale of nations. The spectacle must no longer be presented, as it is at this moment in Cheshire, of a lord of the manor trying his utmost to oust from their holdings poor men, who, having taken possession of a piece of waste land each forty years ago, have reared their homestead, and made the wilderness a garden. Rather let every lord of the manor gather together the poor inhabitants of his dis-

trict and portion off to each so much of the now waste land as may become by their labour sufficient for their maintenance. Such, or something like it, is being done in what are called new countries; why cannot it be done here? We should then keep in their native country those who would produce us food and be retained as customers for our manufactures. They would also be retained as taxpayers. We must remember, what those who are left here are not likely to forget, that a huge debt hangs over the people who inhabit this country, the interest of which must be regularly met, and directly or indirectly those who remain must pay the share of those who leave.

All honour, then, I say, to the patriot who points out the way to increasing prosperity and happiness for the hardy sons of toil. Very few of us, I am sure, in our hearts desire to be expatriated from our native country; and if land can be found—as I am sure it can be found, for I have walked on foot the length and breadth of this country, and have been grieved to see so much given up to the fox, the rabbit, and the furze—let means be adopted, and that soon, by which the now idle hands may be brought into contact with the lands which, now waste, will by their labour become as a garden and blossom as a rose. Let "Back to the land!" be our cry.

E. G.

"WHO VOLUNTEERS FOR PALESTINE?"

Sir,—I read your paragraph last week under the above heading with great interest, and think you would oblige more of your readers than myself by a little more information on the same subject. When is it intended that the expedition should start? And how long will it probably remain abroad? Two or three years between the ages of twenty and thirty form an important period of a young man's life, while the architecture of the Holy Land is not the most important for an architect's study, being more interesting in an archaeological than an architectural point of view. Nevertheless, "the advantage of visiting foreign parts," and in the company of the Palestine explorers, is a matter of considerable importance, and I shall be glad to have further information through the medium of your columns. I enclose my name and address.

T. L. W.

POSITION OF CATHEDRAL ORGANS.

Sir,—Might not the vexed question of the place of a large organ be settled by this plan—namely, by burying it bodily in a grave in the middle of a church? Let a well be made, circular or elliptical on plan, for strength of abutment to earth, 20 ft. deep, or 50 ft. if necessary, for great pipes to stand upright in it, built in Portland cement to keep out damp; and with valves connected with heating apparatus, so that the contents of the well should be sufficiently warmed without being baked (a thing that is not always secured when an organ stands too near to the slates of a roof). Place the organ in this grave or well, and round the month of the well place a screen like that round Henry VII.'s tomb. If at the entrance to the cathedral choir, let there be two such open screens, with a bridge over the well between, to give access to the choir.

If the sound rises too directly upwards, and loses itself in the roof, place a sounding-board at an angle of 45 degrees, to deflect it into a horizontal direction.

G. M.

"DRAINING WITHOUT SCIENCE."

Sir,—A Clod's modesty equals his knowledge of science and drainage. I have to thank him for setting me right, after demolishing my conclusions to his own satisfaction. At the same time, may I ask him what drainage is, how it affects land, and why it is undertaken? At present my ignorance seems hopeless. I always, until I read his remarkable letter, believed that drainage was intended to get rid not only of stagnant surface water, but also that under the surface—not to distribute it. He says drainage distributes it, preserves it from evaporation, and therefore keeps the land more moist. Wise! A wet subsoil is that which should be prevented as keeping land cold, and "cold land," as a farmer will tell him, is a rotter of roots.

What a grand thing drainage would be for the desert of Sahara, if his science is not at fault. Mr. "Clod," good farming and true science will

not admit of you: clods should be pulverized: you have only to try to teach the first clod-hopper who crosses you, and that hopper will assuredly come down a crusher.

I repeat that steps will soon have to be taken, and this matter of land drainage must enter into the consideration of commissioners appointed for the purpose, and who will have to act in concert with those investigating the question of water supply for cities, and the purification of rivers. As I before stated, my idea is that land drainage has had much to do with evils which have assumed such tremendous proportions. No doubt, obstacles will be thrown in the way, and arguments adduced, to prevent proper steps being taken; but common sense only will see that the matter is set right, and that at no late date.

M. U.

GLASS AND PUTTY.

Sir,—We should be glad to know what is the best method of separating the putty from glass and wood where the glazing is forty years old.

F. & Co.

DELAYED DECISIONS.

Sir,—If a competitor for the Tadcaster workhouse complaints at the length of time it takes to decide that competition, I think competitors for the offices of the Halifax Permanent Benefit Building Society may justly complain. The drawings were sent in on the 8th day of February last,—thus five months ago,—and yet to my knowledge nothing decisive has yet been arrived at. Can any reader of the *Builder* inform me what has been done up to the present time, and the cause of so much delay in deciding this lengthened competition?

A COMPETITOR.

HOUSE AGENTS' ACTIONS.

SWAINE AND ANOTHER v. FAULT.

In this case, tried in the Queen's Bench, Guildhall, before Mr. Justice Blackburn and a Special Jury, the plaintiffs are auctioneers and estate agents at Nottingham. The defendant is the son and trustee for Lady George Faulstich.

The action was brought to recover 185l. 5s. commission on the sale of the house, No. 36, Phillimore Gardens Kensington, to Mr. Carl Siemens, the electrical engineer, at the sum of 7,360l., but which sale afterwards went off, as it was said, in consequence of the defendant requiring additional terms to those originally proposed.

The defence was that inasmuch as the sale of the house was never completed, the plaintiffs were not entitled to be paid anything.

Mr. Siemens was called to prove that he was ready and willing to purchase on the terms originally asked by the defendant, but that further terms were asked, which he was not willing to agree to, and that the purchase went off in consequence.

Mr. Justice Blackburn directed the jury that where an agent found an undoubtedly responsible person ready to purchase on the terms upon which the agent had instructions to sell, the agent was entitled to his commission or such a sum as the jury, under all the circumstances of the case, considered a fair and proper remuneration for the service rendered, notwithstanding the sale should afterwards go off on account of any alteration in terms on the part of the vendor.

The jury, without retiring from the box, found a verdict for the plaintiffs for the full amount claimed—185l. 5s.

THE ARCHITECT OF ST. BOTOLPH'S, BISHOPSGATE-STREET.

Sir,—In the very pleasant "Provincial Impressions of Town Structures," in your number of the 9th of July, the tower of St. Botolph's is alluded to as "not certainly one of the happiest of Wren's inspirations."

Wren died 26th February, 1723, ætate 91, ("Parentalia," 1750, p. 347). St. Botolph's was begun 10th April, 1725.

G. James has been credited with this church; also J. James (of St. George's, Hanover-square, and Greenwich Church); it is, however, commonly attributed to James Gold, whose name appears in the Act of Parliament bearing on the erection (Godwin's "Churches of London," vol. ii.).

As the church is a fair example of a well-proportioned, sober structure, creditable to its author (even if not a brilliant performance), and characteristic of its time,—even contrasting not unpleasantly with some clever church-architecture of our time,—it would be a satisfaction to continue to Gold such memory as his "one ewe lamb" may secure him.

The church is hardly in Wren's manner, and he has a most ample store of honours attached to his name.

Is anything known of Gold? The notices of him seem very scanty.

S. F. C.

Slate Pencil Cutting by Wholesale.

Among Yankee ingenuities, there is said to be a machine at Rutland, Vermont, which cuts slate-pencils at the rate of 20,000 in an hour.

CHURCH-BUILDING NEWS.

Mansfield.—The church of St. Peter, at Mansfield, has been re-opened; the nave having undergone a restoration. The *Notts Guardian* says of this restoration:—"In place of the gloomy nave and aisle, loaded with frowning galleries, the worm-eaten floors and pewing, and the general sense of oppression from damp, exhalation, and want of air, there is an interior that surprises us by its light and loftiness. Those pillars which were pared down at the capitals, scored and notched with pew sides, cut nearly to the heart by gallery-bearers, form now an arcade of singular grace and elegance, while the removal of an organ-gallery has revealed a rugged tower-arch, which adds a massiveness and solemnity of effect. When the whole building is thrown open, the rows of columns seen from the western door through the eyebrow of this arch, will be the prettiest view of the interior. In the roofs, all that could be used of the old oak has been retained, with great advantage in tone, but the construction is entirely new. The restoration of the pillars has been a work of some anxiety. Messrs. Cave & Halliday, of Grantham, have well executed this part of their work." The windows have in all cases been re-glazed by Mr. Henry Aves, of Mansfield, who has also provided the work on the roof and the gas-fittings, the pendants coming from Messrs. Hardman, of Birmingham. The new nave requires a fitting pulpit, font, and prayer-desks. The restoration is under the care of Mr. William Smith, of London, architect.

Heigham.—The foundation-stone of the Church of St. Philip, Heigham, has been laid, by the mayor of Norwich, the members of the corporation, with their regalia, supporting his worship, and a large number of persons being present. The building committee selected the design of Mr. E. Power, of London, and from this architect's plans the church is being erected; Mr. J. Nelson, of Necton, being the contractor; Mr. Childs, of Norwich, a sub-contractor for the stone and masonry work; and Mr. Cooper, of London, clerk of the works. The contract is divided into three parts,—one for building the church, with the tower, as far as the roof, 3,262*l.*; the second, for the remainder of the tower, 757*l.*; and the third, for the addition of a spire, 568*l.* Thus the total cost is 4,587*l.* The church, which will accommodate 800, or, in case of pressure, 1,000 persons, is designed in the style of architecture which obtained in France during the thirteenth century. It is faced with flint, with Bath stone dressings, and will consist of a chancel and a nave, with north and south aisles, a tower being erected at the north-west end. The dimensions of the building are as follow:—nave, 95 ft. 6 in. by 24 ft. 2 in.; and in height, 50 ft.; chancel, 28 ft. 6 in. by 20 ft. 6 in.; tower, 130 ft. in height, and 18 ft. wide at the base. The roof will be of open deal timber, stained, with stone moulded corbels, and the nave arches will be supported by clustered columns having carved capitals. There are to be three entrances to the building, one at the west end through an open narthex or western porch. To the chancel, where there are to be two open arches, and on one side of it an organ-chamber and a vestry, there is an apsidal termination, and it was upon the cord of the apse the foundation-stone was laid. The church will be seated with deal benches, the pulpit being also of carved wood, and the passages are to be paved with Staffordshire tiles.

Worcester.—The sum of 13,256*l.* 11*s.* has now been subscribed to the fund for the restoration of the cathedral.

DISSENTING CHURCH BUILDING NEWS.

Delston.—The memorial stone of Delston Baptist Chapel has been laid. The cost will be about 4,500*l.* The new chapel will be erected in the Venetian style of architecture. It will be 70 ft. by 42 ft. There are to be vestries, school-rooms, &c.

Darlaston.—The memorial stones of a new Wesleyan Chapel, which is to be erected at Darlaston-green, have been laid. The land on which it will be erected, consisting of 693 square yards, was presented to the trustees by Mr. George Perry, ironmaster, Darlaston. The chapel will be in the Byzantine style of architecture. It will be very plain, having no embellishment or ornament of any kind either inside or out. It will be 30 ft. by 40 ft. with vestry at the back,

over which an orchestra will be built. The outside will consist of blue brick, with stone dressings. It will be fitted up to seat 150 on the ground floor. The cost of erection will be 692*l.* 14*s.* 6*d.* Towards this sum Mr. Brogden has subscribed 100*l.*, and Mr. Horton has promised another 100*l.* Mr. Loxton, of Wednesbury, is the architect; and Messrs. W. Trow & Sons, also of Wednesbury, are the builders.

Aberystwith.—A new English Wesleyan chapel has been opened at Aberystwith. The building, which stands at the junction of Queen's-road and Newfoundland-street, is built from the designs of Mr. W. H. Spaul, architect, Oswestry. The gable end of the transepts has four plain pointed, single-light windows, divided by light columns, with carved capitals, above which are two windows in the Gothic style, with tracery heads. The side gables are somewhat similar to the front, with the exception of the window above the arcade being a rose-window. The internal dimensions are 65 ft. long, and 45 ft. wide, and the roof, which is of open timber, is 27 ft. high. The pews are all open, with a few free seats at the end of the building. There are no galleries, but provision has been made so as to allow of their erection, should they be required. The chapel will accommodate on the ground-floor 450 adults. The extreme height of the spire, which is pierced by single-light windows, from the ground to the fane is 90 ft. The walls are built with a local stone of a dark colour, relieved with Bath dressings. Along the sides are carved circles, displaying flowers, horns of plenty, &c. The basement is entered by steps at the back of the building, and consists of a school-room, 40 ft. by 32 ft.; also two large classrooms and a minister's vestry. Entrance into the chapel is obtained by a staircase from the vestry-room. The contract for the building was 1,700*l.*, but we believe that amount has been slightly exceeded. The contractors were Messrs. J. & D. Jones, of Llwynog.

Coldingham.—The new United Presbyterian Church has been opened. The style is Early English, from a design by Mr. W. J. Gray, architect, Berwick-on-Tweed. The walls are of white freestone. The tower is surmounted by a slated spire. Seating has been provided for 550. The inner roof and fittings are of deal, stained and varnished. The principal three-light window is filled with stained glass, which, with a bell for the tower, is the gift of a friend of the clergyman.

Burslem.—Since the closing of the Wesleyan chapel, considerable additions and improvements have been made in the old building, one of the principal additions being a complete extension of the west front, executed in stone with polished surface. The building committee, from a limited number of architects' designs, selected those sent by Mr. George Woodhouse, of Bolton-le-Moors, whom they employed to make detailed drawings for the erection of the new portion of the structure. This the architect has accomplished. The chapel is situate at the south-east corner of Swan square, having a large open space in front. The principal and most distinctive feature is a large portico covered by a pedimental roof; it stands upon a projecting base, and is approached by a central flight of steps. On each inner side stands a cylindrical column, with entasis shaft: projecting pilasters are run up at the back and side of these columns. On the outer angles of the facade and ends are coupled and engaged pilasters, all of them built to a uniform height. These shafts and pilasters have decorated Corinthian capitals carved with cauliculus ornament olive-leaves, and curvilinear abacus moulding. Immediately over the external pilasters are two turrets, having moulded base supporting angle pilasters and finials, betwixt which are louvred openings, serving when completed as extractors of the vitiated air from the chapel. From a circular stone base rise dome-shaped roofs with raised ornaments, covered with lead, and crowned on the summit with circular wrought-iron cresting and gilded terminals. The whole height from the ground-line to the top of the ironwork is 64 feet. From the entablature resting upon the capitals springs a semicircular central vaulted arch, the crown of which rises within the tympanum of the pediment. The new vestibule is divided at each end by pitch-pine screens and double-action folding swing doors, the upper portions glazed with polished plate-glass. The corridors are formed by the extension of the vestibule, and contain the circular staircases, forming direct access to the gallery; they are made of pitch pine, protected by balusters, handrails, and carved newels.

Divisional folding doors are fixed on the landings for the prevention of draughts, and the aisles of the ground floor within the chapel are approached from the vestibule through inner inclosed porches fitted with double sets of hinged moulded doors, polished and varnished. Separate entrances from the corridor are provided for a large number of free seats. Under the direction of the architect, the aisles of the chapel, vestibule, corridors, and front porch have been paved with patterns of encaustic tiles, manufactured by Messrs. Malkin, Edge, & Co., of Burslem. In place of the partially decayed wood pillars under the gallery, new iron pillars have been substituted. The architect's plans included new pitch pine seating for the whole of the ground floor, the removal of a pilastered gallery front, and the substitution of a pilastered and panelled front. These, however, from want of funds, are for the present delayed. Under the direction of Mr. Woodhouse, Mr. Langley, of Burslem, has coloured the walls and ceilings; and it is a part of his contract to paint and varnish the whole of the woodwork. The contractor for the whole of the work, including new gutters to the roof, is Mr. John Stringer, of Sandbach. The corner-stone of the new extension was laid on the 2nd of March last. The principal portion of the central front is built of Hollington stone, and the side portions of stone from the Grinshill quarries. The stone carving has been executed by Messrs. Stuart & Simpkins, of Manchester. The total cost of the additions and alterations, it is expected, will amount to about 3,000*l.*

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Arundel (Sussex).—The foundation-stone of the new church, lately alluded to in the *Builder*, has been laid by the aged Bishop of Troy, at Arundel, in the presence of the Duke of Norfolk, by whose munificence the church is to be erected, and of thousands of spectators. It is within a stone's throw of the Established Church, and will be one of the most splendid edifices in the south of England. The position it occupies is one of great beauty. The cost of its erection is estimated at 50,000*l.* The foundation-stone (which Messrs. Myers, builders, who have taken the contract, had in order for the ceremony) was laid with all that imposing ritual which characterises the Romish Church. The length of the nave is to be 123 ft.; the width, 33 ft. The chancel will be 60 ft. long, exclusive of the ambulatory in the rear. The side aisle will be 95 ft. long and 12 ft. wide, and the north and south transepts will be 27 ft. each in length. The chapels (north and south) will be 33 ft. long and 13 ft. 9 in. wide, and there will be a small chapel in the transept, 13 ft. 4 in. by 13 ft. There are to be six altars, the chief altar to be in the chancel. The shape of the building will be cruciform, and it will be constructed in the Geometric style of Gothic architecture. It will be principally of Bath stone, and the tower and spire will be altogether 260 ft. in height. The architects are Messrs. Hansom & Sons, of London. The clerk of the works is Mr. Joseph Seed, and the foreman, Mr. Addis.

Woodhouse.—The *Sheffield Independent* states that the services in connexion with the opening of the temporary chapel of St. John of Beverley have been held at Handsworth Woodhouse. The chapel, which is a wooden structure about 50 ft. by 18 ft., has been built by Mr. John Turner, joiner, Woodhouse, and Mr. J. Greenwood, mason, at a very moderate cost. The congregation, which is composed mostly of poor people, have liberally contributed.

SCHOOL-BUILDING NEWS.

Ashton.—During last year the inhabitants of Ashton-under-Lyne were surprised to receive a gift of 10,000*l.* from a gentleman who, although a native, was not even known or remembered except by the older inhabitants. 5,000*l.* were devoted to the Ashton Infirmary, and a sum of 1,000*l.* was handed over to each of the churches for educational purposes. The donor, Mr. Robert Higgins, early in life left Ashton for Australia, where he amassed a large fortune, and ultimately he returned to his own country, settling down in Liverpool as a merchant. The gentleman died very shortly after handing the money over to the bankers. The money so given to Christ Church has been appropriated to building a new branch school—a want long felt in the district in which

the building is to be erected. The Earl of Stamford and Warrington has given the site for the new building, and the foundation stone has been laid. The building has been designed by Mr. John Eaton, architect, Ashton, and will take the form of a parallelogram, two stories in height. On each floor there are to be school-rooms, 60 ft. by 30 ft., and two class-rooms, each 15 ft. square. The style of architecture is Early English.

Elm-land.—The corner-stone of the new Wesleyan Schools here has been laid. The schools are from plans by Mr. B. W. Jackson, architect, Halifax, and will have a plain front and circular-headed windows. The rooms are 63 ft. by 30 ft., the ground-floor containing two class-rooms, infants' school, kitchen, and other accommodation; the upper room contains large school-room and four class-rooms, and the cost of building is estimated at about 600*l*.

Tower-hill, London.—The foundation-stone of a Roman Catholic School has been laid by Princess Marguerite of Orleans in the neighbourhood of Tower-hill. It is proposed to add an industrial school. The building will cost 2,500*l*, and the site 1,600*l*. The architect is Mr. John Young, junior, of Mincing-lane.

Newcastle-on-Tyne.—The foundation stone of new schools in connexion with Bath-lane Church, was laid on Thursday in last week. The schools are to be built on a site adjoining the chapel, and will accommodate 400 children. The buildings will be entirely of stone, and are in the Gothic style of architecture, harmonising in character with the church adjoining. The principal elevation, facing Locke-street, is to present a large centre block, marked by gables at the east and west ends. The building will be lighted by large three-light windows in the centre block, together with four-light windows in the end gables. Admission will be gained to the building through a porch situated at the north-west angle, and by two side doors situated at the east end of the building. The centre block is to be surmounted by a bell turret, rising about 34 ft. above the level of the ridge. The school-room, which internally measures 85 ft. by 55 ft., will be divided into centre and side aisles by cast-iron columns, used as supports for the roof, the portion of the roof over the aisles being open, and the roof over the nave wagon-headed in form. The height from floor to ceiling will be about 30 ft. Class-rooms, suitable for the requirements of the school, are to be provided at the east end of the school-room. Lavatories, water-closets, and other conveniences are to be provided at each end of the school-room. The space unoccupied at the east and west ends of the building will be used as a playground. Ventilation is secured by cast-iron ventilators in the sides of the school, and by ventilators fixed in the roof of the main building. The building will be warmed by hot water from the heating apparatus in connexion with the church. The cost of the building will be about 3,000*l*. Mr. T. Oliver, of Newcastle-on-Tyne, is the architect: he was also the architect of the church.

Halifax.—The Stannary Congregational Church School has been opened. It is in the Gothic style, and has been erected under the superintendence of Messrs. Horsfall, Wardle, & Patchett, of Halifax. It will seat from 800 to 900 persons. The basement story is devoted to class-rooms, approached by a wide corridor down the centre. The upper floor is devoted to the large room, 85 ft. 6 in. by 42 ft., having galleries at each end, with vestries underneath. The gallery fronts are picked out in crimson cloth. The principal room is roofed in one span; the arched principal hammer-beam roof rising to a height of 38 ft., with a clear span of 42 ft. The building is heated by hot water.

St. Martin.—The foundation-stone of new day and Sunday schools, in connexion with St. Mary's Church, Moston, has been laid. The schools, which are being built on a plot of land adjoining the north side of the church, have been designed by Messrs. Price & Linklater, of Manchester, and the works are being carried out by Messrs. Herd & Eadie, builders, Chesterham. The building is to contain boys' and girls' schools and one class-room, and it is to accommodate altogether 140 children. It is to be of banded brick, with Gothic brick heads to the windows, and ornamental stone heads to the door, and in style the building will be in character with the church. The total cost of the building and land will be about 500*l*. The plans were laid before the Privy Council, and approved by them.

Hereford.—The foundation-stone of new schools, for the parish of All Saints, has been

laid by Lady Saye and Sele, with some little ceremonial. The fund was opened by a lady parishioner with 500*l*, and other subscriptions soon followed.

PROVINCIAL NEWS.

Spennymoor.—The opening of a covered market for the use of the inhabitants of Spennymoor and district has been celebrated. The dimensions of the market are:—Total length, 160 ft.; width, 37 ft. 6 in. There are fourteen shops within the building, and the open space in the centre affords room for the erection of a couple of rows of portable stalls, and there are also a number of shops outside. Attached to the market, at the west end, will be a town-hall, in course of erection by a private company. This latter will supply a great public want in the shape of a reading and news room, suitable also, for the holding of entertainments, with a cloak-room, and an apartment for holding the Local Board meetings. The total estimate for the market was 1,000*l*, but the contracts which have been let out only amount to 89*l*. The building has been erected from the plans of Mr. Byers, surveyor to the Local Board. The market will be used for the ordinary purposes of a meat, fruit, and vegetable market.

Bakewell.—The corner stone of a new vicarage house has been laid at Bakewell. The old dilapidated house has vanished. The style of architecture is Gothic, with limestone facings and Stanton gritstone dressings, the interior to be of pitch pine finishings. The architect is Mr. A. Waterhouse, of London and Manchester; the clerk of the works is Mr. J. Dickson. The contractors are Messrs. Thos. Clay & Son, of Manchester. The entire cost of the new vicarage, adjacent buildings, &c., will be upwards of 6,000*l*.

Olley.—The new Mechanics' Hall, the foundation-stone of which was laid on the 19th of June, 1868, is now approaching completion. The stonemasons, joiners, and slaters have all nearly completed their respective contracts, and little remains to be done save the plastering and painting. It is expected that the building will be completed and the new hall opened by the month of November next. The sum of 3,000*l*, subscribed by the members and friends of the institute, has been nearly all expended upon the land and buildings, and it is calculated that an additional sum of 800*l*, or 1,000*l*, will be required in order to complete the building and to furnish it. The building will afford ample accommodation for carrying on the educational work of the institute.

STAINED GLASS.

Hongkong Cathedral; and Trinity Church, Shanghai.—A stained glass window has just been completed for the cathedral at Hongkong by Messrs. Javers, Barrard, & Westlake, of London. The donor is Mr. John S. Lapraik, who erects it as a memorial of his late uncle, Mr. Douglas Lapraik. It is intended to be substituted for the existing east window of the cathedral. The window forms five tall lancet lights, surmounted by a rose. The subjects are the Ascension and Crucifixion of our Lord, with some "types." The upper parts of the lancet are occupied by the Virgin Mary and twelve Apostles witnessing the Ascension of our Lord, whose figure, surrounded by angels, fills in the rose-window. Below, and extending across the whole of the centre part of the five lights, is the Crucifixion. Under this, again, are four "types" of a true sacrifice, the Sacrifice of Abel, of Abraham, of Melchisedek, and of Noah; the central opening being occupied with a type of the Ascension, viz., Elijah being taken up to heaven in the fiery chariot. The subjects are all executed from designs in the style prevalent in the large churches of Flanders and Germany during the sixteenth century. The cost of this window, we understand, is about 1,000*l* sterling. The same firm have supplied several windows for the new Trinity Church at Shanghai. These include one to the memory of the late Mr. Fitzroy; another in memory of Mr. Lawrence; and a third, of Mr. Pritchard, R.N. A larger one is now being constructed for the same church as a memorial of the late Rev. John Hobson, many years Consular Chaplain at Shanghai.

St. Peter and St. Paul, Cork.—There is at present on view at the Edinburgh and Leith Stained Glass Works, Leith, a series of windows, just executed by Mr. Barnett for the church of St. Peter and St. Paul, Cork. The windows are four in number, each consisting of two lights,

with tracery above; and, with a fifth window which has already been placed, will complete the apsidal chancel for which they are intended. Each light is designed, so to speak, in five stages. In the lowest is a panel containing the figure of an angel displaying a scroll; next comes the full-length figure of a saint; then another panel, with an angel; over that a second full-length figure; and, finally, a third angel, occupying a panel in the cusped top. The work throughout is ruby glass, variegated with conventional foliage, the latter being supported from stalks, which run up the sides of the lights; and, with their twisting and interlacing, define the various stages and panels. The full-length figures, numbering sixteen in all, comprise the four doctors, — Jerome, Gregory, Ambrose, and Augustine, — with twelve celebrated saints. Each is represented standing in a foliated niche, the attributes by which they are respectively distinguished being indicated. The tracery forming the head of each window consists of two quatrefoils and a large multifoil. The multifolios are occupied with designs representing the Nativity, the Resurrection, the Ascension, and the Descent of the Holy Ghost; while the quatrefoils are filled in with ornament corresponding to that introduced in other parts of the windows.

FROM SCOTLAND.

Edinburgh.—The Edinburgh Infirmary Act, 1870, having now received the Royal assent, the acting committee of contributors to the rebuilding fund have resolved to hand over to the infirmary managers the proceeds of the public subscription. It appears that twenty-nine subscribers, representing 1,605*l*, have asked to have their money returned in consequence of change of site. The amount of contributions is 76,831*l*, and there is a sum of 63,684*l* in hand. The total funds available for the rebuilding of the infirmary are roughly stated at 160,000*l*. The plans, which have been prepared by Mr. David Bryce, architect for the new infirmary buildings, have been submitted for the inspection of the managers. The design may be generally described as consisting of five or six parallel blocks of building, three stories in height, and about 70 ft. apart, running north and south from Lauriston to the Meadows. These ranges are intersected about midway by the present Watson's Hospital buildings, which are to remain, and by connecting corridors running east and west. The main architectural front is to look northward—that is to say, towards Lauriston.

Leith.—The foundation-stone of a church now being erected for the congregation of St. John's Free Church, Leith, has been laid by Dr. Wilson, Bombay, the Moderator of the General Assembly of the Free Church of Scotland. The church and tower, which are now being erected on a site fronting Charlotte-street and Quality-street, will, including the purchase of the site, involve an expenditure of fully 6,000*l*. The larger portion of this sum has been already contributed, and about 1,000*l* in addition have been promised. There is to be a separate fund for the tower. The church, which is being erected from plans prepared by Mr. John Paterson, architect, Edinburgh, will be well suited for the congregation, notwithstanding the difficulties which the site presents. The limited frontage towards Quality-street has necessitated the adoption of a peculiar arrangement of the church with the offices and hall required by the congregation. The church will be oblong in form, and will have galleries on three sides. On the north side the pulpit will be placed, the wall behind which will be thrown back, and form a three-sided recess or bay. The building will be lighted by windows in the north and south walls, and the ceiling will be finished and ornamented in plaster. The church will be seated for 906 persons, and provision will be made for 150 additional sittings when special occasions require this extra accommodation. The style of architecture to be adopted will be Gothic, and the most prominent feature in the building will be the tower, which is designed to be square in plan, and will rise to the height of 150 ft. to the terminal point. The tower will be surmounted by an open crown formed with eight moulded ribs, meeting above the centre, and supporting an octagonal terminal and carved finial. The ribs of the crown and the terminal are ornamented with crockets. The main entrance will be placed in the lower stage of the tower at the corner of Quality-street, and there will also

be an entrance at the east end of the building. At both entrances there will be wide stairs leading to the galleries. The Charlotte-street front will have five windows, which will light the area of the church, and an equal number will light the gallery above. The windows have pointed arched heads, and moulded jambs with shafts having bases and carved capitals; and the upper part of the lower set will be filled in with plate tracery. The windows above will be larger than those beneath. They will have double sills, and will be divided by a centre shaft, which supports the tracery with which the heads of the windows are filled. The wall between the windows will be strengthened by buttresses. A string moulding will run down the front of the building beneath the wall head, and rise as a moulded skew to gables, ornamented with finials, formed over the upper windows. Between the gables the wall will be ornamented with sinkings and a moulded cope. The east entrance-door will be of similar design to the first tier of windows. It will be placed in a stair tower which projects from the front line, and will rise to the same height as the walls of the church, and being separately roofed, will form a termination to the design at that part of the building. The west gallery stair will be thrown outside the tower, and form a feature in the entrance towards Quality-street. The remainder of this elevation will consist of the session-house, vestry, &c., above which will be placed a hall for church meetings. The contractors are,—for the mason work, Mr. Bell; joiner work, Mr. Saunders; slater work, Mr. Anderson; plumber work, Stuart & Ray; plastering work, James Sutherland.

Linthgow.—The plans for the proposed alteration of the parish church, which have been drawn up by Mr. Mathieson, of Her Majesty's Board of Works, Edinburgh, have arrived at Linthgow. The alterations contemplated are much the same in design, although perhaps differing somewhat in details, as those carried out some time ago in Glasgow Cathedral, and, if gone on with, will make as great a metamorphosis of the old church of St. Michael at Linthgow as the improvements in Glasgow have made of the cathedral there. The plans will be open for the inspection of the public for a short time, after which it is expected that steps will be taken to have them carried out.

FROM AUSTRALASIA.

South Australia.

Adelaide.—The building which has been erected for accommodation of the local and Insolvent Courts, on the south side of Victoria-square, is a creditable addition to the architecture of the city of Adelaide. The style is of Anglo-Italian character, and it has frontages both to Victoria-square and King William-street. The plans were prepared in the Colonial Architect's office, and the works were carried out by Messrs. Brown & Thompson, of Adelaide, at a total cost of about 13,600*l*. The new police-court and station adjoin that portion fronting to King William-street, and were built, in 1868, by Messrs. Croker & Lawson.

New South Wales.

Sydney, &c.—The interior of St. Andrew's Cathedral, Sydney, may be said to be completed, although the exterior is still deficient in its towers and pinnacles. The whole building, from the west door to the east window, measures 157 ft., and is 61 ft. across the width. The interior width, measured through the transepts, is 110 ft. The height of the aisle-walls is 30 ft., and of the clearstory 50 ft. There are in all sixteen pillars: two of large dimensions carry the unfinished western towers, four in the centre of the building are to carry the lantern, and the other ten support the ordinary arches of the clearstory. The roof of the building is open and of timber, painted in bright colours, with gold stars on an azure ground, and has a number of ventilators, procured from England, which appear to keep the temperature very regularly even when a large congregation and many lights tend to increase it. There is, however, some difficulty felt here, as in all places where large crowds assemble, in procuring sufficient fresh air without the annoyance of draughts. The *Illustrated Sydney News*, of October 27th, gives a double-page engraved illustration of the interior of this cathedral. The architect is Mr. Blackett. —A free public library has been inaugurated in Sydney by Earl Belmore.—Rocky Mouth

School, Chatsworth Island, on the Lower Clarence, about forty miles from Grafton, consists of school-house and teacher's residence, built of weather-boards, plastered within, and has a frontage of 70 ft., with a depth of 35 ft.—A new bridge has been erected at Maitland, connecting it with the village of Durham, on the opposite bank of the Hunter River. It is built on iron tubes resting in the bed of the river. The tubular piers were cast in lengths of about 6 ft., and are bolted together and filled with concrete.—At a meeting of the Royal Society of New South Wales, Mr. Charles Mayes, C.E., read an elaborate paper on "The Water Supply of Sydney from George's River and Cook's River." Mr. Mayes is of opinion that Sydney and its suburbs may be supplied equally well, both as to quantity and quality, and at much less cost, than by the level scheme proposed by the commissioners of water supply, from either the George's River alone, or the George's and Cook's Rivers combined. He cannot agree with the proposal to abandon the present water supply; all that is required being an additional supply to keep pace with the increasing demand.

New Zealand.

Oamaru.—The foundation-stone of the Masonic Hall, Oamaru, New Zealand, was laid with Masonic honours on the 8th of December, 1866, by the Right Worshipful John Hyde Harris, Provincial Grand Master of Otago, E.C., the eastern half of the building having been first completed under separate contract, and the western at a later date. The building has been carried out in strict accordance with the original plan, from the designs selected in open competition, of Mr. E. A. Lawson, architect, Dunedin, and under his superintendence throughout. The building covers an area of about 120 ft. by 40 ft. The façade is divided into eleven bays, and in the upper story contains the same number of windows, flanked on either side by projected Corinthian pilasters, with foliated capitals, in the decoration of which the laurel and acanthus leaves are principally used. In the lower story eight of the bays are occupied by windows, and the remaining three by the entrances to the building. These doorways are surmounted by projecting balustrades, borne on coupled carved trusses, the main central doorway, which gives access to the hall, being flanked by double columns, and supported by relieved circular Doric columns, detached, the entrance-doors being considerably recessed. The building is finished with the characteristic cornices and enrichments of the Corinthian style. The hall occupies the whole of the upper floor of the eastern wing. The hotel portion of the building, known as the Star and Garter, is a commodious structure. The whole of the building is constructed of the Oamaru stone, a material now rising in general estimation as a building stone. When first quarried (which it can be practically in blocks of any reasonable size up to nearly 50 ft. in length), it can be sawn and planed and worked almost as readily as the sculptor's clay, but it hardens on exposure, and has a certain power of resistance and endurance.

Books Received.

The Manual of Colours and Dye Wares. By J. W. SEATER. London: Lockwood & Co. THE object of this alphabetically arranged manual is to furnish, in brief space, an account of the chemical products and natural wares used in dyeing, printing, and accessory arts,—their properties, their applications, the means of ascertaining their respective values, and of detecting the impurities which may be present. Information of this kind seems to be needed both by makers, dealers, and consumers. The author relies more upon strictly chemical methods, as distinguished from rule-of-thumb procedures. He believes there are means of forging those outward features of colour, touch, taste, &c., upon which so many rely. It has not been any part of the plan of the book to give receipts either for the manufacture of colours and mordants, or for their applications in dyeing and printing, as there are already books which profess to do so. Few persons, however, are so generous as to reveal to the world the best and newest processes in their possession, as the author remarks, and he himself is no exception to the rule.

In the preface the author alludes to an alleged discovery, which is to rival the tar colours in brilliancy and purity.

VARIORUM.

The new number of the *Quarterly* will be read through by nearly all who take it up, the whole contents having a general interest. Mr. Disraeli's "Lothair" is laughed at from beginning to end; Lord Stanhope is corrected for erroneous opinions concerning the reign of Queen Anne; and the Police of London are justly praised for the admirable way in which, as a rule, they do their duty. Much learning is shown in the article on Professor Max Müller's translation of the "Rig Veda," the sacred hymns of the Brahmans, and some in the notice of Baths and Bathing-places, ancient and modern; while the article on letter-writing, though incomplete, is full of pleasant gossip. We fully agree with the writer in his leaning towards female fingers and female instinct, when estimating the relative cleverness of the sexes in the practice of this delightful art. The power should be striven for by both sexes. Every one may attain the ability of writing, at any rate, a neat, sensible letter in legible hand, and all young people should view the attainment as a necessity. "I think it is as improper and indecorous," says Lancelot's Pericles to Aspasia, "to write a stupid or a silly note to you, as one in a bad hand, or on coarse paper. Familiarity ought to have a worse name, if it relaxes in its attentiveness to please." —In *The Journal of the Royal Historical and Archaeological Association of Ireland* Sir W. R. Wilde is giving an exhaustive account of Gabriel Beranger and his labours in the cause of Irish art, literature, and antiquities from 1760 to 1780. —"Lectures on Economic Science." Longmans & Co. These lectures were delivered under the auspices of the Committee on Labour and Capital appointed by the Social Science Association. Two of them are by Dr. Hodgson; one on "The True Scope of Economic Science," and the other on "Competition." There is one by Mr. F. Hill on the "Identity of Interests of Employers and Workpeople;" another on "Reciprocity," by Mr. R. H. Hutton; and one by Mr. W. S. Jevons on "Industrial Partnerships." It makes a valuable little book. —"The Civil Service Orthography: a Handy Book of English Spelling." By E. S. II. B. London: Lockwood & Co. One would think that candidates for the Civil Service must at least be able to spell; but it is too true that there are not a few exceptions in which the free and easy mode of spelling adopted by our ancestors still prevails; but as ours are not the days in which either a Shakespeare or any one else in respectable society would be allowed to give an elegant variation even to the spelling of his own name, candidates for the Civil Service must get over this little difficulty in the outset, and learn to spell with accuracy. The author of the book under notice appears to address it specially to candidates for the Civil and other services, as well as for the use of schools. It contains some curious rhymes, in the "Thirty days hath September" style, which may facilitate a knowledge of those irregular variations of spelling in words of similar sound but different meaning which abound in the English tongue. Thus:—

"Spell t-a-r-e, tar, that grows;
But t-e-a-r, tear, rend things or clothes.
Spell tear with a, 'the tear of grief that flows;
Tear with an i, one tier of many rows."

Miscellanea.

Royal Archaeological Institute.—The annual congress is this year fixed for Leicester, and the inaugural meeting will be held in the Guildhall of this town on the 26th inst. The president will be Lord Talbot de Malahide. On Wednesday, under the Presidency of Archdeacon Trollope, the section of antiquities will be opened with visits made to the Mediaeval churches of the town, the Norman hall of the ancient castle, the "Newark" of the Castle, numerous Roman pavements, the noted "Jewry Wall," &c. On Thursday there will be excursions to Ashby-de-la-Zouch, Tutbury, Tamworth, and Polewath, and the Mayor's *conversations* in the evening. On Friday excursions to Kirby Muxloe Castle, and a *conversations* in the Museum. On Saturday visits will be made to Groby, the ruins in Bradgate Park; Ulverscroft Priory; Beaumanor, where Mr. Herrick has invited the party to luncheon; and to Grace Dieu. On Monday the excursion will be to Melton Mowbray. In the evening a *conversations* in the Museum.

Value of Property.—Messrs. Spearman recently offered for sale at the Crown Hotel, Lowestoft, a farm situate at Kessingland, comprising house, garden, orchard, barn, &c., together with 90a. 2r. 30p. of productive arable and pasture land, 66 acres of which are exempt from great tithes, and freehold, with the exception of 7a. 1r. 0p. After a spirited bidding, the property was knocked down to Mr. Robertson, of Mutford Bridge, for 4,750l.—On the same day, Mr. George Turner submitted to competition at the Suffolk Hotel, the absolute reversion to a sum of 300l., secured by mortgage upon freehold property, situate in Lowestoft, payable upon the death of a lady residing in this town, now in her 74th year. It was purchased by Mr. T. S. Allerton, at 160l.—Messrs. Bruton & Knowles sold by auction, at Westbury-on-Severn, the freehold property belonging to the late Mr. Roan, when, after a sharp competition, the lots were sold at the following prices:—Lot 1—2a. 2r. 2p. of pasture orcharding, 530l.; Mr. Sergeant purchaser; Lot 2—2r. 5p. of pasture orcharding, 110l.; Mr. Mayo, purchaser; Lot 3—1a. 32p. house and orchard, 300l.; Mrs. Roan, purchaser; Lot 4—2a. 8p. of pasture orcharding, 290l.; Mr. Gough, purchaser; Lot 5—1a. 2r. 27p. of pasture orcharding, 235l.; Mr. Ellis, purchaser; Lot 6—1a. 3r. 26p. of pasture, 150l.; Mr. John Wintle purchaser. At the same time Messrs. Bruton & Knowles also sold by auction a piece of pasture land at the Dinney to Mr. Holtham, for 570l., and 2 acres of land near thereto to Mr. Vaile, for 185l., and a wharf, to Mr. Coleman, for 80l. The sale was numerously attended.

Extensive Ironworks at Sunderland.—New ironworks to be established on the Hylton Castle Estate are in progress of erection. A tall chimney-stack, which is to reach the ultimate height of 200 ft., is being reared on the river-bank. Occupying an extensive area round the stack are masses of solid masonry, of brick and concrete, to form beds for the ponderous machinery which will be employed in the new works, and nearer the river bricks are being manufactured from a bed of clay. The initials on the chimney indicate that these are the ironworks of Messrs. Oswald & Co. Some portions of the foundations are now ready for their superstructures of machinery, which are being constructed principally in Staffordshire, and will be erected under the superintendence of Mr. Appleton, formerly of Mr. Richardson's works at Hartlepool. The cost of the new works and plant, when completed, will probably not be far short of 100,000l.; and, though at first they will afford employment for 400 men, it is probable that ultimately not fewer than 1,800 ironworkers will be employed there. This will involve the settlement of a large population and the creation of a new town round the Farm House. Already, in a field to the west, a commencement has been made with houses for the manager and foreman, and seventy workmen's cottages; but this number will, no doubt, have to be increased very considerably. The ironstone will be brought round from Cleveland in screw steam vessels, and, as at Jarrow, delivered right into the works. For this purpose a sufficient depth of water must be provided by dredging.

A New Steam Sawmill.—A new sort of circular sawmill has recently been started in one of the forests in the vicinity of Worcester, United States, and is described in the *American Railway Times*. The saw (some 5 ft. diameter) is placed directly upon the crank-shaft of the engine, thus doing away with the expensive and troublesome belt usually employed. The cylinder is placed vertically directly above the crank, at the top of a pedestal-like frame, and works a 7-in. piston upon a 5-inch crank, by means of the usual connexions. A 600 pound fly-wheel is placed upon the same shaft with the saw. This is a plate-wheel, and is turned all over, to insure perfect balance. The improved log-carriage and setting device is employed, and has a sufficient variety of feeds to answer all emergencies. This is said to be a simple and satisfactory portable sawmill.

Proposed New Cottage Hospital, Marlborough.—It is proposed to erect a new cottage hospital here, the present building being insufficient in size. The plans are immature, but we understand the design is to afford accommodation for twenty beds. The cost is estimated at 3,000l. Towards this amount, the Marquis of Ailesbury has, besides giving the site, started a subscription list by the donation of 1,000l. The marchioness has added 300l.

The Knightsbridge Barracks.—On a vote of 700,400l. for the works and repairs of the cavalry barracks at home and abroad, Colonel Gray complained of the item of 5,000l. for the repairs of Knightsbridge Barracks, and moved the reduction of the vote by 4,000l. Mr. Cardwell intimated that he would withdraw the item altogether. Lord Bury wished to know whether the idea of removing Knightsbridge Barracks had been abandoned. Mr. Cardwell said that he did not know that such a proposal had ever been entertained. Sir J. Pakington said that, when in office, he had after much consideration, determined that the barracks should remain where they were, as the objections to them were made chiefly by the house-owners in the vicinity who had built their houses after the barracks had been erected. He wished to know whether the reduction of the vote meant that the barracks were to be given up. Mr. Cardwell only wished to place himself in the same position in that respect as his predecessor. He had no plan on the subject, and, until one was adopted, he could not meet the wishes of the inhabitants of that neighbourhood. The vote, having been reduced by 5,000l., was then agreed to.

Fires.—The galvanising factory at the Chatham Dockyard caught fire recently, in consequence of the composition boiling over. The building was entirely gutted, but the fire was extinguished before it had communicated with the large store adjoining. The damage is about 500l.—Two fires have occurred in Glasgow, which have, unitedly, caused damage to the extent of 20,000l. The first happened in a dyewood-mill, which was rapidly burned to the ground, together with its valuable contents. The other, and most serious, occurred in the stores of William Connal & Company, the most extensive storekeepers in Glasgow. The department in which the fire broke out contained immense quantities of tar, logwood, guano, and sulphur, which burned for a long time with great fury. The greater part of the tar found its way into the Clyde, and completely inundated a large part of Anderston Quay. There were upwards of 8,000 barrels of tar, and several tons of guano, wholly or in great part destroyed. The smell of the sulphur and tar, and the smoke from the fire, were seen and felt nearly over the whole of the city. In both cases the property is covered by insurance.

Steam Rollers.—The Surveyor to the Poplar District Board of Works, in presenting his usual reports, specially called attention to a report on one of Messrs. Aveling & Porter's steam rollers for consolidating the roads. The report states that nearly 57½ tons of material were consolidated per day. The maximum quantity of broken granite and Bombay stone used in one year throughout the district is 4,723 tons, which would employ the roller in question 82½ days, or a little more than three months in the year. The surveyor is of opinion that for the present it is better to hire than to purchase the roller. As to the advisability of using it, he said there could not be two opinions. The short experience they had had of its utility was very satisfactory, and the additional cost over the old system of repairing is not 1½d. per square yard, which would be more than compensated for when the work was once done, over and above the decided advantage experienced to the carriage traffic, and, he might add, to the public generally. The chairman suggested the sending of a communication embodying their experience of the use of steam rollers to the Commercial-road Trustees Board, and the clerk was desired to carry out the suggestion forthwith.

New Drinking Fountain, Malvern.—A boon has been bestowed on the neighbourhood of the Wyche by the presentation of a public drinking-fountain, by Mr. W. H. Ryland. It has been named "The Royal Malvern Well," on account of the patronage accorded by her Majesty to a school recently erected at Bewdley, by the present benefactor of the Wyche. The spring yields seven gallons per minute, which is pronounced to be equal in purity to any in the range of the hills. Monday last was the day fixed for the opening ceremony.

International Exhibition Building.—Messrs. Lucas, having taken the contract for the formation of a subway from the International Exhibition-buildings, and beneath the Cromwell-road, to the South Kensington Station of the Metropolitan District Railway, have applied for leave from the Kensington Vestry to reconstruct in iron the public sewer in Alfred-place West.

Lead Poisoning.—It is well known that workers in lead factories are apt, in the course of time, to suffer from lead poisoning; in fact, a constant series of patients proceed from the lead factories to the hospitals of London. In France the evil effects of the mineral were usually prevented by giving the workpeople a draught containing dilute sulphuric acid, but it has now been discovered that regular potatoes of milk have an equally good effect. Dr. H. Schwarz, of Breslau, has discovered (re-discovered, we might more properly say) a means by which the portion of the lead forming the interior surface of the water-pipe may be converted into an insoluble sulphide, the natural consequence being that the water passing through will be as free from contamination as if glass were used. He merely passes a strong solution of the sulphide of an alkali through the pipe to be acted upon, and the process is completed. This solution, which is either a sulphide of potassium or of sodium, is used at a temperature of about 212° Fahr., and is allowed to act upon the metal for from ten to fifteen minutes. It is stated that in practice a boiling solution of caustic soda and sulphur is found to answer every purpose.

Metropolitan Contractors' Benevolent Institution.—The annual festival in support of this charity was held on Wednesday at the Crystal Palace, under the chairmanship of Mr. James Scully, one of the vice-presidents. The institution was founded in 1864, for the relief of persons overtaken by distress who have occupied the position of metropolitan contractors and master town-carmen. In the former category are comprised parochial dust and water contractors and contractors for building excavations; and in the latter, the conveyors of produce of any kind from one dock or locality to another. Mr. James Brady has liberally given three acres of well and pleasantly-situated freehold land for the erection of an asylum for the reception of distressed, aged, and infirm members of the trade or their widows; and liberal promises of contributions have been made towards the building fund. The invested relief capital now amounts to upwards of 2,000l.; and when it shall have turned 3,000l., it is intended to entertain proposals for the election of pensioners.

The Proposed Bradford Town-hall.—The strip of land between Chapel-lane and New Market-street is at last to be utilised. The Town Council have unanimously agreed to accept the tender of Messrs. Ives, of Shipley, to erect the Town-hall, within two years, for a sum of 43,730l. The amount of the contract exceeds the sum which the council had decided to expend on the building by nearly 4,000l.; but the contract was agreed to without demur, and practically without discussion; the reason being that the additional expenditure is, in point of fact, a piece of true economy. The council have agreed to pay 3,200l. additional in order to obtain the best building stone, and 775l. to substitute oak for deal as the material of the wooden fittings of the structure.

The Thames Embankment.—Lord O. Fitzgerald, Controller of the Household, appeared in the House of Commons on Tuesday with an answer from her Majesty, in reply to the address moved for a few nights ago by the member for Westminster (Mr. W. H. Smith). The reply stated that as no public office could be erected on the Thames Embankment or elsewhere without a vote of the House of Commons, the House had in itself the power of preventing any such erection. It was clear, therefore, that the Government would not move such a vote unless they were of opinion that it was likely to be received with favour.

New Infirmary for Halifax.—It was decided, at a meeting of the governors of the Halifax Infirmary, that a new building, in which to carry on the operations of the charity, should be erected on a fresh site. This decision secures the noble donation of 10,000l., which Sir F. Crossley promised, on condition of the enlarged institution being erected on a new site. The spot selected for the building is on the west side of the People's Park, the gift of Sir F. Crossley; and the expenditure upon the land and building will be about 16,000l.

Clock Tower for Grimsby.—The Mayor of Grimsby, Mr. E. Bannister, has offered to erect an ornamental tower, with a clock, in the new market-place. A plan of the tower is to be laid before the council for their consideration.

Drinking Fountains and Cattle Troughs.—A drinking-trough for cattle, with a fountain for human beings attached to it, the gift of Miss Burdett Coutts, has been opened at Columbia Market, by the Metropolitan Drinking Fountain and Cattle Trough Association. Another trough, the gift of Mrs. Hambleton, has just been erected by the same association on Haverstock-hill; and Mr. H. Edwards, M.P. for Weymouth, has also signified his intention to present one, and has requested the secretary to procure a suitable site.

Catalogue of the Dickens Sale.—Messrs. Field & Tuer have published a catalogue of the pictures and other works of art, and no art, which belonged to the late Mr. Dickens, with the names of purchasers and the prices realised,—the "enormous prices" as they correctly enough say on the cover. It will form an interesting evidence of the popularity of the regretted author at the time of his death.

New Harbour Works and Improvements in the Isle of Man.—At the sittings of the Man Legislature held lately, it was decided that the sum of 14,200*l.* should be expended upon the purchase of the site, and the erection and furniture of new court-houses and house of assembly at Douglas; and the Lieut.-Governor was requested to procure plans from different eminent architects, the old plans being entirely discarded.

Report on Liverpool Privies.—Dr. French has submitted a report on this subject to the Liverpool Health Committee, in accordance with an order of the town council. The report treats of the situations in which such places are, in his opinion, dangerous to health, with the reasons for such opinions. The report was ordered to be printed, and distributed to the members of council.

An Odd Challenge.—Mr. Nathan Hughes, who painted, in twenty-four days, a picture of the "Riot in Hyde Park," has challenged the members of the Royal Academy "to paint with him against time the best work, combining rapidity and excellence, for 1,000*l.* a side, before any large general audience empowered to decide the question by ballot." He can scarcely expect that the challenge will be accepted.

Building Land, Kensington.—The *Kensington News* says,—"The residence of the late Sir James South, bart., the Observatory, on Campden-hill, will very likely pass into the hands of the speculative builders. The grounds attached to the house are very beautiful and rather extensive. The site is computed to be worth 12,000*l.* an acre."

Lightning Conductors.—A few days ago lightning struck the powder magazine of Santo-Spirito at Venice, where 600,000 lb. of that material are stored. The conductor received the electric discharge, and its top was literally melted away, and the whole length twisted, but no further damage was done.

Buxton Improvement Company.—The plan of the walks and proposed erections for the new gardens at Buxton, has been submitted to the directors by Mr. Milner, of Norwood, the landscape gardener engaged to carry out the works. The plan, for a few days past, has been on view at the Court-house, Buxton.

The Institution of Civil Engineers.—The list of members, corrected to July 1, 1870, and just now published, contains the names and addresses of 16 honorary members, 702 members, 999 associates, and 177 students; making together 1874 of all classes.

Petersfield Cottage Hospital Competition.—The committee found much difficulty in selecting the best from thirty-nine plans sent in, and ultimately referred to Mr. Hardwick, of London. He chose one by Mr. Hunt, of Duker-street, Adelphi.

Stockport Borough Surveyorship.—The local finance committee, it appears, have increased the borough surveyor's salary from 120*l.* to 150*l.* per annum, other piecemeal resolutions in reference thereto having been rescinded.

Exhibition of Holbein's Works at Dresden.—It is intended to hold at Dresden, from the 15th of August to the 15th of October next, an exhibition of the works of the great painter, Hans Holbein.

Hinton Martel Church.—We are asked to state that the carving work in this church was entrusted to Mr. Bolton, and was executed under his direct superintendence.

TENDERS.

For mansion, with billiard-room, stabling, with rooms for coachman and gardener, also fences, entrance-gates, &c., at Putney. Mr. Herbert Ford, architect:—

Gammoun	48,189 0 0
Easton	8,385 0 0
Bumpson	7,874 0 0
Healaba	7,906 0 0
Williams	7,882 0 0
Biese	7,848 0 0
Chappel	7,741 0 0
Dave	7,695 0 0
Hobson	7,657 0 0
Atis	7,322 0 0
Corder	7,465 0 0
Brass	7,385 0 0
Scrivener & White	7,178 0 0
Adamson	7,169 0 0
Tongue (accepted)	6,978 13 6

For six cottages at Leytonstone, Essex, for Mr. John. Mr. Iron, architect:—

Brown	21,230 0 0
Wood	1,320 0 0
Moyle	1,165 0 0
Hall	1,154 0 0
Pacher	1,135 0 0
J. Brown	1,075 0 0
Johnston	1,050 0 0

For two cottages at Leytonstone, Essex, for Mr. McDonald. Mr. Iron, architect:—

Brown	2,395 0 0
Picher	390 0 0
Hall	372 0 0
Wood	369 0 0
Moyle	350 0 0
Johnston	333 0 0
J. Brown	320 0 0

For cottages in Pevensey-road, Eastbourne, for Mr. Edward Hurst. Mr. Robert K. Biesley, architect:—

Bradford	2,750 0 0
Ford & Altwood	730 0 0
Francis	710 0 0
Hepple	697 0 0
Housman	668 0 0
Skinner (accepted)	610 0 0

For building Dunwood Lodge, Leek, Staffordshire, for Mr. Thomas Hulme. Messrs. K. Scrivener & Son, architects. Quantities supplied:—

Stringer	43,031 0 0
Fuskes	3,458 0 0
Wade, Brothers	3,450 0 0
Masthead	3,369 0 0
Brindley & Crutchlow	3,350 0 0
Whitcomb	3,350 0 0
Bennett & Cork	3,320 0 0
Bowden (accepted)	3,185 0 0

For villa residence at Newcastle-under-Lyme. Messrs. R. Scrivener & Son, architects. Quantities supplied:—

Barton & Maudslayi	4,092 0 0
Harvey	889 0 0
Bowden	840 0 0
Harvey & Co.	838 0 0
Bennett & Cook	830 0 0
Bailey	815 0 0
Barlow (accepted)	780 0 0

Accepted for refreshment-rooms, Hanley Hotel. Messrs. K. Scrivener & Son, architects:—

Bennett & Cook	£213 0 0
Bickley	162 12 0

For workshops, Haverstock-hill, for Mr. Nott. Mr. J. R. Francis, architect:—

Taylor	4,930 0 0
Hayley	747 0 0
Richard	719 0 0
Hoodham	690 0 0
Bell	660 0 0

For additions to house, Thames-passage, Poplar, for Mr. John Garford. Mr. J. W. Morris, architect:—

Heiser	£233 0 0
Sheffield	162 0 0
Allen	163 0 0
Abraham	179 0 0
Harrop & Goulder	174 0 0
Atherton & Latta (accepted)	163 0 0

For alterations and enlargement of Porres House. Mr. John W. Morris, architect:—

Emor	£1,170 0 0
Watts	1,168 0 0
Kilby	1,167 0 0
Wicks, Bangs, & Co.	1,149 0 0
Abraham	1,137 0 0
Reed	1,097 0 0
Hill, Reddell, & Waldram	907 0 0
Sheffield	973 0 0
Atherton & Latta (accepted)	920 0 0

For works to Episcopal Chapel and Girls' School, Palestine-place, Cambridge-heath, for the London Society for Promoting Christianity amongst the Jews:—

Cole	265 0 0
Manley & Rogers	835 0 0
Newman & Mann	584 0 0
Carter & Son (accepted)	477 0 0

For new police cells, Town-hall, Brighton. Mr. P. C. Lockwood, borough surveyor. Quantities by Mr. Lamb down:—

Lockyer	£2,400 0 0
Cheerum	2,300 0 0
Nightingale	2,273 0 0
Blackmore (accepted)	2,219 0 0

For alterations to 6, Holland Park, W., for Mr. Arthur Cohen. Messrs. Salomons & Jones, architects. Quantities by Mr. Bagg:—

Williams	£402 0 0
Rudkin	311 0 0
Jackson & Shaw	310 0 0
Whitaker	265 0 0
Sharpton & Cole (accepted)	263 0 0
Parsons & Telling	235 0 0

For aquarium to be built at the Crystal Palace, Sydenham, for the Crystal Palace Aquarium Company (Limited). Mr. C. H. Driver, architect. Quantities supplied:—

Hywater	£7,690 0 0
Nixon	7,390 0 0
Brass	6,984 0 0
Higgs	6,929 0 0
Chappell	6,783 0 0
Jackson & Shaw	6,640 0 0
Ferry	6,577 0 0

For four houses in Blue Anchor-lane, Bermondsey, for Messrs. Courage. Mr. Geo. Elkington, architect:—

Falkner	£1,295 10 0
Ken	1,195 0 0
Hollers	815 0 0
Deavin (accepted)	875 0 0

For erecting two shops in the High-street, Harrow-on-the-Hill, for Mr. W. Winkley. Messrs. E. Habershon & Brock, architects:—

Haynes	£1,345 0 0
Manley & Rogers	1,243 0 0
Woodbridge	1,698 0 0
Falkner	1,668 0 0
Crisp	994 0 0
Kindell (accepted)	910 0 0

For the erection of St. Matthew's Vicarage, New Kent-road, Newington, Surrey, for the Rev. W. Y. Thomson. Messrs. Henry Jarvis & Son, architects:—

Gammoun & Son	£2,267 0 0
Marland & Sons	2,232 0 0
Downs	2,198 0 0
Tarrant	2,186 0 0
Rider	2,181 0 0
Colla	2,164 0 0
Cooke & Green	2,143 0 0
Thompson	2,132 0 0
Kenshaw	2,106 0 0
Shepherd	2,026 0 0

For furnishing and carpeting the board-room, and fitting Venetian blinds throughout the building of the new Poplar District Board of Works Offices, from the designs and specifications of Messrs. Hills & Fletcher and Messrs. Arthur & C. Hardacre, joint architects:—

For *Furnishing Board-room.*

Cutting & Son	£350 0 0
Gibbs & Son	489 10 0
Stubs & Son	485 4 0
Rough & Son	408 13 8
Atkinson & Co.	450 0 0
Fox & Co.	449 0 0
Barnes & Co.	437 0 0
Coleman	437 0 0
Lamcraft	390 0 0

For *Carpeting Board-room.*

Shores & Co.	278 0 0
Shaw & Son	156 17 0
Mough & Son	156 9 8
Gibbs & Son	152 17 0
Fox & Co.	152 0 0
Atkinson & Co.	147 14 0
Barnes & Co.	146 15 0
Davis	146 10 0
Coleman	145 0 0
Crane & Co.	143 0 0

For *Fitting the Windows throughout the Building with Venetian Blinds.*

Fox & Co.	77 17 6
Coleman	69 0 0
Atkinson & Co.	65 3 10
Crane & Co.	64 10 0
Gibbs & Son	63 5 0
Barnes & Co.	62 14 0
Askans & Son	67 4 0
Fox & Co.	66 10 0
Simpson	64 13 4

NOTICE.

By the gracious permission of her Majesty the Queen, we are enabled to announce that the next number of the *Builder* will contain a Double-page View of the Interior of the Royal Mausoleum, Frogmore.

TO CORRESPONDENTS.

F. C. B.—C. R.—W. W.—L.—J. B.—J. C. M.—Mr. P. T. M.—A.—T. V.—J. A. F.—R. I. A.—B.—J. T. B.—J. B.—J. G.—T. W. G. W. W.—J. A. B.—B. W. A.—J. W. M.—Another of the Four—W. D. (not easy to prove a negative).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, but not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the author.

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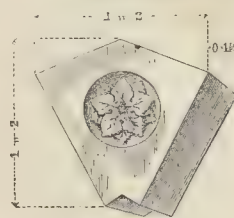
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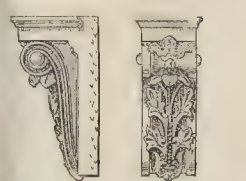
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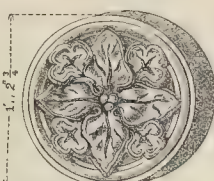
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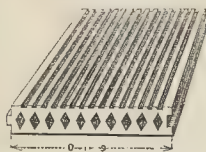
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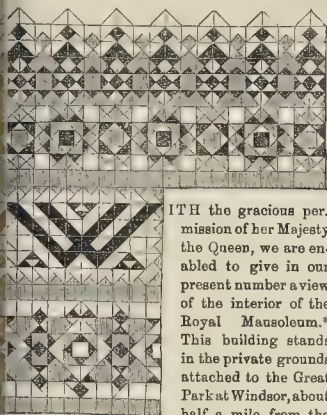
Specimens on view at the Architectural Museum, Conduit-street, W. and at the Crystal Palace.

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The Builder.

VOL. XXVIII.—No. 1434.

The Royal Mausoleum, Frogmore.



WITH the gracious permission of her Majesty the Queen, we are enabled to give in our present number a view of the interior of the Royal Mausoleum.* This building stands in the private grounds attached to the Great Park at Windsor, about half a mile from the south terrace of the

castle, and about 50 yards from the mausoleum erected by her Majesty to the memory of the late Duchess of Kent. In a former volume of *The Builder* we have given a view of the exterior of this building, and a plan; so it will be unnecessary now to do more than state that it is a cruciform edifice surmounted with an octagonal lantern, and is in the Romanesque style of architecture. As will be seen from our view, the interior does not partake of the same style, but is carried out in the Italian Cinque-cento style. Not only are the exterior and interior of the building in different styles of architecture, but they are also the work of different architects; for, while the exterior is entirely the work of Mr. Humbert, the interior is carried out mainly from the designs of Professor Ludwig Grünert, of Dresden, whose work upon Italian decoration is well known. In the beautiful arabesques which adorn this monumental chapel he has shown how thoroughly he has mastered the principles of such decoration.

The monument in the centre of the Mausoleum is from the designs of the late Baron Marochetti, and the recumbent figure which occupies the left-hand space (when standing at the foot of the monument) was the last work of that sculptor. We need hardly state that this effigy represents the late Prince Consort. The space to the right hand is left vacant, and that may very long continue to be so is the earnest prayer of every Englishman. The tomb itself is a genuine "sarcophagus," wrought out of a single block of grey granite. We believe that this is the largest block of granite in existence without a flaw in it. The body of the Prince rests within it, and upon the left-hand side of the monument is the following inscription:—

"FRANCIS ALBERT AUGUSTUS CHARLES
EMANUEL,
DUKE OF SAXONY, PRINCE OF SAXE-COBURG AND GOTHA,
PRINCE CONSORT;
SECOND SON OF ERNEST I., REIGNING DUKE OF
SAXE-COBURG AND GOTHA;
BORN AT THE ROSENTHAL, NEAR COBURG, AUG. 28, 1819;
MARRIED FEB. 10, 1840, TO
VICTORIA,
QUEEN OF GREAT BRITAIN AND IRELAND;
DIED AT WINDSOR DEC. 14, 1861."

The sarcophagus is a beautiful specimen of dark grey (or blue) Aberdeen granite from the Cairngall quarries. Owing to the unusual magnitude required, great difficulty was experienced by Messrs. Macdonald & Field, of Aberdeen, in procuring two suitable blocks. Many were examined and rejected, and many months elapsed before stones fit for the purpose could be found.

The sarcophagus rests upon a base of polished black marble from Belgium, which the late King had promised as a contribution to the Mausoleum, and which was subsequently presented by the present King of the Belgians.

At each angle is a large angel of bronze, also executed by Marochetti.

The walls of the Mausoleum are lined with costly and beautiful marbles, except the spaces which are occupied by the arabesques before mentioned. The dado is chiefly Sienna marble; the walls red Portugal marble (Rouge Royal), a portion of which was a present from the King of Portugal to the late Prince Consort. The columns, strings, and cornices are white statuary marble. The capitals, bases, and other enrichments are of bronze gilt. The pendentives supporting the lantern are decorated with mosaic pictures, and the vault of the lantern is painted blue, and powdered with gilt stars.

The angels attached to the vaulting ribs are likewise gilt. The vaults of the projecting portions, or transepts (if we may so call them), are divided by richly-moulded ribs into panels filled with bas-reliefs and paintings illustrative of different passages in the Scriptures. In this portion of the building the texts describing the subjects are in German; everywhere else they are in English. The ends of these wings or transepts will eventually be decorated with large paintings; at present only one is completed.

The wing opposite to the head of the monument contains a small altar of marble and mosaic, and above it is the only executed picture, representing the "Resurrection." The pavement of the chapel is a very fine example of mosaic work, composed of many kinds of marble very highly polished. The great niches below the pendentives will contain statues of four prophets, but at present only two of these are executed. The windows of the lantern and wings of the building are filled with glass in patterns, and the armorial bearings of the Saxe-Coburg family; and the windows of the aisle or passage which connects the wings of the building are adorned with rich stained glass: each window contains a large figure of an angel playing some musical instrument. All the glass was executed in Munich. The arabesques and other painted decorations were carried out under the management of Mr. Homann. The bases and capitals of the pilasters, and the bronze gilt enrichments in the cornices, and elsewhere, are by Barbedienne, of Paris, as are also the four large pendent lamps.

The sketches and drawings for every part of the building were systematically submitted to the Queen; who always took the greatest interest in them, continually making important improvements and throwing out very valuable suggestions; in these her Majesty was often seconded by the Crown Princess of Prussia and the Princess Alice. One of the paintings on the ceiling (that in the entrance transept or chapel) is the work of the Crown Princess.

The Prince of Wales contributed very handsomely to the cost of the edifice.

Our engraving is from a drawing made on the spot at the command of her Majesty.

NOTES FROM THE SHOWS AT OXFORD.

THE Royal Agricultural Society of England may be presumed to be an English institution, embracing "the principality," and not excluding either Scotland, which has its own more venerable society, "the Highland and Agricultural," or Ireland, which has also its Royal Agricultural Society. The English society is not designed to be either metropolitan or local, but national. The peripatetic character of the shows of the society, and of the Royal Horticultural Society of England, which usually travels with it, makes these exhibitions local, to a considerable extent, and gives them a different local complexion each successive year. Last year, for instance, a number of Manchester and Lancashire nobility, gentry, and merchants, who are enthusiastic and successful cultivators of flowers, fruits, and other vegetable productions, took advantage of the Exhibition being in their immediate neighbourhood, and exhibited. So it was also with traders and producers of other kinds. Exhibitors do not care to encounter such distances as between Oxford and Newcastle-on-Tyne, or between Plymouth and Leicester. This year, as on former occasions, local exhibitors have been numerous and fairly successful in various classes.

Arrived in Oxford, the first of the exhibitions in order of the visitor's progress, if not in importance, was that of the Royal Horticultural Society, kindly and very suitably accommodated in the grounds adjoining the Radcliffe Observatory, which is reached by St. Giles's street, for part of its length, one of the widest streets in the United Kingdom. The beauty of the garden grounds in front of the Radcliffe Infirmary, close to the entrance to the exhibition, could not fail to arrest the attention of every visitor.

As on former occasions, the exhibition embraced flowers, fruits, plants, and vegetables, arranged in numerous classes in a number of spacious tents and marquees. One of the canvas coverings, circular, and 100 ft. diameter, with appropriate height, was supplied by Mr. Unitt, of London, and contained a splendid collection of ornamental plants. Three other tents were 270 ft., 250 ft., and 170 ft. long respectively, by 30 ft. wide. There were other four smaller tents. In addition to the exhibits under canvases, there was a good display in the open air of horticultural appliances in glass, iron, and earthenware. There were 120 classes, for which one, two, and three premiums were offered by the Royal Horticultural Society, and about half as many for members of the Royal Oxfordshire Horticultural Society. The local amateurs and professional growers held their own very creditably in the competition, and took a fair proportion of the prizes. One of the guardians of the tents informed us that when some of the exhibitors saw what Oxford exhibitors had to show, they retired from the competition. The statement was received *cum grano salis*.

It is at the Horticultural as at the Agricultural Society's show, every year, irrespective of the locality of the annual exhibition, York or Yeovil, Plymouth or Peterborough; a number of laudably ambitious and enterprising exhibitors appear in force, to maintain their ground, if not to advance their reputation; and so accordingly appearances were put in and prizes taken in numerous instances by Messrs. B. S. Williams, of Upper Holloway; C. Turner, Slough; Cole & Sons, Withington, Manchester; Bell & Thorp, Stratford-on-Avon; J. House, Peterborough; Rollison & Sons, Tooting; J. B. Mapplebeck, Woodfield; Moseley, Birmingham; Veitch & Sons, Chelsea; and other nurserymen. The Mayor of Oxford gave numerous prizes, and his own gardener took about as many, and as much, although not exactly in the same classes. The classes were, upon the whole, well represented, and some of them very fully; among these, the grapes in ferns, British and foreign; the beauties of the floral world in roses (for which Mr. Turner was conspicuous), carnations and pinks, pelargoniums, petunias, &c., and the *dolies* in orchids. The gardeners of the gentry fought a good fight, and shared the honours, for the best fruits as well as flowers. Messrs. Jackman, of Woking, Surrey, had it all their own way with their fine hardy clematises.

In the open many interesting exhibits demanded attention, among which may be named the very large display of admirable articles, taken from stock not manufactured for show, by Messrs. Gill & Green, of Oxford. It would be impossible within our limited space even to indicate the range of this particular exhibition.

* See p. 608. † Vol. xxi., pp. 145, 152, 163.

Garden chairs, it included, of various patterns, and all of excellent make. One sociable for three persons is admirably contrived; the sitters have ample room, and have their legs well out of each other's way, yet face a common centre. It has a table attached, and is of light metal, with cane-pattern seats and top. They also show *tête-à-tête* and other garden seats, croquet and steel-spring chairs. Their shrubbery gates and fences of very neat rustic patterns, in iron, are also very meritorious, as are their rosaries and other flower-garden accessories.

Messrs. Weeks & Co., of Chelsea, exhibited an extensive display of models, designs, and full-size examples, of glass houses for winter gardens, conservatories, pineries, vineries, peach-houses, and forcing-pits. Many of the designs are highly ornate and effective; others are for useful, plain, yet well-proportioned, and substantial structures. The mode of heating by an upright tubular boiler has proved highly effective, as is evident from the extent to which it has been adopted. The firm have acquired a high reputation as warming and ventilating engineers, as well as horticultural builders. Mr. Cranston, of Barkfield, Birmingham, also exhibited specimens of his construction, including his "Gardener's greenhouse," with forcing-pits at the sides; the combination of the pits with the greenhouse being so contrived as to increase available space, and proportionately much diminish the cost. They are glazed without putty, all the parts being screwed together so as to make them portable, and easily taken down and re-erected. Mr. T. G. Messenger, of Loughborough, showed a well-ventilated, curvilinear conservatory, and a vinery. He claims for the mode of structure that it combines strength with lightness and durability. The rafters are supported by iron uprights, braced by tension rods.

The patented principles in Mr. Messenger's system of construction are in the mode of ventilation, the form of the rafters, the use of tension rods, and saddles at the ridge. The houses have also neat wrought-iron crests at the ridge, and end finials; but this feature is not peculiar. The same patentee has also some valuable inventions in ordinary and in flanged valves for hot or cold water, gas, or steam; and in a triangular tubular boiler; also in pumps and garden engines. In the same department, Messrs. Dennis & Co., of Chelmsford, exhibited their lean-to and other galvanised metal structures for the growth and protection of fruit and flowers. These structures, which were awarded a first-class certificate of merit at Manchester last year, have, as main features, their bars and bindings of T and angle iron. Their heating and ventilating apparatus and arrangements are also effective. Among new exhibitors is Mr. P. J. Perry, of Banbury, who exhibited an improved peach-house and other examples of his peculiar mode of construction. He glazes on lead bars, with bearings of wood, and supplies his curvilinear peach-houses at about 2s. 2d. per lineal foot. Mr. Ayres, of Nottingham, showed a hot-house, consisting of a framework of rafters and mullions which may be placed from 6 ft. to 8 ft. apart, and are connected by T iron purlins, at such distances apart from the ridge downwards, as may be necessary to receive and support by the ends sheets of glass from 20 in. to 40 in. in length, and in any convenient width. Putty, sashes, and sash-bars are dispensed with, as paint may be also, if galvanized iron be used. Glass and slate walls, and glass-covered walls, for horticultural purposes and fruit growing, were shown by Messrs. Dennis; Messrs. Sanders, Brewer, & Co., late O. Beard, of Bury St. Edmunds, who showed also some neat and economical wall tree-glass screens, and by the St. Pancras Iron Company; the last the invention of Mr. J. B. Scott, which has been already noticed in the *Builder*. The glazing under Beard's patent is peculiar. The glass is laid on iron rafter-bars, on which strips of elastic material are placed; similar strips are placed over the glass, and above these a covering-bar. Strips are screwed into the rafter-bars, and are passed through the covering-bars, being threaded at the top. The covering-bar and the glass are fixed by hard white metal nuts, screwed down on the top. The glass used is 26-oz. Belgian sheet, and of uniform size, 30 in. by 20 in. Broken squares can be replaced with the greatest facility by an ordinary gardener. The houses are supplied in uniform bars or lengths of 5 ft. The ventilation is by the ridge, and on the perpendicular portions at the sides. Mr. B. Wheeler, of Nottingham, showed

a good example of his greenhouses, which are slightly in appearance and moderate in price,—25 ft. by 15 ft. 6 in., 50l. in brickwork, or, if portable, 66l. Messrs. Wright & Co., of Birmingham, showed some very good garden-pumps and engines, syringes, shower watering apparatus, and a very ingenious portable self-acting fountain. A hydronette, shown by Haynes & Sons, of Edgware-road, supplied from a bucket placed on the ground, was performing capillary in watering the lawn, the shower being sent to an astonishing distance. Pressure is obtained by the creation of a vacuum in the tube. For heating purposes a meritorious novelty was exhibited by Mr. B. Harlow, of Maccofield, in a safety back or range boiler, in which bursting power is reduced to a minimum. The tubes are so arranged in section that each part is free to expand and contract without injurious result or danger from variable expansion. Mr. H. Ormson, of Chelsea, also exhibited ventilating and hot-water apparatus of an effective character.

A varied and meritorious display of brick, pipe, and tile work, was made by Messrs. Colthurst, Symons, & Co., of Bridgwater; the ornamental ridge tiles, Roman tiles, garden borders, and others of an ornamental character were shown with great profusion of colour and pattern, red, dun, and glazed black or in colour. Their exhibits also embraced drain and water pipes, with socket joints of various dimensions. Mr. Parham, of Bath, had an excellent display of strained wire fences, unclimbable hurdles and fences, malleable iron entrance-gates and foot-passage ways through iron fences secure against sheep and cattle, with espaliers, and ornamental tree guards, gates, and railings.

Mr. W. Edgecombe Rendle had a full display of his economical and ingenious fruit-tree, bine, and plant protectors, consisting of brickwork and glass simply, without the use of iron or wood, mortar or putty. Mr. Rendle's exhibits excited great interest among those not previously acquainted with them. By the way, we may mention that on the last day of the Royal Horticultural Society's Show, the thermometer at the Radcliffe Observatory was registering above 90° in the shade. Notwithstanding the numerous attractions of the show itself, and the supplementary attractions of the sweet music discoursed by the band of the Oxfordshire militia, and by a selection of about thirty of the best men of the Royal Artillery band from Woolwich, the attendance was very limited.

The show of the Agricultural was situated at a considerable distance further out of town than the Horticultural Show. It was truly a bewilderingly vast affair. Opposite the entrance were a number of "shows" of another kind—menageries, waxwork, fat boys, &c., with the smaller accompaniments which were not to be seen last year at Manchester, and that furnished a good representation, or revival, of an institution that might have been supposed defunct—the country fair.

The impossibility of dealing adequately, or even at all, with this great exhibition, and the vastness of the proportions whereunto it has attained, will be readily apparent from a few comparative figures. At the first show of this Society at Oxford, thirty years ago, three acres of ground sufficed for the show-yard; this year, seventy acres have not been found too much; then 22 firms exhibited; this year there were 386; then there were 72 exhibits; this year there were 7,851. Vast though the scale of the exhibition was at Manchester last year, there were this year eleven more stands than were occupied then. The entries for live stock were, however, much smaller in number than at Manchester.

Of the show and its attractions, as of the city of Oxford, we may say with Wordsworth,—

"Ye spires of Oxford! domes and towers
Gardens and groves! your presence overpowers
The soberness of reason."

Roman Pavement.—Workmen employed by Mr. Arkell, builder, in digging out the foundation for a house in the Commercial-road, Gloucester, came, at a depth of about 5 ft., upon a large portion of a beautiful tessellated pavement, with a bordering of unusually large grey and blue tesserae of rather a coarse kind. Next to this was a beautiful design in blue, white, and red tesserae, of quatrifol character, surrounded with a guilloché border; and a few feet from this, another piece of tesserae of geometrical design. As usual, intruders removed some portion of the material; the remainder has been secured. The colours were exceedingly fresh and vivid.

DRAWING FOR CARPENTERS AND JOINERS.*

The drawing for carpenters and joiners to which we are about to allude is contained in the new volume issued by Messrs. Cassell, Petter, & Galpin in continuation of the series, noticed by us on a former occasion, offered for the technical instruction of operatives. Three kinds of drawings are applied to the delineation of objects likely to be useful to carpenters and joiners; and then special erections are fully detailed by means of either or all of them, as the case may be. The three kinds of drawing are described as linear drawing by means of instruments, free hand drawing, and drawing from solid objects, or perspective; and the most important objects selected for illustration of the application of these processes are coffer-dams, wooden bridges, roofs, mouldings, staircases, parquet work, gates, shutters, and doors. It will be remembered that the first volume of the series taught the elementary principles of practical geometry; the second, orthographic and isometrical projection; and the third, building construction. Throughout all these the student was gradually informed of the knowledge he must acquire to be scientifically versed in his trade; and now, in this volume, the particular branch in building construction pursued by carpenters and joiners is selected from others for fresh and full systematic explanation and illustration. Mr. Ellis A. Davidson speaks of drawing as the language of the workshop, and says it is more eloquent than words, more rapidly understood, and less liable to be misapprehended: he adds truthfully, that these advantages are not found in it without intelligent rendering, a thorough knowledge of construction, and correctness in delineation.

The little work is handy and compact, and full of folded sheets of wood engravings, representing working drawings. When we say that some of the designs are scarcely up to the mark, we point out the only shortcoming in the general scheme of it. Some of the erections illustrated, notably wooden bridges, and some of the portions of buildings, such as roofs, are prefaced with short accounts of their gradual development, which cannot fail to interest those who are engaged upon the formation of specimens of the same objects. The first bridge ever built across the Tiber, Mr. Davidson tells the young carpenter, was put together without either bolts or ties, so that it could be readily taken to pieces. That over the Danube, by Trajan, was supported on twenty stone piers, which were 150 ft. high and 6 ft. broad; and formed of timber arches, of 170 ft. span, consisting of three concentric timber rings, bound together by radiating pendants, on which were placed the longitudinal beams for the flooring joists. And that over the Rhine, built by Ulrich Grubenmann, with two great openings, one of which was 170 ft. span, and the other 190 ft., formed of longitudinal beams, bolted together, and supported by numerous struts, kept in their places by vertical binding pieces, and roofed in, was, in fact, an early timber tubular bridge. A Swiss covered wooden-truss bridge of this kind is the subject of one of the drawings. The De Lorme system is illustrated in a bridge over the Weser; and that of Colonel Erya is also fully described and delineated. Here is a wooden railway-bridge from the neighbourhood of Paris:—

"This bridge is supported upon, instead of being suspended from, the four arch trusses. These bows are formed of fifteen laminæ, or layers; but not only is the break-joint system carried out in the length, but in the breadth, as will be seen in the transverse section of the bows. The planks of the bows are tarred, excepting on the outermost edge; and further, coarse paper saturated with tar was laid between them before binding to the template. When the required curve was attained, the planks were united by strong oak pins, plates of lead being previously inserted to prevent the wood suffering from the stress. The planks are further secured by iron bands. . . . The ends of the bows about in cast-iron shoes, firmly fixed in the springings of the piers."

In this way are the student's sympathies with his work enlarged. As examples of roofs, Mr. Davidson has chosen that of the chapel of the Royal Hospital, at Greenwich; that of St. Paul's, Covent Garden, London; and that of Drury-lane Theatre. These three are illustrated on one sheet; and their construction is explained in the letter-press, with directions how to draw it.

* "Cassell's Technical Manuals." Drawing for Carpenters and Joiners. With 260 illustrations and drawing copies. By Ellis A. Davidson. Cassell, Petter, & Galpin: London and New York.

The roof of a German agricultural building is thus described:—

"In this example, the walls are doubly tied together; first, by means of the tie-beam, which rests on corbels fixed on the lower portion of the wall, which is thicker than the upper. The principal weight of the roof is carried down to the tie-beam by means of the struts, and to these the ties are attached, whilst the cross-pieces act as hammer-beams, being attached at their one end to the struts, and at the other to the end of the principals. The principals cannot thus spread outward, and as the hammer-beams rest on the wall-plate, on the upper edge of the wall, a second tie is secured. The principals are further confined at the top by a collar-beam, suspended from the king-post. The tie-beam is supported on bridging-pieces, which run parallel to the length of the building, and are supported on posts, the bearing of which is increased by the cross-pieces."

And this is made clearer still by frequent references to the illustrations. Germany has been laid under contribution in several other instances, owing to the facilities the author has enjoyed from the co-operation of the heads of various Continental technical schools. In Germany, the author tells his students with a view of creating a sense of pride and pleasure in their pursuit, the house-carpenter is called "Ban-tischler" (the building, cabinet, or table maker), and "Fein-zimmermann" (the fine-room man). In a word, the carpenters and joiners who take the trouble to supplement their experience at the bench with the technical instruction in drawing here offered to them, will be glad they have done so, and find themselves much better men.

CONDITION OF DUBLIN.

RETURNING to our recent observations under this head,* let us look at what has been done in another direction. During the last twenty years Dublin has undergone many changes, some improvements; but in architectural design of the highest order she has made no progress. In ecclesiastical architecture she has done much; and in domestic, evidences of improvement are visible.

House property, in many of the old and once-respected quarters of the city, has frightfully deteriorated. Some few streets that seemed for some years on the decline, have gradually emerged from their seedy condition. In these cases the result was owing to the opening of respectable shops, and the erection of extensive and handsome warehouses. In Henry-street quarter the rental has greatly increased; while in Summerhill, once a fashionable quarter, the rental has greatly fallen. What is the making of one district ruins another,—at least, for a considerable time. During the transition of a street from private houses to shops, some interests must suffer, for one grade of occupants are sure to migrate at the approach of another.

In the principal leading thoroughfares of Dublin, north and south of the Liffey, some architectural improvements are visible of late years; for example, Dame-street, Westmoreland-street, and College Green, on the south, and Sackville-street and the streets at right angles to it, on the north side. The most marked evidences are the erection of public offices, branch banks, and English and Scottish Life and Fire Insurance agencies. In these lines several large structures have been erected, and at the present hour others are in course of construction or completion. The style of some of these structures is an imitation or adaptation of the Glasgow and Edinburgh one. There appears to be a fancy for seizing on the corners of streets wherever they can be obtained, so that the architect can have room to indulge in elaborating the angle turrets so common in Scotland. With the architectural appearance of these structures lately erected in Dublin there is little fault to be found, at least, externally considered; but it is to be hoped that the Edinburgh and Glasgow system of "daisies" will not be introduced, nor their spiral corkscrew staircases. Dublin tenements have been enough of late years in some sanitary respects, but we trust the Scottish cancer will not be engrafted on the Irish evil, and that "the second city" in her Majesty's dominions will be saved from perpetuating a disaster which is not agreeable to contemplate.

Within the city of Dublin in the present year building operations are not at all brisk, and the once noble and still spacious squares of Dublin present a dull and decayed appearance. Many of the fine mansions in the squares on the north and south sides of the Liffey are empty; and where noblemen and peers, and merchant princes, formerly resided, fifth-rate barristers and rising shopkeepers reside.

* See p. 579, ante.

In Cavendish-row, Temple-street, Great Denmark-street, and Henrietta-street, on the north, and in Moleworth-street, Kildare-street, Leinster-street, and adjacent streets and squares, the rental has fallen considerably, and the class of occupiers is not near so influential or respectable as formerly.

The southern suburbs have monopolised of late years a great portion of the respectable citizens of Dublin, and the middle classes. Residence is preferred there, and the city is but the place of business, and the dwelling of those who cannot help it.

The northern suburbs of Drumcondra, Phibsborough, and Clontarf, have made very little advance, and it is to be marvelled at.

The existence of turnpikes on the roads of the northern suburbs for many years after their abolition on the south was, no doubt, an impediment, and an eyesore to visitors.

On the score of health, the Clontarf neighbourhood can compete with the marine district of Kingstown or Bray, and the expenditure of a little capital in a few years would transform Clontarf, Dallymount, and Sutton into beautiful watering-places.

The lords of the manor in those districts are neither energetic nor speculative, and they stand in their own light, and suffer accordingly. These lands, which might be let profitably, are lying waste. They ask ridiculously high prices for building purposes. An impetus can be given to building operations on the north side of Dublin only by letting the land at a lower rent and on long leases. Time would arrive hereafter when big prices might be obtained. When the tide of fashion set in, Clontarf and its neighbourhood would prosper; but fashion, like other human caprices, must be offered inducements to settle down. Will our Dublin friends take a hint from the open volume of nature, and react with their human nature's best energies upon her? If they do, another generation will prove the utility of our teachings.

If confirmation were needed to bear out the justness of our remarks in our previous article concerning the present condition of Dublin, ample is afforded. There is no lack of illustrations to show why the capital of Ireland is sunk in a rut from which it seems unable to extricate itself. Wherefore? It is traceable to corporate supineness and want of ordinary public spirit. We have instanced Belfast as an example for Dublin to follow, if she plead her inability to cope with it. The northern capital of Ireland, when she failed in getting Government aid, or advances, set about developing her local resources by the embodied public spirit of her citizens. She did not keep up a continuous whine to the refrain—

"We've got no work to do."

She found she had got plenty of work to do, and by exerting her latent energies she soon found a method to accomplish it. Sooner than beg, Belfast pledged the credit of her local revenues and harbour dues, and raised capital by a lien or mortgage on the income accruing from her port and shipping and other interests, with what grand results we now behold. The navigation of the Liffey is wonderfully improved, hundreds of acres of land are reclaimed, new bridges and new docks are constructed, the revenues of the port are five-fold increased, because a greater number of ships trade with the port, from the improved facilities afforded to the import and export trade. Thus has Belfast improved, and as a port cannot improve without the city which belongs to it progressing at the same time, the city of Belfast has accordingly advanced in commercial and manufacturing prosperity.

Let us point out another simple illustration *apropos* to the present hour,—a matter small in its way, yet fraught with the most beneficial results. Belfast, through some of her citizens, considered it would be to her advantage to be represented at the Workmen's International Exhibition in London. In this she considered well, and at the moment we write she stands alone among Irish cities as an exhibitor both in her citizen character of employers and skilled workmen.

Dublin, the Irish capital, makes no show. No employer represents his workmen, nor workman of Dublin represents himself. It may be said that it is a workmen's exhibition, and there was no need. All exhibitions, more or less, of its kind, are workmen's exhibitions. The products that are shown in all exhibitions are the offspring of skilled labour properly directed; and it ought to be the desire in this case of large manufacturers and em-

ployers of labour to see their workmen in the field. What redounds to the credit of one must reflect honour on the other. But no Dublin artist or artisan, either in his capacity of employer or workman, has entered the lists at the Agricultural Hall. Of all Ireland, Belfast alone is to be noticed. What about the Dublin corporation? Are there not some of her aldermen and town councillors large employers of labour? Whither, let us ask, is the national pride that once existed in Dublin fled? Where are all those grand fabrics of west and warp, once so famous on the forlorn "Liberties" and desolate Coombe? Are the celebrated Irish tabernacles and poplins,—the admiration of Royalty,—no longer woven? Are the Fry, the Pims, and the Atkinsons dead? Have all the looms of South Dublin been broken up for firewood, and the weary-worn workers walked down into "the valley of the shadow of death"? Have Dublin's celebrated cabinet-makers turned into auctioneers or furniture-brokers, and levanted into the regions of Bride's-alley? Are the Messrs. Beakey and McDowells, the Strahans, the Joneses, the Williamss, the Scotts and Kerrs, descended into the grave of the Capulets? Do the monster houses of Henry-street, Mary-street, and Sackville-street, monopolise all? and have they placed an interdict on Irish exhibitions outside Dublin? Is there an interdict against the men? or how is it, or why is it?

In bell founding—that boasted trade of Dublin—not one exhibitor or workman shows a bell, or its metal.

We remember, in the Exhibition of 1851, and later ones, the Murphys, the Sheridans, and the Hodges, Irish and Anglo-Irish firms vindicated their claims, and upheld their own and their workmen's repute: have the principals of these firms sickened and died since then, or have they lost faith, or do they scorn contact with "Sassenach" workmen?

What of the superb old coachmakers of Dublin? Not extinct, we hope. Surely the Messrs. Hutton and Longe, the Fowlers, the Nugents, the Floods, and others whose names we forget, but whose workmanship we admired,—surely, we repeat, they have not, like the great Colliers of the last century, "died out"? Not one characteristic "low-backed car," from one erratic workman of these firms even, has found its way to Islington.

We thought at least, too, that the gun trade in Dublin was rife, and that the Messrs. Rigbys, and Trulocks, and Kavanaghs, and Parkinsons, were alive in the land, and that Italian, Neapolitan, and other alien gunsmiths would meet competitors in the persons of their workmen. Alas! neither in boots nor shoes, hats nor coats, statuary nor stationery, nor those very small articles, pins, of which Dublin boasts a manufactory, is the Irish capital represented in the Workmen's International Exhibition.

Belfast has its machinery and sewed muslins, its linens and its tweeds, its snow-white fabrics and its snow-white starch, and though she exhibits on a limited scale, she has exemplified her characteristic enterprise by her action.

Passing from this matter, which might be dilated upon with profit, we will but allude to instances where private generosity has stepped in to do for the trade and ornamental improvement of Dublin, what the collective corporate capacity of her municipal councils could not and would not attempt. Every one remembers what the late Sir Benjamin Lee Guinness, by a princely donation of upwards of 150,000*l.*, did at St. Patrick's Cathedral, affording employment for four or five years to hundreds of skilled workmen, many of whom would otherwise have been idle or receiving parish relief, and thereby increasing the taxation of the city. Again, it is only a few days since the son of the former has bought up the Dublin Exhibition building and ground, known as the Winter Garden. This affair has been purchased at the cost, we believe, of 45,000*l.* The whole collective public spirit, corporate and otherwise, of Dublin, was unable to do anything to save it from utter bankruptcy and ruin. Where there exists such an absence of public spirit in a city as we have shown exists in Dublin, it need not be wondered at that, commercially and sanitarially, she is in a backward state.

The House of Commons is now to be resorted to, to empower the corporation to possess themselves of certain lands, or the freedom of doing as they like with certain land, in carrying out the future sanitary improvement of the city. It will afford the corporate authorities of Dublin a capital excuse; for no matter what

delay may be occasioned, the blame will be thrown on the back of the Government or the law. A river embanked like the Liffey for years could with little trouble have been kept tolerably pure; and for the last fifty years any amount of waste land could be had within a stone's throw of the mouth of the river at a mere nominal price. There any amount of sewage and dredging might be shot or utilised for more profitable inland purposes. Two canals have their mouths in the harbour of Dublin, north and south; so facilities exist and existed, independent of the railways, to spread the science of irrigation into the heart of the country, and make the Liffey the chief feeder. Dublin could not do, it seems, without her smelling salts; so the corporation preserved the sewage in the bed of this beautiful river, quarrelled with the Ballast Board for doing nothing, and showed to the public at large their own admirable capacity for doing the same.

ANOTHER LONDON CLUB.

At the beginning of this month, as of old time in July, the Noviomagians took their day out, making Tunbridge Wells, Penshurst, and Hever Castle the ground of action. Some two-and-forty years have passed since Thomas Crofton Croker and A. J. Kemp, both good antiquaries and merry men, founded, on the occasion of the discovery of certain remains of the Roman city of Noviomagus, near Bromley, in Kent, the little "Society of Noviomagians," semi-serious, semi-social. Like the "Cocked Hats," that came after, and of whose latest outing we spoke the other day, Noviomagus is an offshoot of the Society of Antiquaries. The only rule it has, indeed, that may not be broken is, that no one is eligible as a member but a fellow of the Society of Antiquaries; and the second toast uniformly drunk at its little dinners—and little dinners are, after all, its *raison d'être*—is, "Our parent Society, the Society of Antiquaries." With unwavering persistency, though, of course, with chequered brilliance, its dozen members—alas, how often changed!—have held each year since then their half-dozen town meetings between November and April, and their one antiquarian ramble in the country on the 1st of July; precursor, in this way, alike of "Archæological Association," "Archæological Institute," and the host of County societies that now make an annual excursion. In a quiet way, hints were given and old buildings saved at a time when there were fewer who recognised their value than there are now. Love of good wholesome fun has been always professed in Noviomagus: with a well-known Latin poet they hold that "it is pleasant to play the fool in the proper place," and say, with the French satirist, "*Qui vit sans folie, n'est pas si sage qu'il croit.*" Perhaps this was never shown more forcibly than when, at the time that a little ill-feeling ruffled the antiquarian world, the Noviomagians invited the officers of the Society of Antiquaries and of some cognate societies to dinner, and gravely received them attired in ancient and foreign dresses. Those who knew Sir Henry Ellis, Mr. Amyot, and Mr. Pettigrew, then amongst the visitors, will judge of their surprise; gravity was out of the question, and all went merrily. On that evening the president, Crofton Croker, distributed copies of Garrick's first draft, from the original in Garrick's handwriting, of what afterwards came to be "The Clandestine Marriage." It showed the curious growth of a play. This sketch, which Garrick called "The Sisters," and sent to George Colman, was suggested to him by a French comedy of the same name (where the French writer got his idea from is not mentioned), and Colman, though he says he threw "The Sisters" into the fire, wrote his popular comedy on that as a foundation. We must not be tempted, however, to remembrances of this sort, or the story will be too long. The meetings of the Club at that time, and for years after, were held at Wood's Tavern, in Portugal-street, Lincoln's-inn-fields, because Joe Miller's tombstone was against the wall of the house. Changes took place in the neighbourhood, and since then the *locus in quo* has been less permanently fixed. Amongst the older members whose names occur to us were Sir William Betham (Ulster); William Jerdan; the Comproller Saunders, who saved the Lady Chapel at Southwark; G. R. Corner, well known in that borough and beyond; the late Lord Londesborough (when Lord Albert Conyngham); John Barrow, of the Admiralty; John Britton; John Bruce; F. W. Fairholt;

Mr. Planché; and other known men. In the early days Theodore Hook (then a neighbour of Croker's in Fulham) and the regretted Macleise were not unfrequent visitors. On a special occasion Arctic explorers were the guests of the night; on another came Dickens; and it was at one of these unpretentious dinners that Thackeray, soon after he had first really hit the public with "Vanity Fair," warmed into confidence, and sketched his intention of writing a set of lectures, taking them to America, and with the money he looked to make, some 7,000*l.* or 8,000*l.*, he said, as a nest-egg, founding a little fortune; all which, as he afterwards told this present scribe, did really follow with curious agreement.

Odd contrasts have been seen in Noviomagus. A notable instance occurs to us. It was at a dinner during the mayoralty of one who has long been a member of the Club, Sir Francis Moon, when, to increase the joke, he came attended by three gold-laced servants, stately and stalwart,—so stalwart, that the little overflowing room scarcely afforded space for them and their amusement. Amongst the visitors, that night being special, were the then Lord Chief Baron, always as ready for innocent fun as for profoundest mathematics, an eminent poet, and the United States minister, Mr. Buchanan, who soon after left this country and assumed the presidency, which led to such bloody results. Mr. S. C. Hall played president in his happiest manner, and the evening was certainly remarkable. A genial message to the Club from the "White House," during troublous times afterwards, showed that it had not been forgotten by the President of the United States.

The Minutes of Noviomagus have always been kept, with more or less fulness and fun; John Richards, of Reading, John Bruce, Mr. Godwin, F. W. Fairholt, amongst others, having each held for some years the office of secretary: Mr. Fras. Bennoch now carries on the torch, and it burns no dimmer than of yore; Mr. S. C. Hall still sits in the presidential chair; while around him muster, with a few already named, Mr. Charles Hill, Mr. Durham, A.R.A., Mr. Joshua Butterworth, Dr. Diamond, Mr. Henry Stevens, Mr. Lawrence, Mr. Obbafors, Sir Francis Moon, Captain Charles Ratcliff, and others, making up the regulation dozen irrespective of visitors. But now, as to the outing that led us to this little reminiscence, on which we have dwelt so long that we can give but small space to what suggested it.

After a ramble on the "tiles" of Tunbridge Wells, and much wonderment at the growth of the place on the part of some that knew it long ago, the members and their visitors, including an eminent citizen of the United States (who has recently devoted a million dollars to the foundation of a public library in his native state), Mr. James Dafforne, and a sprinkling of lady archæologists, proceeded to Penshurst Place, which, thanks to Lord de Lisle, they were able to see thoroughly. Unfortunately, however, the rooms are "in curl-papers." Works are going on, including decorations by Messrs. Crace; and the pictures are scattered about here and there in "most admired disorder," taking the word "admiration" with its Shakspearian meaning, wonder. We therefore cannot say with Ben Jonson, when describing a visit by James I. to Penshurst, that there was not a room but was

menting on there being no bay window at the end of the dais, had to be reminded that Eltham was more modern than this (a hundred years or so), and that the bay window in that position was not used till the fifteenth century. As originally fitted up and decorated, the hall must have been a sight:—

"Clothes of gold and arras were hanged in the hall,
Depayted with pyotures and bytories many folde,
Well wroughte and craftely with precyous stones, all
Gyltynge as Phebus, and the licten golde."

Enormous sums were charged for hangings at that time; documents remain showing the prices paid. They were hung on pegs to a height of 8 ft. or 9 ft. round the walls, which above were painted.

Penshurst Church was well restored some few years ago, and has a pleasant aspect. Two thirteenth-century sculptured grave-stones have been built into the inner wall of the tower. There is a small brass, amongst others, to "Thos. Bullayen, son of Sir T. Bullayen;" but of these Boleyns more, of course, was heard when the party reached Hever Castle.

Hever has one of the finest gate-houses in the country, with bold machicolations over the gate, panelling in the front, and grooves for three portcullises, two of them holding portcullises, though these, perhaps, are not original. There is a well-filled moat, too, round the house, so that on the approach the effect is charming. Within there is less worth seeing than might be expected: still there is much, and all who are interested in the story of Anne Boleyn, who, poor woman, has managed to keep enemies active up to the present moment, will visit it with pleasure, and look at the window whence she used to watch the approach of the selfish king. Here, too, died Anne of Cleves, to whom Henry had given the castle. It has its name from Sir William Hevre, of Hevre, near Northfleet, who built the castle that preceded the present structure. One of the guide-books says:—"Another room will be shown the stranger—Anne Boleyn's bed-room." Do not expect it, at least just now. The place is in somewhat churlish hands, and if Mr. Fronds himself sent in his name, and said he could not finish his next article for *Fraser* without looking into Anne's room for a fresh bit of evidence against her, he would be refused. However, there are several parts that can be seen,—the so-called council-room in the gate-house, the long gallery in the roof, and the exterior of the back part of the castle,—so the visitors were content; but on the road back they contrasted the curt refusal of the yearling-tenant at Hever, with the many gracious receptions they had experienced in their time from owners of historic houses, and admitted the existence of the feeling that *noblesse oblige*.

When back in Tunbridge Wells, an excellent and merry dinner at the Sussex Hotel brought all things straight. Part of a poem by the secretary, prompted by last year's outing to St. Alban's, and titled "A Legend of the Abbey Church," was read with approval, and the general belief went in favour of the correctness of the inscription on the original seal of the Society, to wit,—

Noviomagum non potuit abolere virtutis.

In other words, there is still a future for the little Society of Noviomagians.

INDIAN PUBLIC WORKS.

On this subject, some little time ago, Sir Bartle Frere addressed the East India Association at very considerable length, and his paper was discussed at subsequent meetings. The following extract from his paper will interest some of our readers. The subject is one by no means foreign to our pages, and will be treated of again before long:—

I will very briefly state to you what is the rule which I think should be laid down for the future, and the rule is one which is not new nor of my own devising. You will find it very eloquently stated by Mr. Sumner Maine, in some very useful discussions which took place on this subject in the Legislative Council of Calcutta some years ago; and it is simply this, that the Government should have a share and a voice in the construction and management of all works which are of such magnitude as to affect public interests or private rights, by establishing a virtual monopoly. Where no public interests are involved, nor private rights affected, in the way of monopoly, there let the enterprise, however vast, be left to unrestricted and unfettered

"Dread'd
As if it had expected such a guest,"

There are some good pictures here, and some that are not so, but all are interesting: the whole place talks history, and we remember that

"Sidney here was born;
Sidney, than whom no greater, braver man
His own delightful genius ever feign'd."

and Waller has given it other associations.

The great hall, a fine apartment built in the fourteenth century, is, reasonably enough, the most attractive part of the place. Right to fortify the house (*kernellare*, to crenellate) was first given in the year 1321, when Sir John de Polteney held it. Later it came to the Crown, and King Edward VI. gave it to the Sidney's. A vaulted apartment at one end of the hall is of somewhat earlier date: its age has been called twelfth-century, but we see no reason to date it earlier than the thirteenth. The open roof of the hall, the dais and high table, the side-tables, the hearth and dogs in the centre, with at present, no louver in the roof above, to let out the smoke, though it doubtless did exist, are all objects to note. Some of the visitors compared the hall with that at Eltham, and com-

private enterprise. The rule would be very like that which you lay down in this country where you involve the intervention of the State in the shape of an Act of Parliament, whenever public interests are involved, or private rights of adverse parties affected, or where it is sought to create anything in the shape of a legalised monopoly. In all other cases you leave owners and capitalists unrestricted.

The rule is best illustrated by instances. No great railway, or trunk road, or canal, or scheme of drainage can be carried out without affecting the interests of others than the projectors,—of the public, in fact,—or without creating a virtual monopoly. In all such cases it would be imperatively necessary to invoke the intervention of Government. Harbour works, gas-works, water-works, and the like, may be mere improvements of private property, or may be intended to produce water or gas for sale, like any other commodity. In that case Government intervention would not be required; but if it were sought to create anything like a virtual monopoly, or to affect the rights of other parties, then Government intervention would be necessary. This brings us to the question how the capital is to be provided? If the public is willing to provide the capital on receiving a guarantee for a certain amount of interest from the Government, I, for one, think it an exceedingly good system, and capable of being easily guarded against abuse, and freed from the objections which have been of late years urged against guarantees. But such a system is not very easy of application where there are no direct pecuniary returns; and for this and other reasons we will postpone its consideration for the present, and consider how capital is to be provided for works to be executed and managed on the exclusive responsibility of Government? such, for instance, as great military works, canals, roads, harbours, and the like. This is, in fact, the question which lies at the root of all our financial difficulties in India,—how is the public works capital for India to be provided? Of course you can continue the present absence of all system; but I doubt whether that would find many advocates. You may propose to do the whole work from the surplus revenue of India. That plan, of course, has more advocates than the other, but I doubt if any man in his senses, who really knows the extent of this work, would dream of doing all that India now requires out of the surplus revenues of India; and in the belief that that is an untenable proposition, I will say no more on the subject; then, if you adopt neither of those two courses you come to borrowing; and on in their present haphazard way, nor leave them entirely alone, nor attempt to do them out of your surplus annual income, then in one shape or other you must resort to borrowing; and the question arises, how would you borrow?

Now, I cannot help thinking that a similar question has been fully considered, and it has been to my mind very satisfactorily solved in this country. If I go to any of our great cities, where the commercial element has had perhaps its best development, what do I find? I find very magnificent harbour works, halls of justice, jails, spacious commodious markets, and other works of the like character; and when I inquire how they have been erected, I am told that they are public works, and that the body which represents the local government of that place generally has provided them by borrowing under Acts of Parliament, and under conditions which oblige the taxpayers and ratepayers of that part of the country to pay a particular sum in excess of the ordinary interest on the capital raised, by which the loan is extinguished in a few years. The system seems to be thoroughly well understood, and very extensively acted upon, and, as far as I can see, there is no sort of practical objection found to attach to it, either financially or in any other respect. The work appears to be well done, and it is economically and promptly done, and done in every respect, I should say, in the way in which those who are interested in public works in India could desire their works to be done. Again, if I inquire how a large landed proprietor in England, or in Ireland, improves his estate, what do I find? Many men have an estate of 10,000 acres and more which requires a very large outlay in draining and other works of the kind, perhaps an outlay almost equal to the fee-simple of half the estate; but what does the owner do? Very often he borrows the money from some private money-lender; but you have a device which has been acted on both in England and in Ireland with the greatest success, as far

as I know, without any disadvantage arising in its administration, by which landowners situated as I have described may improve their estates by the application of public funds advanced by the nation. The system is this: Parliament from time to time places in the hands of commissioners or trustees a certain sum which is lent out by those trustees to country gentlemen, who lay out upon their estates such sums as they require, and repay the loans back to the nation within a certain time—generally within the range of an ordinary lifetime. Thus you have two modes of raising funds; one of them very much followed by landed proprietors in England and in Ireland for the improvement of their own estates, and the other followed by some of the greatest commercial centres of England, and in both cases the work is done with public money, or rather with money raised on public credit, under the sanction of Parliament; and this is all done under conditions which enable the minister of the day at once to lay his finger upon the person who is responsible for any malversation. I would ask gentlemen who are here present whether it would be possible to misapply any large sum which had been raised to be expended upon a gaol, or upon a court-house or a market-place, in Manchester, or Bolton, or Liverpool, or whether it would be possible to misapply money which had been advanced for the drainage of a private estate under the systems I have alluded to, without its being certain that the evil-doer would be at once found out and brought to justice? That is a state of things of which you have no parallel in India, but is precisely the state of things at which you would wish to arrive there.

Now the system which I would ask you to consider is not proposed now for the first time, for it was proposed by me, many years ago, to be followed in India; and I now propose it for consideration, not as a new system, but as one which has been known and acted on, and acted on beneficially among you in this country. It is simply this: that Parliament should pass an Act appointing a commission or trustees who should have power to raise and apply a large sum of several millions sterling; this sum to be raised by loan in England, the interest to be paid by the Secretary of State for India in Council from the revenues of India, and the money to be applied to public works in India. This would be done by empowering the commissioners to allot sums for specific works on the application of the local governments in India, and on their engagement to repay to the trustees such loans, with interest by annual instalments. That is the system to which I have alluded as in force in this country, simply putting the local governments of India for the corporation—it may be of Bolton or Manchester—or for the owner of an estate in England.

You may ask, in the first place, "Why have a Commission? Why would not the present Government of India or the Secretary of State in the Council of India do it?" The Council of India being, as you know, intrusted with the control, to a certain extent, of the finances of India. I will simply mention one or two reasons, out of many, why neither of these existing authorities should be intrusted with the power of advancing money from those loans to be raised for public works. The main reason is this. You want for such a purpose to establish personal direct responsibility. Hence, what you want is a very small number of trustees, and not a large body that should be able to divide the responsibility. You may, doubtless, find the men you require among the members of the Council of India; but they should be specially selected, and it should not be made a part of their ordinary duty. I do not know how many are usually intrusted with the disposal of sums raised by loans for carrying out similar works in England; but, if I am rightly informed, the men who are made personally responsible are never more than two or three; and therefore I consider that a commission, not exceeding a very small number of men, should be appointed by Parliament. But why should it be appointed directly by Parliament, and not by the Government of India and Secretary of State in Council? For this reason, in order that it should be more immediately responsible to Parliament than the Council of India or any other body connected with ordinary administration can possibly be. You may have most admirable, well-selected men in the Government of India and in the Council of India, and yet they may not be precisely the men whom you would choose as trustees. When you are looking out for a banker

or a trustee, you do not look out for the ablest engineer, the most acute man of science, the greatest politician, the most able or the most eloquent statesman, or the bravest of soldiers; you look out for a man possessing those very peculiar, simple, but very necessary qualities which you compendiously describe as constituting "a good man of business," "a man fit to be a trustee." That is the sort of man you look out for, whether for a private trust or a public trust; but your governor-general may be a man who is entitled to a statue and to a burial in Westminster Abbey—a man who is a great administrator in peace or war, who will make a great figure in history. That is not the man you need as a trustee. He may be all that, and yet he is precisely the man you would wish to exclude from such a trust; and in order to avoid having any one on the trust but those possessing the plain and simple qualifications which you require in such a trust, you should not make it a part of the ordinary duty of the Government or of the Council of India. Then you may perhaps say, Why should all this be done by Act of Parliament? There is one sufficient reason, among many others, that might be given, and that is, that Parliament really holds the purse-strings of India. Whatever we may talk about other bodies or authorities, if Parliament is determined that there shall be an expenditure in India, that expenditure will be. If Parliament is determined that a particular expenditure shall not be, that particular expenditure will not be. The purse-strings, then, are in the hands of Parliament, and you only injure India, and you do no service to Parliament itself, by putting up any screens that will diminish the responsibility of Parliament.

COMPREHENSIVE SPECIFICATIONS.*

AFTER a design is accepted, and the working drawings for it are accomplished, many an experienced practitioner, as well as "rising young man," considers he has come, not to the end of his undertaking, but to the real "tug of war," when he begins to make out the specification. It is so imperative that a coach-and-six should not be drivable through any portion of it, to use a popular figure of speech associated with the framework of Acts of Parliament,—so imperative that no clause could be interpreted to mean anything but the exact intention of the architect, and so important that no item should be forgotten; that the compilation of a specification is a matter of moment. Some of our public offices, in view of the difficulty of the task, issue to architects engaged upon works under their control, or for which grants are solicited, a list of items for consideration, and dimensions and qualities of some of the materials recommended for use, which is, doubtless, found to be of good service. But such schedules are of limited circulation. There was an opening for an accessible, comprehensive, and suggestive list of parts and processes requisite to be remembered in the drawing up of general specifications; and an endeavour has now been made to fill it. This aid to remembrance and technical perspicuity is entitled "Pewtner's Comprehensive Specifier."

The student must not conclude he is now equipped with an assistant that will meet every emergency. Even with Mr. Pewtner's 694 suggestions he will find he has much to decide. As an illustration of the limit of the assistance rendered, we may point out that in specifying for the construction of a gentleman's house, it would not do, for instance, to describe the necessary oven in Mr. Pewtner's terms:—

"Build the oven with Welsh fire-bricks, arched over with a 9-inch camber arch, closely set, and paved with Welsh oven-tiles, 9 in. square, set upon 12 in. of concrete; the openings arched over with 9 in. camber arches, closely set; the furnace, frames, doors, and dampers fixed in the work, and the flue turned, pargetted, and cored; the whole constructed upon brick footings 6 in. high, with two 2½ in. set-offs on each side, upon a concrete foundation ... in. deep and ... in. in width, and the whole of the work to be executed and set in Portland cement."

Oh,—Sometimes it is necessary to state the number of bushels the oven is to contain, and always, when there are no drawings, showing the construction."

He must be content, simply, with being reminded that there is a necessity to specify the kind of oven really required, and not blindly furnish a baker's oven to a private house.

* "Pewtner's Comprehensive Specifier: a Guide to the Practical Specification of every Kind of Building-Artificers' Work; with Forms of Building Conditions and Agreements, an Appendix, Estimates, and copious Index. Edited by William Young, Architect, London: Longmans, Green, & Co. 1870."

Nor would any client be likely to be satisfied with the artistic appearance of a stained glass window, executed merely from the annexed specification:—

The to be glazed with 16 oz. stained glass, in colours, stopped in lead framework, soldered at joints, and copper-banded to the saddle-bars, tongued and puttied round.

On the other hand, though thus limited in its application, this comprehensive specifier will evidently prove a very useful work to many persons anxious to proclude deficiencies; for, although they may have thought of ninety and nine of the requisite items to be mentioned, they may here be reminded of the hundredth that they might otherwise have forgotten, to their great vexation at last. It is furnished with a consecutive index, "adapted for office use as a skeleton specification." In this index the various trades are arranged in the order in which they are generally placed in practice. After indicating the form in which the title should be set forth, the general conditions are suggested to come next, with, however, the option of giving them towards the close of the document; and then the usual clause that contractors should give the necessary notices to the commissioners of paving, &c., and the district surveyor, and obtain all necessary leaves and licences, comes in. The excavator, bricklayer, mason and pavior, carpenter, joiner, and ironmonger, slater, plasterer, smith and ironfounder, bell-hanger, plumber, zinc-worker, painter, glazier, paper-hanger and decorator, gasfitter, writer, and blind-maker, then follow each other in the order given. A section on sundries, consisting of the following miscellaneous objects, brings up the rear:—Speaking pipe, hose pipe, Boyle's patent ventilator, enclosure to bath, enclosure to lavatory, soot-door, soot plug, flap and door, fount cover, slate water-closet built out, prayer-desk, blind to greenhouse, and step-ladder. These might be more candidly called afterthoughts come to mind too late for classification. The general conditions are lastly given fairly and fully. Over and above all this, there is an appendix in which much of the same ground is gone over again, with special view to utilise the information for those who require only to repair or alter an existing building, instead of erecting a new one. There is, however, a section absent that should be present in any work of the kind aiming at comprehensiveness. We mention this as a means of adding to its usefulness, should an opportunity occur of adopting the suggestion. There should be a section devoted to precautions that may and should be taken to avoid several evils, and ensure several comforts in most classes of domestic buildings:—precautions against fire, water, damp; precautions against smoke, and want of ventilation; precautions against rats, mice, and other vermin; precautions against lightning; and, as far as our present resources serve us, precautions against thieves and explosions.

The author says he has endeavoured to describe each item in detail so precisely as to obviate the misunderstandings that frequently take place between the architect and the builder, or between the former and his client, when a vague and superficial description has been prepared; and his editor, Mr. William Young, tells us that Mr. Fawcett has tried to make his work as independent as possible of drawings. We do not say that the first has been done, because that which Mr. Fawcett has specified may not always be exactly what is required, every case requiring skilful adaptation; nor do we see that the second aim is particularly desirable unless one dead level of uniformity should eventually be preferred to artistic variety. But the catalogue of materials and appliances coupled with the terms in which they can be wrought together in construction, will surely prove a valuable assistant in the offices of most architects.

The Worcester Cathedral Restoration.

Next to the donation by Earl Dudley, the dean and chapter have given 2,500*l.* towards the work, which is 500*l.* recently added to the amount at first set down for the capital body. The dean, besides the reverend, has now given 600*l.* to the general restoration fund. The bishop of the diocese has contributed an episcopal throne, of expensive work, and has sent a donation of 500*l.* to the restoration fund. The required amount named by Lord Lyttelton and Sir John Pakington was 15,000*l.* The subscriptions now amount to more than 15,157*l.*

PHILOSOPHY OF ARCHITECTURE: A SKETCH.

WHAT do we mean by the philosophy of architecture? That is what is proposed to be shown in this paper, which will treat not so much of the orders and styles as of the causes which influenced and from which sprang the art. It is of architecture as an art, not as a science, that the writer intends to speak.*

The mere edification of huts by primitive wandering tribes on the earth, whether the material used was turf, or the boughs of trees, the closing of caverns, to render them safe for habitation, does not fall under the term architecture. Ere architecture could exist, it was necessary that men should settle on some spot of ground, should till the earth, form a community, dwelling together in what, according to its size and importance, would be called a hamlet, a village, or a town. Even this, however, would not suffice to create the art, as the huddling together of the buildings is still unworthy of the name. In order to bring it out, the people must be united by a firm, strong bond, and this bond might be either of a political or religious nature.

In early ages the bond was naturally religious, because religion then included the whole life of the people, and politics,—that is, the difference of conduct between communities,—bore at first solely on points of worship and property. But as the priests had full power, in primitive states, property was mostly ecclesiastical, and thus politics came within the pale of religion.

The settlement acquiring strength and importance, it followed that it tended to consecrate the dwelling of its god, or the representative of it, or perhaps to perpetuate the memory of some great event. A monument, which took the shape of a temple or a pyramid, was raised, and in this expression and embodiment of the thought of the nation, its architecture first revealed itself, and sprang into life; and thus, also, did architecture from the first become symbolic.

Be it remembered, moreover, that as the language of primitive races is always much more pantomimic than spoken, the face of the monument would bear certain details and ornaments destined to express words and actions.

This early architecture must have been of a colossal, vague, and indefinite character; for these reasons,—that man, when first he looked around him, saw nothing resembling regularity. The jagged or wavy lines of the mountains and hills, the vast contours of the forests, the windings of the rivers, the ever-varying shapes of plains and valleys, did not at once reveal their careful planning to him. He saw the Infinite. Let him go where he would, Space seemed to recede farther and farther before him. Its companion, Time, flowed on unceasingly with unequal change of light and darkness. His mind, thus led to seek after the vague and immeasurable, strove to grasp those two portions of the Infinite. He discovered geometry and time (applied to music). Therefore, impressed with the grandeur of the objects strewn around him, and desirous to emulate Nature, and to make the temple of his God suited to the idea he entertained of him, he imparted to his architecture that character of awe and colossal size which is its chief peculiarity. In one word, that architecture embodied the thought of a nation, and not the will of a class or an individual. It was general and undefined, and therein opposed to the architecture of our day, which is definite.

We must carefully guard, however, against a very prevalent though erroneous belief, against the belief that religious architecture sprang from the civil. It was religion that first boasted of true art, while civil life was still deprived of it. It has already been shown how religious architecture strove to imitate the magnificence of Nature. All its parts recalled some of the striking objects around: the pyramids, mountains; the towers, peaks; the vaults, caverns; the starry ceilings, the heavens; the columns, forests; and the vast horizontal lines of the buildings, the immeasurably vaster lines of the sea.

There was nothing of all this in the dwellings of the inhabitants, and thus the difference between a building visibly intended for human habitation and the temple of the god. This is strikingly exemplified amongst the Egyptians, as well as here with the early inhabitants of Britain and their Druidical religion. There were mighty altars built, which to this day remain as

stupendous monuments of religious art, but the civil dwellings were mean and wretched.

Early architecture being always colossal, sublime, and awful, did not appeal to man's love, but worked on his imagination through a primary feeling of fear. As it appealed to Nature alone for its elements, taking only the vast and gigantic, it thereby became sublime. Architecture becomes more and more beautiful as it draws its own proportions more and more from those of the human body; for the beautiful belongs to Man, and the sublime to Nature.

In architecture were first contained the other arts of design, viz., sculpture and painting. Music, the other fine art, sprang up along with architecture, and is closely allied to it. Like architecture, it was at first the expression of general thoughts, before it became the vehicle of particular passions or ideas. It is superior to it, in that it appeals solely and directly to the mind without any other aid, and in that it deals with the intangible *soul*, while architecture appeals to the mind through the eye by means of matter fashioned to its end.

In early times the architects were the priests; there was a symbolism in every building, in every detail of the building, understood only of them. They raised and served in the temple which was sacred to their god. Their class was all-powerful and had possession of the whole government, whether civil or religious; education, justice, all was theirs. In time, however, the next great class, the warrior, rose, not in importance only, but in wealth. The nobility, or richer and more powerful part of the laity, gradually became independent. It, too, acquired wealth and influence. The whole resources of the nation were now no longer lavished on the temples only; a portion was applied by the chiefs to the adornment of their private dwellings, which improved daily and culminated in handsome mansions. The laity asserted itself. Next to the temple rose the palace.

Then took place the enfranchisement of the other arts, sculpture and painting. Both lost some of their former monumental and impressive grandeur, but, on the other hand, gained liberty, motion, and life.

Yet sculpture long remained a mere basso-relievo, the one surface scarcely raised above the other; gradually the projection became bolder, and the stone was worked out, but still the figures, whether single or in groups, remained fixed in and a part of the wall. With the Greeks it reached its apogee. That nation which worshipped the beautiful, and rightly saw it carried to its greatest perfection in man, could not do otherwise than devote itself to the developing of an art which attains its highest triumphs when it represents the perfection of human beauty. So we find that they made a close and loving study of man's frame; they strove to bring out its grace and power by every means at their command; they represented it alone, apart from any other object that might distract attention from the glory of the god in human shape. In one word, the Greek nation was ruled by the idea of the beautiful, and it expressed that idea by the most glorious embodiments of it in marble that it has ever been the lot of man to create.

It will now be understood how it is that, in the mythological ages, painting always held a secondary place. It cannot and does not pretend to represent the object as it is; it gives but its semblance, as it strikes the eye, and, by the deep meaning in the painter's soul, its aspect as it strikes the mind. To the Greek, this was insufficient; to the Indian impossible. The one wanted to have the fulness of form, the tangible expression of beauty; and, in the other case, painting was powerless, because awe in the abstract cannot be represented by any combination of colours alone. Therefore the Greek expressed the idea—the worship of the beautiful—which ruled him, in his noble statues; the Eastern nations, at the root of whose religion lay awe and terror, expressed those sentiments in their formidable and sublime temples in the rock and in their pagodas.

When Christianity arose, this order of things was altered. Painting, which hitherto has played a secondary part, now rose to the first rank. The aim of religion was different: it no longer set bodily beauty above all others, but, on the contrary, despised and stigmatised it, as likely to lead to sin and idolatry. It preached the doctrine of the beauty of the immortal soul. Under such conditions, sculpture must sink, and it did. Unable to force the marble to speak, as it were, the chisel gave way to the

* We allow our correspondent to speak unreservedly.

—En.

brush that, with its magic colours, fixed for ever the ever-changing expression of the face, the mirror of the soul. The passions, which marble bound within its stony grasp, found free play on the canvas and panel.

In order that architecture may fulfil its purpose, three requirements are necessary; namely, beauty, appropriateness, and solidity. The rudiments of the first will be apparent in the plan of the building, and will be developed in the elevation; the second will and must be evident in the plan; while the third will be proved by the section.

Let each of these now be discussed in turn, beginning with beauty, in which shall be included the sublime in as far as it mingles with beauty, heightening the character of this quality, while its own is rendered more pleasing to the human mind.

In architecture the elements of beauty may be reduced to three,—grandeur, simplicity of lines, and continuity of lines.

To attain grandeur in a building, there must be in it at least two of its components, height, breadth, and depth; and in order that the edifice may have its full force, one of these elements must be sacrificed. Otherwise the eye and mind are not sufficiently, at times not at all, impressed with the desired feeling. For example, in St. Peter's, at Rome, which is so admirably proportioned, the first impression is far from conveying an idea of the actual vastness of size and height; and thus the effect, which ought to overawe the soul, is most disappointing. The mind, instead of being swayed one way or another, of being directed either to the earth or the heavens, remains doubtful and undecided.

Far otherwise did the Gothic architect act, when rearing the glorious fane in which mediæval Europe worshipped. The thought which worked unseen by all, unknown to many, in the Christian society, and which urged minds to aspire to heaven, asserted itself in the predominance of height over breadth. The Christian church rose to the skies, the Pagan temple clung to the earth.

Each of the elements of grandeur awakens a corresponding feeling in the breast of man: height raises the soul, elevates the mind, and inspires noble thoughts; breadth suggests ideas of calm, repose, stability and duration; depth fills the mind with awe, inspires a vague dread of the unknown, because of the obscure.

These various sentiments, as springing from each of these components of grandeur, are developed and exemplified in the architecture of the various races. The Easterns, whose religion was a vast, undefined, mysterious pantheism, had depth as the basis of their style of architecture. The rock-cut temples of Ceylon, of Ethiopia, on the coast of Coromandel, all owe their greatest claim to grandeur to their mysterious depths and recesses.

The Egyptians, who firmly believed in the immortality of the soul, and believing that it would return to its former habitation a thousand years after death, were careless of the dwellings of the living, but expended all their science and art in erecting temples for the dead. They wished to secure immortality, everlasting duration for their buildings; and thus their style is characterised by great breadth and by vast horizontal lines. Even in the Pyramids, which at the first glance would seem an exception, the breadth is greater than the height.

Now, the Christians, moved by the intrinsic properties of their faith, and led by it to a contemplation of heavenly things, taught to look upwards, and to aspire ever higher, could not any more than the Indians or Egyptians, help yielding to the influence of their faith, and consequently sacrificed breadth to height. For it must be noted that they still made use of depth, for the revelation having taught the fear of God, a feeling of awe mingled with love was to be evoked in the mind of the Christian who stood in the temple sacred to his Maker.

Thus we see that all nations have had more or less to abandon one of the parts to obtain the true expression of their creed. All, save one—the Greek,—at the root of whose religion, as has already been said, lay the worship of the beautiful, embodied in man; so that its architecture, notwithstanding all its glory, was subsidiary to sculpture. The Greek alone, through his wondrous genius, balanced the three proportions as nearly as is consistent with that ideal he ever strove after; for it is evident that the three can never be perfectly equal in architecture: the result would be an infinite ugliness, a monstrosity. Nearly balanced: for the difference,

though not so striking as in either Indian or Egyptian art, or in Gothic afterwards, still exists, the breadth being usually equal to twice the height, and the length twice the breadth.

Simplicity, that second requirement of beauty, is to be carefully distinguished from mere barrenness. Because a building, whatever its nature, is totally deprived of any detail or decoration, it does not thereby become beautiful through simplicity. The mere absence of such ornament does not constitute this latter quality, which, in architecture, results from the careful elimination of all lines which are not to the purpose, of all useless surfaces and redundant decoration. Simplicity may be defined as the sober use of lines and ornament, however that ornament may be obtained. It is for this reason that the Doric temples are more striking and majestic than the lighter and more graceful Corinthian fanes; and that the Early Gothic is so immeasurably superior to the florid style of a later date.

The third, continuity of lines, is undoubtedly a great element of the beautiful. That cannot be truly and fully beautiful which the mind cannot contemplate with feelings of satisfaction; and such feelings can only be engendered by continuity. Whatever tends to break this, also tends to break the train of thought into which the mind was led, and changes its ideas from ideas of regularity and order to ideas of trouble and uncertainty. As much as Grecian art is characterised by continuity, so much is Gothic generally characterised by the want of it. Beauty also requires, besides those three great elements just spoken of, that proportion, character, and harmony, should be visible and marked.

Both in Greek and in Gothic art, proportion,—that is, a due relation of part to part,—is absolutely necessary in the exterior; but there the dual necessity ceases. The Grecian temple need not have the proportion which also demands repetition of certain features within; but the Gothic cathedral imperatively requires it. The reason lies in the fact that while in the former the worship was wholly external, the priests alone entering the cell containing the statue of the god, in the latter the worship is internal, the full congregation meeting within the church, and the spiritual life of the people manifesting itself there.

The character of a building should always be evident from its exterior. We should know, and in good works, both antique and mediæval, we do know, a church from a theatre, a town-hall, a palace, or a prison. There is an essential thought predominant in each of those; nay, many thoughts grouped under one chief idea. For instance, on entering a church, the immediate effect is an idea of the loftiness of heavenly hopes, of calm, of love, of rest, of awe, of high aspirations, which all unite in that feeling known as religious sentiment. And the greater the number of thoughts thus grouped together, the greater the beauty of the edifice. Who is there that has not felt the overpowering sense of beauty and majesty which falls on the visitor who enters Westminster Abbey?

Another point to be noticed is, that the more numerous the thoughts, the less the originality, which has also a beauty of its own, but a far less pleasing beauty; that, as the thoughts diminish in number, and gradually resolve themselves into one, the more sublime does the edifice become, and its proportions the more colossal. The feelings and ideas which boil up within the one great thought of a nation seem to have a power akin to that of the subterranean fire, and to heave the architecture of the people to gigantic proportions.

Harmony, of which the original meaning is "bond" or "tie," demands that in a building no single part should be removable or transposable without destroying the unity, and this with the parts differing from each other or similar to each other. And thus is obtained that universal law of art: Variety in unity is harmony.

Let it also be borne in mind how very important it is that unity of impression should spring even from collective variety of causes. If the work on which the architect is engaged is some serious task, some solemn building, let solemnity be throughout the ruling thought, and, however it may be modified, let it always stand out clearly and unmistakably. Let the plan, the elevation, be characterised by straight, severe lines; let there be large plain surfaces, colour and ornament both sparingly used, and even the materials employed be of a grave, sombre sort.

The causes which influence architecture, and

which have yet to be spoken of, contain the proofs of the necessity of appropriateness and solidity, insisted upon as required by architecture. The chief of these causes are climate, materials, and site.

But first let the fact be noticed that architecture is the least independent of all arts. As has been pithily remarked by a French writer, "No one builds for the sake of building." Architecture is bound down by the end it has to fulfil; the very parts of the building, arch, window, or door, do not explain themselves. The mind invariably seeks out a symbolic or practical sense in each. But this necessity, of which the philosopher makes a virtue, the architect has in his power to use as a means of producing beauty, and that by working out as a choice what is imposed on him as a "sine quâ non." Moreover, he has this in his favour: unlike the painter and sculptor, he has not to imitate God's handy-work; he has only to set forth his thoughts. How wondrous is the art which, out of blocks of inert, dull, coarse matter, brings up ideas of awe, invisibility, ideality!

It has already been seen how the ideas and religion of a people re-act on its architecture: let the influence of climate be now discussed.

In the East, where snow-covered mountains rise immediately above sandy plains, burnt up by the rays of the scorching sun, men dug caves and hollowed out rocks for dwellings and temples. The very pagodas which they erected seem to be imitations of the lofty mountains which surround them, while the apartments in their interior recall at once the caverns of the rock.

The Tartars, whose wandering habits accustomed them to live in tents, when they settled in China, preserved in their architecture the principle of the tent, and, indeed, the whole Chinese style of building still partakes of that character; it is eminently light and fragile.

Egypt seems to have drawn the notion of pyramids from the masses of debris excavated from the earth, and, besides, the form of the pyramid, which is, *par excellence*, that of solidity, tallies still more closely with the genius of the Egyptians, in whose minds a wish for the eternal duration of their monuments was ever prevalent.

With this single exception, all Egyptian architecture is characterised by terraces and vast horizontal lines, as is natural in a country where rain is almost unknown.

Furthermore, the ideas and religious and moral character of the Egyptians must necessarily have yielded to the influence of the country, to the influence of its ever-blue sky, of its majestic, winding, regularly overflowing Nile, of its unchanging clearness of atmosphere, of its ever-blazing sun, of its landscape flooded with light and heat.

Roofing especially shows the influence of climate; it is therefore very important to notice it.

Throughout Africa, from Egypt to Morocco, in the East, and in Southern Italy, the edifices are topped by platforms. In Greece, the climate requires the roof to be slightly raised. In more temperate climes, the angle becomes more and more acute, and in Northern Europe it is very steep. The reason is that the rains in warm countries, coming down with great violence, are drained by their own rapidity; while in cooler zones they fall with less impetus, and are apt to remain longer on the roofs.

The difference of roofing also entails a difference of ideas. The flat roofs suggest repose and calm, opposed to the bustle and life expressed by the sloping.

Solidity springs from the material used and from the ways in which it is used. It should be not only apparent, but real. And materials greatly influence the aspect of architecture in this respect. Throughout Egypt, Greece, and a great part of India, the vast and easily-worked quarries of marble, limestone, and granite have given rise to imposing architecture. The fragile and light buildings of China and Switzerland draw their materials from the forests.

Thus the architecture of those two countries possesses elegance and gaiety, as contrasted with the greater stability of the other.

Site is the last point to be examined. The architect, who has, above all to deal with lines, straight or curved, must necessarily study the contrast or harmony which his buildings must have with the landscape. So it will be found that, in the majority of cases, straight lines in building are opposed to wavy lines in the landscape, so as to break the uniformity, while the

character of the building will also partake of the character of the landscape. In Egypt, pyramids and obelisks; in Greece, temples situated on heights; in the north, high buildings, cathedral towers, towered castles overlooking flat plains. The outline of buildings, too, is, in the north, more broken and picturesque; and in the south, as already stated, distinguished by flatness, campaniles and towers here and there rising to give the necessary contrast. Further, where colour is wanting to the landscape, the buildings are more richly decorated; and no more striking example of this can be adduced than the gorgeous architecture of Venice, which rises on a waste.

Thus has it been attempted to show what are the great elements of architecture as an art. The necessities of architecture as a science flow from these, and are intimately connected with them. But they cannot be properly attained if, in any building, the aim is not made the highest, and the purpose fully borne out.

The preceding remarks do not pretend to give more than a very slight sketch of the Philosophy of Architecture; they are more intended as suggestions to be developed by abler hands. Should they serve such a purpose, the efforts of the writer will have been amply rewarded.

F. C. S.

STABLE FITTINGS AND FITTING STABLES.

THE St. Pancras Iron Work Company have done a clever thing and a useful thing. They have set up a stable at their works, upwards of 100 ft. long and consisting of ten stalls and three loose boxes, in which are shown feeding arrangements, divisions, drainage, ventilation, paving, heating, and lighting of every variety. Taking these heads separately,—the Feeding Arrangements for stall and box show improved modes of constructing a manger to prevent the horse throwing out oats, and improved mode of supplying fresh and taking away foul water by double-action cook. Divisions,—Variety of form and substance of wrought-iron used wherever practicable; its advantages in all portions exposed to horses' hoofs. Improved mode of constructing ventilating ramps and grating-bars, cast in, not riveted, much stronger, and more durable. Drainage,—all kinds of gutters and traps shown. The Company urge wrought-iron gutter alone should be used. Part of stable fittings severely exposed to action of horses' hoofs; various plans of drainage. Paving of all sorts is exhibited; granite, Welsh and Staffordshire plain and grooved bricks, Dutch clinkers, adamantine clinkers, plain and bevelled, the Company's patent bricks. Ventilation, by shafts and through walls,—all the various known ventilators; improved mode of opening and closing wall ventilators. Lighting,—by sashes of wrought iron, with improved mitre joints and cast-iron joints, former preferred; various modes of opening and closing casements are shown; while beyond is a harness room, warmed, lighted, and fitted up complete, with brackets, harness and bit cases, table, stove, and hot-water pipes. The cost of a well-fitted stall may be put at from 12*l*. to 15*l*. A visit to this model stable may be recommended.

DAMAGE TO ST. SAVIOUR'S, SOUTHWARK.

DURING the severe storm of Tuesday morning, at about half-past eight, the lofty tower of the fine old church of St. Mary Overies, otherwise St. Saviour's, Southwark, was struck by lightning, the electric force totally destroying the south-east pinnacle, and scattering the fragments in every direction. An eye-witness says that the pinnacle, which, without the turret on which it stands, is more than 20 ft. high, seemed to be lifted entire from its base, and then to burst like a shell, throwing the massive stones, of which it was composed, with tremendous force, to the ground, a distance of about 150 ft. Providentially the greater portion of the ruin fell on the tower roof and into the churchyard, otherwise loss of life would probably have resulted. Many of the stones were, however, hurled on to the roofs of the church, neighbouring houses, and warehouses, smashing their way through to the floors beneath. Whether any personal injury resulted we cannot say, but much damage was done by the admission of torrents of rain into the various buildings.

The principal damage to the church, besides the loss of the pinnacle, was done to the south

aisle of the choir. Great masses of stone seem to have struck the first flying buttress eastward of the transept, cutting it nearly into halves, and glancing outwards, carried away the parapet, tearing the metal-work of the aisle roof, and finally striking the ground with tremendous force.

Some idea may be formed of the destructive power of the electric discharge, from the fact of a stone of at least 15 lb. weight having been thrown on to the lead flat of a high house not less than 200 ft. off, whilst smaller stones were projected to even greater distances. One large fragment broke in pieces two of the iron rails of the churchyard, and bounding off the paved street, struck the opposite house with such violence as to smash itself to atoms.

The destroyed pinnacle was one of four built on the octagonal turrets at the angles of the tower. They were restored about the year 1818, and are, as may well be imagined, not in the best possible taste.

From a careful examination, it would seem that the lightning first struck the copper ball which surmounts the vane staff, and passing down the staff (also of copper) entered the pinnacle, when, meeting with material of low conducting power, it forced its way out on the north-west side, slicing off a great piece of the turret, and scattering destruction on every side, made its way along the gutter, and thence to earth by means of the iron rain-water pipe. The churchwardens would do well to have conductors properly fixed connecting the high points and great masses of metal about the church with the earth, to act as a highway for the electricity. The present arrangement of four copper points terminating on the pinnacles is but inviting destruction from every passing storm. It is said that the tower was struck by lightning about eighteen years ago, so that this is not the first warning.

BRICKMAKING BY MACHINERY.

At a meeting of the Manchester Institution of Engineers held on the 20th inst., a paper was read on "Brickmaking by Machinery," by Mr. J. F. M. Pollock (Pollock, Laing, & Powley, Leeds).

Mr. Pollock said that at a time when mechanical brickmaking was creating so much attention, and in a district where such outrages on civilisation had been perpetrated on those whose enterprise had led them to attempt the amelioration of the position of their workpeople by its introduction, he would fain be some able orator to disclaim against such proceedings; that making clay into bricks was one of the most servile kinds of work that could well fall to the lot of the labouring classes. However, it was not his purpose to treat on the moral bearings of the subject, but he sincerely hoped that the matter might shortly be taken up in the Houses of Parliament, and that such legislation would take place as would put an end to the perverseness with which brickmakers and others had been standing in their own light and bringing opprobrium and obloquy on their fraternity. The writer then entered into a short retrospect on machinery for making bricks, showing what an important place it held among inventors and patentees of all ages. Coming to modern machinery, he divided it into three classes, viz.: 1st, wet clay, or expressing machines; 2nd, dry, or pulverised clay machines; and 3rd, the medium of the preceding two. Mr. Pollock then proceeded to point out at some length the disadvantages of producing bricks from machines in a state either too wet or too dry;—in the first case too much drying being required before the bricks were ready for the kiln; and in the second case the granular condition of the clay preventing it from ever really cohering, and producing a brick which was too great an absorbent of moisture. The writer described machines of each class to prove his statements, and then proceeded to show the advantages derived from a middle course. He then gave an elaborate description of his patent machine, made in three sizes, to produce either 1,000, 2,000, or 4,000 pressed bricks per hour, or 20 per cent. more of common bricks. He pointed out the advantages of having a machine which would make at will either pressed or common bricks, and might also be used as a pug-mill only, if required. His remarks were illustrated by half-size drawings, and a model; and the machine was described as combining on one baseplate all necessary grinding, pugging, lubricating, moulding, pressing, and delivering apparatus. An engine, also, could be attached to and form a portion of the

machine, so as to make the driving power self-contained and form a very compact arrangement. In concluding his paper, Mr. Pollock addressed a few words to those who would hinder the introduction of machinery to supersede labour. He said, was it not at one time supposed that the steam engine itself was to ruin the working classes, and was not the same mania at work when cotton machinery was first introduced? And are there fewer hands employed than before those great offsprings of the human genius were known upon the earth? Nay, rather, has not the introduction of machinery always created a demand a thousand-fold larger than the most sanguine ever looked for? Then, why does the working brickmaker shut his eyes to these facts? Cannot he see that when bricks are made by machinery, his position will be raised from that of a drudge to that of a scientific employe? That the demand which was now supplied by numbers of little masters who could barely earn a living, would, with mechanical agency, become so thriving a business that the working man's practical abilities would become tenfold more valuable, and he would no longer need to bring his wife and children into the open brickyard to earn his living during a few months in the year, but would take his post among mechanics and other artisans who owe their existence to the mechanical resources and inventive genius of this great country. But surely the common sense of the working brickmaker could not long remain unimpressed by the false position in which he had put himself, for the inevitable current of advancement would force upon him that which he so vainly strove against.

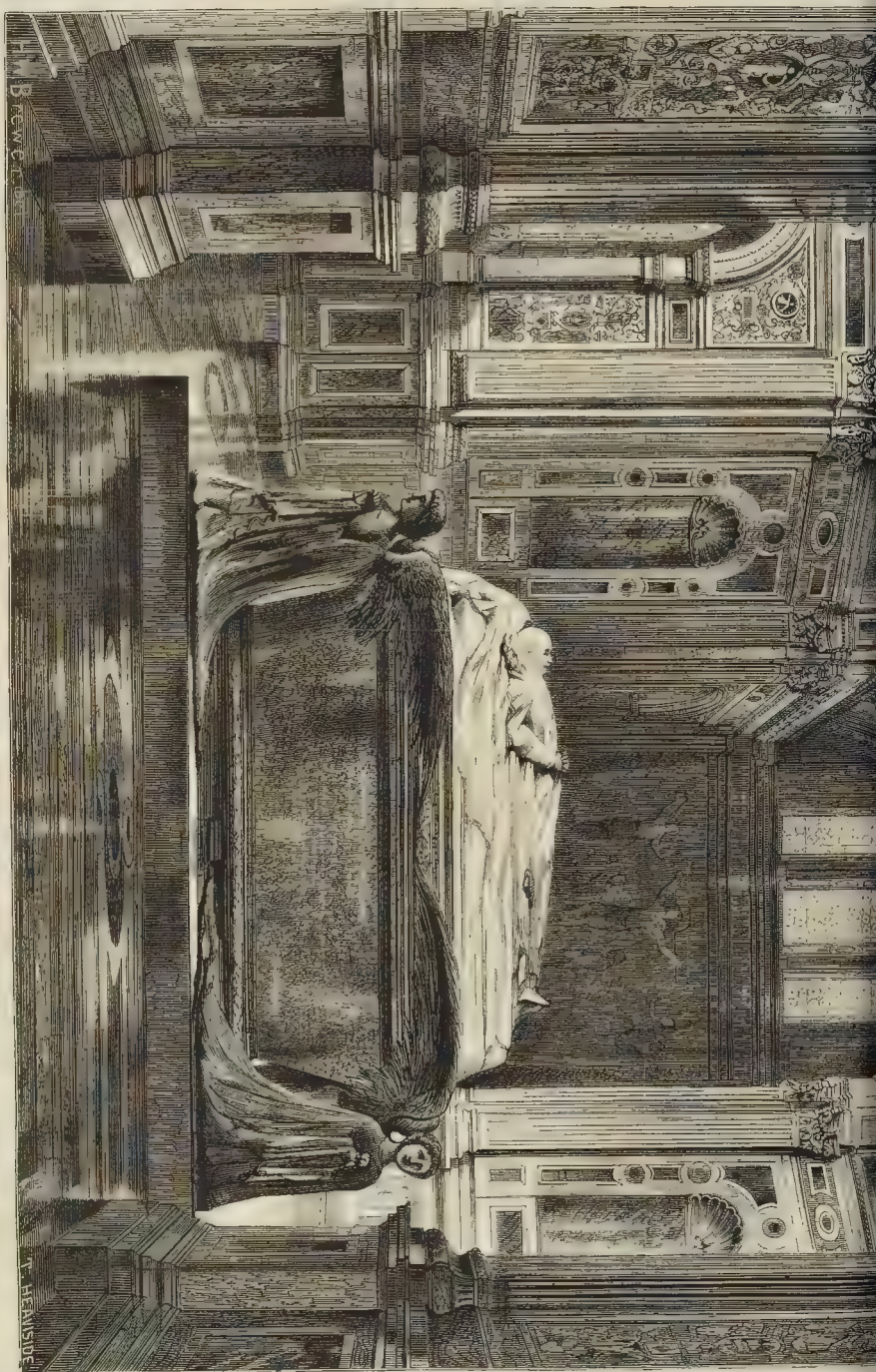
ACCIDENTS.

A BRICK-BURNER, residing at Camberwell, went into a pit with another man, for the purpose of getting sand. The pit, which was about 13 ft. deep, suddenly fell in at the sides, and both men were buried beneath the earth. An alarm was raised, and they were soon extricated. The brick-burner was taken to Guy's Hospital, where his left leg was found to have been broken by the fall of earth. The other man was only slightly injured. The brick-burner expired from the effects of the injury. A verdict of "Accidental death" has been returned.—A young man has been killed by a falling bough from one of the elm trees in the Long Walk, Windsor Park, while lying asleep beneath the tree. Mr. Menzies attended the inquest on behalf of General Seymour, deputy ranger of Windsor Great Park. He said he had made an inspection of the tree. The branch was a living one, and had fallen about 40 ft. The tree itself was in perfect health as looked at from the outside. During great heat and great drought, branches of elm trees were exceedingly liable to fall without the slightest notice of warning, and green branches much more so than dead ones, even in the calmest weather. His attention had been especially called by Prince Christian, the ranger, and General Seymour, to the Long Walk. With respect to the tree in question, he should not have expected the branches to have been unsafe. During his experience of twenty years, he had only known one person to have been injured by the falling of a branch of any description. Witness said he constantly warned picnic parties sitting under elm trees in hot dry weather of the danger they were running from their position. The jury returned a verdict of "Accidental death."

PICCADILLY TO OXFORD STREET.

THE old proverbs, not to halloo till you are out of the wood, and to take care not to count your chickens before they are hatched, are applicable to London improvements, as to other matters of daily life. We recently spoke of a "ready-made improvement" in the shape of a clearance of the existing block between Bowwick-street and Rupert-street, on the south side of Oxford-street, as being warmly taken up, and apparently likely to be carried through, and we still think this to be the ultimate issue. At the same time we are reminded by our proverbs that it is too soon to congratulate ourselves, and that it behoves all whom it may concern to urge on those who have the control of this matter not to let it fall through for want of energy, or because it is so simple an improvement that it is sure to be carried out without individual exertion and perseverance. With this note of warning we leave the subject in full confidence and hope.





THE ROYAL MAUSOLEUM, FROGMORE, WINDSOR.

THE BUILDER.

[JULY 30, 1870.]



PROPOSED ALTERATIONS IN THE HOUSE OF COMMONS.

THE House having gone into committee of supply on the supplementary estimates, Mr. Ayrton moved that 10,170*l.* be granted for new buildings and alterations in the Houses of Parliament. These buildings and alterations were for the purpose of providing new refreshment-rooms for the members, and he explained minutely the alterations proposed to be made. One great principle which had guided him, he said, in planning these alterations was that there should be no alteration of the permanent structure of the building. He might mention that the ladies' gallery was to be altered, by giving them additional room, and removing the grating which interrupted their view of the House. An additional room for the purpose of serving refreshments was also to be provided for the reporters. There were some minor improvements, among which was the cutting down of the principal window in the smoking-room, so as to give members a view of the terrace, and if that was found to be a good arrangement a further move in that direction would be made. It was also proposed that there should be a better access to the strangers' refreshment-room, and a means whereby the privacy of the members' lobby would be secured. All these and other rooms would be *en suite*.

Mr. Bentinck moved the reduction of the vote by the sum of 7,000*l.* odd. He felt bound, after the extraordinary statements made by the right hon. gentleman who had just sat down, to traverse some of the allegations contained in that statement. The right hon. gentleman had always been known as the possessor of a strong imagination, but he had now taken a very high light, and asserted himself to be the entire inventor of this plan for the improvement of the Houses of Parliament. According to his own statement, the right hon. gentleman himself had done everything, Mr. Barry nothing; but that assertion had no foundation in fact. No doubt, Mr. Barry did, in 1863, suggest a plan for enlarging the refreshment-room by altering the walls of the present structure; but that plan was not adopted, and Mr. Barry afterwards maintained the best plan would be to secure the conference-room and the tea-room for the purpose.

There could be no doubt that the plan as ultimately presented to the House was entirely Mr. Barry's, and was part of the plan which was laid before the committee of the hon. member for Newcastle (Mr. Headlam), in 1867. In all the proceedings of that committee, and in the correspondence which took place upon it, he plan was recognised and acknowledged as Mr. Barry's; and he could not understand how the right hon. gentleman could now calmly appropriate it in this way, without one word of acknowledgment to its real author. It was repugnant to say that, because, some years ago, the right hon. gentleman had made a similar suggestion, therefore the whole merit of the plan belonged to him. The contrary of his statement was proved by the Kitchen Committee of 1867, who reported as follows:—"Mr. Barry has now suggested a plan for improving the accommodation by converting the present conference and adjoining rooms into a large dining-room for both Houses of Parliament, in lieu of the present separate dining-rooms; and they are of opinion that this plan is preferable to any yet produced before your committee."

In 1868 Mr. Barry was instructed to prepare a plan in accordance with this report, and the proposal for the dining-room on the ground floor was the result of the objection on the part of the House of Lords to give up the conference-room, which objection of course rendered a new arrangement necessary. But Mr. Barry met his objection by proposing to give the Lords a new room in the space beyond the lower waiting-hall, which the Commissioner of Works now intended to take, and this plan was approved by the Lords' Committee last year and also by the Kitchen Committee of the Commons, who, on the 12th May, 1869, reported that "They saw it with satisfaction that in the new plans of Mr. Barry it is proposed to adopt the original proposition of converting the present tea-room and conference-room into dining-rooms." In July, 1869, Mr. Barry, by the direction of the Lords' Committee, sent a plan and also a letter to the Office of Works. He (Mr. Bentinck) had moved these documents, but the letter was not forthcoming, as it fully established the facts alleged, though no one could dispute their accuracy. On the 9th of August the Commons

committee appointed to consider "a joint service for both Houses," reported. Mr. Barry was examined before that committee, and as he had received insufficient instruction, he was only able to say that the covering estimate for the whole work would be about 22,000*l.*; but then it must be remembered that this estimate comprised more than double the works now contemplated,—a fact carefully concealed from the House by the First Commissioner, and nothing could be more unfair than to say that the Commons' committee of last year decided the plans to be unsatisfactory because their report merely stated that they were not prepared to recommend to the House that so considerable an outlay should be made at once, but thought the subject should be deferred until next year. Mr. Barry continued to be recognised as architect during Mr. Layard's tenure of office, but the instant the right honourable gentleman succeeded he reversed the policy of all his predecessors, and put into practice the fixed idea which possessed him that the worst man to be employed in these works was the man who knew what he was about. The right hon. gentleman relied upon the report of the committee of May last upon his plan, but this report was wholly defective for want of evidence. Two witnesses only were called, and they were both officials of the Office of Works. Mr. Barry was not summoned, or he would have shown how his plan had been stolen, how his estimates had been grossly misrepresented, how he could have done the present work for 6,000*l.*, and also the patent defects of the First Commissioner's plan. But the right honourable gentleman had made a most egregious blunder by not examining before the committee a single witness connected with a refreshment department, either there or in any other place, or who knew how to serve a dinner, and the result was that no satisfactory kitchen service could by any possibility take place under the proposed arrangements, and it was manifest that the subject required reconsideration. The reports of the committees of the House of Lords of this session advocated and confirmed all his (Mr. Bentinck's) objections; and, though the Lords had agreed to accept the new conference-room, they had not withdrawn any one of their unanswerable objections to the scheme. But if common sense and expediency did not demand the employment of Mr. Barry, the Government were bound to this by their own declaration. On the 13th of May, the Chancellor of the Exchequer had expressed an opinion that Mr. Barry ought to be employed on architectural works in the House; and how could he retreat from that position with honour in the case in point, where main architectural features of the House were proposed to be obliterated and altered. The architectural objections to this scheme were:—1st. That the Lower Waiting Hall would be entirely destroyed in effect by cutting off the branch which intersected the corridor. 2. That the continuity of corridor, one of the main principles of the building, would be permanently interrupted. 3. That the new conference-room, which was to be architectural in character, was supported upon columns in the court below, carrying a projection of above 11 ft., and darkening all the rooms below. It was manifest that such works could not be properly executed by obscure clerks, but only by a competent architect. The practical objections were, if possible, even more serious. The kitchen was small, and ill ventilated; and it was impossible the kitchen service could be carried out, the kitchen being only 90 ft. from the serving-room, which, according to the testimony of the managers of two of the largest clubs in London, would render it impossible to dine fifty or sixty gentlemen who might rush in for dinner on a busy night. The place where the dinners would all be brought up he proposed to construct out of an elaborate Gothic porch which would bring all the dinners of the House into a place where there was neither light nor air, the effect of which would certainly be to create unpleasant odours and intense heat. Then he proposed that the bar should protrude into the room itself. But it was impossible to have wines and liquors served properly in such a place, because there was no air, and the heat would be too great. A place for wines had been entirely forgotten. Now, it was absolutely necessary, where wines might be called for in a hurry, to have the place in which they were kept on the same floor as the dining-room. Apart entirely from aesthetics, this plan would not do. The last thing for his right hon. friend to do would be to leave out the item, and let the matter be considered next year. The governing

party invariably had an official to "meddle and to muddle." Lord Russell used to fulfil this function; but the right hon. gentleman (Mr. Ayrton) had taken his place with great aptitude and effect. He begged to move the omission of the vote, in order that the question of re-arrangement of the refreshment-rooms should be more fully considered.

Mr. B. Cochrane deprecated any alteration which would look like ingratitude to the late Sir Charles Barry, and saw no reason why the opinion on that question of his son should be disregarded. This was the old story of squandering public money by false economy.

Mr. Cowper-Temple was sorry that his right hon. friend had entered into a comparison between himself and Mr. Barry in regard to architectural matters. The scheme seemed to him very faulty.

Lord J. Manners expressed his regret that the plan of Mr. Barry had been departed from. Though more expensive, it was by far a more complete and perfect plan. He protested against alterations in the present building being undertaken by gentlemen who, however trustworthy and eminent in their profession, were not professional and skilled architects. He still hoped that the right hon. gentleman would call in the services of Mr. Barry.

Mr. Gregory concurred, and Colonel W. Patton thought they ought not to make so large an alteration as that now proposed without taking the opinion of a competent architect.

Mr. B. Hope supported Mr. Barry's scheme for altering the dining-room, and condemned that of the Board of Works.

The vote, however, was ultimately agreed to.

OFFICE OF WORKS, &c.

On a vote of 22,421*l.* for salaries and expenses connected with the Office of Commissioners of Works and Public Buildings, Mr. Bentinck moved that the salary of the Director of Works and Buildings be reduced by the sum of 750*l.* He said that as he only wished to show his want of confidence in the new policy of the Government, he should be glad to reduce the sum to a mere nominal amount. Until the right hon. gentleman came into office the principle had always been adopted in the Office of Works of having a salaried and professional architect to advise the First Commissioner. The right hon. gentleman, however, had re-constituted the functions previously discharged by Mr. Fennesthorpe and Mr. Ferguson in the office held by Captain Galton, who was not a professional architect. The result of this arrangement did not come out until the debate on the dismissal of Mr. Barry. He (Mr. Bentinck) complained that Captain Galton had been placed in a position which he was not qualified to fill, inasmuch as he had to perform architectural duties, and he also complained that the Board of Works should be left without the assistance of a consulting architect.

Mr. Gladstone said that when the hon. gentleman stated that it had been determined to have nothing to do with architects at the Board of Works, he was mistaken. Far from the Office of Works not having the assistance of an architect, they thought it would be better to employ one if necessary, from without the department. Thus, by appointing Captain Galton, who was thoroughly acquainted with construction, but not with architecture, they would avoid any difference of opinion if they at any time wished to consult a special architect in order to carry any important work into execution. He maintained that if the First Commissioner of Works had had competent advisers to have given advice, as practical constructors, in connexion with the Houses of Parliament during the last thirty years, a very considerable saving of expenditure would have been effected.

Mr. Beresford Hope said he regarded the creation of the new office of assistant-surveyor of works as the turning-point in the new system. The new policy of the Government was to dispense with the services of eminent architects, and to entrust the architecture of our public buildings to a mere clerk of works. The circular advertisement of the First Commissioner of Works, inviting competition for the office of assistant surveyor, set forth the qualifications that were required in the candidates, who must be competent to design and superintend the construction of buildings, and be capable of writing reports of the works without any blunders in orthography. What, then, was the use of advertising for a man to design and superintend the construction of buildings if he was not to be called upon to do so. There was ground for supposing that the policy of the Board of Works was to dispense with the consulting architect and with the services of independent architects of eminence, and entrust the designing and superintendence of the works to a mere underling, who was to be brought in to represent the national taste in the architecture of our public buildings; and it was the duty of the Treasury bench to say whether that really was the scope and object of their present policy.

Lord J. Manners thought that the question of his hon. friend the member for Whitehaven had not been answered. What he wanted to know was, who was the architectural adviser of the Board of Works, and whether architectural advice could be obtained from Captain Douglas Galton. He (Lord J. Manners) thought that a better system could be devised, and he was glad that his hon. friend had called the attention of the committee to the subject.

Mr. Ayrton desired to remark that the duties of his office were regulated by statute law, and in fact, his own position was little better than that of being a superior Treasury clerk. In the Office of Works there were gentlemen called assistant surveyors, but they were, in fact, architects, and carried on the business of architects in the Office of Works. The Director of works was an officer of great importance, and one who rendered valuable service to the public. Before the employment of an architect, there were many preliminary questions to be considered, and hitherto there had been no one responsible for this duty. He believed that the change would affect a saving to the public, not of thousands only, but of hundreds of thousands.

Mr. Monk said he had listened with dismay to the Chief Commissioner of Works. If we were to have a director of works, he ought to be an architect.

After some further conversation, the vote was agreed to.

THE DECORATIONS OF THE CENTRAL HALL.

Mr. Ayrton stated, in answer to questions, that nothing had yet been determined; but having placed the matter in the hands of six or seven artists of eminence, he should be guided very much by their opinion.

The committee are Mr. Cope, Mr. Ward, Mr. Watts, Mr. Armytage, Mr. Poynter, Mr. Horsley, and Mr. Herbert.

PARLIAMENTARY.

WESTMINSTER CHAPTER-HOUSE.

On the vote of 6,395*l.* for the repair of the Chapter-house at Westminster, Mr. Goldney asked for an explanation, and Mr. Ayrton said the shell would be completed for 30,347*l.*, and it would then be for the House to determine what should be done with it.

THE EMBASSY BUILDING AT CONSTANTINOPLE.

On the vote of 41,610*l.* for the British Embassy and consular establishments at Constantinople, and in China and Japan, being taken, Mr. Rylands complained of the past expenditure as being altogether unsatisfactory, and Mr. Candlish expressed a hope that the British Embassy at Constantinople would not be rebuilt without Parliament first having had an opportunity of considering the matter.

In reply to Mr. E. N. Fowler, the Chancellor of the Exchequer said the building was not insured, adding that the site was one which had the advantage of very cool air. The walls of the building were almost entire.

THE NATIONAL GALLERY.

Mr. B. Hope called the attention of the House to the present condition of matters relating to the plan for the enlargement of the National Gallery, complaining that all the correspondence in reference to this subject which he had a right to expect had not been laid upon the table. Having asked for important papers, he had been fobbed off with antiquated and obsolete returns, which only left the subject he wished to elucidate more complicated than before.

The Chancellor of the Exchequer announced that the Government had come to the conclusion that it would be possible to do something in the direction of the enlargement of the National Gallery during the present session, and a supplementary estimate would be laid before Parliament for the purpose in a few days.

VENTILATION OF SEWERS.

A PAPER read at the Liverpool Polytechnic Society by Mr. T. C. Thorburn, C.E., Surveyor to the Birkenhead Commissioners, on the method adopted in Birkenhead for ventilating sewers, and carrying away the gaseous emanations generated therein, has been recently printed, and may usefully be made more public:—

In the district under the control of the Birkenhead Commissioners there is a length of about 60 miles of roads and streets, laid out or constructed, and the length of main or common sewers laid down or constructed under such roads and streets is about 42 miles.

The area of the district is about 1,684 acres (with levels varying from 24 ft. to 184 ft. above Old Dook Sill), but the total area within the watershed, for which the main sewers act as an outlet, includes part of Tranmere, and is something like 2,224 acres, in addition to which there is a large agricultural district drained by the fender brook, and thence through the great culvert, parallel to the docks, into the river Mersey, at a point near the north end of the Woodside stage: the area of this district is about 13,800 acres, equal to about 21½ square miles.

The drainage area of the town is divided into three districts, each of which has a separate tidal locked or flood-flapped outlet into the river.

The length of streets laid out and sewered in Birkenhead is at present out of proportion to the number of buildings (9,200, with 4,200 water-closets), and a population of about 50,000, giving a density, in including the area occupied by the Dock estate, of 30 per acre, and, exclusive of the same, about 41 per acre, or something like one-third the density of the population of Liverpool. The dual use, therefore, for which the sewers are ultimately intended to answer, if they are to continue to be used as at present, viz., the carrying off by suspension in water of the sewage matters discharged from the dwellings of the inhabitants, as well as the surface drainage, being therefore limited and out of proportion to their capacity, or to the purposes that they will ultimately be used for when the town becomes fully built upon. Hence we have not in Birkenhead the same amount of deleterious gases to contend with in the sewers as is to be found in the sewers of Liverpool, where the population is so much greater per acre, and the sewage largely diluted, or mixed with the refuse from chemical or other similar works.

The ventilating shafts, therefore, erected in Birkenhead, have not been so severely tested as they would have been if erected as part of the Liverpool system of sewers, in connexion with which it appears from the last report of my friend Mr. Newlands, the borough engineer, that there have recently been erected 1,080 Archimedian screw ventilators fixed at the termination of pipes, in connexion with the sewers, attached to the houses, and carried up to the top of the buildings, as recommended by the Mortality Sub-committee in 1866.

The principle of the ventilating shafts erected in Birkenhead by me of recent years will be easily understood from the drawings now submitted for the information of the society.

These ventilators are for the most part constructed adjoining the vertical manhole entrances to the sewers from the roads.

Each shaft is provided with a galvanised iron wire basket of 3-in. mesh, 10 in. square, filled with small wood charcoal for a width of 6 in., fixed in a short horizontal gallery between the opening through the crown of the sewer and the upcast shaft, terminating at the surface of the street, in a position so as to protect the charcoal from being saturated with rain-water falling through the surface cast-iron grating, fixed on the top of the shaft, level with the street.

The manhole entrances are found to act as downcast shafts, thereby facilitating the draught of gas through the charcoal filter fixed in the ventilating or upcast shafts, very much on the principle of syphon ventilation.

These ventilators are found to answer their purpose effectually, and very little, if any, trace of deleterious gas or unpleasant smell is perceptible at the grating in the street. It is estimated that about 90 per cent. of the sulphurated hydrogen or other gaseous emanations from the sewers is intercepted in passing through the charcoal filter. (See Report of Mr. Tate's tests of the emanations of gas from sewers.)

The number of these sewer ventilators constructed in connexion with new works is 4 double (a), 53 single (b); and the number in connexion with old sewers, 16 (c). In the latter case, the charcoal basket is fixed in a horizontal gallery, constructed near the top of the manhole entrance, with an outlet to the street similar to the others; the total number of ventilators constructed up to the present time being, in all, 73.

The principle upon which they are arranged is on the main lines of sewers at every junction, and at the termination of the collateral sewers in the side-streets and courts.

It is intended to extend the system to the drains in courts and back passages, where they will be constructed at the termination of each line of drain, on the same principle, but on a smaller scale.

Many of these ventilators have been in use for upwards of four years; and, while we have had complaints of unpleasant smells emanating from untrapped gullies, we have never had any complaints during that period of any disagreeable emanations from the grids over the ventilating shafts.

The adoption of the Archimedian screw ventilator in Birkenhead has been limited to one instance, where it was fixed in connexion with the new water-closets recently erected at the Market-hall; and the connexions with chimney-shafts have been secured in two instances—one at a low level in Park-street, and the other at a high level in Oxton-road, all of which have been found to act efficiently.

The objection, however, to connecting furnace-chimneys with sewers is, that it is found in practice that the area ventilated is limited to a distance sufficient to replace the gases drawn out of the sewers and drains by air from the streets and houses of the district, through untrapped gullies or other openings; and that it has a tendency, while at work, to untrap the gullies fixed at the inlets to the drains; and, when out of work, such inlets form outlets for the gases generated in the sewers; and therefore, at such times, dispersing the sewer gases into the air of the streets and dwellings of the inhabitants of the district; or, in other words, such a system is violent, local, and intermittent in its application.

In certain states of the atmosphere, the gases discharged from the Archimedian screw ventilators are found at a lower level than the point of exit, and therefore become mixed with the air at too low a level.

Vertical shafts provided with baskets filled with charcoal, which answer all the purposes of a deodoriser, are, in my opinion, better adapted for rendering innocuous the aqueous gases emanating from sewers (vide Mr. Tate's tests) than either chimney shafts or Archimedian screw ventilators, as they allow of a natural diffusion of the deleterious gases by their own specific gravity, and pass them into the air of our streets comparatively harmless, and are superior to the plan recommended in the Parliamentary blue-book, by the inspectors of the Local Government Act Office, where the charcoal trays are fixed horizontally in the manhole entrances, and require to be removed when access is required to the sewer.

The extra cost of constructing the ventilators,

according to the various arrangements, is as follows, viz.:—

For plan a (double ventilator, constructed at the summit level, when two lines of sewers run in opposite directions), 2*l.* 12*s.*

For plan b (ordinary single ventilator placed on the line of brick sewers), 1*l.* 8*s.* 3*d.*

For plan c (a modification of b to adapt it to old manhole entrances), 16*s.*

The parts of sewers where ventilators are most required are at "dead ends," and the summit points of termination of the system.

Other means of ventilating the sewers suggest themselves, such as conducting the shafts through the columns of large lamps, fixed in open spaces, and provided with gas jets kept constantly burning inside the shaft or column, to facilitate draught, and to destroy the deleterious gases as they are drawn out; but as yet I have had no opportunity of testing this mode of sewer ventilation, which I am inclined to think would be effectual, and comparatively harmless to the inhabitants of the adjoining houses, and not likely to contaminate the atmosphere of the surrounding district to any appreciable extent.

Some years since I connected two or three flues in a large mansion in the country, with the system of sewerage and drainage provided for the same; but from the experience there obtained of house-flues as a means of ventilating sewers, I do not think that they can be safely used for that purpose. It is found that the objection urged against the use of factory chimneys, as a means of sewer ventilation, is more or less applicable, to an intensified degree, to the use of house-flues for the same purpose.

The roof rain-water conductors, or drop spouts of houses, have been extensively used as a means of ventilating sewers, but experience has shown that such pipes are not adapted for this purpose, as the joints are seldom, if ever, made air-tight.

The same objection more or less applies to special ventilating pipes attached to houses, which have in many towns been erected in connexion with the sewers.

No drain should be carried under a house without having a proper trap fixed or constructed outside the external wall of the building, and all soil-pipes should be ventilated to the external air, and, where possible, a current of air should be secured between the water-closet and the house.

By strict attention to these and other like matters, in the laying down and construction of systems of sewers and drains for the carrying away of the sewage and drainage of the dwellings in our towns, many of the evils and unpleasant effects now complained of will, for the most part, if not wholly, be removed.

The question as to the length of time that ordinary wood charcoal will effectually act as a deodorizing agent of sewer gases is one that I feel incompetent to give satisfactory answer to without further experience. The charcoal that I have used for this purpose has hitherto, in my opinion, not required renewing, although in some cases it has been in constant use for upwards of four years.

I have to acknowledge the assistance of Mr. Norman Tate, who has this day made an experiment with the sewer gases issuing from the Birkenhead sewers, through the charcoal filter above described, and from the manholes direct, from which it appears that only a trace of sulphurated hydrogen was detected in the gases issuing from the former, while from the latter it was very perceptible.

The question of the durability of the charcoal, as an effectual means of deodorising the noxious or deleterious gases issuing from town sewers, is a very important one, and no doubt the chemical members of this society will give their valuable aid in elucidating the question.

The ventilation of sewers in a harmless manner is a very important question, and no doubt its discussion by the members will throw considerable light upon the subject.

My own efforts in endeavouring to elucidate the problem have been done in a quiet way; there is no novelty in the deodoriser made use of, but I believe the arrangements explained, as recently adopted by me for the ventilation of sewers in Birkenhead, are convenient, self-acting, and effectual in their operation.

Royal Academy.—The exhibition will close at the end of this week. There is still time for those not the best off to see it for 6*d.* No one who really wishes to see the pictures of the year will find this sum an obstacle.

BLESSING BELLS.

UPWARDS of 2,000 persons assembled in the Catholic Church of St. Francis Xavier, in Liverpool, on Sunday last, July 24th, in the afternoon, to witness a novel ceremony, at least, in this country. This ceremony was the blessing of a new set of bells by the Catholic Bishop of Liverpool, previously to their being placed in position in the tower of the church. The Church of St. Francis is served by priests of the order of Jesus, and is a large and handsome structure. For some time it has been in contemplation to set up a full peal of bells, and recently a purchase of a set was effected from Mr. John Murphy, the bell-founder, of Dublin, at a cost of 500*l*. They are in the key of F. They weigh collectively 3½ tons, the largest bell being 16 cwt. For the purpose of the ceremony they were hung on temporary framework, within the altar-rails. The bishop, attended by a large number of the clergy, first blessed salt and water, with which the bells were washed, and afterwards dried them with linen cloths. They were then anointed with "chrism," in the form of a cross, at which each bell received the name of a saint, the tenor taking that of St. Francis, the patron saint. Incense and myrrh were then placed in the thurible, and this was placed under each bell in turn, so that it received the whole of the smoke, when, after the recitation of prayers and a portion of a Gospel, the ceremony concluded.

St. Francis's is the first and only church in Liverpool which can boast of a full peal of bells. How far such a ceremony as the above is in accordance with the spirit of the age, would be a somewhat difficult matter to define.

POSITION OF CATHEDRAL ORGANS.

THE suggestion of "G. M." as to burying the organ alive in a well below the floor is not new to me, though I do not remember to have seen it in print before. There would be some manifest objections to carrying out such a scheme in its entirety. The expense of constructing the vault so as to insure dryness, the absence of daylight for repairs and tuning, are among these; the latter not to be under-rated, for the more daylight you can get to the interior of an organ the better; mechanical defects are then more easily perceived and remedied, with less chance of fire from careless candle-holding. The musical effect of such an arrangement is doubtful; for soft passages it would probably have a good effect; for loud passages on the "full organ" probably not; there would be a clamour of sound just over the opening, which would not adequately reach other parts of the edifice. "G. M.'s" proposed sounding-board "at an angle of 45 degrees" to obviate this, would surely be a greater eyore than the organ itself; and indeed there are probably few architects who would wish to bury the organ completely out of sight; for every one must admit that, if reduced within moderate proportions, an organ-case is an opportunity, though a much neglected one, for the display of decorative treatment both in form and colour.

A partial adoption of the burial suggestion might, however, be made with successful results. In the case of a cathedral organ, for instance, the smaller parts (say all the manual pipes) might be placed in the customary position in the choir screen, and the pedal pipes might be partially buried in ranks, on each side of the entrance, from nave to choir, so as not to project far above the floor, and only to require a low screen to cover them, which would not materially interfere with the vista. The pedal pipes would then be in their best position, almost, for sounding individually, would be massed together, and would not be so far from the rest of the organ as to prevent their blending with it to produce a homogeneous effect. In the case of smaller organs, for ordinary churches, where, owing to the plan of the church, these have to be placed in the "organ-chamber," which has, unfortunately, become so universal, an excavation of about 4 ft. below the floor of the church, and building up the organ from that level, would neither be difficult nor expensive, and would go a great way to help the effect of the instrument, by avoiding the necessity of bringing the larger pipes up with their tops close against a roof or ceiling, as is often the case with instruments placed in a small organ-chamber. This suggestion was actually made, in a case that came under my notice, by a very high authority on organ matters.

In the case of new churches, a great deal of the organ difficulty is chargeable solely upon the architects, who, though perfectly aware that an organ has to be put in the church, make no proper provision for it, take no trouble to ascertain what are the best conditions for placing it, and then are angry with the organist and the organ-builder for doing the best they can under the circumstances, and complain of them for spoiling the architectural effect." This is not fair; but indeed it must be said that organists, as a rule, have been treated with great contempt, not to say contumely, by the architects; and this very natural wish to obtain an effective position for a fine instrument has been considered quite beneath attention on the part of the latter. We all know Wren's contemptuous expressions about the "box of whistles" in his cathedral; and it is on record, that when so eminent a musician as Dr. Wesley expressed his wish to have one end of St. George's Hall in Liverpool reserved for the grand organ which it was proposed to place there, he was contemptuously answered by the architect, "Do you suppose I made my building to be a case for your organ?" Those who now go to that room to hear the performances of one of the finest of living organ-players on an instrument of exceptional grandeur and perfection, and find half their pleasure therein destroyed by the preposterous echo which blurs all the outline of the music, may be excused for wishing that the architect had condescended to consider the subject a little, and that the building were a little more of "a case for the organ" than it is. If the architects would treat the organists as one artist should treat another, and consult with them for the achievement of a satisfactory acoustic and architectural result, when an organ of any size is to be erected in a building, there might be fewer causes of complaint on both sides afterwards. S.

THE UNEMPLOYED POOR.

Sir,—The London Registrars of the Cosmopolitan League of Industry having had their attention directed to the article in your issue of the 9th of July, 1870, entitled, "Lands that want Hands," have unanimously voted you their thanks for your able advocacy in the article of the interests of the British poor and industrial classes, and in the propriety of that vote, I, as chancellor of the League, entirely concur.

The object of the League being "the general advancement of the moral, mental, and material interests of all persons engaged in useful arts, trades, occupations, or pursuits," its London registrars view with serious apprehension the neglect of the British Legislature in not having provided at the cost of the State, the means for the emigration or home employment of the unemployed poor; and they agree with you, that if this question be not solved on the side of common humanity, a still increasing number of the best and most useful working members of the British community will be forced outside of that tacit and equitable compact of mutual interest and advantage, upon which, under various dominating circumstances and phases, all human society has been originally based; and by the faithful observance of which compact society can alone cohere and progress, and, while giving full scope to its various individual and corporate energies, feel itself individually and collectively secured in its liberties and rights behind an ideal, but, in effect, adamantine bulwark of law and order.

The London registrars of the League believe that the only really noxious or dangerous units of any aggregation of men, are those who are uselessly employed, or absolutely idle; and they agree with you, "that the most anxious care of the most provident statesmen is demanded by the necessity, not only of guarding against the inroads, but of checking the increase of the members of the dangerous classes," and they further believe that the establishment of well-organised systems for emigration, home colonisation, and useful public works' construction, is absolutely required to meet the present exigencies and prospective necessities of the British poor and industrial classes.

In view of the statements and information I have received as chancellor of the League, combined with information previously acquired as consulting engineer of the former Tydal Harbour Commission, and as public inspector and surveying officer under the late harbour branch of the Admiralty, it becomes my duty authoritatively to pronounce that while thousands of the British poor and industrial classes are dying a lingering death by semi-starvation, or by diseases incidental thereto, numerous public works are needed in the execution of which the mass of the persons employed would require comparatively little skill or previous training; and I may also point out that even in the case of those who were weak from previous residence in close towns, or employment upon unhealthy or sedentary occupations, good feeding, and a moderate and gradually increased amount of healthy and open air exercise would tend to the rapid physical renovation of themselves and their offspring.

Reservoirs for the storage of water are needed in districts where human beings and cattle are periodically subject to severe and distressing droughts. Existing harbours require improvement, and new ones are needed for refuge and for commerce; rivers long neglected and navigations impeded should be cleared out and improved to facilitate tidal and arterial drainage, and to cheapen the internal transit of bulky and heavy materials and goods; trees need planting in suitable localities to form plethoric forests, parks, road avenues, and pleasure grounds; new territories might be gradually reclaimed from the sea; unsanitary and barren tracks might be drained or otherwise treated so as to add a large area to the existing healthy and habitable land under pasture or cultivation. And, in addition to the present and lasting benefits which the execution of such works would confer upon the community,

if a system for their control were devised and enforced, in which there was an absence of useless and overpaid functionaries, and a sternly honest administration of the moneys employed and received, it might reasonably be hoped, that besides from time to time affording a necessary and under-estimated relief to the poor and industrial classes, many of those works might be made to yield an ample return to the public Treasury.

J. G. C. C. GODSMAN.

THE HOUSE IN PARK LANE.

Sir,—May I request that you will kindly add to the information contained in last week's *Builder* the fact that the parquet floors laid in the two drawing-rooms, boudoir, and ante-room of Sir D. O. Marjoribanks's new mansion were executed at the London Parquetry Works, by

CHAR. STRINIZ.

TO SOFTEN PUTTY.

Sir,—In reply to your correspondent as to softening putty,—Soft soap, it is said, will in a few hours soften the hardest putty.

G. H. RIDGDALE.

THE STORM IN LONDON.

WARNING.

Sir,—Perhaps the coincidences of the storm in London on Tuesday morning may appear to justify the special warnings which were published in the *Builder* in a full anticipation of the event, when the necessity of providing for storm outfalls, and other suitable provisions, were distinctly pointed out, with the view to meet the emergencies, both with respect to overflow from sudden rain during a storm, and the proper protection of buildings from lightning.

The remarkable and, indeed, unprecedented character of the past five months would suggest that causes of action which are worthy of being investigated by sincere and scientific bodies of men, as it is impossible to assume that the systematic magnetic observations are concluded, or that a perfectly normal state of things exists at the present moment.

With the desire to protect building property, it will still be quite necessary to remember that the barometer has been without any considerable fluctuations for a very long period of time, and continued very high above the average; at the same time that an increased heat exist in the atmosphere calculated to develop and to mature a series of provisions for ultimate meteorological complications, and for the salutary restorations to the usual climates in different parts. It takes time to accumulate and store up the electricity; and I venture to state that we have only had in the late storm an "exemplary instalment" of the fund of water in store for us; which is most valuable as a natural element for our use, but most destructive to artificial town restraints in the event of obstructions, or unsuitable adjustments.

The second instalment of water may come much sooner than we anticipate, and subject exposed positions to temporary inconvenience, and not a few to serious losses.

Immenus est potentia coeli.

ARTHUR GEARING.

CHURCHES NEAR LONDON.

St. Peter's, Paddington.—On the 23rd ult. this church was consecrated by the Bishop of London. It is situated in the Harrow-road, and has a district assigned to it taken out of the parish of Holy Trinity. The church is built to accommodate 1,190 persons, 920 seats in the ground-floor galleries being intended in the transepts and at the west end. It consists of nave, aisles, transepts, and chancel, with a vestry on the north side and organ-chamber on the south side of the chancel. The tower and spire at the south-west angle of the nave are not yet built. The columns of the nave arcade are of polished granite, with carved capitals of Bath stone; the other columns in the chancel and transepts are of Devonshire marble. The cost of the church, as far as at present completed, including the heating and lighting, is about 6,000*l*. The architects are Messrs. Newman & Billing; and the contractors Messrs. Dove, Brothers. The incumbent, the Rev. W. H. O'B. Hodge, has been assisted in the raising of the necessary funds by a grant from the Bishop of London's Fund, by an anonymous donation of 2,500*l*, and by subscriptions from many friends. The site was given by Sir John Neeld and his lessee, Mr. Vigers.

St. Luke's, King's Cross.—A church, called St. Luke's, King's Cross, was built some years ago upon the present site of the St. Pancras station of the Midland Railway. When it was resolved to build this terminus, the Midland Railway Company gave 12,500*l*. for the existing fabric and site, and by a special Act of Parliament, leave was given to build a church with this fund upon another site, and form a new parish, the original parish, as well as the church, having been almost swept away to make room for the buildings of the Midland Terminus. The site of the present church and parsonage was given by Christ Church, Oxford, and a parish fund out of the surrounding districts, and out of the fund obtained from the Midland Railway, greatly diminished by the ex-

penses of obtaining the Act of Parliament, the present church and parsonage were built. The contract for the church was 9,391l., and for the parsonage, 2,615l. The entire cost of the church, including railings and facing round church, stained glass, warming apparatus, &c., will have amounted to about 10,500l.; that of the parsonage to about 2,750l. The contractor was Mr. Thomas Williams, of Cardiff and London; and the architect, Mr. Basil Champneys. The stained glass was executed by Messrs. Heaton, Butler, & Bayne, from designs by Mr. Henry Holiday. The material of the church and parsonage is red brick, of a dark tint. The stone used is from the Tibbury and Hollington Quarries.

St. Matthew's, Limehouse.—This district having been successfully worked by a missionary clergyman, in connexion with the London Diocesan Home Mission, and a numerous congregation having been drawn together, the present temporary place of worship being found inadequate, a church is about to be built in the Commercial-road, near the Stepney Railway Station, to accommodate about 700 persons, at a cost of 4,500l. The site was purchased by the Bishop of London's fund, who also contribute largely to the building funds. The remainder of the cost has been nearly entirely raised by subscriptions, aided by an anonymous donation of 1,000l. The plans have been prepared by Messrs. Newman & Billing, architects.

TELEGRAPHIC MUSIC.

ONE of the things not generally known is the fact that our Government has generously, though inadvertently, supplied the dwellers in towns and suburban districts with cheap music. Just before the post-office authorities looked over the then existing telegraphs numbers of workmen were engaged in extending the lines to villages inland on the tops of poles; like gigantic clothes-lines, in fact. These lines were single wires of galvanised iron; and when stretched tight and agitated by a gentle wind, gave out alternately two notes in a minor key, of a most melancholy strain, reminding one of Sam Slick's account of the singing by the black "help" of the song, "Oh no, we never mention her," and causing him to observe that he wished to Heaven she never would mention her, unless she could do it more cheerfully. Similar feelings have been produced in the dwellers near any of these monster Eolian harps, especially if a "bight" had been taken round their chimney, or fixture made on their roof. The house, or row of houses, was then thrown into vibration, and formed a kind of sound-board to the string. On this matter being represented to the Post-office authorities, they promised to remedy it, by placing a double-span wire in the place of the single wire, availing that that could not "sing;" but the wind is too much for them, the second wire "sings" as well—or ill—as the former one. Can any of the readers of the *Builder* suggest a remedy? E. G.

SOMETHING PREPOSTEROUS.

THE following tenders have been sent in for painting and decorating two villa residences in Kew-road, for Mr. Thomas Agns:—

Brown & Eldridge	£250 0 0
Buckley	176 0 0
Shepherd & Reid	168 0 0
Hicks	125 0 0
Frend	116 0 0
Johnson	110 0 0
Southwick, Brothers	105 0 0
Boulton	84 0 0
Butten	90 0 0
Sargeant	83 10 0
Ross	80 0 0
Hansen	75 0 0
Pickford	65 0 0
Picknell	51 10 0

As a parallel, we give the tenders just now delivered for painting and other works at the Vestry-hall, Chelsea:—

Church	£226 0 0
Elliot	197 0 0
Sansom	150 0 0
Aunger	127 0 0
Sawyer	117 0 0
Buckley	117 0 0
Emth	114 0 0
Whitlick	99 0 0
Seal	89 0 0
Turrell, Brothers	70 0 0
Winchester	53 0 0

Apart from the scandalous differences shown, a curious coincidence is observable.

CHURCH-BUILDING NEWS.

Burston.—The church here has been re-opened after having been repaired. The work recently carried out was mainly confined to the roof, which, before the restoration, presented symptoms of dilapidation. Up to a recent date the tiles, lying upon laths, with no mortar under them, showed themselves between the beams. The old beams have been renovated and stained. The tiles are set in mortar, from which the beams stand out in relief. Probably the original outer covering was lead. In addition to the roof, some attention has been paid to the east wall, which was restored some years ago by the Ecclesiastical Commissioners. The mortar of this wall, of indifferent quality, remained soft and damp. It has been removed, and the wall faced with tiles. At the foot of the east window is a piece of work by Mr. Day, of Ipswich, executed on zinc, including the *Agnus Dei*, with Alpha and Omega, and the sacred monogram, at either end. In the chancel, stalls have been erected for the choir and one for the clergy. The cost of the work was about 80l. The architect was Mr. Barnes, Ipswich; the builder, Mr. Welham, Hoptesham.

Chiddingfold.—The church of Chiddingfold has been re-opened after a restoration. The tower has been raised 14 ft., giving room for its peal of five bells, and for the ringers; but its little spire remains. The Georgian apartments have been removed, and the old oak sittings have been cut down, and are open. A new east window has been put in, with three chief lights representing,—centre, the Crucifixion; and beneath, St. Paul shaking the viper into the fire; while on the right hand side is the Resurrection (Christ appearing to Mary); and on the opposite light is the Nativity, Peter on the sea; with some minor subjects, in both lights, as well also in the upper panels. The table is of polished oak, and is backed by a reredos and "super-altar" of the alabaster, with panels, having in front in the centre a white cross, standing in a miniature porch. The inner chancel is paved with Minton's glazed tiles, and the remainder of the church with plain coloured tiles alternating. The alterations consist principally of a new north aisle, new chancel aisle, new roof, the restored tower raised, the work being executed in Bath, and in some parts Pulborough stone. A new clock has been placed in the tower, and the bells re-hung. The whole of the alterations have been made from the designs of Mr. Woodyer, the church architect, and executed by Mr. Harris, of Woking. The church will seat 500 persons. The total amount of the contract for the alterations and rebuilding was 3,000l., but extras will bring it considerably over this. The reredos was executed by Mr. Nichols, and the stained glass window, by Mr. Warrington.

Gravesend.—The foundation stone of the new chapel for St. Andrew's Waterside Mission has been laid. A lady, who desires that her name shall not be published, has offered 1,000l. for the erection of a memorial chapel. The committee then resolved to purchase a strip of land 17 ft. wide, to the west of the present building, and to obtain from the Thames Conservancy a grant of 20 ft. on the river side. To quote the words of the report, they "have undertaken the purchase of the site, the construction of the sea wall (a costly business), the expense of putting the mission house to rights, and the building of the foundation up to the level of the street. This will cost 1,500l. at least, of which they have got 500l. They propose to take contracts for a bit at a time, and will go on as they get money—not incurring debt further than is absolutely necessary for the progress of the work. From the level of the street the cost of the chapel will be borne by the benefactress." Mr. G. Street, architect, has furnished designs for a chapel capable of accommodating 150 persons, and Mr. Blake, of Gravesend, is the contractor for the building. The stone was laid on the chalk rock, a few feet below the Mission House, and it was necessary to select an hour when it would be low water. The small available space, and other circumstances also rendered it undesirable that there should be any grand parade and ceremony.

Ely.—The foundation stone of a new chapel for the Ely union-house has been laid. The building, when completed, will be 52 ft. long, and 21 ft. wide inside; the height, 19 ft. to the line of collars of roof. The materials will be white bricks and stone dressings. It will be lighted by eight windows on the sides, and three windows on the east and west ends. All the

windows will have plain stone heads and cills, so as to harmonise with the union building. The roof will be an open-timbered one, covered with slates, and the building will be strengthened by projecting buttresses on each side, and at the angles. The interior of the walls will have courses of red bricks introduced in bands at intervals and above the arches. At the east end will be fixed an altar-rail and communion-table. The chapel will be fitted with seats to hold about 160 persons. The work has been designed by Mr. D. Oldfield, of London, architect, and will be carried out by Messrs. Freeman, of Ely. The cost will be about 400l., provided by voluntary subscriptions.

Altham.—The Transitional Norman Church, situated at the base of the Cheviot Hills, at the source of the river Aln, and close to the ruined castle of the Umphravilles, has been in a deplorable state of bad repair for many years. It is now to be restored. The sash windows will be removed, and the openings filled with stone-work and glazing in character with one of the ancient round-headed lancets still remaining at the west end of the church. The church will be refloored and supplied with open benches, and otherwise the entire fabric is to be carefully and conservatively restored. The Duke of Northumberland, the Bishop of Durham, the Archdeacon of Lindisfarne, Mr. Ralph Carr, J.P., and the Vicar, the Rev. M. Lazenby, are the principal promoters of the work, all of whom have approved of the architect's designs. Contracts have been entered into during the last week for the work. Mr. F. B. Wilson, of Alnwick, is the architect.

South Penge, Surrey.—A church is about to be erected in this now populous neighbourhood in a district about to be taken from the parish church. Under the auspices of the Archdeacon of Surrey efforts have been made to raise the necessary funds, and the building committee, having determined to proceed forthwith, invited designs from architects in a limited competition for a church to accommodate 1,000 persons. Those submitted by Messrs. Newman & Billing were selected by the committee.

Eastmeon.—The ancient church of the parish of Eastmeon, second largest in Hampshire, has gone through a restoration, and been re-opened. The old roofs have been taken down, and new ones carried up to their original pitch. They are all open. The chancel and transepts are covered with green tinted slates. The south chancel aisle (or lady chapel), south aisle, and nave roofs, have had the old lead recast and relaid. On the old Norman tower a new spire has been erected, and covered with lead, in every way as near as possible to the old one. The work of restoration has been carried out by Mr. Ewan Christian, architect, with Mr. Smith, of Postea, as contractor. The cost is estimated at upwards of 5,000l.

FROM SCOTLAND.

Edinburgh.—There is in course of erection a new schoolhouse in connexion with St. Patrick's Roman Catholic Church, Cowgate. The building is intended to take the place of the temporary premises put up some twelve or fourteen years ago, but which have been turned into a brewery. The plans, prepared by Mr. R. Anderson, architect, have received the sanction of the Committee of Council on Education. Of the estimated cost (1,600l.), nearly 400l. will be obtained from Government, being at the usual rate of 2s. 6d. per square foot, and the remainder will be raised by voluntary subscription among the members of St. Patrick's congregation. Occupying a vacant piece of ground adjoining the church, the new schoolhouse will be an oblong structure, 86 ft. long by 45 ft. in breadth, covered with a roof of two spans. Internally the building will be divided into two class-rooms, each measuring 77 ft. by 20 ft., with a cloak-room at the end of each; an additional class-room of 24 ft. being provided in a projecting wing thrown out at one corner of the block. Near the top of each gable will be placed a large circular window swung on pivots so that it may be readily opened for purposes of ventilation. The principal light, introduced at intervals along the roof. The heating-apparatus intended to be adopted is a modification of a system which has been recommended by the Committee of Council. The fireplace is of the ordinary construction, with the exception that the fire is placed close to the hearth, with a grating below communicating by

pipes, with apertures in the floor of the room. In this way the fire is supplied with air from beneath. The smoke-flue, constructed of iron, is carried up through a hollow space into which fresh air is admitted. The heat of the flue is thus utilised in raising the temperature of the air through which it passes; and this air being allowed to enter the room at a convenient height, serves to supplement the heating effect of the fire. In connexion with this arrangement the removal of vitiated air will be provided for by a shaft running along the ceiling of each room, with wooden flaps at frequent intervals, which may be opened or closed at pleasure, and zinc ventilators giving egress above. A fall which takes place in the ground gives the architect an opportunity of constructing in the basement a large coal-cellar and store-room, with latrines and other conveniences.

Books Received.

Transactions of the Architectural Institute of Scotland, 1868-69: Church dedicated to St. Magnus, Orkney.

BETWEEN 1845 and 1855 Sir Henry Dryden made a large number of measurements and drawings relative to the Cathedral of St. Magnus, at Kirkwall, in Orkney. These Sir Henry has presented to the Architectural Institute of Scotland, and the committee have lithographed a selection from them to form a part of their "Illustrations of Scottish Buildings," issued to members as portion of their "transactions." The building was commenced in the year 1137 by Earl Ronald of Norway, and the earliest part is therefore Norman in style, going off into Early English. All the plates are very elaborately figured,—over-figured, one might almost say,—and have been lithographed with more precision and care than was the case with some other sets of illustrations issued by the same Institute. Sir Henry Dryden has made the members his debtor.

VARIORUM.

"Industrial Employment Association: Fourth Report of the Executive Committee. June 1870. London: Printed by A. Boot, 8, Eastcheap." This association has been "established for the purpose of preventing pauperism and crime, by rescuing destitute children, and employing 'waste labour on waste land.'" The honorary secretary is Mr. F. Fuller. This fourth report of the executive committee states that "all the circumstances which have transpired in the interval [since the third report] have confirmed and justified the principles of the association, and the conviction of the committee, that in the application of 'waste labour to waste land' lies the efficient and trustworthy remedy for grievous social ills, whilst no other possible policy can operate as an efficient substitute, or avert the pernicious consequences of neglecting it." The statement of receipts and expenditure from the commencement of the society in January, 1869, to June, 1870, shows that 205l. odd have been received in donations, and 62l. odd in annual subscriptions; and that the expenditure has been 738l. odd; including 353l. for printing and circulating the reports; 137l. for salaries of clerks and travelling agents; 112l. for advertising, public meetings, &c.; 108l. for rent of offices, &c.—"On the Vernon Dante; with other Dissertations. By H. C. Barlow, M.D., F.G.S., Cav. Mau. Soc. Corris. le' Quiriti di Roma, &c. Williams & Norgate, Henrietta-street, Covent-garden." The interest which the English Danteophile, Dr. Barlow, takes in his hero, Dante, is profound and inexhaustible, and for this alone Dr. Barlow well merits the honour conferred upon him by the King of Italy. The present learned contribution contains much that is of importance in reference to Dante.—"Palestine Exploration Fund. Quarterly Statement No. VI. March 31 to June 30, 1870. London: Society's Office, 9, Pall Mall East." [This number contains various interesting papers, especially one on "Inscriptions and Mosaics' Marks," by Captain Warren. Beside the Statement of Progress, there are also papers on "The Original Discovery of the Moabite Stone," "Expedition to the East of Jordan," by Captain Warren, also his continued Letters, and various others, besides the Report of the Annual Meeting of May 16th.—"A Handy Book of the New Law of Bankruptcy, and Private Arrangements

with Creditors. By W. A. Oliver, Solicitor. Simpkin, Marshall, & Co." This is another manual for the guidance of debtors, creditors, and trustees of bankrupt estates. In an Appendix are the new Acts themselves, with rules and forms.

Miscellaneous.

Jacob's Patent Sewer Ventilator.—Mr. Arthur Jacob, Assoc. Inst. C.E., and engineer to the Bombay Local Board, has lately introduced a new street-ventilator. It is an improvement on a somewhat similar contrivance by him. The essential parts of the apparatus, which is illustrated in the *Engineer*, are, first, the outer frame, which is bedded on a piece of good landing, or even on the brickwork of the man-hole, or inspection shaft. This frame has a circular opening in the centre to receive a perforated double cylinder of galvanised iron or zinc for holding the disinfecting material, which may be either charcoal, carbide of iron, or carbolate of lime. Within this cylinder is fixed another of about a third of the diameter, and both are perforated for so much of the length as remains suspended below the casting. Both cylinders are closed at bottom. The outer cylinder is furnished with a collar, on which it bears, and underneath, between the collar and the casting, there is a washer of india-rubber, to prevent the escape of the foul air otherwise than through the deodorising material when the cylinder is placed in its position. The cap is dropped into its place, and effectually prevents the contents of the cylinder from becoming damp or damaged by rain. The principle of the apparatus is simple. The foul air passes through the perforations of the outer cylinder, then through the detergent material, and so reaches the inside of the smaller cylinder, through the top of which the purified air escapes, and, passing through the openings between the cap and the frame, reaches the surface of the street. There is a syphon outlet at each corner of the outer casting for allowing the escape of rain.

The Tooting Common Case.—The Commons Preservation Society and its clients have had another triumph. The Tooting-Graveney case has been settled in their favour, and the lord of the manor restrained in every essential particular, as well as condemned in costs. A City gentleman bought the rights of the lord of the manor of Tooting-Graveney, an open space between Tooting and Streatham, for 3,000l. Those dwelling near did not compete with him, because they understood that the object of the new purchaser was to improve the common for the public good. A stiff fencing, however, was soon put round what had been an open space, and the rumour went round that it was to be treated arbitrarily as freehold and sold or let for building. The public spirit of the neighbourhood was roused. The fencing was removed. Actions and counter-actions were brought. In 1868 a bill was filed by Mr. Betts, for himself and other people having common-rights in Tooting-Graveney; and the decree just pronounced by the Master of the Rolls grants them all they ask. An injunction is granted against the lord of the manor which will prevent his enclosing; while the rights of the commoners to pasture, to cut furze and bushes, and to dig gravel in moderation, are all affirmed. Such results will gradually put an end to illegal encroachments by lords of manors.

Feasts.—We cannot pretend to mention all such events, now so common. On Saturday last the workmen of Messrs. Thorn & Co., the well-known contractors for new Blackfriars Bridge, went to Rosherville Gardens, by Citizen M boat. Nearly 280 partook of dinner. Amongst the subscribers to the "bean-feast" was Lady Marian Alford, 20l. Each man received from the treasurer, Mr. W. Coleman, a dividend of three-shillings.—The workmen employed upon the extensive alterations and additions at St. Audries, the seat of Sir A. A. Hood, bart., were invited by their employer, Mr. Henry Davis, of Taunton, to a day's excursion to Minehead, on Tuesday, the 19th inst., to which pleasant watering-place they were conveyed in breaks and omnibuses. After strolling along the beach for some time, the men, together with a few friends connected with the works and estate, sat down to a substantial dinner, provided by Messrs. Fry & Langdon, of Williton. Mr. Griffiths, the clerk of the works, occupied the chair.

The Metropolitan Board of Works.—At the meeting of the Metropolitan Board of Works, on the 22nd inst., Mr. Le Breton said it would be a great public convenience if tramways could be laid down on the Victoria Embankment. He moved that it be referred to the Works Committee to ascertain whether it would not promote public convenience to appropriate a part of the carriage-way to tramway, and whether such an appropriation might not be so carried out as to be the means of considerably relieving the parishes from the charges annually required to maintain, cleanse, and light the carriage and foot ways of the embankment. The motion was carried. It was resolved that immediately after the 31st inst. notice be given to the Metropolitan Sewage and Essex Reclamation Company that the 25,000l. deposited with the board are absolutely forfeited. Mr. Runtz said the company had failed to carry out the undertaking, and stood in the way of others utilising the sewage. Mr. Shaw urged that other steps be taken against the company. The chairman said other proceedings would be taken, but to declare the deposit forfeited was the first step.

Anticipated Destruction of the Cheese-wring.—Attention has been drawn more than once to the perilous situation of that remarkable pile of rocks, six or seven miles north of the town of Liskeard, in Cornwall, and known as the Wring-cheese or Cheese-wring. Of late years this hill has been so extensively quarried for granite that the workmen are now within a few paces of the Cheese-wring itself. When a lease of the ground was first granted, it was stipulated that no stone should be removed within a certain distance of this well-known landmark, so as to prevent any possibility of its being destroyed. Now, however, the boundaries of the quarry have been so extended that powerful blasting operations are continually being carried on within a short distance of it, not without very great risk to the whole structure. In fact, it is on the eve of being destroyed, unless a vigorous and powerful attempt be made to save it.

Sheffield Architectural and Archaeological Society.—The last of the monthly excursions of the members of this society was to Adel Church and Kirkstall Abbey, near Leeds. A party of ladies and gentlemen left Sheffield by the Midland Railway, and arrived in Leeds about noon. A carriage awaited them at the Leeds Station, in which they drove off to Adel, where they were welcomed by the Rev. George Lewthwaite, and hospitably entertained at luncheon; after which they went to examine the old church, conducted by him, and he gave a clear account of the history and architecture of the whole building. Time pressed for the party to go on to Kirkstall. They arrived at the old abbey about five o'clock, and, after a short paper read by the Rev. J. Stacey, they examined the ruins. Returning to Leeds to tea, the party got home to Sheffield by the train, arriving a little before ten o'clock.

Girls' Industrial Home, Ealing.—The efforts which the committee of the Refuge for Homeless and Destitute Children have for some time been making to provide increased accommodation for destitute orphan and friendless girls were on Saturday crowned with success, by the opening of two new wings which have been added to the home at Ealing, by means of which fifty additional girls can be admitted. The Earl of Shaftesbury presided at the inaugural ceremony. The object of these homes is not the reformation of criminal or vicious children, but to rescue those who are exposed to temptations. An anonymous donor gave 1,000l. towards the building fund, but about 1,800l. are still required. The operations of the Ealing Home have been carried on since May, 1867. At present there are sixty inmates, a number which now will speedily be increased to upwards of 100.

Government and Inventors.—The Society of Arts have appointed a committee to report whether there is good foundation for the statement that reasonable dissatisfaction exists respecting the manner in which inventions are examined and dealt with by the Government; and, if such be the case, whether any practical remedy can be suggested. They have sent out a number of questions, prepared by the committee, and addressed to those inventors and others who may possess information and are interested in the subject, and they ask for their return by November 1.

The New Locks and Weirs on the Severn.—These works are making progress. They are being carried out by Mr. Alfred Williams, the resident engineer, a son of the engineer, Mr. E. L. Williams, who designed the works. No contractor would undertake them, the cost being limited to 20,000*l.* All the stone, nearly all the blue bricks, and many of the red bricks are already on the ground; the other material needed is at hand; the men are at work from six in the morning till eight at night on every day of the week save Saturday; and there is not much doubt, it is said, that sufficient progress will have been made by November to allow the traffic to pass, though the other work then remaining will occupy a considerable time. The engineer is confident that the work will be finished within the original low estimate.

Monument to Kepler.—The monument to Kepler at Weidestadt, in Wurtemberg, has been inaugurated, says *Nature*. The statue is of bronze, 10 ft. high, in a sitting posture, his left hand supported on a celestial globe. The four corners of the pedestal are adorned with statues, 5 ft. in height, representing M. Maestlin, who taught Kepler mathematics, Copernicus, Tycho Brahe, and Jobst Byrg, the mechanician. On each side of the pedestal are bas-reliefs, representing different circumstances in his life. The monument is the work of the sculptor Kreling, director of the School of Fine Arts at Nuremberg; the statues and bas-reliefs were cast and chased in the workshops of M. M. Lenz & Hérold, in the same town; the pedestal, of red sandstone, from a quarry in the neighbourhood of Weidestadt, was constructed by the architect, Egler, of Stuttgart.

The Legal Status of Building Societies. A deputation, representing, 116,900 members of building societies, having an aggregate capital of 5,000,000*l.*, established in various parts of the metropolis and the country, waited on Mr. Bruce, the Home Secretary, to urge upon the Government the desirableness of passing the Bill now before Parliament, which proposes to deal with their societies this session. It was pointed out to the right hon. gentleman by Mr. T. Hughes, M.P., that under the law, as it at present existed, building societies suffered great inconvenience from being classed together, under the jurisdiction of the registrar, with co-operative, friendly, and other societies, with which they had no connexion.

School of Art, Winchester.—A further advance has been made towards establishing this very desirable addition to the educational appliances already existing in Winchester. At the meeting of the committee, at the house of the president, the Rev. Dr. Ridding, on Thursday, it was decided to abandon the idea of taking premises in the square, but to accept the accommodation offered by Mr. Sheppard, of Wolvesey, at a rent of 20*l.* for one year, exclusive of fire and gas. Mr. Clarke, a gentleman, who has had charge of a large school in London, was engaged as master of the Winchester school.

The Rowland Hill Statue.—The statue of Rowland Hill, which has been executed by Mr. Peter Hollins, is, by the consent of the Birmingham Exchange Committee, to be placed in the bay of the Exchange Building, until the new post-office is completed. The statue is of a marble which will not bear exposure to the open air. It stands 10 ft. 9 in. in height, including pedestal, upon which there is a bas-relief of a sick girl in bed, receiving a letter from a postman.

The late Mr. B. Baylis, C.E.—We mention with regret the unexpected death of this gentleman, in his 58th year, on the 23rd inst. He had been slightly unwell, but had recovered, when an attack of heart disease suddenly carried him off. Mr. Baylis had travelled considerably in discharge of the duties of his profession. His communications to us from Central America, the West Indies, and other parts, will be remembered by some of our readers. He leaves a widow and large family to lament his loss.

A Bridge on Fire.—The high level bridge at Newcastle has had a narrow escape from destruction. The roadway for vehicles having been under repair, an apparatus for boiling pitch had been left standing on it, when the woodwork in the vicinity took fire. The risk of its spreading was at one moment imminent; but owing to the prompt arrival of the fire-extinguishing apparatus, the danger was averted.

The Government Palace, Lima.—According to *Nature*, the old Palace of Government at Lima, in Peru, is condemned, and a new one, which is to be a stone palace from the designs of M. Zolles, architect and engineer, is to be built. In preparation, the Ministerial departments have been removed from the old building.

TENDERS.

For painting, &c., at Christ's Hospital:—
Hayward & Son £298 18 0
Pritchard 911 18 0
Palman & Co. 875 0 0
Shaw 654 0 0
Richardson 832 0 0
Morby 815 0 0
Firman & Catberston (accepted) 780 0 0

For house and schools, Reigate. Mr. John Lees, architect:—
Cook £3,230 0 0
Wright, Brothers 3,150 0 0
Nightingale, Brothers 2,834 0 0
Brown 2,750 0 0
Wilcocks 2,400 0 0

For pulling down and rebuilding St. James's Tower, Taunton. Mr. Houghton Spencer, architect:—
Manning & Patch £3,640 0 0
Pollard 3,232 0 0
Davis 3,282 0 0
Spiller (accepted) 3,070 0 0

For building a lodge to Henlade House, near Taunton, for Mr. J. E. Anderson. Mr. Houghton Spencer, architect:—
Pollard £540 0 0
Shewbrooks 458 0 0
Davis (accepted) 460 0 0

For altering and enlarging the Taunton and Somerset Hospital. Mr. Houghton Spencer, architect:—
Pollard £2,748 0 0
Dinham & Manning 2,313 1 6
Spiller 2,183 0 0
Finch & Hawkins 2,104 0 0
Fox 2,098 0 0
Giles 1,922 17 6
Moss & Tisdell 1,735 12 0
Shewbrooks (accepted) 1,670 0 0
Alpha 1,493 13 0
" (amended tender) 1,543 12 0

For a pair of semi-detached villa residences proposed to be erected on Wandsworth Common, for Messrs. Larnier & Watts:—
Tilley £282 0 0
Easton, Brother 624 0 0
Ronald 813 0 0
Hearn 810 12 0
Brett 788 0 0
Thornton 689 0 0

For new cookhouse, bakehouse, &c., Maidstone Prisons. Mr. Martin Bulmer, County Surveyor. Quantities by Mr. George Ruck:—
Dowd, Dover, & Co. £1,933 0 0
Vaughan 1,880 0 0
Avar & Abnett 1,680 0 0
Bridge 1,687 0 0
Clements & Wallis 1,560 0 0
Ansonab (accepted) 1,610 0 0

For Police Station, Canterbury, Kent County Constabulary. Mr. Martin Bulmer, County Surveyor. Quantities by Mr. George Ruck:—

Denne, Brothers £2,490 0 0
Richardson 2,460 0 0
Carkin & Gordon 2,480 0 0
Judges 2,470 0 0
Shrubsole 2,448 0 0
Solitt 2,444 0 0
Wison 2,429 0 0
Naylor 2,390 0 0
Adcock & Rees 2,385 0 0
Epps 2,364 0 0
Coxen, Brothers 2,349 0 0
Mathews (accepted) 2,160 0 0

For addition to Sittingbourne Police Station. Mr. Martin Bulmer, County Surveyor. Quantities by Mr. George Ruck:—
Tozer £230 0 0
Richardson 805 0 0
Solitt 470 0 0
Epps 419 0 0
Shrubsole (accepted) 419 0 0

For three houses and shops at Deptford. Mr. Northcroft, architect:—
Dove, Brothers £2,225 0 0
Shepherd 2,180 0 0
Winship 1,940 0 0
Scott 1,869 0 0
Nutt 1,860 0 0

For the erection of houses and shops at Wandsworth, for Mr. Simpson. Mr. J. Gibson, Architect. Quantities supplied:—

Smith (accepted) £3,984 0 0

For alterations and additions to the Griffin public house, for Mr. Rowell, 4 and 5, Liqourpond-street:—
Bridgman & Co. £727 0 0
Turner & Son 687 0 0
Wearman 689 0 0
Langmead & Way 678 0 0

For pitch pipe seats for the West London Synagogue. Messrs. Davis & Emmanuel, architects:—
Myers & Son £2,460 0 0
Hunter 2,097 0 0
Lasselles 1,860 0 0

For proposed works at Tonbridge Chapel, Easton-road. Mr. G. Judge, jun., architect. Quantities by Messrs. Curtis & Son:—

Cave £1,064 2 0
Conder 968 0 0
Axford 961 0 0
Roberts 930 0 0
Hebb 918 0 0

For alterations and additions to Borough-road Chapel, Lambeth. Mr. A. Bridgman, architect:—

Palmer & Son £1,484 0 0
Nightingale 1,395 0 0
Pavitt 1,135 0 0
G. & J. Waterman 2,849 0 0
Hoare & Son (accepted) 998 0 0

For Croxley Church, Rickmansworth. Mr. John Norton, architect. Quantities by Mr. Thacker:—

Gibson, Brothers £2,989 0 0
Chappell 2,963 0 0
Wood 2,900 0 0
Nightingale 2,883 0 0
Wall & Hook 2,830 0 0
G. & J. Waterman 2,849 0 0
Diment 2,849 0 0
Price 2,817 0 0
Coner & Mann 2,785 0 0
Hookham 2,750 0 0
Bowler 2,670 0 0
Holland 2,371 0 0
Clarke 2,233 13 0

For alterations and repairs at Greville House, Kilburn. Mr. H. Saxon Snell, architect:—

Green & King £710 0 0
Phillips & Baker 699 0 0
Manley & Rogers 674 0 0
Bird 648 0 0
Smith 613 0 0
Howard 605 0 0
Crabbe & Vaughan too late) 693 0 0

For alterations and repairs, 63, Kingland-road, for Messrs. Packridge & Nephew. Mr. J. Joseph Tanner, architect:—

Lark £1,234 0 0
Crabbe & Vaughan 1,173 0 0
Mar 1,121 0 0
Greenwood & Sons 1,115 0 0
Eaton & Chapman 1,079 0 0
Turner & Son (accepted) 1,049 0 0

For new granary and for alterations to Sunderland wharf, Bermondsey, for Mr. T. Richards. Mr. George Elkin, architect:—

Wells £2,574 0 0
Tarrant 2,510 0 0
Thomson 2,470 0 0
Little 2,371 0 0
Conder 2,189 0 0
Shepherd (accepted) 2,084 0 0

For the completion of three houses in Park-road North, Acton, W., for Mr. J. C. Taylor. Mr. Edward Monson, jun., architect:—

Rhodes & Roberts £725 10 0
Nightingale 683 0 0
Rankin 650 0 0
Hawker & Custer 645 0 0
Hoare & Cleland 645 0 0
Stocks & Tidey 631 0 0
Hurst 608 0 0
Whiting & Dickson 600 15 0
Holding 630 0 0
Bowler 550 0 0
J. & R. Whitaker 515 0 0
Faulthorpe 547 0 0
Scarlett & Elmer 398 0 0
Warr 476 5 0

Arrived too late.

Harrison & Son 710 0 0
Taylor & Son 421 13 0

TO CORRESPONDENTS.

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COMPLETION OF ST. PAUL'S, IN ACCORDANCE WITH THE ORIGINAL PLANS OF SIR CHRISTOPHER WREN.

A MEETING was held at the Mansion House on July 13, when it was unanimously resolved that it was an incumbent duty to complete this great Protestant Cathedral. As the Ecclesiastical Commissioners have left to the Cathedral only a bare sufficiency for carrying on its Services, the only way by which this can be effected is by Voluntary Subscriptions.

The sum of 27,000*l.* and upwards has already been promised, the principal Contributors of which are mentioned in the following list, but the Committee feel it their duty to say that this amount represents but a small portion of the Sum required to render the Cathedral of our Metropolis worthy of the Nation and of the Reformed Religion. They trust that Englishmen, whether living in London or the Country, in England or Abroad, will feel a pride in helping this important work to a triumphant conclusion, and that they will contribute according to their means, whether they be large or small. The Dean of St. Paul's, or the Secretary, W. CALVERT SHONE, Esq. Chapter House, St. Paul's, will gladly receive Contributions.

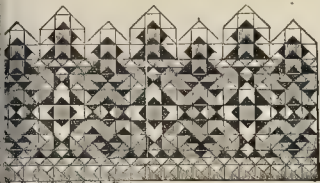
	£.	s.	d.		£.	s.	d.
The Dean of St. Paul's	500	0	0	Sydney Smirke, Esq. R.A.	21	0	0
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The Builder.

VOL. XXVIII.—No. 1435.

Sanitary Appliances in Time of War for Troops in the Field, and for the Care of Sick and Wounded.



ANCIENT history records battles, but nothing worth study as to sanitary arrangements. The armies of Greece and Rome made wonderful marches, as did also the Carthaginian army under Hannibal, and we may infer from known results that the military arrangements must have been more perfect than those for the British army in the Crimea, up to the spring and summer of 1855. We, however, now have a military sanitary history, and so have the states of North America, embodied in printed volumes, containing full details of the works and regulations suggested and carried out. The writers for the daily press do not, however, seem to know anything about these volumes. Sir John Pringle for the army, and Dr. Lind for the navy, about a century ago, also published the results of their experience, and embodied rules for observance in any future wars; but armies continue to take the field without any clearly defined regulations as to sanitary works and appliances. Generals, quartermasters, commissariat officers, and army surgeons are supposed to know all, and to be enabled to do all that is official and necessary. There is a society endeavouring to organise an extra system of relief for the wounded, but their main reliance appears to be centred on nursing, as this was considered to be successful in the Crimea. The sooner it is understood that nursing is a secondary consideration, the better it will be for the sick and wounded soldiers. In all campaigns sickness is the great destroyer of armies, and sickness has been aggravated tenfold by ignorance of the most simple sanitary rules, and by neglect. The British army in the East during the Crimean War suffered fearfully up to the spring of 1855, as did also the French and Sardinian armies to the end of the war. Undue exposure, defective clothing and feeding, killed hundreds of men; but fever and cholera were the terrible scourges, both in camp and in the unregulated hospitals, which only intensified the death-rate. The lady nurses who so nobly entered the hospitals on the Bosphorus had no power over structural arrangements (or malarrangements) and over-crowding, but sank into the mass of misery by which they became surrounded. No person will undervalue their noble, energetic, and efficient labours; but to attribute results not in any way due to those labours will only mislead. The British Government appointed and sent out to the seat of war three sanitary commissioners in the spring of 1855,—Dr. John Sutherland, Mr. Robert Lawson, civil engineer, and Dr. Hector

Gavin. These gentlemen landed at Constantinople on the 6th of March (1855), and after reporting themselves to the authorities, at once commenced the work they had been sent out to perform. A Blue-Book Report, drawn up under the directions of the Minister at War, contains the instructions to the commissioners, (prepared by Lord Shaftesbury), the work performed under the directions of the commissioners, and the results. At the end of the Report there is a summary, and instructions for future guidance. In the winter, 1854–1855, the British army in the Crimea suffered a rate of mortality unprecedented in the worst previous wars. During three months, December, January, and February, regiments at the front were reduced, by deaths and sickness, seventy per cent. Sanitary works and regulations were commenced in March (1855); and by the end of the summer the mortality in the hospitals on the Bosphorus was at a less rate than in civil hospitals in England, and the entire British army in the Crimea was in a better state of health than it had ever been in barracks at home in time of peace. Neither the French nor the Sardinian armies knew any such improvements. In the months of May and June (1855) the Sardinian army, as encamped, but without trench duties, lost by cholera about 1 in 15 of the men in the field; or 1,000 out of 15,000; and, during the last three months of the war, the French army lost, from deaths in hospitals, at a rate of 5,000 per month; or, some 15,000 men died in hospitals of types of disease banished from the British hospitals. As was said at the time, "Here was an experiment in sanitary science on the grandest scale worked out for the instruction of the world." Certain benevolent men in the Northern States of America studied the British Sanitary Commissioners' reports, adopted and put into practice the regulations laid down, and, organising an independent sanitary commission for the armies of the North, saved the Union, and enabled the war to be successfully closed. The transactions of this American Sanitary Commission are embodied in a set of reports full of interesting information. Since the Crimean war, the British Government has organised sanitary committees for both army and navy at home and abroad. Great improvements are shown in the annual reports and returns to have been accomplished, especially in the Indian army. There is a reduced sick-rate for the entire British army to the extent of some 40,000 or 50,000 cases, and a saving of from 2,000 to 3,000 deaths per annum. War has commenced on the Continent, and it may safely be predicted that powder and shot, sword and bayonet, will only play secondary parts in the destruction of human life, perfect as these new weapons of war for destruction have been made. Tents *d'abri*, overcrowded hospitals, and bad air resulting from such overcrowding, will be the most deadly arrangements in the campaign. Exposure to the elements in war is not to be avoided, and there must also be excessive fatigue and great privations, with occasional bad food and tainted water. These contingencies, under any circumstances, would lower the general health, and give epidemic diseases a start; but there may be much of overcrowding and of bad air avoided by very simple means and regulations. The following brief rules, or rather hints, for the conduct of an army in the field, are offered from experience, and if attended to may be of use to French and Germans alike:—

1. A good supply of water is necessary. All wells and other sources should therefore be put at once under guard to prevent pollution and waste.
2. There should be an organised water service—that is, water-drawers and water-carriers to draw and distribute with order and regularity, and not random dawning, as is usual.
3. For cavalry and artillery horse-watering in camps, if troughs are used, each watering-trough should be filled independently, and the surface should be paved round, or have a covering of broken stone to prevent the ground being worked into mud by the horses' feet and by slopping of water.
4. If surface springs are used, the water should be impounded in a temporary tank to equalize the night flow, and water should only be dipped or drawn by men appointed for the purpose, to prevent its being dirtied or wasted.
5. Each 100 men should have a trench-latrine excavated, a portion of fresh earth being thrown each day over the *excreta*. A rude seat, side-fence, and shed-roof may, in many cases, easily be provided.
6. For hospital purposes (sick and surgical cases, and especially after an engagement) public buildings, churches, and private houses, will be taken possession of, and will, as a rule, be overcrowded. In summer all the windows may with safety be removed; in autumn and in winter the upper squares of glass may be taken (or broken) out, and in huts and sheds there may be ridge ventilation. Cold is injurious, but overcrowding in foul air is deadly.
7. As much cleanliness as is practicable should be obtained. Surface scavenging may always be accomplished, and surgeons should be instructed to demand the necessary materials and labour, or be empowered to engage and pay any native non-combatants to be obtained in the district, for the purpose of executing sanitary works, and for daily cleansing.

The *Builder* desires to be impartial in offering advice on sanitary regulations. We do not in any degree admire war; we hate it, this war especially: it is a brutal and bloody business under any conditions. The horrors of a battle-field have been only faintly described; no pen can fully record the hideous reality. The greatest amount of human suffering is not, however, on the battle-field, where men are under excitement and delirium, which for the time abstract attention to injury and deaden feeling; but it is afterwards, when the exhausted and shattered frames of the war demon's victims have been removed to some sort of shelter, that the man's real sufferings and misery commence. "The glorious pomp and circumstance of war" cannot be seen in writhing, gasping victims, crowded together amidst filth, given over to death, left to despair. The sanitarian may be of great use here, and the appliances necessary are simple and easy of execution,—cleanliness, nursing, and fresh air. That nation which treats its soldiers with the greatest sanitary care (other conditions being tolerably equal) will ultimately be the strongest.

LEICESTER CONGRESS OF THE ARCHÆOLOGICAL INSTITUTE.

OLD members of the Institute are not over well satisfied with the recent Congress held in Leicester. There has been plenty of hospitality, but there is not much to look back to in the shape of real work done. We will mention a few of the more prominent papers and events. Lord Talbot de Malahide, the constant friend of the Institute, did his best as president. At the opening meeting, on the 26th of July, the Mayor, in welcoming the Institute, said,—Some regret, no doubt, would be felt by the members of the Archæological Institute that there were so few remains of Roman life in Leicester; but they had catholicity enough and philosophy enough to know that under the advancing steps of commercial prosperity, there was every chance that the vestiges of ancient Leicester would be trampled out and obliterated. The factories and warehouses which had arisen in such abundance in the town, and indicated its prosperity, would have concealed from their powerful means of observation and reflection many a vestige of ancient Rome which would have excited and delighted them. They must be contented, however, with the blessings of an advanced civilisation which they enjoyed in this

age of the world, and it was some satisfaction that although they might have lost some of the grandeur, some of the indications of that high refinement which Rome had attained even in the period of her occupation of Leicester, yet that the civilisation of modern Leicester might have been pervaded, as he hoped and believed, by sentiments more humane and more Christian. And he thought, as they were all philosophers, or flattered themselves that they were, they must take that consolation for the loss of many a relic which they would have been proud to exhibit on this occasion.

Lord Talbot de Malahide said the Mayor in his address had alluded to the difficulties which a thriving, flourishing town like Leicester had to contend with in the preservation of its antiquities. He fully admitted this; at the same time, he did not think if persons really felt their value and were anxious to preserve them that the two objects might not be reconciled. It was perfectly possible for a town to follow the line of progress which, of course, was inevitable, and at the same time not to disregard the memorials and the glory of their forefathers. He might also say that there were no individuals or corporate bodies in the country that ought to lay more stress on and feel prouder of those instances in which they could connect themselves with long bygone ages. There were hardly any bodies, hardly any individuals, he might say none that could boast of longer pedigrees than some of the ancient corporations of this country. And although great changes might have taken place in the constitution of corporations and civic bodies, and these of course were inevitable and desirable, yet still they all inherited the glories of the early bodies, and none of them would be anxious to disclaim all connexion with the original founders of the corporations of this country. The corporations, and here he did not draw a narrow distinction between the corporations and those bodies which they represented, had reason to be proud of the career which they had had, and the line which they had taken during the many centuries of English history.

Mr. G. J. Clarke said one of the landed proprietors of that county not only claimed descent in an unbroken line from the founder of the House of Austria, but boasted the far greater honour of his line having given to the world the author of "Tom Jones." Another family claimed descent from the early kings of France, and had given to the English world one of its greatest second-class dramatists. It was not surprising that a county which had given the world a Fielding, a Beaumont, a Herriek, and a Hazle-rigg, should be ready to welcome a society that dealt with the past.

After a few words by Mr. Parker on the Town-hall, the meeting broke up, and proceeded to visit Wyggeston's Hospital, the Jewry Hall, All Saints' and St. Margaret's Churches.

At the evening meeting a paper was read by Mr. Jas. Thompson, on "The Jews and the Jewry Wall," from which the following is an extract:—

"The Jewry Wall in this town, which will interest the visitors drawn to Leicester by the Congress of the Institute chiefly as a relic of Roman masonry, has also its claim upon the attention of the antiquarian engineer on other grounds. As its name implies,—a name it has always had in the memory of man, and by which it is known in ancient records,—it was once the quarter in which the Israelites of former times were compelled to seclude themselves, owing to the aversion with which they were regarded by our Christian forefathers. The eminent historian of Leicestershire, Nichols, in the first part of his first volume, says truly, 'Whatever may have been the first distinction of these (the Jewry) walls, there can be no doubt; but that they were originally of Roman construction; and that the name of Jewry was adopted when that part of Leicester became the peculiar residence of the Jews, who, in all great towns, were customarily limited to a particular district.' The historian goes on to give examples of the usage; as in London, in connexion with the places called *The Jewry*, *Poor Jewry Lane*, and the *Old Jewry*. In Leicester the old fragment of Roman masonry, of which we are speaking, perhaps in the early Medieval period surrounded by ruins of large Roman structures, was deemed a refuge which was good enough for the outcasts, and where no Christian would care to intrude.

In the earlier half of the thirteenth century a tide of persecution appears to have set in against the Jews. The treatment of the Israelites in Leicester is indicated in a document or charter, of which a free translation is here rendered, by Simon de Montfort to his burgesses of Leicester:—

"Simon de Montfort, son of Earl Simon de Montfort, Lord of Leicester, to all the faithful in Christ by whom this present document [paginam] may be seen or heard. Let it be universally known that I, for the health of my soul, and the souls of my ancestors and successors, have granted and by this my present charter confirmed, for me and my heirs in perpetuity, to my burgesses of Leicester and their heirs, that no Jew or Jewess, in my time or in the time of my heirs, to the end of the world, shall have the liberty of the town of Leicester, inhabit, remain, or obtain any residence. I also wish and command that my heirs after me shall maintain that liberty entire, and shall

guarantee it to the burgesses before named in perpetuity. And in testimony of this I have appended my seal to the present charter. These being witnesses: Sir Aunery de Milton, Sir Walter de Aquila, Sir Roger Blund, chaplain, William Baggett, William de Miravall, and others."

Shortly after the date of this charter, it cannot be doubted all the Jews and Jewesses made their exodus from their ancient quarter in Leicester; though, after the lapse of six centuries, their former home among us still bears its designation.

The Rev. J. G. Joyce, who came strongly to the front during the meeting, read a paper on the well-known glass at Fairford, with reference to the controversy some time since which our readers heard all about.

The Privy Council on Education have ordered a set of drawings to be taken of all the windows, for art purposes, to be deposited, as our readers know, in the South Kensington Museum.

Mr. Joyce said the windows were in a somewhat perilous condition: the lead was decayed in places, and they had sustained injuries from various causes, though they were now carefully preserved. The glass was in pieces unusually long, some pieces being, according to his estimate, 2 ft. by 1 ft. They therefore were the more liable to fractures. Many important parts were wanting, and others were cracked and starred. The local story was that all the glass was at one time buried, to protect it, in the time of the Commonwealth. He then traced the history of the windows. They found them a great celebrity up to 1650; and to a Mr. Holdsworth, who died in 1680, it was said they were chiefly indebted for preservation. Mr. Joyce summarised the various subjects presented in the windows—the Temptation passages in the Life of our Saviour and in that of the Virgin Mary; the Twelve Apostles; the Twelve Prophets; and, lastly, the Judgment Day, which had been treated in an extraordinary manner. It was full of the figures of devils, one of whom was wheeling away to hell a woman in a wheelbarrow. On one of her fingers was the cypher, of the painter, no doubt,—the letter "A," but this was certainly not the cypher of Albert Dürer. He went on to point out that there had always been a certain conventionalism in treating these sacred subjects, which Medieval artists refrained from departing from or tampering with. These conventionalisms had been handed down from age to age, and related to scenes in the life of our Lord, the Virgin Mary, the Apostles, and other matters to which an art tradition attached. He went on to contend that neither the design nor the execution of the glass in the windows in Fairford Church belonged to one person. The characters of the different designs were distinct: some were Flemish in their type, and some more Medieval than others. He instanced the great west window as a work impressed with the strongest Medieval character, as, for instance, in regard to the foot of St. Peter, with its elongated toes, and the naked spindle leg of the woman imploring admission into Paradise, with the great Medieval foot—such a foot as Albert Dürer never could have drawn, even at the age of fourteen. And not only did the designs differ, but the execution of a series of designs differed; the method of using the brush differed; the type of the crocketing differed; and the handwriting of the persons differed.

Mr. Wyre contrasted the character of Albert Dürer's known works with the Fairford windows, in order to show that the latter could not be his handiwork. He especially noticed the *nimbi* and the drawings of horses. An engraver, whose name was unknown, but whose cypher was "W. A.," was more likely than any artist he knew to be connected with the Fairford glass.

Mr. Clarke questioned the statement about the glass having been buried, and said it appeared to him that this glass took an intermediate position between the old and the modern glass.

On Wednesday morning Mr. Joyce gave a description of the Roman town of Rata (Leicester). He stated that it appeared to have been almost, if not quite, in the form of a parallelogram, and in the formation of streets could be traced now pretty nearly where the walls were. They appeared to have ranged nearly north and south, east and west. The Romans constantly seized upon settlements advantageous for position made by the Britons, and on them drew their own lines. In the excavations under his direction at Silchester, the Romans clearly made use of the old British town, a kind of stockade, which was a polygon of nine sides, necessitated by the form of the plateau on which it was situated; and using one line, drew from its streets at right angles. Apparently, at

Leicester, the origin of the walls was a camp actually measured by Roman soldiers. He had not had an opportunity of ascertaining the length of the sides, but believed they would be those given for large camps by Roman writers. Rata was entered by gates on four sides, and yesterday they saw the Jewry wall, which he was of opinion was a gateway. The place was directly opposite where there was an ancient bridge that had been more or less an access to the town from the Fosse-way. It was puzzling to find the arches such a height from the ground, because he found that the pavement a little further down the valley was only about 5 ft. below the street. That floor was undoubtedly the level of the Roman street at that very ancient time. It did not appear to him that the latest condition of the arch of the Jewry wall would require them to go down about 20 ft. There was a great difference in the level of these old towns. At Silchester they had only 5 in. in some places, and in others more than 3 ft. The centre of the Roman town would be in High Cross-street, where it was joined by Blue Boar-lane. When he came to inquire, he found that the whole line of the front of the Roman houses, from the exact point where the street struck, was still underground. The next point was to find the market-place or forum. All Roman life was municipal, and wherever the Romans went they took their old municipal conditions. Therefore there was one considerable central building, which would be the place for shops, and courts of justice. In the forum at Silchester they had the complete lines, as if freshly laid in the earth, probably of the time of Vespasian, of a large parallelogram, 315 ft. long, by 275 ft. wide. Within were public offices, a basilica, and various rooms. It would be interesting if they could recover such a place at Leicester, and the place for such a discovery was at the intersection of the great roads. He found that there had been discovered in Bino Board-lane certain ranges of pillars in their places. A pair he had sketched were on the line of wall where the forum most likely would be. Between the pillars was a stone lying down, which indicated the flowing of a stream of water between these pillars into the street. These pillars were covered with lead, and he supposed this was through some pigment being applied, which was a precipitate of lead. It might interest them to learn something of the date at which Rata was occupied. It appeared that in the mortar of a villa on the Cherry Orchard, was found a coin of Vespasian, which probably showed a near connexion with the reign of that emperor. The town had been particularly prolific in pavements. The figure called Actæon was not Actæon; it was a male figure standing by a stag. The execution was not very good, and it was probably of the period of Valens or Valentinian. In the museum were some pipes which appeared to have been used for the passage of water or heat, he believed the latter, in connexion with a hypocaust. One fact connected with this city could not fail to interest them; they had it on record that two Christians were martyred in Leicester at the time of Dioclesian.

Archdeacon Trollope explained as to the raising water to supply cities by the Romans, that they appeared to have known and used a kind of force-pump, used like fire-engines by double action.

Mr. Barritt, in a paper with reference to Leicester Abbey, observed:—"Those remains are, I believe, in a very unsatisfactory condition to the antiquary. Without going to the question of the 'why' or the 'wherefore' of the great change in the sixteenth century, which ruthlessly swept from the surface of the land the establishments which the piety and the religious feeling of our ancestors had planted on so many a fertile spot, and among such picturesque scenery, the intelligent inquirer into the earlier condition of our country loves to be able to trace the true outlines of such establishments, when wandering among their ruins—to know the exact site of the sacred edifice in which the brethren and sisterhood united in their public prayers and praises to their Creator—to be tolerably certain of the appropriation of the locality to the domestic needs and the social requirements of the institution. Several of the religious orders followed precise rules in these matters, modified, of course, at intervals, and by circumstances. So, one such establishment found fairly complete is a key to all others of the same rule. But the buildings devoted to

the uses of the canons regular of the order of St. Austin, to which Leicester Abbey belonged, followed no such regular plan."

At the evening meeting, after Mr. T. Burgess's paper "On the Battle of Bosworth Field," a member observed that it was commonly believed that the inn which Richard stopped at in Leicester was the Blue Boar.

Mr. Burgess said it was the White Boar, but that after Richard's defeat all the White Boars were changed to Blue Boars. A street called Blue Boar-lane had since been corrupted to "Blubber-lane."

In a conversation which followed the reading of the paper, it was mentioned that the bones of Richard were said to have been thrown into the river over Old Bow Bridge, and that in more modern times, when the water was drawn off, a skeleton was actually found on the spot indicated. It was taken to the Guildhall at Leicester, and much commotion was occasioned by the discovery; but it was clearly proved that these could not have been the bones of Richard, but that they must have been those of a much younger person.

Mr. Burgess mentioned incidentally that a descendant of Sir Simon Digby, the spy in Richard's camp on the eve of the battle, and also a descendant of Catesby, Richard's knight, both lost their lives in the Gunpowder Plot a century or two later.

On Thursday, a party visited the ruined castle and the church of Ashby-de-la-Zouch, and then proceeded to Tubbury and Tanworth, to examine the antiquities in those places. In the evening, a conversation, by invitation of the mayor, Mr. G. Stevenson, was held in the town museum.

At Friday's meeting, the most noticeable paper was that of Dr. Margoliouth, who related the continued persecution of the Jews in Mercia (which comprehended seventeen of the English counties), the extortions, the murders, and the persecutions to which they were subjected, chiefly at the instigation of the Christian clergy, and especially in the reign of Henry III. He was of opinion that a Jewish community existed in Leicester at three eras, viz., contemporaneously with the Roman occupation of Leicester, before that period, and during the Norman Conquest. He believed they lived in harmony with the Gentiles until Simon de Montfort issued his sudden edict in 1240 (not 1220, as alleged by others), banishing Jews from Leicester during "the time of his heirs and to the end of the world." In conclusion, he said he saw vestiges of Hebrew extraction in every assembly that he met. Others might think what they pleased, but he considered it an infinitely higher honour to be able to trace one's descent,—be it ever so scantily,—to this sacred race than to the equivocal races of Saxon, Dane, and Norman.

Mr. Holt's paper on "The Leicester Parliament of 1414" was one of considerable interest. The Parliament was ordered by Henry V. to be held in Leicester, and it lasted thirty days. Mr. Holt read some of the old documents convening and proroguing the Parliament.

The great event of Friday was the visit to Beaumanor, and the entertainment given by Mr. and Mrs. Herrick. It is a modern-built residence, but has many historical associations, which were referred to in the course of the afternoon by the present occupant, Mr. Herrick, and other gentlemen. Here, among various relics, is the bed on which Richard III. is said to have slept on the night before the battle of Bosworth Field. It is a massive piece of furniture, with heavy carved head-board and rich heavy scarlet and gold furniture. Mr. Herrick, in exhibiting it to his guests, said it was not pretended that the bed as now equipped was the one used by the hump-backed monarch; but the foundation,—the ground part of it,—was believed to be genuine. He traced its authenticity for between 200 and 300 years, and showed that it was originally in the possession of the Drake family, who formerly occupied the Blue Boar at Leicester (originally the White Boar), where Richard slept when passing through Leicester to Bosworth Field.

Some pleasant speeches were made, and Mr. Nichols (a descendant of the Leicestershire historian), offered some remarks on Beaumanor and its history. The ground on which they stood was originally part of Charnwood Forest. It ceased actually to be a forest in the reign of Henry III., who disafforested it in the eighteenth year of his reign. It was mostly now, by successive acts of inclosure, cultivated like the rest of the country, though part of it was still in its original wild state. He then traced the manor

of Beaumanor from the De Spencers, temp. Edward I., through successive centuries. It then came to the Beaumonts by marriage, and remained in the family down to 1596, when Sir W. Herrick purchased the manor. Leland, in his Itinerary, said, "Then I came to Beaumanor, where there is a pretty lodge, belonging of late to the Beaumonts." The house was represented as standing in a square inclosure, with water all round four sides. From this point, Mr. Nichols continued the history of the place from his grandfather's work,—Nichols's "History of Leicestershire," the present modern mansion of brick, he added, was built about twenty-five years ago.

The Rev. E. Hill afterwards moved a vote of thanks to Mr. Nichols for his explanations; and Mr. Herrick, in according it, said that there was no family that the county of Leicester was so indebted to as the Nichols family, in an archaeological point of view.

In the hall is a remarkable piece of furniture, a large chair cut out of a solid oak tree which was cut down in the park in 1680. Upon it hangs a withered garland with three rosebuds. This is sent annually from Quorndon as a service or chief rent due to the lord of the manor of Beaumanor.

The papers promised for Monday were not sent; but amusement was found, and in the afternoon there was an excursion to Melton Mowbray.

The museum which was established contained an interesting collection, although it did not come up to expectation in respect to the number of portraits of worthies and distinguished persons born in or intimately connected with the counties of Leicester and Rutland, which it was particularly desired should be got together. There were, however, a few notable works of art of this class:

a portrait in oil, perhaps by Holbein, of Lord Berners; also portraits of Prince Arthur, eldest son of Henry VII., by Mabuse; Sir W. Eyricke, knight, who represented Leicester in 1601-29; Prince Rupert; Henry, Earl of Westmoreland; Admiral Galloway, one of the earliest works of Sir Joshua Reynolds; and three portraits called Wycliffe, but all imaginary.

ROYAL ACADEMY STUDENTS.

EVERYBODY knows that there are now, and are likely to be, but forty academicians, some thirty or more associates, and a few engravers; that these numbers constitute the whole of the practical and working body of the Royal Academy, and have done so ever since the foundation of the Academy, now 100 years ago. What was enough in the days of Sir Joshua Reynolds and in the reign of George III. is considered sufficient in the reign of Queen Victoria, when the number of practising artists is ten times what it then was. But our present business is simply with (what the Commission, in their report, have altogether forgotten) the class of "Students."

We do not wonder that, in the importance and magnitude of this inquiry, the Academy student, or even the mention of his name, should have been so altogether forgotten; for no man can, by any possibility, realise the condition of a "student" of the Academy unless he has himself been one.

Although we cannot wonder at this, still the public, or at any rate the art public, will feel inclined to ask how it is that, considering the ranks of the Academicians are always eventually filled up from the student class, this vital element of the Academy, its young life, has not met with its due share of regard and help. We may try to explain this mystery. What is an Academy student? And in what light is he regarded by those to whom he looks as his masters in art, and whom he is to succeed? These are the most important questions that can now be asked; for just so far as they shall be fairly and kindly answered must be the future of fine-art progress in England. Shall the Academy be really reformed and changed, or remain for ever as it is? What especially makes the first question of such moment is this, that a student of the Academy is altogether different from all other species of students; he is always a volunteer, and joins the ranks of the Academy from simple art instinct, and a sort of natural incapability of applying himself to any other vocation but art. Accident, mere liking, future prospects, the wealth of friends, a good opening, or a hundred other influences, may incite a medical or clerical student to take to his calling;

but nothing save strong instinct and love of art for its own sake, can or does take a youth or young man into the schools of the Royal Academy. So stern a law is this that it would seem to be the only vocation into which it is absolutely impossible for mere wealth of friends to force any one. There is no power by which it is possible to improve art capacity. No man can be taught to paint without a certain natural capacity for painting. Practice adds to the power, but cannot create it. The Royal Academy contains within its body the best and highest art-faculty which the country and time produce. If the Academy fails to produce noble work, we are all quite sure that it cannot be obtained at all. The time fails to produce the mental power asked for. These students are volunteers coming up from all quarters, not from force or persuasion, but because they like the work, and cannot help volunteering into it. There is nothing in modern life at all equal to this in force, intensity of purpose, noble daring in defying difficulties, and risking all in the pursuit of a doubtful future. This consideration, if nothing else, should have led the Academician Council to a kindly thought about the "Students of the Royal Academy." They have considered academicians and associates, and engravers and foreign artists, and even artist workmen, but have forgotten, strangely enough, the very men who will and must succeed themselves, if the institution is to continue its existence. Possibly the Commission, not consisting of artists, have simply not known what questions to ask, and perhaps did not know that there exists such a body in connexion with the Academy, or those who were examined considered the subject as unworthy of notice or regard, and so did not lead to the subject, and thus come to a fair and full inquiry.

No one can at all comprehend the position of a student of the Academy, except those whose fortune it has been to have joined the ranks themselves. We do not say that the Academy treats its student class with active contempt, or hate, or scorn, or that it desires to be rid of it. It simply is cognizant of its existence, and that is all. What is done for the student cannot be helped: it is part of the regular routine of the institution. Like the opening and shutting of its doors, it is a necessary process, but altogether unnoticeable, and a matter about which no one need or does ask a question or give a thought. Nothing can indicate the state of art feeling more than this: it shows how very little of real and living influential force it has. The academicians commands respect, from the fact of his being one of so august and exclusive a body, not because he is one of nature's artists, for in so far as he is one with the student, and a brother craftsman. The student meets with no respect at all, in spite of his like vocation, for he is not, and may never be, an academician. Who can wonder at the low social position of the artist, and that when a new art society springs into existence without the artificial help of the Academy, it is rather an existence by sufferance than anything else?

We would not be supposed to be unconscious of the debt owing by the student for the help given to him by the Royal Academy. We do not know how the student can well be too thankful for the help afforded by the Academy. For it, gratitude only can be his best feeling. Long before the existence of any of the multitude of art societies now everywhere to be found, before the Institute of Architects had an existence, or the water-colour societies, or archaeological societies, or any of them, the Royal Academy opened its doors to the student—which, by the way, these have never condescended to do,—and in it he found a room to study in, and models to study from. The student must ever thank the Academy for what it has done. Had it not been for the British Museum and the Academy, we do not know what the then race of art-students could have done or where means of study could have been come at. It is therefore not to pick out blemishes, but in the hope of making things better, that we have ventured on these remarks, and because we feel sure that the subject has only to be thought better. Who will believe it when they are told that all students end in seven years, so that a man at twenty considered fit for the honour and advantages of studentship—for which he must offer fair and sufficient proofs—after seven years' further practice and increased power then ceases to be a student, and is of course denied the advantages flowing from it, and that perhaps in

some cases just when he needs them most. What a reform that would have been, and yet will be, to urge "life studentships." It is sometimes said that the greatest men remain *always* learners. We think every student entering the Academy after fair trial should retain his privileges during the whole of his art life. We think, too, that looking at what the students—some of them, at least—must in course of time come to, academicians, a limited number should be selected from the whole body of students—those who contribute to the annual exhibition; and these form a student class immediately under the class of associates: this would be to acknowledge the existence and honour of the studentship. Why the number forty was fixed on for the academicians, and still retained, it would be difficult to say, but it certainly seems somewhat strange that forty should have been few enough in Reynolds's day, and that but forty now should be considered sufficient to fill up every want, and exhaust the artistic power of the time and country. But all reforms must commence slowly to last; so let us be satisfied. Forty academicians, the apex of art, and an indefinite number of life students, the basis of art. What a charge this would in time create in the annual Academy show!

We could say much on what the Royal Academy have to do to make this great institution what it ought to be; the way through which the public should be invited to acknowledge the high value of art and the dignity of artists; and how the Academy must more and more rely on artistic strength, and less on mere social considerations. A great artist needs no social or artificial rank, and seems to lose so much of his artistic strength as his artificial titles are added to. The greater and mightier the artistic power, the less would it seem to endure of artificial and sham elevation, touching, as such does, only the mere wondering crowd of people who are blind to realities. There is a good deal more to think about, and of a very different kind to anything which appears in the report on the Royal Academy by its Royal Commission.

THE ORGANISATION OF LABOUR.

It is a matter of the utmost importance to investigate how far new conditions of national life may be slowly but surely developing among us, and what will, sooner or later, be the result of those changed conditions.

There can be no doubt that the present century has witnessed a change in this respect, of which, in its magnitude, no precedent exists in human history. European society, as it re-formed after the irruption of the barbarian tribes, settled down into certain great classes, the existence of which is tacitly contemplated by most existing institutions. There was the noble class, on which, at one time, the hope of the world depended—a class which now nowhere exists, in its original form of at once caste and aristocracy. In France and in Germany, where the principle of caste is still kept up by the exclusive marriages of the noblesse, power altogether, and wealth to a great extent, have been lost by the old families. In this country, where wealth and its consequent power are open to all, and where the army, the bar, and the church each gives access to the House of Peers, the nobles are no longer a caste; they can hardly be called even a distinct class.

To the old noblesse of the sword, and the later nobility of the Robe, European society of the eighteenth century added the Church, the trade element (which was already the decomposition of the old municipalities), and the peasant population. Each of these classes is visible in this country; the peasants being, of all, the most unchanged.

But the innovation and the perfection of the steam engine have called into existence a class of men unknown to earlier history. The artisans are the army of steam. Gathering in large masses,—increasing, at times, with sudden and enormous rapidity,—educated with an education peculiar to themselves,—embracing within their ranks men who easily earn high remuneration, and men who, by long and patient toil, can hardly keep body and soul together,—subject to great fluctuations of activity, over which they have no control, in which slackness of work means starvation, uniting often the hardships endured by the peasant, with the discomfort and want of health peculiar to the residents in towns,—the class of artisans is one which must exert an immense influence on the future of Europe.

It is important to bear in mind the broad line that separates the artisan from the tradesman. Among men who buy and sell, from the princely merchant to the village huxter, there is a certain amount of fellowship. But the shopkeeper is, at times, almost the natural enemy of the operative. The gains of the former, which on certain occasions he knows how to increase according to opportunity,—that is, in proportion to the need of his customers,—are often looked on with evil eyes by the latter. That most nefarious alliance of capital and of oppression, known as the truck system or "the shop," a system far easier to legislate against than to suppress, is simply an organised robbery of the workman; and, in point of fact, the state of tension existing between the operative and the small tradesman is, at least in many cases, more marked than is that between any other grades in the social scale.

To go fully into the subject demands both space and time. One or two facts alone may give some idea of its importance. In the United Kingdom there are ninety towns, each of which contains more than 20,000 inhabitants. London, as our readers are aware, contains upwards of three millions of residents. If we add to the population of London that of the fourteen largest towns in England, we very nearly double that large total. If we throw in Dublin and Belfast, we find these northern centres of city life to contain very nearly one third of the number of the inhabitants of England, and considerably more than a fifth of that of the United Kingdom. For the due representation, ordering, and organisation of this powerful, intelligent, and laborious army, the host on whose efforts depends not only the primacy of England in Europe, but her maintenance in the number of the Great Powers of the world,—what has been effected by the statesmen, politicians, and public writers of the day?

The necessity of the organisation of this great army of industry has been so urgent, that it has produced a series of internal associations, of which we cannot at present speak. But it is our firm conviction that the state, and permanent welfare, of the country demands that the careful thought of the statesman should be directed to this great element of the history of the future. If the only relation between the State, and the operative classes, be that established by the rude process of counting noses or canvassing for votes; if there exist none of the organisation which binds together society in its classes and grades, in default of which, the tie that holds the individuals in a mass may at any time be rudely rent asunder; a great source of danger lies in the increase of our manufacturing population. On the England of the future, this large and new class of citizens must exert an immense influence, for good or for evil. And yet, so far is this actual problem from being even in the course of solution, that we look in vain for the writer, or the speaker, who has yet submitted it to the attention of the age in its naked and gigantic magnitude.

To recapitulate: the main truth which it is essential to bear in mind, is this. The stability of the institutions of a country, in time of trial, and the permanent culture of all the citizens, depend to a great extent upon the organisation of the several classes of the community. To form an organic whole, the members of society must first form organised parts; and must have not only an individual, but a social, tie to the State. A vast and powerful class is rapidly growing up among us which has no traditional organisation, owing to the comparatively recent date of its origin. In instinctive self-defence, different sections of this great class have thrown themselves into associations, the object of which too often has been rather to equalise the rate of wages, than either to encourage the best workmen, to increase the demand for the production of the trade, or to unite as closely as possible the provider of money with the provider of labour. An organisation that shall be co-operative in the highest sense of the word; that shall stimulate demand by increasing both the cheapness and the excellence of supply; that shall insure to the ablest and most industrious workmen their proper grade among their fellows; that shall bind together employer and employed, in one common bond of enlightened self-interest; and that, originated as an industrial movement, shall result in a patriotic union such as will strengthen the very sinews of the country,—this, in our view, is the great want of the day. Nor do we think it to be a want which, if boldly and honestly regarded, England will long suffer

to remain unsupplied. Let those who are in a position to aid the workman by their counsel meet him on the ground of practical utility. Let them discard political theory. Let them cease to expect everything from artificial legislative changes. Let each trade regard its own true welfare as a whole, and then we shall find every trade to unite in advancing the common welfare of the working classes, and thus the permanent safety and happiness of the whole social structure of the country.

A WORD ON THE WAR.

We have received a pile of maps purporting to show the theatre of the present infamous war; but they are mostly incomplete and bad. The best of them are from Mr. Wyld and Messrs. Bacon & Co., to whom, therefore, we refer such of our readers as desire to be able to follow the progress of the belligerents. We must say a dozen words on the general question. In consequence of the war, bridges are being destroyed, railways dismantled, telegraphic communication stopped; the proposed Holbein Exhibition in Dresden is postponed; and the abandonment for the present of our own International Exhibition of 1871 is on the cards. Property has been depreciated to an immense extent, and hundreds of persons in Germany, France, and England were ruined before a single gun was fired. What destruction, desolation, and misery will be produced before the last gun be heard, who can calculate? And all for what? To advance the designs of a few bad rulers. Every honest man who can write, every man who can command a press, should feel bound to protest with indignation against this scandalous war. If two men quarrel in the street, and would fight it out, the policeman interferes, and the magistrates properly reprove even the attacked for taking the law into his own hands. Why should it be otherwise with nations? If the rulers of life and death feel affronted, or that their private ends may be answered, hundreds of thousands of men are set to slay each other. Where is our boasted civilisation? What have the ministers of peace done? If the conspirators at the head of the present war do not at once agree on some mutual scheme of plunder, and operations go on for a month, it is a moderate estimate to say that 50,000 men will be slain or wounded, and that half as many women and children will be left desolate and starving; and when that has been done, a scheme of plunder on the part of one of the sovereign rulers will have to be assented to on the part of the other sovereign ruler. It is too dreadful and too abominable to contemplate calmly. A deep debt of thankfulness is owing to the *Times*. There is little doubt that if the Secret Treaty had not been published as it was, the two conspiring monarchs would, by this time, have been working harmoniously their wicked will in the face of comparatively unarmed Europe. What may yet follow it is scarcely possible to say; but if England be drawn into the strife, it will be in aid of the weak, in support of the right, and to fulfil solemn obligations. Let the punishment fall on those who force her to it.

INVASION War! Foul curse of this fair Earth!
Must we once more bow down beneath thy sway?
Must once more lay our dear-bought Peace away,
And give to Rapine and to Crime fresh birth?
Thy proudest triumphs are but little worth,
Weighed 'gainst the noble lives with which we pay;
For though far off thy wilful footstep strays,
Thy shadow falls on us and blights our hearts.
Will Heaven forgive such outrage of its laws?
"He who sheds blood, his own blood shall be shed."
What though just vengeance seem awhile to pause,
Till surely fall in judgment on the head
Of him who ruthlessly unchains thy jaws,
And lets thee loose with all thy hell-hounds freed.

NORTHERN NOOKS: CULROSS.

WHILE speaking some weeks ago with regard to the ancient castle and village of Dunrobin, in Perthshire, we pointed out the fact that it is getting excessively difficult for the poor artist or antiquary to find secluded and pleasant objects of study. The pilgrimages we make nowadays by railway are all getting somehow or other to be as rapid and commonplace as it is possible for railway tourists and excursionists to make them. Most of our large towns are well known, and have been minutely described even in such channels as our own columns; and as to our great feudal or ecclesiastical buildings, they have been studied, criticised, and delineated until every feature has been brought within easy

access of the library table or the portfolio. Still, it is possible with some care and research to discover now and then a picturesque nook lying in some unfrequented thoroughfare or forgotten by a path; and one of the most interesting of such places which we have come across for some time is the ancient and royal burgh of Culross, situated within a few miles of Dunfermline, on the northern shore of the Firth of Forth.

There are few spots, in our opinion, within a day's journey of Edinburgh better worthy of a visit than this ancient and picturesque town, and there are few, we believe, so little known. One reason for this, perhaps, is that Culross is one of those unfortunate places which have been thrown into the background by the development of the railway system. In the good old coaching times, the mail between Dunfermline and Glasgow passed daily within a few hundred yards of it; now its nearest point of contact with the route of the traveller is at East Grange Station on the Stirling and Dunfermline Railway, fully three miles off. The town, as we have said, lies on the northern shore of the Firth of Forth, but the receding tide leaves so wide a breadth of shallow and muddy beach that direct communication with the river steamers which ply between Granton and Stirling is generally a thing to be avoided; and passengers by water must perforce disembark either at Crombie Point or at Kinparlane, each as far from the village as the railway station is. But though thus somewhat difficult of access, Culross, when reached, will be found amply to repay the toils of the pilgrimage; and even to recompense the pilgrim for a walk over some very sludgy and miry country roads. We do not understand how it should be that the roads in this district are in such bad repair. The great apostle of road reforms in Scotland (Mr. Pagan), who was a native of the neighbouring kingdom of Fife, would certainly not have observed them for a moment. There is an obvious and most perceptible want of macadamisation over most of these roadways.

As you approach Culross it is seen at once to possess a curious and venerable appearance; besides having at the same time much natural beauty in its surroundings. It is sheltered on the north and east by a crescent of wooded eminences, and appears to lie embosomed among rich plantations and blooming orchards. The little town, in fact, nestles snugly on a gentle declivity, lying open to the sunny south, its antique dwelling-houses straggling upwards from the water-side to the hill-top, from which the venerable abbey and palatial mansion of the old Earls of Kinnaird seem to look down on the placid scene as the civil and ecclesiastical authorities of the place. Few old towns retain so many of the picturesque features of the past; and there is a remarkable air of repose about Culross, greatly owing, no doubt, to its quiet and isolated situation, which is infinitely refreshing to the poor way-worn traveller in these days of turmoil and excitement. In the narrow winding streets there are to be met with not a few bits of quaint domestic architecture, testifying that the knights and burghers of two or three centuries ago must have been men of taste as well as substance, and must have known how to take advantage of the fine natural acclivities of their town. Something of this, no doubt, was owing to the refining influences of the great ecclesiastical foundation to which the old burgh owed its origin. For example, we looked at a curious old-fashioned house, built by Sir George Bruce, of Kinross, about the close of the sixteenth century, which contains a spacious room, with a nicely-panelled roof, each panel decorated by a painting of one of the virtues, together with certain appropriate inscriptions in Latin and English. The neighbouring castle of Blair will also afford indications that the spirit has not died out in their descendants.

The antiquity of the town is, of course, very great, and it has played an important part in the ecclesiastical history of the country. So far back as the sixth century, Culross (a name which some authors hold signifies literally "the wooded ridge or promontory") was chosen by St. Servanus, the great evangeliser of the southern Picts, as the head-quarters of his missionary labours. Here, too, St. Kentigern, the child of the Princess Therasa or Thernock, when driven with his mother from the court of her father, Loth, the heathen King of the Lothians, was received, as the monkish historians tell us, by St. Serf, and brought up as his adopted son, until the period when he went forth to preach the Gospel to the Britons of Strathclyde. Six centuries later, a beautiful abbey, bearing the name

of Serf, or Servanus, was reared on the hill where the primitive oratory of the saint had stood, the Thane of Fife, whose castle crowned an adjacent eminence, being the founder. The site of this castle is still pointed out on the wooded eminence of Dunimarle, which overhangs the Forth, about half a mile to the west of Culross. Here tradition fixes the scene of the murder of Lady Macduff and her children, by command of the usurper Macbeth, as described in Shakespeare's tragedy of that name; but, of course, our recent and exact topographical and historical researches on this subject somewhat disconcert the truth of the tradition in many points. The hamlet which eventually rose under the shadow of the monastery gradually increased until, in the reign of James IV., it was created a burgh of barony, the dignity of royal burgh being subsequently conferred by charter from James VI.

The remains of the ancient abbey are still a prominent and picturesque feature in the landscape. It was founded, to be more particular, A.D. 1217, by Malcolm, Earl, or Thane, of Fife; and was first inhabited by an order of Cistercian monks. The choir, which was originally of Early English type, has been modernised, and, of course, somewhat damaged. But long anterior to the foundation of the abbey, Culross had, as we have seen, arrived at a high pitch of ecclesiastical repute; and it is a well-ascertained fact that the celebrated St. Kentigern, who was born and educated here in the sixth century, was otherwise that same St. Mungo who is still regarded as the tutelary saint of Glasgow, and who founded its cathedral. A faint and very gentle, but distinct *rapprochement*, with its ancient ecclesiastical character, still hovers about, as it were, in the surrounding atmosphere. Even when the abbey had fallen into disuse; even after the feudal barons, who descended from King Robert the Bruce, who came in place of the monks, had developed the great natural resources of the district, and made the industries of Culross in coal and iron famous throughout the kingdom, it still clung to its ancient traditions. The town is now little more than a shadow of its former self; but it is not a little remarkable, that in spite of the lapse of time, and the many violent changes, civil and ecclesiastical, which have intervened, the name of St. Serf is still held in grateful and loving remembrance by its inhabitants, just as that of the sainted Queen Margaret is in the neighbouring town of Dunfermline.

Culross, we have indicated, had other qualities to recommend it than its ancient ecclesiastical character. It was, at one time, celebrated for its iron manufacture, particularly of girdles for firing the oat-cakes of the country—those round iron plates which, as Froissart, it will be remembered, described as part of the regular accoutrements of the Scottish light irregular cavalry, who made such tremendous havoc in their marauding expeditions into England. The girdle is still largely employed by the Scottish peasantry, of course; but the seat of the manufacture is no longer at Culross. This curious historical circumstance, which we quote from Murray's "Handbook," is referred to by Sir Walter Scott, in his novel of "The Heart of Midlothian," where the fact seems to be admitted that the hammer-men of Culross were superior handicraftsmen to the hammer-men of Edinburgh. In this respect, the Scottish town seems to have resembled the Mediaeval German cities, specimens of whose ironwork we have frequently engraved in our pages.

What we have space to add partakes of a more modern and contemporary character. The ancient Dunimarle (now called Castle-hill) is said, as we have observed, to occupy the site of Kennaway Castle, where Lady Macduff and her children were so ruthlessly sacrificed. It is certainly a splendid site, and surrounded with many natural advantages. The present liberal and enlightened lady who succeeded to the property some thirty years ago, —Mrs. Sharpe Erskine (of the Erskines of Torrie), has made extensive alterations and improvements about the mansion-house and grounds. The former, a rather heavy eighteenth-century building, has been largely added to in the English castellated style, in harmony with which it is intended that the remaining part of the house shall be entirely rebuilt. The grounds have been laid out with taste, advantage having been taken of their fine natural situation to form a broad terrace with embattled and turreted wall, which, with the towers of the castle at its western extremity, forms a most conspicuous object as seen from the Firth. On a gentle declivity to the south of this terrace a

new Episcopal chapel is now being built at the sole cost of Mrs. Sharpe Erskine. This edifice, which is intended to bear the name of St. Serf, has been designed by Mr. R. Anderson, architect, of Edinburgh. The style of architecture adopted is that of the Transition (end of the twelfth century), being the style exemplified in the earliest remaining parts of Culross Abbey. The building is intended to serve as a mortuary chapel for the fondress, as well as a place of worship for the Episcopalian families of the neighbourhood.

It is of oblong shape, measuring internally 66 ft. by 18 ft. The east end is apsidal, and the west gable is surmounted by a massive belfry, having two tiers of openings for a peal of three bells. This gable is strongly buttressed, and has a large circular window filled with rich tracery. The entrance to the chapel is on the south side near the west end. It is a large projecting doorway of three orders, the jamb shafts detached, and the orders of the arch richly moulded. The apex is lighted by five single-light windows, the semicircle internally being richly arcaded. The chancel has a two-light window on the south, and an archway on the north side for the organ. From the organ recess access is given to a small vestry. The nave is lighted by five single-light windows on each side. The whole of the chapel is vaulted internally with wood. The church will be fitted up in the usual manner for the clergy and choir, and the nave will be furnished with open deal benches for a congregation of about eighty.

We have only room to add, in conclusion, that we are indebted for some of these details to a well-written article which appeared some months ago in the *Scotsman*, and any one who wishes to know more about this curious northern nook, will find some graphic notes in *Land and Water*, from the pen of Mr. J. E. Bertram.

COLOUR AND ARCHITECTURE.

THE following correspondence will be read with interest:—

The church decorator is now becoming a special trade with us, as the church embroiderer is in Italy. You are aware how many operations are going on about London even, to touch up churches with colour, whether Gothic, Greek, or Roman. I send you a letter on this subject, recently received from Mr. Edmund Sharpe. The question of colour, as applied to architecture, has now so great influence, that the opinion of so good an authority in Mediaeval art as Mr. Sharpe will be read, I have no doubt, with interest, even by those who entertain opposite judgments upon the matter. A full argument upon the subject is now of the greater consequence, as so large a sum as a quarter of a million has been suggested to be expended upon St. Paul's Cathedral, London, and it will depend upon the mode in which these decorations will be applied, whether the application of so considerable a sum on purely superficial decoration can be justified. Splendour must be toned down by sobriety, and no attempt made to vie with the drawing-room or the theatre. I presume that the model exhibited at the Mansion-house will be materially modified; that religious historical painting by men of the highest talent will be more largely introduced, not of subjects tending to superstitious adoration. It may be a question whether a canopy at the east end be doctrinally appropriate in a Protestant, as it is in a Roman Catholic, place of worship: for in the former a movable table is used for the Holy Communion, in the latter an altar for the mass. And are the right men on the working committee, or may it not too largely consist of the amateur and fancy decorator? T. L. D.

MY DEAR DONALDSON,—I am obliged often to do things by snatches; and thus, in returning from abroad after a six months' absence, I find a heap of transactions of the Institute of Architects for the past six months to scan over. Amongst these I find a discussion in March, on a paper by the Rev. E. L. Cutts, on "The Introduction of Colour in Churches;" and you will not, I know, think it a presumption on my part if I offer my entire adhesion to all that you uttered on that occasion. This rage for colour in our churches is likely to lead to a reversion of the true principles of art as applied to building; for the members of this new school, instead of making, as they profess, painting the handmaid of architecture, would really make architecture the handmaid of painting—they would, in fact, disinherit the elder sister, and make colour predominant over form.

I hold, on the contrary, in architectural art the maxim that whenever the effect of colouring is to attract the eye more than the form of the design, colour is an impertinence. Thus, in Ely Cathedral some one has in this way impertinently coloured the boards and rafters of the roof of the

triforium of the choir, in crude, gaudy colours—blue, chocolate, red, and yellow,—the whole covered with white stars, in so obtrusive a manner that it is impossible for the eye to rest on the elegant stonework of Bishop Northwold's charming design, in its native cream-coloured modesty, to which this tawdry work, as seen from below, forms the disturbing background.

If any one desires to see how it is possible, without displacing a stone of the original building, to take out of our old minsters every particle of that grand and solemn effect, which is their principal characteristic, if not their greatest merit, let him go down to Winchester, and see in the neighbouring church of St. Cross what an art, which is lower than that of sign-painting, has done to disfigure that grand old building.

If you wish effectually to take all light and shade out of a moulded arch, you have only to paint it. All the glorious effects produced by a flood of sunshine on the rich series of mouldings that clothe and charm the pier-arches of our English cathedrals, are irremediably lost the moment they are painted; the delicate transition from light to dark, on a rounded projection; the sharp line of bright light carried along the bordering fillet, and the dark shadow by means of which the deep adjoining hollow throws the two former into high relief, are altogether lost in a painted arch. The delicate natural play of light and shade designed for, and realised in, the original stonework, is neutralised and absorbed in the painted coat.

The relief produced, such as it is, is artificial, forced, false, and monotonous. And yet this is the condition to which the new school would reduce the noblest buildings in the land, if the guardians of those national treasure-houses would let them have their way. There is a consolation, however, in the thought that, inasmuch as this new rage, the promptings of which are of the same nature, and rise to no higher level than that which formerly led the town barber and the landlord of "The Chequers" to adopt the same gaudy expedient for attracting their customers, will soon pass away.

It is only necessary that a new fashion, whether of dress or building, which is not solidly based on true principles of art or utility, should become sufficiently common in order to cause it to fall into disfavor; and the extent to which the owners of modern Alhambras, tea-gardens, dancing-rooms, and other places of entertainment are following in the wake of their clerical pioneers in the use of gaudy colours, and in the gratification of vulgar taste, will soon bring this sort of meretricious decoration into discredit. Is it too much to prophesy that the next half century will see our future church restorers as busily engaged in denuding our churches of the unsightly coats of false paint with which we are now loading them, as we ourselves have been in the first part of the century, in stripping them of the conservative whitewash, with which our forefathers in their ignorance considered them for us. It is, I know, much easier and a much pleasanter thing to sail with the tide, and to turn with the tide, than to oppose vigorously at the right moment a popular error. I believe, however, that the middle classes in the country are possessed of more common sense and good taste in matters of art, as well as in matters of practical utility, than they usually get credit for, and we have only to appeal to that characteristic sentiment of national sobriety in matters of taste as well as in matters of religious feeling, which distinguishes us from all other nations of Europe; we have only in fact to appeal from Philip in his cups to Philip sober, to insure the banishment of the colour-pot and gold-leaf to those situations and to those regions where they will offend neither the one nor the other.

EDMUND SHARPE.

Ironwork in the Crystal Palace.—Messrs. E. & F. Crook wish it mentioned that the wrought-iron lily to which we lately referred was produced by them. They add,—"The intention of the work is an ornament for the top of a wood cover to a font. The article, as you stated, represents a full-grown, large white lily, with a complement of flowers and buds; the stem of the plant being fully supplied with side leaves in various forms and stages of growth. The base on which the flower stands is also of wrought-iron; the ornaments upon the scrolls are chiselled out of the solid, leaving the outlines and fibrils of the leaves sharp."

THE SEWAGE QUESTION.

Maidstone.—The Local Board have unanimously decided to carry out the drainage of the Kingsley Estate and the West Borough, at a cost of about 5,000*l*. The Board, it seems, have already power to borrow the requisite amount, so that the works can be proceeded with at once.

Doncaster.—The Corporation are threatened with an injunction by the River Don Navigation Company, if they continue to cast the town's sewage into the river, and a conference has been held at the Mansion House between certain of the directors and a Committee of the Council, as to the best method of carrying the sewage forward to the Corporation estate of Sandall, and there applying it to the irrigation of the land.

Leamington.—Messrs. Coghane, Grove, & Co., of the Phoenix Works, Wolverhampton, have received the contract for the supply of cast-iron mains for the new sewage irrigation works. It is estimated that 640 tons of straight, and 14 tons of irregular, pipes will be required. The contract prices are 4*l*. 17*s*. 6*d*. for the former, and 9*l*. for the latter.

Northampton.—In the case of Harrold v. Markham, which came before Vice-Chancellor Bacon, on Thursday, evidence was given as to the best mode of disposing of sewage. The authorities on the subject appear generally to have advocated sewage farms where the sewage matter is used for the purpose of irrigation. The advocates of this plan contend that the liquid which reaches a stream, after passing through the earth for any distance, is, by the natural filtration of the soil, entirely freed from any noxious particles of organic matter. On the other hand, it is objected that in the irrigation system the sewage matter has to be spread over a considerable area of land, and necessarily constitutes an offensive and fever-causing nuisance in the neighbourhood, which, however, is denied; and, further, that in clay soils it is almost entirely useless. The case which came before Vice-Chancellor Bacon furnished an illustration of the unsatisfactory state of our knowledge on the subject. It was a suit against the Northampton Improvement Commissioners, in which an injunction was granted last year to restrain the defendants from polluting the river Nene with the sewage of Northampton. The execution of the writ had been delayed until the 1st of July this year, and a motion was made to enforce it by sequestration, which, as pollution was proved to continue, the Vice-Chancellor said that he was compelled to grant, but recommended that it should be suspended until the 1st of November next, as the defendants protested that scientific authorities were still in doubt as to the best mode of destroying the noxious qualities of sewage matter, and that the delay in obeying the injunction was caused by endeavours to discover whether it would be better to attempt a sewage farm, or to carry to greater perfection the plan which the Commissioners now adopted. This appears to be a system of defecation by means of large tanks, in which the sewage is precipitated by an admixture of sulphates and clay. The sewage matter is deposited at the bottom of the tanks to the extent of 400 tons a week, and sold in a dry state to the neighboring farmers. In support of the present plan the defendant put in some evidence of Dr. Letheby and Mr. Hawksley, the concluding passage of which is as follows:—

"Finally, we think it right to state that both before and since our visit to Northampton we have made careful inspection of all the principal works of irrigation and precipitation used for the prevention of the flogging of rivers by sewage water, and that the result of our investigations has briefly stated is, that on the whole a much greater sanitary improvement in the prevention of nuisances can be effected by the use of precipitating agents than by the application of sewage to the surface of land."

Hertford and Ware.—A meeting of the general committee of the town council of Hertford has been held to consider certain proposals made by the Ware Board of Health to undertake the conveyance and disposal of the Hertford sewage in conjunction with that of Ware, on to certain lands proposed to be purchased by the Ware Board for the purpose of irrigation. The terms offered by the Ware Board were that the Board would undertake the conveyance and disposal of the Hertford sewage, on the payment of an annual sum of 400*l*. to be secured by lease for twenty-five years, all expenses of surveys, lease, agreements, &c., to be paid by the corporation; and also to undertake to construct the necessary works, to connect the Hertford with the Ware sewers at the estimated expense of 1,800*l*. The

committee were of opinion that the terms offered were very high, and as it was very doubtful whether, after the lapse of a few years, the whole of the concentrated sewage of the two towns being thrown upon a limited area, the land might not become so impregnated with the noxious fluid as to be an intolerable nuisance to the locality, the scheme might have to be given up after a large expenditure had been incurred. Alderman Ludlow thought that it was the most feasible plan of getting out of the difficulty, with regard to the disposal of the Hertford sewage, that had been offered. He believed the plan of irrigation was the most likely to meet the requirements of the Lee Conservancy Act, and that it could be effected, in conjunction with Ware, at a very much less cost to the town of Hertford, than in any other way. Alderman Gilbertson advocated the A B C plan of purification of the sewage, which he had himself, he said, witnessed in operation at Hastings and elsewhere. The committee were almost unanimous in adopting the views and proposals of Alderman Gilbertson. It was then unanimously resolved that the town clerk should inform Mr. Cobham that the Hertford Corporation felt bound to make further inquiries. The town clerk was also requested at once to communicate with the "Native Guano Company (Limited), Works at Leamington, and offices at 1, St. Swithin's-lane, London."

Dublin.—At a recent meeting of the Dublin Corporation, the Lord Mayor formally announced that the Government had promised a loan of 300,000*l*. for the main drainage of Dublin and purification of the Liffey, on the same terms as to interest and repayment as they had already granted for the London main drainage.

HOUSE OF COMMONS.

LAW COURTS—SOUTHWARK PARK.

On the vote of 21,450*l*. for the purchase of site and erection of building for the new Palace of Justice, Mr. Ayrton, in his explanation of the vote, said, the royal commission had not declared their final adoption of the plan of Mr. Street, but they had expressed their readiness to approve of it. The object of the present vote therefore, was to take such a sum as was necessary to clear the ground and lay the foundations.

Mr. Alderman Lawrence said that by the present plan the projected building would approach much closer to the Strand and Carey-street than in the original designs; but, as had been the case around the Westminster Palace, what was wanted was space from which the building could be viewed. They ought to look, not to the wants of the day, but to the wants that were likely to accrue. It was often said that Temple Bar was a great obstruction to the traffic of the metropolis; but it was not in consequence of Temple Bar that a congestion of traffic took place, but in consequence of the counter-traffic coming in and out of Chancery-lane. What was wanted was space for five or six vehicles to pass abreast, and that was what the present plan did not provide. He believed there would be no indisposition to remove Temple Bar, if the promoters of this building would place it far enough back to enable suitable approaches to be made to it, so that efficient arrangements might be made for the traffic. The Treasury, however, did not think it necessary to consider the subject of approaches, all it aimed at being to produce a building at a less cost. All the legal profession wanted was isolation and concentration; but the requirements of the public also should be attended to. He did not expect much from the Chancellor of the Exchequer or the First Commissioner of Works, but the matter should, nevertheless, be considered.

Mr. Beresford-Hope said he was glad that they had at last reached the accomplishment of a great work.

Mr. Ayrton said that all the committee were asked to do was to give a general assent to the plan. As for the question of approaches, they had nothing to do with that subject at the present time.

Sir J. C. Lawrence, as a member of the royal commission, protested against the alterations which had been made on the original plan in respect to light, air, and the approaches. He regretted that all other considerations should have been lost sight of save the sole one of economy. Other members spoke, and the vote was then agreed to.

At a recent sitting of the House, Mr. Locke called attention to the intended appropriation of

large portion of Southwark Park for building purposes by the Metropolitan Board of Works; and moved that in the opinion of the House the whole of the land purchased under the Act of 1864 (the Southwark Park Act), should be preserved as a park for the use and recreation of the public.

Mr. Secretary Bruce said the general principle upon which the Metropolitan Board of Works had acted was a wise one. They considered that by the construction of the park the neighbouring property would be greatly increased in value; and, acting upon this, they had determined to set aside 16 acres, to be let on lease, by which they hoped to obtain, for the general body of the ratepayers, from £2,000, to £6,000, towards the expense of making the park. He asked the House whether it would be consistent with its dignity to pass a resolution calling upon the Metropolitan Board of Works not to exercise the powers conferred upon it by Act of Parliament. Such a resolution would not be worth the paper upon which it was printed. The matter was one for the ratepayers rather than for Parliament; and the proper course for the hon. member to take would be either to bring in a Bill repealing the power given to the Board of Works, or to apply for a legal injunction to restrain them from exercising it.

Mr. Locke consented to withdraw his motion, estimating, however, that he should early next session move for leave to bring in a Bill to restrain the Metropolitan Board of Works from diminishing the area of Southwark Park.

On the vote of 13,000, for the new Home, Colonial, Poor-law, and other offices,

Mr. Beresford-Hope asked if the design would be exhibited to afford members an opportunity of judging of its character.

Mr. Ayrton said that Mr. Scott, the architect, could construct the building in harmony with the portion already erected. There would be no advantage in delaying the work for another year merely to allow members an opportunity of seeing a design which they probably would not now what to do with when they saw it.

Mr. Beresford-Hope accepted with great gratitude from the right hon. gentleman this homage to the profession of architects, even if made at the expense of the amateurs.

The vote was then agreed to.

On the vote of 37,250, for the site of the National Gallery,

Mr. Beresford-Hope asked who would be employed as architect?

Mr. Ayrton replied that, subject to his acceptance of the conditions, Mr. E. M. Barry, the architect appointed by the late Government, could be employed.

ESSEX ARCHÆOLOGICAL SOCIETY.

THE annual general meeting of this society was held on Tuesday in last week, and proved an interesting day to those who attended. The meeting was held at Braintree, where three papers on various subjects were read, and from whence an excursion was made to several places of unusual attraction in the neighbourhood. The meeting for the transaction of business was held at the Horn Hotel, the company present at the meeting and during the excursion including a number of ladies.

The report stated that since the last annual meeting twenty-seven new members had been elected, besides four to be proposed that day, making a total of thirty-one, a larger accession than the society had received for many years.

The Rev. B. Lodge read a paper "On a Roman Sepulchral Monument, with Effigy of a Centurion, found at Colchester," illustrated by Mr. Parish, artist, Colchester.

The Rev. E. J. Hill followed with a paper "On a few brief Notes of Objects of Interest in the Neighbourhood of Braintree."

Mr. H. W. King, the honorary secretary, contributed the third paper, having for his subject "The Ancestry of Sir Denner Strutt, bart., the Cavalier."

Leigh Priory was suggested as the object of next year's investigation. The company then adjourned to luncheon supplied by Mr. Johnson, after which, in several vehicles, they proceeded on the excursion. The objects inspected were varying in character and interest, and the drives from place to place were through a beautifully picturesque district, abounding in well-wooded scenery, interspersed with hop-grounds, abrupt declivities, and occasional glimpses of a long stretch of country. The first stage was to

Gosfield Hall (the residence of Mr. S. Courtland), once the shelter of Louis XVIII. and other royal fugitives from France, and the scene of banquetings given by Lady Rich and Lady Maltravers to Queen Elizabeth. The church was then visited; and at Gosfield Church Mr. King gave an explanation of the eucharistic vessels upon the altar, and Mr. C. F. Hayward added a few words about the character of the church. Shalford Church, Panfield Hall, and Panfield Church were each taken in turn, and at six o'clock the party returned to Braintree.

SOFT WATER v. HARD.

At a recent visit of the Manchester Town Council to the Waterworks, Mr. Bateman drew attention to reports which had been industriously circulated of late years to the prejudice of soft water, attributing to its use the great mortality which, unhappily, still existed in some of the large towns and cities in the kingdom. He stated, most unhesitatingly, that there was no foundation in truth for such reports; that they were entirely fallacious; and that the presumed facts which were relied upon would not bear the test of scrutiny. He referred to a table appended to the evidence taken before the committee of the House of Commons on the East London Water Bill, in 1867, in which the whole question of the metropolis water supply had been inquired into. This table purports to give the mortality of various towns and places, distinguishing between those supplied with water above and below 10° of hardness. The strongest proof that excessive mortality must be sought for in other causes than the hard or soft character of the water supplied to the inhabitants, will be seen by an examination of the mortality which obtains in different places supplied with the same water. For instance, the population assigned to Birmingham in the table alluded to (a town supplied with water of 16½ degrees of hardness) is made up of those living in Birmingham, King's Norton, and Aston, the density of population being respectively 100, 137 and 27 persons to the acre, the mortality being also respectively 26.5 per 1,000, 17.1, and 21 per 1,000. This varying mortality cannot surely be owing to the water, which is the same in all the three cases. Again, Liverpool, having water of 9° of hardness, is composed of Liverpool and West Derby; the mortality being, in the former place, 33.29; and in the latter, 27.73, per 1,000; the water being exactly the same, but the density of population being, respectively, 100 and 3.7 per acre. Sheffield, a soft-water town, is composed of Sheffield and Eccleshall; the mortality in the two places being 28.45 and 22.75. Manchester, Salford, and Chorlton-on-Medlock, all places supplied with the soft water of the Manchester Waterworks, exhibited a mortality, at the time the table was prepared, of 31.48, 26.00, and 23.94 per 1,000, respectively. If the high death-rate in Manchester was due to the soft water, why did it not poison as many persons in the 1,000 in Chorlton-on-Medlock and Salford? Instances from all quarters of the kingdom could be crowded upon each other, showing a like result, and thus also showing the fallacy of the deductions which have been drawn from such unfair statistics as have been thus only slightly exposed.

A MEMORIAL FOR BOMBAY.

At the South Kensington Museum, a statue of the late Prince Consort has been temporarily erected, and it will remain there on view for a short time.

This fine memorial is the gift of the late Mr. David Sassoon, and is intended, ultimately, to be placed in the Victoria and Albert Museum, Bombay. The entire work is about 19 ft. in height, and is wholly of marble,—steps, plinth, pedestal, and supporting emblematical figures, of Sicilian; the statue of Carrara. The figure of the Prince has been modelled 8 ft. in height. The figure is standing; and the costume includes the robe and decorations of the Star of India. In the right hand there is a manuscript scroll,—and the left hand reposes on the breast. The portrait is perfect. He stands "a Prince indeed!"

The supporting figures are feminine, placed in sitting postures; on the right, Science,—on the left, Art. The proportions of the several parts are admirable; and, being entirely of marble, there are both breadth and keeping. The enriched mouldings of the pedestal and plinth have a

meaning. The oak leaf and acorn denote Strength; the olive leaf, Peace; and the lotus leaf and flower, Wisdom.

On two panels of the pedestal is inscribed, in four languages,—

ALBERT, PRINCE CONSORT:
Dear to Science; dear to Art;
Dear to Thy Land and Ours.
A Prince indeed!

The block of marble from which the statue of the prince has been carved is of the purest, clear and uniform, without colour, without blemish. We venture, on behalf of the British public at home and the native and British public of Bombay, to thank the representatives of the late David Sassoon for this princely memorial; and we cannot refrain from also thanking Mr. Noble, the sculptor, for his beautiful and most successful work.

THE PROPOSED THOROUGHFARE BETWEEN HOLBORN AND THE STRAND.

MR. P. H. LE BRETON, member for Hampstead, has presented a memorial to the Metropolitan Board of Works, signed by 562 barristers and firms of solicitors having chambers in Lincoln's-inn and its immediate vicinity, urging the co-operation of the Board in carrying out the proposed new road from Holborn at Southampton-row to the Strand and the Victoria Embankment at Norfolk-street, the details of which have already been made public in connexion with the Mid-London Railway. The memorial states—

"That it is in contemplation to construct a railway from the point at the junction of the Hampstead, Kentish Town, and Camden roads, thence passing by the Eastern square Terminus of the London and North-Western Railway, and running to the Waterloo Junction Station of the South-Eastern Railway. The promoters of the railway are willing to co-operate with the Board in constructing the following new roads in the line of their railway—that is to say:—1. A road from Vernon-place, Southampton-row, passing across Kingsgate-street to Holborn, and thence in the line of the Little Turret-street and Gate-street to the north-west corner of Lincoln's-inn-fields; 2. A road from the south-west corner of Lincoln's-inn-fields, passing through Clare-market, and crossing Wyck-street and Holwell-street to the Strand; 3. An enlargement of Norfolk-street leading down to the roads now in course of construction, which will communicate with the Thames Embankment. It is also proposed to make a direct communication between Vernon-place and Theobald's-road, and to remove the pile of buildings between Holwell-street and the Strand, and to widen the latter at its present narrowest point to 70 ft. The road will bring into communication, by a direct road, the Thames Embankment, the Strand, Holborn, and the Euston-road, with the districts of Hampstead, Highgate, Kentish Town, Holloway, and in general the northern parts of London."

It is said the project has been submitted to the benchers of the Hon. Society of Lincoln's Inn, and to the council of the Incorporated Law Society, and has received the formal approval of both those institutions, as well as that of her Majesty's First Commissioner of Works, and of Mr. Street, the architect of the New Palace of Justice. It is also understood that no opposition has been offered on the part of the persons most affected by the course of the road and railway.

THE PROGRESS AND BUILDING TRADE OF HULL.

THE progress of this ancient seaport has of late years been very great. And so numerous have been the erections and development of certain parts of the town that the coming census cannot fail to show a very large increase. The building trade during the past few years has been active, the docks and public buildings increasing the ordinary work.

Within the last six or seven years a new town has sprung up at Drypool, which in 1835 was taken from the East Riding by the Municipal Boundaries Act, and united to Hull. Some hundreds of cottages have been built, which for the most part are, however, of a slight construction and somewhat confined, both in area and extent of out-door accommodation. The handiwork of the builder may also be traced in the construction of a better class of property in Hessle-road and other parts of the town; whilst, at the present time, several public buildings are engaging the attention of the builder and architect.

Looking back to the time when most of our large towns presented but few traces of improvement, we find that Hull possessed waterworks so early as 1613, which were worked by horses during a period of 157 years, when steam power was introduced. Its dock accommodation, which from time to time has found so much employment for the building trade, dates from the year 1778, when the first dock was opened. The

length was 1,703 ft., and the breadth 254 ft. In 1869, the Humber dock was completed at a cost of 220,000*l*. Its length is 914 ft. and its width 342 ft. Next followed the Junction Dock, which was opened in 1829, and constructed at a cost of 107,000*l*. It contains 6*h*. 5*p*. The New West Docks were made in 1867, and were estimated to cost 1,000,000*l*. The docks are nearly a mile long, and 120 yards in breadth. Even up to the present time workmen are still employed constructing warehouses, sheds, &c., for the accommodation of the shipping trade, which brings to the town something like half a million of money annually as Custom duties.

The public buildings in Hull have just now been augmented by the erection of several structures. Foremost in merit are the new dock offices, which for some time have been in the course of construction by the workmen belonging to the dock companies. The building which, when finished, will do credit to the company, is erected at the junction of Saville-street, on a triangular-shaped plot of land. It has three moderately large domes, and is beautifully carved on the exterior with the arms of the borough and other companies. Arrangements are being made for the erection of a public clock. At the junction of the Market-place the Hull Banking Company are erecting a substantial and somewhat ornamental building. The work is being done by Mr. Mngrove, and is making satisfactory progress. The High Church is being renovated, and several improvements introduced. Amongst the public buildings of recent construction may be mentioned the new town-hall, by Brodick. The structure is in the Italian style, and has a frontage of 105 ft. to Lowgate. It has a central tower 135 ft. high, and was built at a cost of 28,000*l*. The new theatre was set apart for public use in 1867, the new corn exchange in 1866, and the public baths and wash-houses in the year 1850.

The population of Hull in 1801 was 29,849; in 1811 it had increased to 37,466; in 1821, to 45,078; in the year 1841 it had increased to 66,258; and at the last census it was 97,661; whilst now it is considerably more than the last-named figure.

ROMAN PHOTOGRAPHS.

SOME of our readers may be glad to know that Mr. Parker's photographs from Rome will remain in Candall's Gallery, Bond-street, until the 13th of August. Mr. Parker writes to us:—"These photographs throw a new light upon many things in Rome which have hitherto been very obscure. Photographs can only tell the truth, and the naked truth is not always quite agreeable to either party. This is probably the reason that this Exhibition has been received with such remarkable apathy and indifference by both parties. The Liberal party does not like to see the Niebuhr theory shaken by seeing that the walls of Romulus, Anons Martins, and Servius Tullius, and the buildings of the time of the Republic and Early Empire succeed each other in natural chronological succession, exactly as we should expect from Livy's history, especially from the first book, which is considered by many of the Niebuhr school as a mere fable, or at best an historical romance. On the other hand, the Jesuit party in the Roman Church, and their followers and admirers, do not like to see the traditional history of the paintings in the Catacombs upset by a comparison of them with the mosaic pictures in the churches of Rome. It is always assumed by the Jesuit school that these paintings of saints and of the Madonna are of the second and third centuries: the greater part of them are really of the eighth and ninth; and another large proportion, of the sixth. They were painted by the Popes for the pilgrims, when the Catacombs were restored after the invasion of the Lombards. I have no hesitation in saying, after a long and careful study of the Catacombs, that on all points in dispute between the Roman Catholic and the Anglo-Catholic, the evidence of the Catacomb paintings is entirely in favour of the Angelican view;—that is, I believe, is proved by these photographs,—that is, by the comparison of the mosaics in the churches with the fresco paintings in the Catacombs.

The Pontifical Government, which has hitherto treated me with such kindness and consideration, has now, under the dictation of the Jesuits, reversed its conduct: the same parties who have dismissed my worthy and excellent friend, Padre Theiner, from the post he had filled so long and so well, of keeper of the archives, because he allowed some of the non-Jesuit party to see a

little of the truth, has also forbidden me to take any more photographs in the Catacombs, or even in the Pagan tombs on the Via Latina, because the frescoes in these tombs are really of the time of the martyrs, and a comparison of them with the frescoes in the Catacombs makes it quite impossible to believe that both can be of the same period. The art is altogether different."

Whether the conclusions at which Mr. Parker has arrived, from the study of the objects shown in these photographs, are correct or not, which may fairly be a matter of opinion, the photographs themselves are more exact representations of the objects than can be obtained in any other manner, and we advise our readers to go and see them.

BUILDERS' BENEVOLENT INSTITUTION.

THE twenty-third annual general meeting of the friends and subscribers of this charity was held on Thursday (28th ult.), at Willis's Rooms, King-street, St. James's, Mr. J. M. Macey, the president of the past year, in the chair. The purpose of the meeting was to receive the report for the past year; to elect a president, treasurer, directors, and auditors for the year ensuing; and other matters connected with the welfare of the Institution.

Mr. Harris, the secretary, read the report, which showed that the total number of pensioners is now forty-four, viz., twenty-two men and twenty-two women. The pensioners last elected were Mr. Richard Burdett and Mrs. Martin. The amount of stock, Three per Cent. Consols, purchased during the past year is 32*h*. 5*s*. 21*d*. 1*h*. for the relief fund, and 10*h*. 9*s*. for the building fund, making a total of 15,075*h*. 14*s*. 11*d*. viz., 11,921*h*. 6*s*. 8*d*. for the relief fund, and 3,154*h*. 3*s*. 3*d*. for the building fund.

On a proposition from Mr. Cooper that the thanks of the meeting be accorded to the patrons of the Institution, and that the names of Mr. Thos. Brassey and Mr. J. M. Macey be added to the number, it was unanimously carried.

Mr. Plucknett next moved a vote of thanks to Mr. Macey for his performance of the onerous duties of president for the past year, which he had carried out with the greatest satisfaction.

This vote was also unanimously passed, and Mr. Macey acknowledged the compliment. An important instance of the need of the Institution had just come to his knowledge. He had heard the name of one who from his position did not appear to have the slightest possible chance of ever being associated with poverty, but misfortune had overtaken him. With respect to his duties having been onerous, such was not the case, for which he was indebted to Mr. Plucknett, the committee, and the secretary, who made them so light as possible.

The retiring directors and auditors were next re-elected, after a marked expression of approval of past services.

On a vote of thanks to Mr. G. Plucknett, the treasurer, being proposed, Mr. J. Thorne said he had much pleasure in seconding it. For some years, since they lost the services of Mr. G. Bird, Mr. Plucknett had filled the important office of treasurer with great zeal and ability, and there was hardly a meeting but which he attended. He had taken great interest in the Institution, and had rendered it very valuable services, and they might think themselves fortunate in having obtained the services of so good and talented a man.

Mr. Plucknett returned thanks for the very kindly manner in which the vote of confidence had been passed. It was true the receipts were not quite so good as usual, owing to the fluctuation in the trade. He, however, had a hope that next year they would be as good as formerly. They were not very deficient, when they considered that all the charities had felt the effect of the general bad time.

The offer of Mr. Alfred J. Mansfield to officiate as president of the Institution for the ensuing year, was cordially accepted.

The remaining business was then disposed of, when it was stated that there would be an election of pensioners in November next.

MAN THE BOATS!

SIR,—Would it be possible to apply the principle of the measuring tapes (inclosed in a round box, which can be run out any length, and then wound up again) to the lowering of boats into the sea? Would it be practicable to have a ring attached (as by the ring on the measuring tape) to the stern of boats which hung up, such ring fastened to a rope in a round box in the ship, so that in an instant, if required, the boat would be run out into the sea, and when launched the ring unfastened and the rope wound up in the ship? H. B.

THE NATIONAL STRENGTH.

SIR,—I was much interested in the leading article in the *Builder* of the 23rd of July ult. I consider Dr. Beddoe's investigation a very important one, and one that ought to have been made years ago. There is a popular belief among working men that the English labourer is fast deteriorating, and this opinion is universally believed in by labourers, workmen upon public works, and also by the farm labourers in the south-east of England. I have often heard them speak of feats of strength, endurance, and agility that were performed from forty to eighty years back, such as the weights lifted, the quantity of timber sawn in a week by a pair of sawyers, the quantity of grass mown or corn

reaped in a given time, or the yards of earth excavated, and their concluding remark is, "Every generation gets wiser, but weaker." It is a question of national importance, and one that affects the safety of the country; for what is the use of the most improved arms if the wielders of them are deficient in strength and stamina? The history of the bayonet is a case in point. An improved arm may give a temporary advantage, but superior strength and stamina in the men and a permanent advantage. It is to be hoped Dr. Beddoe will pursue his researches, and ascertain whether the English improve or not by emigrating. It strikes me some curious facts would be ascertained. I think it probable the English race, for instance, in South Africa, would differ materially from those in Australia or America. I take one thing for granted, that as a rule a civilised man is inferior, physically speaking, to savage races (?). A friend of mine, who had been three or four years out on the North-west Coast of America, brought home some photographs of the Chinook Indians; they struck me as being deficient in bulk of limb, and I was surprised at a statement of their strength and endurance. Is it the climate, or their exercise, or their food? T.

MANSION IN SURREY.

THE mansion, of which a view and plan are given, is situated at Haslemere, on an old site upon the side of a hill, commanding an extensive and beautiful view. The steepness of the ground allowing but a small space for the building itself, has given rise to the peculiar arrangement of placing a row of cellars, larders, &c., at right angles with the main house. A carriage approaching the house drives under an archway, A (with a room over), the space from a to f being under cover; the carriage then passes round the out-buildings, and comes back by an archway, g, corresponding to the porch. The stables are in close proximity to the house, and are hidden by the shrubbery.

The house is built of red brick, of a fine quality and colour, from Rowland's Castle, the cornices being of moulded brick of the same make; and the windows and dressings are of red terra-cotta, supplied by Mr. Blashfield, of Stamford. The roof is tiled. The staircase, the panelling of the hall, and the doors of the reception-rooms are of oak. A recess, forming an "angle nook," at the back of which is the fire-place, is obtained in the library, under the upper flight of staircase, which is divided from the hall by moulded piers and arches of oak.

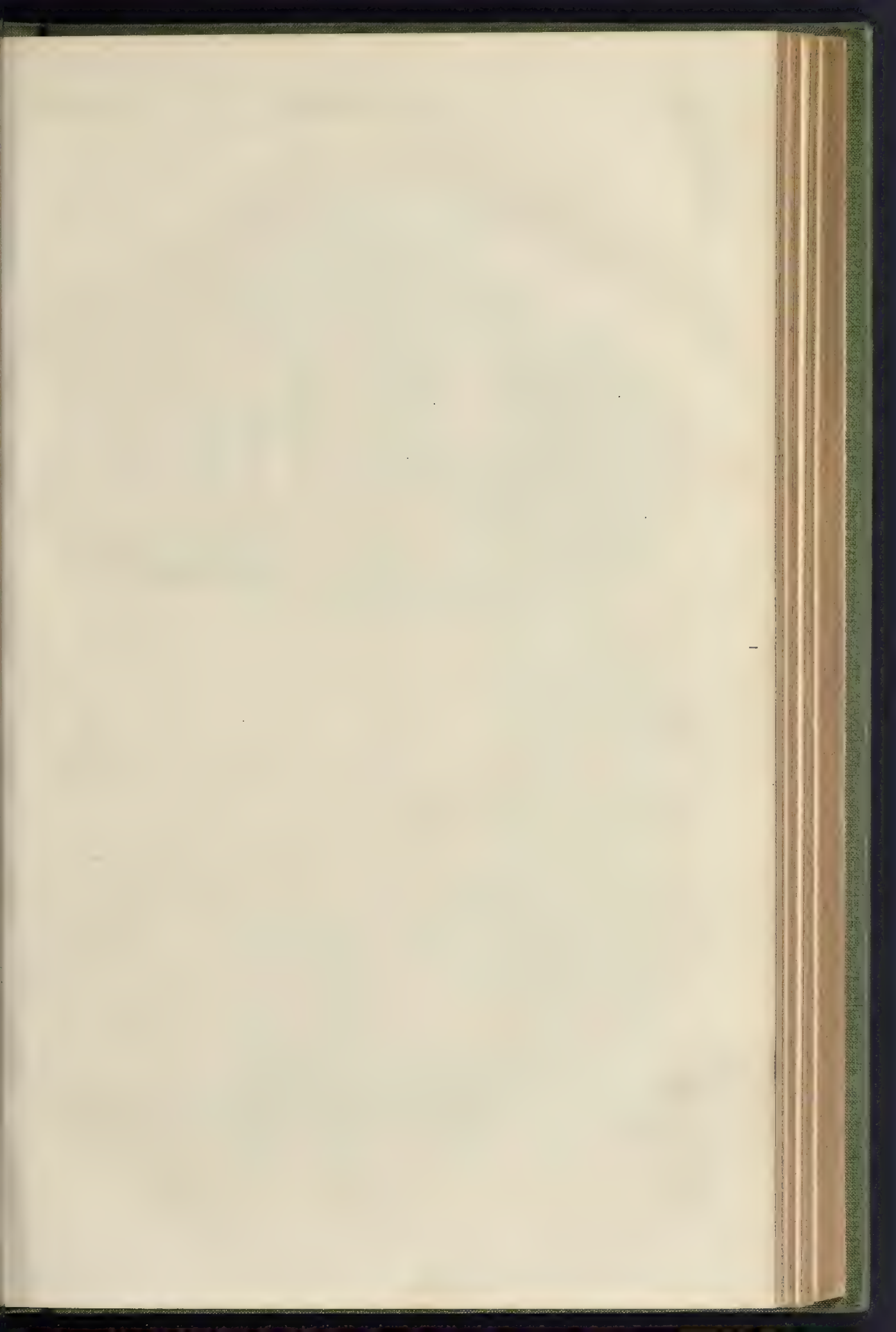
The architect is Mr. F. P. Cockerell. The general contractors are Messrs. Hayward, Bros., all of London.

THE RELIGIOUS INSTITUTE, MANCHESTER.

THE Religious Institute, which forms the subject of our illustration, is now in course of erection in Corporation-street, Manchester. The site was purchased by subscription, and the building is being erected at the sole expense of Mr. John Fernley, of Clairville, Southport, and it is expected will be ready for occupation by February next. The object has been to provide suitable depôts for the Bible and Religious Tract Societies, and offices for the City Mission; and, in addition, a spacious room, occupying the whole of the two-pair floor, about 60 ft. by 40 ft., and accommodating from 400 to 500 persons, is provided for the purpose of holding prayer-meetings, tea-meetings, and other meetings of a strictly religious tendency; it being expressly stipulated by the donor that no political or semi-political meeting shall be allowed to be held there. Rooms for a porter's residence are provided in the basement.

The front and side, as shown in the view, are being executed in stone. The plaster-shafts and spandrels of entrance-doorway are of polished Peterhead granite. In the design the aim has been to give a quiet dignity to the building by breadth of surface, deeply-recessed reveals, and simple detail relieved by carving. The latter is by Messrs. T. & R. Williams, of Manchester. The Bible, as an appropriate enrichment, is made to form part of the keystones of the front entrance doorway.

The architects are Messrs. Horton & Bridgford, of Manchester, and the contract was let to Messrs. Swindells & Little, of the same city, for the sum of 4,051*h*.





MANSION IN SURREY.—MR. F. P. COCKERELL, ARCHITECT.

REFERENCES.

- | | |
|---|--------------------|
| A. Porch. | Q. Kitchen. |
| B. Vestibule. | K. Scullery. |
| C. Hall. | S. Drying-closet. |
| D. Drawing-room. | T. Footman's-room. |
| E. Billiard-room. | U. Larder. |
| F. Library. | V. Water-closet. |
| G. Smoking-room. | W. Area. |
| H. Dining-room. | X. Yard. |
| I. Morning-room. | Y. Keepers. |
| J. Servants' Hall. | Z. Game Larder. |
| K. House-keeper. | a. Dairy. |
| L. Back Stairs. | i. Lairs. |
| M. Butler's Pantry. | c. Wood. |
| N. Butler's Bedroom, with
Dressing-closet. | d. Coal-cellar. |
| O. Bill-room. | e. f. Archway. |
| P. Covered Way. | g. Gateway. |
| | h. T. Stables. |



Pl. of Ground Floor.



THE "RELIGIOUS INSTITUTE," MANCHESTER.—MESSRS. HORTON & BRIDGEFORD, ARCHITECTS.

DANGER OF LIGHTNING.

MR. ARTHUR GEARING suggests the possibility of our having a repetition of Tuesday's storm, and the propriety of taking some precautions against damage from water and lightning.

To judge from past events, I fear there is little chance of his good advice being heeded. St. Saviour's Church, struck for the second time, will serve for a specimen of how much regard is paid to warnings to take care of our buildings. Then, as to human life, how many times since the days of Franklin has this caution been repeated,—Keep away from trees during a thunder-storm? Yet what happened on Clapham Common on Tuesday morning? Two persons, sheltering from the rain under a tree (one sitting and the other standing, with his left foot on the seat), were struck, and severely injured. The report of the disaster, instead of dwelling on the real cause of it,—their sheltering under the tree,—says, "Mrs. Bulpin's stay-busk and crinoline steel are supposed to have attracted the lightning;" just as if her head had not received the charge of electricity first. Probably, all the harm done by the stay-busk, &c., arose from any burns caused by their fusion, if they were really fused. Some French electrician states that more men than women are killed by lightning. Is this because women generally have some small lightning conductors in their stay-busks, that would, to some extent, protect those portions of their bodies near which they were placed, in the same way that a wire or pipe will often convey the lightning, and prevent it doing injury, for, at least, the distance that the wire, &c., extends? There is, or was, a good example of how readily lightning will leave a tree for a better conductor, to be seen in the Mall, St. James's Park, nearly opposite Marlborough House. A tree was struck that had an iron seat under it; the lightning took a strip of bark from the tree down to the level of the seat, and there leaped out, and found its way to the ground. Had any one been sitting on the seat, most probably he would have been killed, and we should have found the tree only barked to the height of the head from the ground.

It would not be a bad plan, when a tree in our public parks was struck like the one I have mentioned, to put a little warning memorial under it, something after this style:—"This tree was damaged by lightning on the — of—." Caution—Keep from under trees during storms."

There are numbers of persons who are needlessly cautious, who put away their knives, needles, &c., during a thunderstorm; or cover up, as I once saw done, the fireirons with the hearth-rug, as if the lightning would pay more respect to a rug than to a stonewall; yet let them be caught in a storm, off they run to the nearest tree, and risk their lives to save their bonnets. These persons will tell you "they have seen the lightning run down the fireirons," with as much gravity as if the house really had been struck, though the amount they would see passing down the irons then would be rather small. Perhaps when a slight knowledge of electric science is more general than at present, warnings may be heeded, but till then I fear it is a hopeless case.

H. T. G.

SAFETY OF THE "CHEESEWRING."

We are glad to receive the following:—"Our attention has been called to a paragraph in your issue of the 30th ult. in reference to the above subject.

As the lessees, under the Duchy of Cornwall, of the Cheesewring Quarries, we feel it is due to ourselves to say that the report which has been industriously circulated that danger is arising to the 'Cheesewring' from the quarry operations in their neighbourhood, is without foundation.

It is quite true that the quarry has approached the Cheesewring, but any one who is acquainted with the structure of the granite formation will easily understand that the beds upon which such a pile as the Cheesewring rests may be separated entirely from the surrounding rocks by vertical heads or joints, and that quarrying operations may be carried on in the immediate neighbourhood without any danger to them. This is actually the case at Cheesewring.

But in addition to this natural guarantee of security, we are bound to say that the Duchy authorities have been fully alive to the matter, and we know that they will acquit us of any

want of disposition to carry out the arrangements which have been made, with a view to allaying the groundless disquiet, which has been awakened in the public mind with respect to the safety of the pile.

We may add that very exaggerated statements have been made respecting 'powerful blasting operations.' It was reported to the Duchy that we were in the habit of firing holes charged with 300 lb. of gunpowder; the fact being, that 10 lb. are very rarely exceeded, the absolute range of charges being from 5 lb. to 15 lb. The vibration of the air caused by a clap of thunder has a far greater effect upon the pile than the heaviest charge of powder which has ever been exploded in the quarry.

JOHN FREEMAN & SONS."

TOWER CHIMES WITH KEYS;

OR, LE CARILLON À CLAVIER.

DURING the last few years I have frequently pointed out, in the columns of the *Builder*, the prominent features of the machinery of the most excellent self-acting periodical chimes, or *carillons*, in Belgium, and suggested that it would be well to introduce similar instruments of moderate compass and size in some of our towers in Great Britain.

On the present occasion I have a very few words to say on chimes played by hand, or, as designated by French writers, *le carillon à clavier*. In several instances the Belgian instruments of this description have forty bells and upwards, tuned to the chromatic scale, with a set of keys for the hands and pedals for the feet. The keys may be called projecting sticks, being wide enough asunder to be struck by the hands clenched and sideways, without hitting the neighbouring sticks.

In his work on "The present State of Music in Germany, the Netherlands, &c.," London, 1773, Dr. Burney gives a very amusing account of certain wonderful performances upon *le carillon à clavier* at Amsterdam. He says:—

"At noon I attended M. Pothoff to the tower of the *Stad-huis*, or tower-house, of which he is *carillonneur*; it is a drudgery unworthy of such a genius; he has had this employment, however, many years, having been elected to it at thirteen. He had very much astonished me on the organ, after all that I had heard in the rest of Europe; but in playing these bells, his amazing dexterity raised my wonder much higher; for he executed with his two hands passages that would be very difficult to play with the ten fingers; shakes, beats, swift divisions, triplets, and even *arpeggios* he has contrived to vanquish.

He began with a Psalm tune. . . . He next played variations upon the Psalm tune with great fancy and even taste. When he had performed this task, he was so obliging as to play a quarter of an hour extempore in such a manner as he thought would be more agreeable to me than psalmody; and in this he succeeded so well that I sometimes forgot both the difficulty and defects of the instrument; he never played in less than three parts, marking the bass and the measure constantly with the pedals. I never heard a greater variety of passages in so short a time; he produced effects by the *pianos* and *fortes*, and the *crescendo* in the shake, both as to loudness and velocity, which I did not think possible upon an instrument that seemed to require little other merit than force in the performer.

But surely this was a barbarous invention, and there is barbarity in the continuance of it; if M. Pothoff had been put into Dr. Dominiotti's hottest human cauldron for an hour, he could not have perspired more violently than he did after a quarter of an hour of this furious exercise: he stripped to his shirt, put on his nightcap, and trussed up his sleeves for this *exercitation*; and he said he was forced to go to bed the instant it was over, in order to prevent his catching cold, as well as to recover himself, he being usually so much exhausted as to be utterly unable to speak."

I cannot, of course, deny the statement of the learned doctor, that M. Pothoff perspired so violently after a quarter of an hour of this "furious" exercise, and was usually so much exhausted as to be utterly unable to speak. But having tested the touch and action of some of the largest instruments now in existence, and attended the excellent organist and *carillonneur* of Antwerp Cathedral during some remarkable performances, I may state that, in the present day, so far from being a "drudgery," playing upon *le carillon à clavier* is an agreeable recreation.

To prevent mistakes, however, let me add, that any musician practically acquainted with one of the finest instruments of this class ever constructed, must agree with me, that it is utterly incapable of producing all the varied effects mentioned by our highly esteemed author.

THOMAS WALESBY.

Society of Engineers.—Arrangements have been made for a visit of the members to the new works of the Chartered Gas Company at Beckton, on Monday, the 8th of August.

NEW MANSION AT BARNARD CASTLE.

A CONSIDERABLE extent of land on the north side of the Greta Bridge-road, near the Militia Barracks, Barnard Castle, which is now being enclosed with high walls, and in the centre of which the outlines of a large ornamental building are beginning to appear above the ground, has been purchased by Mrs. Bowes, the wife of Mr. John Bowes, of Streatham Castle. The building will be in the nature of a museum, as it is stated to be the intention of Mrs. Bowes to place therein a large and valuable collection of ancient and modern paintings and objects of art and curiosity, now in France, which Mr. and Mrs. Bowes have spent many years in collecting. The length of the frontage is about 300 ft.; the height of the centre pavilion, 115 ft.; the height of the two end pavilions, 90 ft.; the picture galleries are 400 ft. in length; the cellars, 210 ft. by 45 ft., which are built entirely of dressed stone. It is in the Renaissance style of architecture, ornamental in character, from designs by Mr. J. E. Watson, architect, Newcastle-on-Tyne, under whose direction it is being carried out. Mr. Joseph Kyle, also of Newcastle, is the contractor for the whole of the works.

THE CRYPT AT ALDGATE.

THE houses at the end of the block separating Leadenhall-street and Fenchurch-street have been pulled down in order to widen the entrance to both these thoroughfares, and a very considerable improvement has thus been effected. Underneath one of these houses, however, and just opposite Aldgate Pump, was an ancient crypt that has been described in our pages more than once; and the vanishing of this being found insecure and, as we understand, too high to suit the level of the new pavement, it was taken off, and the crypt has been filled in,—in fact, to all intents and purposes, obliterated. This is very much to be regretted: it was an historical landmark, a vestige of ancient London, and of value for more reasons than one. However, it is of no use repining, still less finding fault; the past must yield to the present: onwards is the word, and onward we must go. Some of the papers, including journals supposed to know better, have described the crypt as a discovery,—simple nonsense.

BELLS, LIVERPOOL.

SIR,—A letter in your publication of July 30th, describing the "blessing" of a peal of bells by the titular Roman Catholic Bishop of Liverpool, contains a statement that "St. Francis's is the first and only church in Liverpool which can boast of a peal of bells." This must have been intended to mean the only Romish church, as three other churches of the Established religion in the town have peals, two of them good, and one of them splendid.

The parish church of St. Peter has a good peal of ten bells, recast (with, I presume, additional metal) from a peal of eight just forty years ago, the old peal appearing, from the annals of the town, to have been cast at Dobson's foundry, Downham, Norfolk, early in the eighteenth century, the church having been begun in 1700, and consecrated in 1704. The old peal of eight were in tone superior to the new ten, which are, however, good.

St. Luke's Church has a good, but light-toned peal of eight, first rung in 1829, the church having been begun in 1811, and consecrated in 1831, remaining for some years incomplete. These bells are hung in cast-iron framing, and it used to be thought, I am now rather of opinion erroneously, that their tone suffered from this.

The other parish church, St. Nicholas, known as the "old church," being on the site first occupied in Liverpool by a chapel-of-ease under the mother parish of Walton, possesses a magnificent peal of twelve bells, of large scale, unsurpassed in tone by any I have heard in the kingdom, and a good deal resembling the peal of ten in York Minster. These seem, from the town annals, to have been supplied at twice, a "set" being recorded as purchased from Drogheda, out of the proceeds of the town fines, in 1628, and six more from Bristol, paid for out of the same fund (as well as were the first peal of St. Peter's), in 1725. The effect of these bells, when ringing changes on a quiet night, as heard outside the town, at some two miles or two miles and a half distant, or from the western or Cheshire shore of the Mersey, on the eastern margin of which the church stands, is literally sublime,—the richness

and fullness of tone, with the combinations which, through the blending power of distance, the harmonics in the long succession of an octave and a half render to the ear, producing an overpowering effect, such, indeed, that I have seen persons of strong musical and poetical sentiment yield their whole feelings to it as long as the sound lasted. This effect, under the swelling and diminishing alternations caused by a fitful breeze, can be compared only to that of a gigantic Æolian harp, sounding, as it might seem, from the clouds; and whether from the position of the building or other causes, this grand peal of St. Nicholas's, Liverpool, excels in this respect any that I am acquainted with. The bells are not by any means known as they deserve. Their great weight and power have a crashing effect when heard near, but as heard at a distance they deserve all and more than I have said of them. Their fullness and volume may be judged of by the fact that they can be heard in quiet weather, at Preston, some thirty miles north of Liverpool. If the peal at St. Francis Xavier's is a good one, the position of the building, rather high on the eastern slope of the town, will give great advantages for its effect; but I do not look for anything like what I have just described. AN ARCHITECT.

WAKEHURST, ARDINGLY.

The interesting Elizabethan mansion known as Wakehurst, in Ardingly, Sussex, having been purchased by the Marchioness of Downshire, who has determined on restoring the original structure, and enlarging its extent, for which purpose a new wing will be added, at a cost of upwards of 4,000l., the ceremony of laying the first stone was performed on Monday, July 18th, by the marchioness, who briefly addressed the workmen, congratulating them upon their steady conduct, and assuring them that while she continued they would always find in her a friend.

A substantial supper at the Gardeners' Arms, on Thursday, followed. Amongst the toasts we hear of Mr. Box, the contractor, and Mr. Brown, "the superintendent of the works," but no architect's name appears. It is to be hoped that so interesting an old building as Wakehurst is will not be meddled with excepting under proper artistic direction.

NEWARK CHURCH COMPETITION.

Eight architects residing in Nottingham and neighbourhood having sent in designs by invitation, the committee called in Mr. G. G. Scott, who pointed out two designs for choice, one by Mr. Evans, the other by Mr. Knight. Mr. Scott suggested that Mr. Knight's chancel was too small, and the committee have given the commission to Mr. Evans.

A correspondent, who signs himself "One who has wasted Five Weeks in the Preparation of his Design," objects to the referee's report, and says that as the church is to accommodate 600 persons at the cost of 3,000l., Mr. Knight's chancel, 32 ft. long and 19 ft. wide, is quite large enough. We should think so too. When, however, a committee call in a professional referee of standing, and follow his advice, we are disposed as a rule to accept the decision without comment. No one will doubt that the report in the present case was an honest one, and architects who choose to compete must take their chance as to the particular bias or opinions of the referee who may be chosen.

AN ARCHITECT'S ACTION.

At Rotherham County Court, before Mr. Thomas, Ellison, Judge, the action, Thomas Dobb v. William Kitching, has been tried. In this case the plaintiff, an architect, of Rotherham, sued the defendant, a medical man, residing at Calverley, for 11l. 11s., the price of plans, &c., for a villa residence. On the part of the plaintiff, it appeared that in 1869 the plaintiff received instructions from the defendant to prepare plans for a new villa residence, to be built at Calverley, and the instructions thus received were carried out. A few alterations were made at the defendant's suggestion, and tenders were advertised for. The defendant then considered that the cost was larger than he intended it to be, and said he would have a less house. He instructed the plaintiff to send in his bill for preparing the plans, which amounted to 11l. 11s. The defendant thereupon declined to pay this sum, and the present action had, therefore, been brought. The plaintiff, cross-examined, said that certain alterations were made in the plans after he sent them in at the defendant's request, and these had increased the cost. For the defendant it was contended that the plans were not made at all in accordance with the instructions given by the defendant, a specific sum, viz., 600l., being mentioned as the

utmost that the erection of the villa must cost, and the tenders far exceeding that sum.—The defendant swore that plaintiff offered to prepare the plans, and that if they were not used he would make no charge, but, if they were, the charge would be 3 per cent. He distinctly mentioned that the house was not to cost more than 6000l. The Judge said he considered that the case was not made out, and he should, therefore, give a verdict for the defendant. At the suggestion of the Judge, costs were not asked for.

HOT-AIR STOVES.

SIR,—I see that the stock of the late Mr. Pierce is to be sold. It is to be hoped that some stove manufacturer will take up the patent (which is an improvement on the ordinary hot-air chamber), and supply the stoves to the public at a moderate cost, and with slightly fronts. Their high price and their repulsive ugliness, have hitherto prevented the general use of this most valuable grate. G. ARTHURSON.

EPPING FOREST.

SIR,—You some time since permitted to appear in the *Builder*, a proposition regarding public access to open spaces, by means of footpaths, to be made by negotiation with the landowners. May I now be permitted to point out the application of this principle in the case of the projected enclosure of Epping Forest? Report says that if the Act be passed, 600 acres are to be reserved for public use out of the several thousand acres to which the public has hitherto had free access. Suppose that while 600 acres of this reserve of 600, are laid out in a park of compact form, the remaining hundred acres are applied in conformity with the special object of this letter. One hundred acres formed into an elongated band of ten yards wide, would form a walk of more than 27 miles in length. Such a walk taken in a serpentine direction, might lead the pedestrian over the whole region now occupied by the forest. But ten yards is an excessive width for a country footpath; and if in those parts of the walk most remote from London, the width were diminished to one or two yards, a great saving in the acreage would be effected. Such savings of acreage might be applied to the formation of oases at intervals, or, in plainer language, sidings, with seats to accommodate the wayfarer, and alcoves to shelter him. Such sidings might be placed where clumps of trees newly planted, or else remaining within them as vestiges of the old forest, would produce the best effect.

The present is the time for negotiation. It would be essential that a condition of enclosure should be the bounding of the proposed walk by an open wire fence, and not a high stone wall.

While what might be called a concentrated syrup of nature may be viewed by means of private resources, in an aquarium or a flower garden, it seems daily becoming more needful that State aid should favour the unrestrained pedestrianism, which is equally essential to forming an efficient volunteer, a *Salvator Rosa*, or a J. M. W. Turner, &c. G. M.

IRON GIRDERS.

SIR,—Will one of your correspondents be good enough to inform me what grounds there are for making the proportion of the top and bottom flanges of cast-iron girders different when the weight is on the top or bottom flange? Hurst gives one-third in the former, and one-sixth in the latter case. In the late Mr. Aspinell's book "On Architecture and Building" I do not see any notice taken of this, but I suppose that Mr. Hurst had some authority for the statement in his Handbook. L. S.

COMMONS, FOOTPATHS, AND BRIDLEWAYS.

SIR,—A cry is at last raised—"When will Government defend our commons?" But there is another and a louder shout, which ought to echo throughout England—"Who will preserve our pleasant footpaths and bridleways?" Slowly, silently, and surely, these byways of merry England are being encroached upon.

"Jog on, jog on, the Footpath way,
And merrily beat the stile—
A merry heart goes all the day,
Your head and toes in a Mile—"

said Shakespeare. If something is not done, however, we shall have to jog off instead of on. Local associations have been formed to check the evil, but their power is limited, and their very existence proves the necessity of Parliamentary interference. The existing law is jealous in guarding these public rights, and places numerous obstacles in the way of aggression. A method, however, has been found to evade the law.

The plan is this. A man desires to stop an ancient footpath. What does he do? Just this: if there is no middle class in the neighbourhood to oppose him, he puts up notice boards, saying there is "No Road," and threatening prosecution. Fences, or other improvements, are placed across the way. Keepers, or men of some kind, are told to annoy and intimidate passengers. Supposing there is some person who has energy enough to assert his rights, and break open the way, the landowner at once issues an *Exchequer writ*, and if an appearance is put in, the matter has to be tried at the assizes.

Consequently, if the man has not 1000l. to spare, he is forced to drop the matter, and the landowner carries his point.

It is not necessary to expatiate on the pleasure or utility of footpaths and bridleways; these ancient byways of old England have existed for ages. Over green pastures, through shady woodlands, and midst waving cornfields, how delightful are they! To the tired labourer who "homeward plods his weary way," what a boon is the short cut, and how much smoother hate does the stopping up of an old footway cause in the country around?

It is impossible to estimate the ultimate effects of the bad feeling created by such wrongs. It is a great, increasing, and crying evil, which has been too long overlooked. There is a remedy for it, neither difficult nor costly, which would save much litigation throughout the land, and insure our byways to us for ever. In the meantime a check might be put on these encroachments at once, if the Government would only order that all such highways be marked and lettered on the new great Ordnance survey.

Were this done, and sign-posts put up on these roads by the parishes, and provision made for their due maintenance, a great boon would be conferred on all men, from the poor to the peasant, though more especially on the working classes. G. R. JESS.

OBITUARY.

Mr. John Shaw, Architect.—We mention the death of this gentleman with extreme regret. Mr. Shaw was the attached architect at Christ's Hospital, London, and one of the earliest members of the Royal Institute of British Architects. In the latter part of his life, he had acted very much as a referee. We had desired to give a notice of his life; and one well qualified, by long personal knowledge, had undertaken to write it. In deference, however, to the strongly-expressed objection to publicity on the part of a member of Mr. Shaw's family, we give up the intention.

Mr. Zocher, Holland.—We have to announce the death of Mr. J. D. Zocher, architect, of Haarlem, on the 8th of July, in his eightieth year. He had been, for thirty years, Honorary and Corresponding Member of the Institute of Architects, and had frequently communicated valuable information, as he took a deep interest in the success and operations of the Institute.

Mr. J. B. Pyne, Artist.—Mr. J. B. Pyne, the artist, who was for many years vice-president of the Society of British Artists, died at his residence, in the Camden-road, on the 29th ult., in the seventieth year of his age. Mr. Pyne was a native of Bristol, and, when a lad, was articled to an attorney. The law was not, however, to his taste, and he soon abandoned it to follow the more congenial pursuits with which his name has become associated. His views of the English lakes and his Italian scenes are the works by which he is best known. Mr. Pyne had been ill for many months, and for some time but little hopes had been entertained of his recovery.

ACCIDENTS.

Fall of Houses.—Leather-lane has been the scene of a very alarming occurrence. A house used for the business of a wholesale and retail provision merchant, and the next house, in the occupation of a greengrocer and fruiterer, have partly fallen to the ground. The storm of Tuesday week had, no doubt, some influence in causing the accident. The houses were in a dilapidated condition from old age and decay, and the inmates had received notice that they were about to be pulled down. Just before the accident happened a loud noise was heard, and portions of the two houses were seen falling towards the street, and at the windows of the remaining portions were to be seen men, women, and children crying piteously for help. Mr. Bridges, the chief officer of the metropolitan brigade, having been given to understand that a fire had occurred, had the engines and a fire-escape brought to the spot, and the firemen were instrumental in extinguishing several families. There has been great destruction of property, but it is believed no lives have been lost.

Church Spire Struck by Lightning.—A great tempest has occurred at Rotherfield, when a vivid flash of lightning struck the spire of the church at the top of the shingling on the west, displacing some shingles, and then on the north side, immediately at the same place where the spire was struck on St. Swithin's-day in 1845.

At the present time (as on the above-mentioned day), a considerable rent was made from a few feet down from the upper damage, to nearly the bottom of the spire, a distance of nearly or quite 30 ft., the main heart-of-oak timbers being shattered, and the churchyard strewn with shingles. About the same time the electricity struck a barn on Stockwell Farm, Town-row, about a mile from the town, and in a few minutes the building, which contained a wagon loaded with hay, and a cleaning machine, was in a blaze from bottom to top, and, with the contents, was entirely consumed. Lightning has been committing a good deal of damage this year, and not a few lives have already been lost by it.

Falls from Buildings.—One of the men employed in the work in the course of progress at Bath Abbey, has had a narrow escape from being killed. He and some others have been engaged in doing repairs to the roof of the nave at the extreme west end; and in order to raise the materials necessary, a jib had to be fastened to one of the turrets, from which a wheel and rope were suspended. The work had been completed, and the apparatus was about to be taken down, the man having undertaken to do it. In order to get at the wheel, which was fastened to the jib, he placed a ladder at the side of the turret, the other end being on the roof of the nave. Unfortunately the ladder was not properly fixed, and on the man ascending it, it turned over on its side (which was parallel with the western wall), and he was thrown over, with about 80 ft. between him and the ground. He fortunately, however, caught hold of the line which hung from the wheel and was fastened to it. He had fallen 20 ft. before he took hold of the rope, and such an impetus had been given to his descent by this preliminary fall, that he came down very rapidly, still retaining a firm grasp of the rope. The man's life was in this way saved, but he sustained some very painful injuries, especially to his hands.

THE ITEM "WASTE."

Srs.—The profitable appropriation of anything hitherto thrown away, obviously, is a gain to manufacturing industry; but notwithstanding that such gains are often realized, and largely too, in many instances, there is a large amount of wealth waiting to be won, in the shape of waste products yet unutilized. It may reasonably be inferred that if a knowledge of such products and their properties were more widely disseminated, and the products themselves made more get-at-able, good use would be found for many of them; and materials, which are now very much in the way, would be naturally sought after as sources of profit and advantage. The initiative of such a work might well be undertaken by the authorities of the South Kensington Museum. The importance of the work would well warrant the formation of another department there, somewhat similar to the Food Department, a department where merchants and manufacturers could send samples of raw materials or refuse, for which a profitable use had not yet been found (articles in a perishable state always excepted). These samples to be exhibited, with a popular description of their chemical and other properties, and any other particulars of importance attached to them. Such descriptions should be published (by a bookseller) at a cheap rate, and samples of the materials themselves should be supplied to any person signing a guarantee that they required them for the purposes of experiment, on payment of a small fee to the curator of the department. Measures might be also provided for supplying country institutions and clubs with sets of specimens for exhibition, and giving them the power to supply individuals with samples, as at the chief museum. It cannot be contemplated that there would be any lack of supply; for producers and possessors of waste would gladly assist in carrying out any scheme calculated to convert incumbrances into marketable commodities.

ORU.

CHURCH-BUILDING NEWS.

Metheringham.—The church of St. Wilfred, at Metheringham, has been re-opened, after undergoing alteration and enlargement. The alteration which has been made in the edifice is an enlarged aisle on the north side, by which means accommodation will be afforded for 100 more persons. According to the old plan there was room for 200. The church of St. Wilfred was restored about ten years ago, and the foundation-stone of the enlarged aisle was laid by the vicar on the 23rd of June. Messrs. Drury & Mortimer have been the architects; Mr. Greenwood, the stone-waller; Mr. Belton, stone-mason; and Mr. Alderson, carpenter and joiner. It is a rather curious fact that the church of St. Wilfred was much damaged by fire—as the inscription on the buttress at the west end shows—and the pillars, which were of the Tuscan order, were rendered so irregular in height, that during the present alterations much difficulty was experienced in the efficient and symmetrical construction of the roof of the aisle. It is apparent that the fire so disintegrated the stone used for the tower as partially to pulverise it or reduce it to lime. That part of the church requires some

improvement. The stone which has been used for the new aisle has been given by Mr. Henry Chaplin, and is from his quarry at Blankney. The seats, which are moveable, are made of pine, and the open roof is of Memel timber. It is intended that the extra sittings shall be free. The cost of the enlargement of the church will be about 400*l*.

Cleator Moor.—The foundation-stone of a new church has been laid at Cleator Moor. Though the new edifice will possess room to accommodate 600 persons, 405 only will be provided for at first. It will consist of a tower, about 30 ft. square; a nave, aisles, and chancel with aisles,—one side designed for an organ-chamber, and the other arranged for a vestry. The total length of the church will be about 130 ft., and its width about 60 ft. The architects are Messrs. Cory & Ferguson, of Carlisle. The roofs will be groined in brick, and the whole of the church will be lined with brick of a straw colour, relieved with red brick, and the chancel floor will be laid with encaustic tiles of a simple pattern. The chancel is sub-divided into quadripartite vaults, groined with moulded stone ribs. The nave is spanned by a single pointed arch, the arches of the clearestory windows being groined horizontally into it. The aisles are sub-divided into bays by ribs in brickwork, springing from stone corbels; whilst the tower, which is to be used as a baptistery, is again of quadripartite groining, with moulded stone ribs. The main entrance and the chancel-arch have been made the leading features, and on these the chief ornament has been bestowed. The doorway is deeply moulded and recessed in four orders. The chancel arch, of stone 4 ft. in thickness, is moulded and wrought. A cavity will be left in the wall, and filled up with asphalt, as a protection from damp. The frontage towards Leconfield-street will be enclosed with a low wall, with wrought-iron railing and large double gates, which will form the principal entrance to the grounds. The work has been let to Mr. Ellibek, Galenire; the sub-contractors being, joiner, Mr. Weeks, Keekle Cottage; painter, plumber, and glazier, Mr. Holloway, Whitehaven; slater, Mr. Whitfield, Workington. Besides this church, an unpretentious parsonage-house is to be erected, and a considerable plot of ground walled in as a cemetery. The principal entrance will be from Leconfield-street. The site, which has been presented by Mr. Thos. Brookbank, is at the corner of Leconfield and Crossfield streets. The estimated cost of the church is 5,000*l*.

Kensington (Liverpool).—The Bishop of Chester has consecrated Christ Church, Kensington. The new edifice is situate on the high road to Fairfield, and close to the Kensington Water-works, and is intended to accommodate about 800 persons. The cost of the work, together with the land, will amount to about 10,000*l*., a very large proportion of which was bequeathed by Miss Colquitt, of Liverpool, that lady appointing as her trustees the Dean of Ripon (the Rev. Dr. McNeill), the late rector of Liverpool, and Archdeacon Jones; 1,000*l*. were also contributed to the building fund by the Liverpool Church Extension Society. The church stands on an elevated position. It was constructed from plans furnished by Messrs. W. & G. Audsley, of Liverpool; the contractor being Mr. E. Hughes, also of Liverpool, builder. The foundation-stone was laid about eighteen months since. The building, which is Romanesque in design, consists of a nave, 91 ft. long, 24 ft. wide, and 67 ft. high from the floor line to the apex of the roof. The aisles on either side are 13 ft. 9 in. wide, and 90 ft. long. The choir and chancel conjointly are 32 ft. 3 in. long. The north transept is 19 ft. by 18 ft. The south transept is occupied as an organ-chamber and vestry. Externally the church is built of ordinary grey brick, with Stourton stone bands and red and black bricks in bands and arches. A tower is attached to the west end of the church. Its height to the top of the stone cornice is 103 ft., and from the roof to the top of the final seat 50 ft., giving a total height of 153 ft., with 20 ft. exterior width. It is intended to place a bell in the tower. On either side of the nave are five arches, each 17 ft. wide, and 20 ft. 6 in. high from the floor to the underside of the arches, springing from piers formed of red granite columns polished, with Bath stone bosses, bands, and capitals, each capital being diversely carved. The reredos at the back of the altar is composed of ten arches formed of Caen stone, each arch resting upon a small column of green Irish

marble, and the credence is in harmony with this arrangement. The pulpit is formed of Caen stone with coloured inlaid decorations, and it rests upon a plain base of red stone. The font, at the west end of the church, is carved in Caen stone resting upon York stone steps. A larger number of windows than usual, including a large wheel window, have been introduced into the building—there being nearly fifty in all, the circular heads of which are in harmony with the special style of architecture. The eastern window is in three compartments, the glass being in alternate sections of square and diamond-shaped frames, the whole being relieved with a small quantity of coloured glass. The roof of the church is open-timbered. The altar floor, chancel, and wall round the font have been laid with encaustic tiles, supplied by Mr. Oppenheim, of Manchester. A hot-water apparatus has been furnished by Mr. Seward, of Lancaster. The artificial lighting of the nave will be effected principally by rows of three-light jets projecting from beneath the clearestory windows, whilst brackets of ten lights each, springing from above the capitals of the pillars on which the arches rest, will furnish lights for the aisles. Over the chancel are two large brackets with seventy jets. The gasfittings, and all the ornamental ironwork of the church, have been furnished by Messrs. Smith & Sons, of Birmingham. A stone wall, surmounted by an iron fencing, encloses the building on the north and west sides.

Chaldon (Surrey).—The ancient little church in this village is undergoing a process of restoration. The old-fashioned high seats will be replaced by seats of a new pattern. The workmen, in scraping off the old whitewash from the wall of the west end of the church, found that the wall had been, at some time or other, painted in distemper, with several figures, representing men and women. In addition to the improvement intended to be made in the interior of the church, the spire will be covered with oak shingles, under the superintendence of Mr. Saker, of Stoa's Nest, the contractor for the job. The restorations are being done under the superintendence of Mr. Richard Martin, of Caterham, architect.

Aksey (Doncaster District).—About the end of April, 1869, Messrs. Anelay entered on their second contract for the restoration of the nave, the side aisles, and the porch of the ancient parish church, under Mr. G. G. Scott, architect, which contract has now been completed, and the edifice re-opened for divine service. The north-west aisle was the first commenced, and at the outset it was found necessary to foot and concrete all the foundations to the level of the ground. The north door which has been walled up some years, has been re-opened and restored to its original character, and the old coal-house adjoining pulled down and removed. The buttresses of the aisle which had given way were taken down, and after placing in new foundations have been rebuilt. Considerable portions of wrought jambs, window sills, &c., were discovered in the walls whilst making these repairs. From their appearance it is not unlikely that they belonged to the first side aisle which was built, being of the Early Decorated period. All the battlements and window tracery have been repaired, and where needed furnished with new mullions. The west end of the aisle has been fitted up with a new traceried window, taken from what is supposed to have been the original west end aisle window, a portion of which was found, and now forms a part of the new erection. The old roof of the aisle was all removed and repaired with new oak, and stained and varnished, and has since been re-covered with lead. The nave has also been furnished with a new high-pitched roof of oak to correspond with the old pitch of the tower. A new west end window with tracery, battlement, pinnacles, and buttresses, has also been added. While making these alterations in the nave there was discovered the original belfry doorway, which was opened out and repaired, the more modern one being closed up. In the south aisle all the windows have been supplied with new tracery, and some of them have been furnished with jambs, battlements, pinnacles, buttresses, &c., besides which all the ashlar has been repaired. A cross, placed at the west end of this aisle was worked out of part of an old cross discovered in the foundations of the north aisle while the workmen were footing it. This cross was considered by Mr. Scott to be a portion of the original one. The old porch has been pulled down, and a new one built, the foundations

being concreted. The soil on the outside of the whole church has been removed to a certain depth, and a channel of hard black Staffordshire bricks has been laid in cement, in order to keep the building dry. There are also fall pipes round every side of the edifice, which conduct the water into small cesspools, whence it is carried by drains to the common. All the work has been executed under the superintendence of Mr. Thomas Stenton, the foreman. The cost of the entire restoration will be nearly 3,000*l.*, of which there are from 600*l.* to 700*l.* still to be raised.

Corton Denham.—The re-opening of St. Andrew's Church, at Corton Denham, near Sherborne, has taken place. The church has been completely rebuilt and enlarged, as the old building was in a very dilapidated condition, and was too small for the accommodation of the parishioners. The edifice, which is erected on the site of the old church, is in the Perpendicular style of the fifteenth century. It consists of a nave, north aisle, chancel, and vestry, with a tower at the west end. The walls are composed of Ham-hill stone, with Bath and Doulting dressings. The roof is open woodwork, stained and varnished, and the seats are open oak benches, with carved ends. The chancel forms an apse, and has a groined roof, supported by carved corbels. The chancel is paved with Minton's encaustic tiles. The pulpit is of Bath stone. The church is to be heated by a patent apparatus, and is well lighted and ventilated. The organ was built by Mr. Ewens, of Stratford-on-Avon, and cost 110*l.*. The contract amounted to 2,350*l.*, but the extras will be fully 500*l.* more. The whole expense will be defrayed by Lord Portman, who is the principal landowner in the parish, and lord of the manor. The plans of the church were drawn by Mr. Pearce, architect, of the estate office at Hasselbury. The contractor was Mr. Draper, of Crewkerne. The architect under whose superintendence the work has been carried out is Mr. Green, of Blandford, who designed the chancel roof. The masonry department was sub-let by the contractor to Mr. C. Traek, of Norton-sub-Hamdon. Mr. Holliday, of Wells, did the carving of the pulpit and font; and Mr. Boulton, of Cheltenham, was the artist who produced the work in the chancel.

Wettonhall.—The new church of St. David's has been opened for divine service. The church is situated at the side of the road leading from Bunbury to Over, and is three miles from the Calveley station, on the Chester and Crewe line of railway. The style of architecture is a simple Gothic type of the thirteenth century. The building, which is cruciform in shape, and consists of nave, transepts, and porch, is of brick, with a little of the red stone from the old building, and white Kelsall stone sparingly introduced. The dimensions are—front east to west, 67 ft. 5 in.; from the north to the south walls of the transepts, 36 ft. 5 in.; the nave being 14 ft. 4 in. wide. The entrance is by a small porch at the south-west end, and the interior is as unpretending as the exterior. The minister's vestry is in the arm of the south transept, while the choir will occupy the north transept. There is, perhaps, a surplussage of light; for besides the coupled windows of the nave, which alternate, we may remark, with plain chamfered buttresses, there are triple-light windows in the gable walls of the chancel, transept, and west end; and this effect has been heightened by the light stucco used for the walls. However, the clergyman and his congregation would, no doubt, gladly accept, in the place of the plain glass, memorial windows; and, as there is no elaborate tracery, but simple lights of lancet shape, the cost of stained glass would not be very expensive. All the sittings, which will accommodate 200 persons are to be free and unappropriated. They have been made of Savannah pitch pine, varnished, the wood being supplied at a nominal price to the builder by a Winsford tradesman. The roof, of high pitch, is open, the dark timber-work being relieved by ultra-marine straps, fastened with gilt-headed bolts. Externally, the western gable is surmounted by a bell turret, and the other gables by stone crosses and iron finials. The architects were Mr. James Redford, of Manchester, and Mr. J. A. Davenport, of Over, near Winsford (the latter having all along taken an extra official interest in the work); and Mr. Peter Hodgkinson, of Sandbach, was the builder.

Plaistow.—The new Church of St. Andrew has been consecrated by the Bishop of Rochester. The building stands a little off the Barking-road. The style of architecture is Early English. The

length of the building, from east to west, is 160 ft., while from north to south it measures about 50 ft. It is built of Kentish rag and Bath stone, and is paved, the nave with Staffordshire and the sanctuary with encaustic tiles. Besides the nave, the roof of which is supported by four bays, finished with stone; there is a central tower, a south transept, and north chapel, while the chancel, which is 60 ft. long from the nave to the wall, finishes with an apse, the roof of which is almost dome-like in appearance. The reredos, presented by lady friends, is approached by nine steps from the nave, and is built of Bath stone, inlaid with mosaics, with detached arcading, divided into five compartments, the arches of which are supported by marble columns. The figures in the central compartment are those of the Saviour, St. Mary, and St. John, while the others contain different Scriptural characters. Clearstory windows are carried entirely round the church. Four windows in the north chapel, two in the nave, and one at the east end, are of stained glass, and one in particular is placed there to the memory of Miss M. E. Banks, who for a long time acted indefatigably as schoolmistress. The font, which is the gift of the vicar of the parish, the Rev. E. W. B. Marsh, is composed of various marbles, and harmonises in design with the building. The seats are open benches, and are all free and unappropriated: accommodation will be given to 1,200 persons. The architect was Mr. Brooks, of Lincoln's-inn, and the contractor was Mr. Perry, of Stratford. The cost of the building, as it at present stands, is 10,000*l.*. About 4,000*l.* more will be required to complete the tower and spire, which it is intended to carry up to about 220 ft.

Books Received.

"The Disposal of Town Sewage. By R. W. P. Birch, C.E. London: Spon." This is a reprint of a Millar prize paper read at a students' meeting in the Institution of Civil Engineers. In its pages are collected well-authenticated particulars of some of the chief undertakings already carried out, and their results;—the opinions of scientific men as to the probable effect upon the country of a considerable increase in the number of sewage-farms;—and a few notes upon the true theory of filtration and the self-purifying tendency of polluted streams.—
"A Treatise on the Utilization of Town Sewage. By James Dalziel. Preston: Dobson. London: Simpkin, Marshall, & Co." The author of this pamphlet is clerk of works to the Preston Local Board of Health, and his treatise relates particularly to Preston. His scheme is illustrated by diagrams. It combines the irrigating, precipitating, deodorising, and filtering principles in one; and he believes that this combination of principles renders his scheme superior to all others; and that the investigations of the Rivers Pollution Commission must result in some such scheme.—
"Report of the Streets Committee of the City Sewers Commission on the Val de Travers compressed Asphalt Carriage-way Pavement. Judd & Glass, Printers, Doctors' Commons." With this report is printed the report of Mr. Haywood, the engineer and surveyor to the Commission, on which the committee's report is based. The committee recommend the Threadneedle experiment to be extended in a line of street having great traffic. The cost will be 18*s.* per square yard, including concrete foundations; and for keeping in repair, 1*s.* 6*d.* per square yard per annum, the pavement to remain in as good condition as when first laid. Mr. Haywood states that the pavement is not slippery; that it is, perhaps, more noiseless under the traffic than stone flagging; is impervious to moisture; and can be swept like any other pavement. As to its durability, more experience is requisite. He wished for a more extended trial of the pavement.—
"Railways and the Public. By Raphael Brandon, F.R.I.B.A. Seventh Edition. National Railway Association, 17, Clement's-inn, Strand." Mr. Brandon, who is the hon. sec. of the association, has been working hard to found his scheme of shilling, sixpenny, and threepenny fares throughout for long distances; and fourpenny, twopenny, and penny fares for ten miles and under, and he now publishes it condensed, in penny pamphlet form, giving more facts and tables. It seems that the Great Northern actually convey ticket-holders between London and Welwyn, a distance of twenty-two miles, at an average rate of less than sixpence all the way, so that they already do

what they declare they cannot do. This, too, is the case with other companies.—
"The Rectangular Review,—not a good title for a quarterly communication on philosophy, archaeology, science, and the arts,—has begun very well. No. 1 contains a considerable amount of agreeable and useful reading. The editor, however, must not let his writers talk about "a slight preventative." It proposes to pay particular attention to Freemasonry.—And this reminds us to mention a trade-book of "Masonic Clothing and Jewels," all coloured and gilded, issued by George Kenning, of Little Britain. The prices seem moderate. The illustrations provide for degrees not recognised by strict masons, such as Templars and Red-cross Knights: good authority for these decorations it would be difficult to find.

Miscellaneous.

The Suez Canal.—With regard to the Suez Canal, Sir D. A. Lange has furnished the following particulars relating to the traffic and receipts:—"The total number of vessels which have passed through the maritime canal is 363; of these 130 traversed during the four days of the inauguration, exempt from payment of dues, leaving 233 ships, representing 106,428 tons; when to this is added the tonnage of small craft, viz., 6,498, the total amount on which dues have been paid is 201,926 tons, composed as follows: 153 British ships, 134,712 tons; 55 French ships, 33,804 tons; 19 Egyptian ships, 12,760 tons; 9 Austrian ships, 5,943 tons; 7 Italian ships, 3,717 tons; 4 Turkish ships, 2,548 tons; 3 Spanish ships, 732 tons; 1 Russian ship, 450 tons; 1 Indian ship, 686 tons; 1 Chinese ship, 87 tons; total, 233 ships, 197,428 tons, including the fractional tonnage. The receipts in June amounted to 817,117*l.* (32,684*l.*), being nearly double those of the preceding month, and the total revenue derived from all sources, made up to the 30th of June, amounted to 3,244,616*l.* (129,784*l.*). Fourteen dredgers are at present employed in widening the "bonds" and making such improvements as are deemed necessary for facilitating, in a still greater degree, the navigation through the canal, and obtaining a uniform depth of 26 English feet throughout."

The A B C Process.—After visiting the A B C Model Sewage Works at Leamington twice, the Rivers Pollution Commissioners report the following as their conclusions as to the merits of the scheme:—"1. The process removes a large proportion of the suspended impurities from sewage, but on no occasion, when we have seen it in operation, has this removal been so complete as to render the effluent sewage admissible into running water.—2. The A B C process removes a very small proportion of the soluble polluting matters from sewage. After treatment by this process, the effluent sewage is very little better than that which is obtained by allowing the raw sewage to settle in subsidence tanks.—3. The manure obtained by this process has a very low market value, and cannot repay the cost of manufacture.—4. The manipulations required for the extraction and drying of this manure are attended with a nauseous odour, especially in warm weather, and would occasion a serious nuisance if the works were situated in or near a town."

Lee, St. Peter's.—The rapidly-increasing population in this popular suburban locality rendered increased church accommodation necessary; steps have therefore been taken to build a new church. A temporary iron one has been in use for some time, but a site having been offered by the Crown and their lessees, Messrs. Gates, a committee was formed, and the new church, which is to be of brick, designed by Messrs. Newman & Billing, architects, will shortly be commenced. It is intended to provide, at first, accommodation for 700 persons, at a cost of about 4,500*l.*

A Wire Tramway in Scotland.—Lord Kinnaird is at present putting up "Hodgson's Wire Tramway," for the transit of blocks of stone from a quarry in Hilltown, a little north-east of Rosbie Priory. The stone in this quarry is to be thus conveyed to a huge stone-breaking machine, driven by water, to be prepared for causeway and other purposes. The works are already far advanced. The Duke of Sutherland is to construct one of these tramways 10 miles long, to transport limestone from Loch Shin to Golspie Harbour.

New Process of Metal Casting.—A party from London, Manchester, and other places assembled lately at the works of the Lancashire Engineering and Compression Casting Company, St. Helen's Junction, to witness a new patent process of casting refractory metals. The invention is of American origin. The pattern is placed on an oiled foundation-plate, and bemerged with fine wet clay. It is then buried in a box with mixed clay and sand, which moving is pressed downwards until it assumes the consistency of an unbaked brick. In this state the clay cake is carefully removed from the box turned upside down upon a table, and the pattern adroitly lifted from the bottom by means of a small gutta-percha suction ball, leaving a distinct representation of itself in the vacuum so caused. After being sufficiently hardened in a stove, the moulds—for many can be operated upon at the same moment—are packed closely together in a large receptacle, which is made air-tight. The fused metal is then poured from the crucible into an easily-opened channel of this vessel, and forces itself into every crevice of the moulds, aided in its course by the action of a compressing machine. The moulds are next taken out into the open air, and broken with hammers, when there are found imbedded in them a perfect *fac simile* in metal of the different objects originally used as patterns or castings. Even the most minute lines, such as may be seen in engravings or wood-cuts, are clearly reproduced. One casting can be used to mould another without any need for the retention of the original pattern. Medallion making, type casting, and file making are said to be among the developments of the invention. Finger-plates for doors were chiefly made on one occasion referred to.

Death in a Well at Repton.—Drowning by carbonic acid gas is just as frequent as ever, notwithstanding all that has been said about it. A man was recently engaged with others cleaning out an old well, at Repton. The well, as far as water, was 64 ft. in depth, and the men had in several occasions found that there was a quantity of choke damp, as the light of a candle which they used was frequently put out. The deceased was let down by a rope, one end of which passed round several staves of a ladder, whilst another part went round a windlass. In the well was a flooring above the water, and the deceased was lowered on to it. He pulled up the end of the old boarding, which was hoisted up, and a piece of new wood was let down in its place. The deceased continued at work for about half an hour, at the end of which he remarked, "This is a rum place to work in," and was then asked if he might be pulled up, and he replied, "Yes." The men at the top then again hoisted him up, and when he had got within 12 ft. of the mouth he made a noise as if he was breathing heavily, and fell down the well. Another man was then let down to rescue him, but he soon began to faint, and had to be heedily lifted up again. In letting him down to precaution of having the rope fastened round his waist had been taken. The body was recovered about five hours afterwards, when, of course, life was quite extinct. At the inquest, a verdict of "Died whilst working in a well, by falling into the water," was returned.

Theatre Royal, Haymarket.—While Mr. Luckstone and the regular Haymarket company are delighting the provinces, an entirely fresh troupe, under the management of Mr. Coe, have taken possession of the "Little Theatre," and are revived, with very considerable success, Mr. Tom Taylor's excellent comedy, "The Verland Mail," and the late Mr. Talfourd's witty and amusing extravaganza, "Atalanta." Several new actors have been introduced to London, notably Mr. E. Arnott, an artist of evident ability; Mr. A. Wood, a low comedian; and Miss Edith Challis. We are bound to speak of all of the whole undertaking.

School of Art for Birkenhead.—Taking into consideration the difficulties connected with the useful existence of a School of Art for some time past established in Birkenhead, Mr. John Laird, the member for that borough, offered to give 1,000 yards of land in Conway-street, and erect a building at his own cost, if the friends of the institution would provide a maintenance and the requisite furniture, at a cost of about 1,100l. in all. The Committee of the School of Art have accepted Mr. Laird's offer, and promised to take immediate steps to fulfil its requirements.

Improvement of St. Paul's Churchyard. At the last meeting of the Metropolitan Board of Works, a report was presented from the Works and General Purposes Committee in reference to the proposed improvement on the south side of St. Paul's Churchyard, by the removal of the unsightly railings, and throwing more space into the roadway; and it recommended that the Commissioners of Sewers of the City of London be informed, in reply to their further letter on the subject, that the Board see no reason to depart from their former decision, namely,—that they are not prepared to contribute towards the proposed improvement, as the same does not provide for the opening up for carriage traffic of the roadway on the north side of the cathedral. Mr. Saunders moved as an amendment that the Board should contribute 5,000l. towards this improvement, and the corporation of the city of London would supply the rest of the cost, amounting altogether to something like 25,000l. The amendment was negatived by a majority of 15 to 7, and the recommendation of the committee agreed to.

New Theatre for Hanley.—The old theatre at Hanley has now entirely disappeared, and the new erection is, we are informed, to be pressed forward as rapidly as possible. The projectors, as appears from the plans, have taken pains to provide means of ingress and egress, the width of the doorways taken together being equal to an opening of 23 ft. There will also be a communication between the gallery and the boxes, the opening of which, in case of a panic, would tend to break the force of a rush from the gallery, and enable some of the occupants to escape at the back of the theatre. The plans have been passed by the buildings committee of the Town Council, and the Mayor and ex-Mayor, with the borough surveyor, have engaged to watch the progress of the building in the interests of the public.

Destruction of the Reading Assembly Rooms.—The Reading Assembly-rooms have been destroyed by fire. On Sundays the rooms were used for religious services, and on Sunday night these were continued until about a quarter to nine o'clock, when the building was left in apparent safety. Shortly afterwards, however, the place was discovered to be in flames, and by half-past ten it was a mass of burning ruins. The roof of the building had fallen in by the time that the engines had got to work. The origin of the fire is unknown, although it is believed that it was owing to the gas.

Somersetshire Archaeological Society.—The twenty-second annual meeting will be held at Wincanton, on Tuesday, August 23rd, and the two following days, under the presidency of Sir William C. Medley, bart. Papers will be read in the Town-hall. On Wednesday there will be an excursion to North Cadbury, Cadbury Camp, Compton Church, and Mapperton; and on Thursday one to Temple Coombe, Stowell, Milborne Wick Encampment, Milborne Port, Henstridge, reaching Temple Coombe Station at seven p.m. The members are invited, by the president, to a luncheon at Venn.

Galignani's Hospital.—Messrs. Galignani, the proprietors of the well-known *Galignani's Messenger* published in English in Paris, having built a hospital in that city for the benefit of poor British strangers or residents, have generously offered the same to the British Government, together with an endowment for maintaining it in operation. This offer, however, the British Government has declined. All the expenses of the hospital are being defrayed by Messrs. Galignani.

Bells.—Messrs. Mears & Stainbank have recently hung in All Saints' Church, Youlgreave, a peal of eight bells, tenor 26 cwt., key of D, paid for by Mr. W. P. Thornhill, Stanton-in-Peak; and another peal of eight bells, tenor 18 cwt., key of E, in St. Alban's Church, Rochdale, at the cost of Mr. Jonathan Field, of Demster House, Rochdale.

Overflows of the Fleet Sewer.—The heavy rains have produced overflows in Farringdon-street and Bridge-street, which have inundated cellars and stores. Two or three of the main channels had been stopped for repairs. Engines of the fire brigade were used to pump out the water.

Land in London.—The freehold site of the Church of St. Mary Somerset, Upper Thames-street, occupying an area of 3,740 square feet, was last week sold by tender by Messrs. Fuller, Horsey, Son, & Co., for the sum of 10,200l.

Copper.—Day by day prices fall lower and lower, according to the *Mining Journal*. Chili bars have been sold at 65l., the price, according to the average difference, compared with English, that they ought, and would have been at, if speculation had not forced them up beyond their relative value; therefore they are just brought to their proper level. Ores have declined 3s. per unit. There is a wide difference between buying and selling prices, and a great reduction would have to be made to effect large sales in any kind of copper.

Free Bridges.—The joint committee of the Metropolitan Board of Works and the City Corporation, appointed under the provisions of the Act of 1869 for freeing the Thames bridges from tolls, have already opened Kington Bridge, and on Wednesday, in the midst of general rejoicings on the part of the inhabitants of Walton, in Surrey, on the south, and Shepperton, in Middlesex, on the north, side of the Thames, Walton Bridge was thrown open and declared henceforth free of toll.

Dressing Stone.—The invention of Mr. L. Pochet, Vendome, France, consists of an apparatus containing a striking or picking tool, and weighing from 30 to 100 kilogrammes, or more, according to the force of the blows desired to be struck, the said tool being worked either by steam or compressed air, and suspended in any suitable manner, so that the workman can easily direct it upon the stone to be cut, without using his own muscular power either to guide or support the machine.

Explorations of the Deep Sea.—The last published number of the "Proceedings of the Royal Society" (Vol. xviii., No. 121) contains the "Preliminary Report of the Scientific Explorations of the Deep Sea in the *Porcupine* during the summer of 1869," conducted by Dr. Carpenter and others. To the council of the Royal Society belongs the credit of having led the Government to give the assistance without which these important investigations could not have been pursued.

The Maryport Roman Altars.—It was believed that the red sandstone of which these altars were composed was got from the rock at Maryport, close to the site of the old Roman station; but a working miner, named Hodgson, has discovered that they must have come from an ancient quarry at Sheep Field, on the Allerton Hall estate, Aspatria. The stone is said to be identical, which is not the case with that at Maryport. The quarry was an extensive one, and the remains of ancient tools have been found.

The Art Challenge Accepted.—It is announced that Mr. Hughes's challenge to paint "the best picture, against time, for 1,000l. a side, with any artist of any country," has been accepted by an American artist, and that he, as well as the challenger, has signed the preliminaries and deposited 1,000l. in the Bank of England for the match, to come off, on or about the 13th inst., in the saloon of the Palais Royal, Argyl-street, Oxford-circus! Who is to decide whether the things produced are pictures or not?

The Carlisle School of Art.—The Mechanics' Hall, in this city, has been fitted up for the accommodation of the students of the local School of Art. About a hundred students passed through the Carlisle School of Art last year, and we are glad to observe that under the training and direction of Mr. Herbert Lees, the master, they spent their time to such good purpose, that two of them succeeded in obtaining prizes in the national competition.

The Grosvenor Gallery.—The Marquis of Westminster, who is just now doing all sorts of liberal things, has allowed the authorities of the South Kensington Museum to select for exhibition any pictures from the Grosvenor Gallery, for which space can be found. Many of the finest works have been accordingly removed, and will be exhibited in a few days.

Monumental.—The Metropolitan Board of Works have agreed that permission should be given to place a statue of Sir James Outram on the Thames Embankment.—Her Majesty has assented to the proposal of the House of Commons, that sufficient gun-metal for the making of a statue to commemorate the services of Field-Marshal Lord Gough, should be granted, the House making good the cost of the same.

I PEOPLE, continued to the death of the Prince Consort.
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The Builder.

VOL. XXVIII.—No. 1436.

The Wellington Monument for St. Paul's.



VIOLENT attack, in which the leading columns of one of our most important daily contemporaries have not only supported, but supplemented, the unsparring action of the Board of Works,

has been made upon two professional men, one of whom occupies the honourable and important post of surveyor to the Dean and Chapter of St. Paul's, while the other was selected, in the year 1858, to execute the monument which was then determined to erect in that cathedral, at the national expense, in honour of the great Duke of Wellington.

Readers of the *Builder* will remember that we have on several occasions blamed Mr. Alfred Stevens, the sculptor, for the slowness with which the work proceeded, and urged him to a straightforward explanation of the causes that had led to it. We are not surprised, therefore, to find a movement on the part of the First Commissioner to obtain the fulfilment of Mr. Stevens's undertaking, but we certainly are, at the shape which it has taken.

Every one, even the most obvious and self-convicted criminal, is entitled, by the courtesy of our law, to be held innocent till proved guilty. Neither can he be proved guilty by an investigation conducted like that of the Holy Inquisition, or of the police of King Ferdinand of Naples—*à son insu*—behind his back. It was not fair to hold up Mr. Penrose and Mr. Stevens to public reprehension, if only for a few hours, for the guise of convicted conspirators against the public purse—for to no less does the charge amount.

For nearly eighteen years we have been without a sepulchral commemoration of our great defender. It would almost seem as if the monument was doomed to remain unfinished, so long as the shadow of that eagle, which he had not only chained, but, as he thought, for ever banished from Europe, was still causing an armed and doubtful peace, almost as intolerable as war.

It is impossible to glance at the correspondence without observing the absence of that precise and definite method of business which the conduct of a work of that importance imperatively demands. We find that a sum of 20,000*l.* having been voted for the erection of a monument to the Duke of Wellington, the Assistant Secretary of the Office of Works, on the 9th of September, 1858, authorised Mr. Alfred Stevens to proceed to the preparation of a full-sized model, "as to the composition of the design" of which he was left "entirely unfettered."

The model was to be placed in the Chapel of the Cathedral formerly used as a Consistory Court. The cost of the monument, if executed according to the model, was not to exceed the sum of 11,000*l.* Mr. Stevens, whose design had been sent in to meet the stipulated sum of 10,000*l.*, writes, on the 9th of October, "that the cost of a monument in accordance with the selected design would be considerably in excess of the sum named above." He says that he would "be prepared to complete the work, of

which I am about to commence the model, for the sum of 14,000*l.*," and on this the contract rests. The sum named, let us say at once, was greatly too little for the work proposed, and this unwelcome reduction, made greater by the cost of the large model required, was the cause of the trouble that has followed.

On the 19th of November, 1858, Mr. Penrose writes to the Office of Works to say that Mr. Stevens has incurred considerable expense, and has prepared the skeleton frame of the model, and he recommends the payment to him of 400*l.*, "according to the terms of the letter addressed to Mr. Stevens from the Office of Works, on September 9th ult., respecting the said model."

With the exception of a letter of the 30th of November, 1858, from Mr. Penrose, as to raising the cost of the monument, from 11,000*l.* to 14,000*l.*, we have no further information on the subject for two years. Up to this date, as far as documents go, no time is specified in which it is to be completed.

On the 28th of November, 1860, appears for the first time anything approaching to a specification for the monument. This comes in the form of a report from Mr. Penrose, which states that 1,600*l.* have been advanced to Mr. Stevens during two years.

Seven letters follow, to the general effect that Mr. Stevens is not getting on with his model. In the eighth, on the 6th of December, 1862, Mr. Stevens writes to say that, owing to the inadequacy of the advances made to him, which incidentally are stated at 2,200*l.* (instead of 6,400*l.* to which he was *prima facie* entitled under the terms of a letter of the 9th of September, 1858), he has been compelled to give much of his time to further commissions. He offers to complete the model within fifteen months from the time when he shall receive 2,466*l.* more,—a sum which would make up one third of 14,000*l.*, the price of the monument when completed, and which proportion is ordinarily received by sculptors on receiving a commission, and before beginning work.

Mr. Penrose, on being applied to, recommends the payment, on the score of the ordinary custom of payment to sculptors, and states some of the difficulties with which Mr. Stevens has had to contend in the execution of a work for which there is no very good precedent in the country. In February, 1863, the sum of 2,466*l.* is paid to Mr. Stevens, who on this agrees to have his model complete within fifteen months; but by June, 1864, this promise is not redeemed, and in that month, in August, in March, 1865, and in February and March, 1866, recur letters of complaint from the Office of Works.

On January 17, 1867, we have extracts of a letter from Dean Milman (to whom is not stated), giving a qualified approval of the design hitherto left to Mr. Stevens's "unfettered judgment." Now, for the first time, occurs the suggestion that it should be worked out in "rich marbles." Mr. Stevens says that it was proposed by the Office of Works that Derbyshire alabaster should be used, a substance of disproportionately smaller cost than the beautiful Carrara marble now actually provided; but as to this the Blue Book is silent. The extract from the Dean's letter shows the incredible looseness of the whole transaction; nor is there a single word, to this date, to intimate that Mr. Stevens should employ "rich marbles" for the purely architectural part of his design. At this date, it first appears that an order is given for the actual monument. No specification is drawn up; no time is fixed for completion; but in March, 1867, 2,800*l.* further are paid to Mr. Stevens; and in October, 1869, a further sum of 2,200*l.* is recommended for payment. On the 20th of December, 1869, Mr. Penrose furnishes an estimate of the cost of the monument, for the guidance of the Board of Works.

On the 29th of December, 1869, Mr. Penrose addresses a long letter to the Secretary of the Office of Works, summing up the history of the case, pointing out that it had actually been left to Mr. Stevens himself to decide on details of his monument which had so much influence on its actual cost, and that the expense of preparing a full-sized architectural model, a quite unusual procedure, had never entered into Mr. Stevens's calculations. On this follows some rather sharp correspondence, and a report, signed Douglas Galton and Henry A. Hunt, to the effect that the expenditure to date has been 17,900*l.* (including work in chapel done by other artists), and that, to complete the monument, a further sum of 15,000*l.* will be required. And then come the letters to Mr. Penrose and to Mr. Stevens, dismissing both, which have already been made public.

Thus far as to the facts of the case, as they appear from the Blue Book. As to the actual condition of the monument, all the architectural work is either fixed or "ready to be taken to St. Paul's." With regard to the part actually fixed, comprising the basement, columns, and entablature below the arch, it is a work of rare richness and beauty of execution. We can personally bear witness that the work actually in the cathedral is of admirable design, faultless marble, and patient and finished workmanship. The rich effect of the columns, covered with an embossed diaper; of the capitals, which are of an original design; and of all the delicate mouldings of basement, and frieze, and cornice, it would be hard to rival. Messrs. Galton and Hunt say that "much remains to be done in preparing the models and moulds for casting, which must be the work of a sculptor." For this last step of the sculptor's work, the casting, the reporters allot the sum of 12,500*l.* Mr. Stevens states that he has a tender for the casting at the sum of 3,500*l.*, and that, in an estimate which he was asked to give of the sum requisite for the completion of the monument, he put down 6,500*l.* for the completion of this part of the work, including all contingencies and responsibility. It does not seem that any justification exists for doubling this sum in the Board of Works' estimate. Moreover, as we understand, Mr. Stevens admits his obligation to complete the monument for the original sum, and is ready to do it, if insisted on.

It is very much to be regretted that so loose and ill-defined a contract should have been entered into by either party. Mr. Stevens can not escape the blame of having allowed a long time to elapse since the commencement of the work. On the score of workmanship, so far as the marble is concerned, there is only room for admiration. No reply can be more conclusive, to any reflections such as have been thrown on these two gentlemen, than the fact that they have neglected to take proper care of their own pecuniary interest. Mr. Penrose has not received a single penny for all his trouble in the transaction. Mr. Stevens is, as he says, and as we can well believe, out of pocket. A valuation of even the work done, made by a sculptor of proper standing, would show that the nation has already an equivalent for the sum paid: so that we have not wasted our money, and the valuation would moreover, if carried further, convince the nation that the monument, if finished equal to the parts already done, would be very cheap at the sum originally named, 20,000*l.* It is 40 ft. high, and includes, besides all the architectural portion with large marble columns having ornamented caps and bases (the shafts elaborately covered with oak-leaves), a sarcophagus of remarkable richness supporting a recumbent statue, two colossal groups of figures above, and an equestrian statue of the duke at top.

As we have already said, Mr. Stevens has laid himself open to just reproach for delay and miscalculation, but it must not be visited on

him too severely: it was the delay of over-fastidious care; the miscalculation of an artist anxious for the opportunity to produce a noble work. The monument, once finished successfully, no one will ask how long it was in hand; and the only way to have it so finished is to allow Mr. Stevens, under proper guarantees, and with a reasonable advance on the amount of the original contract, to proceed with the work. We have strong confidences that if this course be pursued, we shall obtain a monument worthy of its object, and of which the country may be justly proud.

SANITARY APPLIANCES IN TIME OF WAR FOR TROOPS IN THE FIELD AND FOR THE CARE OF THE SICK AND WOUNDED.

ACCORDING to official announcements, both the French and German armies enter this campaign with "full and complete sanitary appliances." We, however, know by sad experience in our army what red-tape assurances are worth. The army of the Northern States of America were also (officially) "fully prepared for all contingencies." The then president (Lincoln) considered that "a sanitary commission would be of about as much use to the Northern States army as a fifth wheel to a coach." The good Abraham Lincoln, however, lived long enough to regret this joke. The people of America voluntarily undertook to furnish a sanitary commission, and right nobly did the members of this commission fulfil the duties of their self-imposed task.

Officialism is the same at all times and in all countries. "How not to do it" is a lesson readily learned and easily practised. The British army before Sebastopol, when in its worst state, was officially, "perfect in all respects." The lady nurses were "an offence," and the sanitary commission was "a gross insult." The quiet, enduring, and unobtrusive work of the lady nurses told at once on the sick and wounded men in hospital, and a sort of official muzzle was applied to the obstructive from head-quarters; but this did not enforce cordiality. The ladies could, however, only see their work ever present before them in all its misery, and now and then, in intervals of repose, feel the official snubs intended. The sanitary commission, having an official standing, could work independently of subordinate cold-shoulder, though the disposition to give this was both seen and felt. The swift destruction of human life in the field and in the hospitals was with these men "quite according to rule;" it was "inevitable." As human nature is the same in all nations, and as officialism is necessarily conservative, bonded up with regulations, we will make our appeal to the voluntary sanitary corps now being organised. We venture to predict that the army sanitary arrangements for the proper care of the sick and wounded will break down in the face of the contingent epidemics and slaughter. The sick and the wounded will be over-crowded, and ventilation will be neglected. Scavenging and lime-washing, with a use of carbolic acid for disinfection, will consequently be of the greatest use. Let us plead that these things may be attended to at once and continuously. Churches and public buildings with the windows out, barns, open sheds, and temporary shed shelter, where the free air of heaven can play over the poor prostrate sick and wounded, will do more than medicines. Lime-washing, disinfecting, and surface-cleansing, will give relief and work wonders. The tendency to overcrowd will be very great; the poor sick and wounded will be laid side by side as close as possible. Those who have ever had to attend one sick person labouring under a foul sore in a room, or who have visited hospital-wards when full, know what sort of atmosphere there will be. Fresh air means change of air; constant motion over the prostrate sick and wounded,—change in abundance,—such change as would be obtained beneath a large railway shed with side protections 6 ft. or 8 ft. in height, but all above up to the eaves open. Cleansing means a full and proper sweeping up and removal, day by day, of all matter liable to become corrupt. The carbolic acid disinfectant will stop decomposition and diminish the terrible plague of flies, which so torment the sick where the emanations from dirt prevail. If a moiety of the money collected, and to be collected, to aid in nursing, is expended in ventilating and cleansing, the results obtained will be

greater, and consequently more satisfactory. Water, pure water, for sick and wounded, is of the greatest importance. This water should not be stored within the wards of any hospital, as the gases of impurities are absorbed and render such contaminated water poisonous. Let the water be stored outside. In a land of vines there will be wine-casks.

Surface trenching, so as to throw off surface water, should be attended to; and external latrines should be provided for all who can use them. In a district where wood-charcoal is used it may be remembered that waste charcoal dust is a powerful disinfectant.

At the risk of tautology, we must repeat that pure water, fresh air, and daily surface cleansing, will be most required for the sick and wounded of the armies in the field.

THE CONDITION OF DUBLIN.

ONE section of the Irish press says that we have in our recent articles on the condition of Dublin dealt rather harshly with the corporation, and that our remarks in general were too severe. On the other hand, the fairness of our observations is acknowledged by several of the journals. One writes,—"The articles in the *Builder* on the condition of Dublin are good, and true in all points." The *Irish Builder* says,—"The Condition of Dublin" is the heading to a well-written paper in the columns of our esteemed contemporary the *Builder*. There is very little in the statements made by the writer to which we can take exception. The sapientness of our citizens and corporation is dwelt upon in no measured or disguised terms." We have certainly not measured our censure, or disguised the fitting terms that were needed to be used in condemnation of corporate neglect.

We boldly assert then, without fear of denial, that Dublin at present is not half cleansed; and, as we will make no loose assertion, we shall point out some of the districts where corporate vigilance can never be detected. In the Earl of Meath's Liberties, the Coombe, New-street, Patrick-street, and many of the adjacent streets, courts, lanes, and alleys, around the quarter. In the North Dublin district we might instance Church-street, Bow-street, Mary's-lane, King-street, Brunswick-street, Pill-lane, Barrack-street, Strand-street, and sundry and several other streets between the line of Capel-street and Oxman-town. We have walked through these quarters, and examined the house property, questioned the dwellers as to their wants, and during our visit seen sufficient with our own eyes to justify every word we have written or may write. The corporation of Dublin imagine that if they sweep a few leading thoroughfares, like Sackville-street, Dame-street, Westmoreland-street, and the squares, they may do as they please elsewhere,—that they may levy rates and taxes, and laugh down the complaint of the less opulent inhabitants and ratepayers. This system of polishing the front of the boot, while leaving the heel to retain its old dirt, may pass muster in the regions of the blind, where the one-eyed are kings; but it will not do in these sanitary times, so we advise the city authorities that their ostrich-like wisdom will not avail them much. The county Dublin farmers and market-gardeners' men are the city's best scavengers. Were it not for the quantity of city refuse, exclusive of mere stable manure, that these men carry out into the country, Dublin would be a hot-bed of fever and infection.

Municipal councils have many ordinary and specific duties devolving upon them to perform, but of late years, in Dublin, these duties are either purposely lost sight of, or altogether ignored. The lord mayor's duty of looking after weights and measures is performed yet but on a limited scale. To punish the dealer in light weight is a commendable act, but we are sorry to say that the working poor of Dublin are cheated to an enormous extent by dishonest tradesmen using light weights and measures. If those who require a licence to carry on their trade, ran the risk of forfeiting it by being caught in the act of using light weights and measures, a salutary lesson would be taught, and the robbers of the poor would be properly punished. The question whether the city police should be under the control of the Irish executive, or be a force amenable to, and managed by, the corporation of the city, is a moot point. We fear much that there would be nothing attained by the change, the city council is so

often at loggerheads with itself, by the charges and counter-charges of its members. We think it is better that the head of the police department should be in the castle than in the city hall. It is still the same in Dublin as when O'Connell spoke, and Lady Morgan sang,—

"Where men are fighting for conclusion,
And hating each other for the love of God."

Many improvements that it would be desirable to have carried out are hanging fire at present. Neighbourhoods are sinking lower and lower, north and south, for want of proper outlets and leading thoroughfares. One great crying shame is the want of a direct route from Stephen's-green, or that quarter, to St. Patrick's Cathedral. Here is a costly architectural pile buried in the lowest and meanest quarter of Dublin, hemmed in on all sides by low and dilapidated tenements, forgotten almost and unvisited, because the road to it is tortuous, and through dingy bye-streets. By a very little amount of energy, and an avoidance of any serious expenditure, a new street could with facility be constructed, leading direct from York-street, across Angier-street, Whitefriar-street, and thence, with a slight curve (entailing only the demolition of a small number of houses of no great value), to St. Patrick's Cathedral. This route would give a line of communication nearly direct from Stephen's-green to Patrick-street, and open up a neighbourhood sorely in need of trade, light, and air, and other sanitary requisites. The new street formed by the carrying out of this measure would be the pioneer of future improvement in that part of the South Dublin neglected quarter, and it would lift the lorn and wood-bogged "Liberties" from a region of eclipse into a region of light.

We wonder how long the railings in front of Trinity College will remain an "obstruction" to public traffic? They are regarded as ornamental by some, but we consider that in their present dimensions they neither are, nor have ever been, either ornamental or useful. Well, we must qualify; they are useful at either end, where recesses afford room for a select number of hereditary apple-women, who have held a freehold for themselves and their stalls from time immemorial; but with this honourable exception in their favour, there is no excuse why they should not be at once swept away, or curtailed to a few feet in front of the college. Speaking on this matter, we may also point out that the removal of the dead wall along the line of College-street would be a decided improvement. Why this dingy portion of the college, bounding on the north, should be allowed to stand for upwards of a quarter of a century after its counterpart in Nassau-street has disappeared puzzles us to answer. The sooner that a base of granite, with a similar ornamental railing to that on the south, replaces this dead wall the better.

The old city graveyards require overlooking, for they are in a bad state. Many of the most noted of them are situated in the old, neglected quarters of the city, surrounded by a thickly-crowded population, at a distance from a green field, a free common, or a free park. They might be laid out with taste and made attractive for the poor to walk through, instead of being kept barred up, yet still visible, in all their original repulsiveness.

The fine public squares of Dublin should not exist as a monopoly, but should be thrown open like those in the French capital. No fear need be entertained, that if free to the working classes outrage would result. The parks of London are free to all, yet neither flowers nor shrubs are destroyed. Dublin, it is true, can boast of one magnificent park, which, for extent, has no equal in Great Britain; but the Phoenix Park is outside the city, and is a park which, in its management and control, is open to objections. It is a great boon, however, to have such a free park on the borders of the city, and to its existence we are certain Dublin is much indebted on the score of health and delight.

There are some manufactories scattered through the city which are prejudicial to the health of the population. We do not desire to allude to them by name, for our motive is not to lead to individual injury, but collective good. It is impossible, however, to effect a sound sanitary reform in a poisonous atmosphere. If human beings have to live and breathe in homes that are enveloped from chimney tile to threshold in sulphurous smoke, and out their daily meal over open and reeking drains, where city and shamble sewage seethe—what can be expected but disease? If the water that is drunk

the poor is poisoned, and if their sleeping apartments are placed above normal cesspools, civilisation must soon find an exodus, though man retains a home.

The cry of "vested interests" is all very well, but neither law nor divinity has a right to sanction the commission of crime; neither will the plea that Mr. So-and-So is a large employer of labour suffice to excuse the retention of any works in the heart of a locality where their existence is fatal to human life.

When we view things in this light—and it is the fair way in which to view them—we are forced to apply the same line of reasoning to public bodies.

If an individual (and we have noticed many recent instances) is held to be amenable for endangering the lives of the inhabitants of his neighbourhood by the carrying on of certain works, and by the existence of a certain nuisance resulting therefrom—if such persons can be prosecuted and fined, and in a grievous case his works ordered to be removed,—why should the law allow a number of individuals, even though in a corporate capacity, to kill and slay as they please by a like method?

This the corporation of Dublin has been doing for a number of years; and the crime has culminated at a point where they should be arraigned and made to answer for their neglect.

To sum up the question, the Liffey, for two miles of its length through the heart of the city, is a moving bog of unutterable filth; the sewers everywhere north and south are insufficient or choked up; the rain-pour remains on most of the streets in pools until it is converted into most objectionable traffic; and what should be surface drainage goes down through the street-ratings and traps in the consistency of "floaters' floating stuff." This no doubt causes scavenging, horses, and carts, and allows the corporation at their quarterly meetings to vote fresh supplies for tearing up the public sewers, which their own bad management or that of their employes wantonly destroyed.

We now take leave of Dublin for the present. We have only slightly touched upon her wants and impartially dealt with local evils. Nature has favoured her with natural resources and natural facilities. Blessed with a splendid bay, fringed with (what might be) a noble river, rich in mineral resources, with a granite bed sufficient to rebuild London, and latent veins of lead, iron, and coal, capable of revolutionising a hemisphere—with all this wealth, Dublin is all but sepulchred. The children of her bosom have left her a dirt and rags.

Since the above was written we find that the Government has consented to lend the citizens of Dublin 300,000*l.* for the purpose of carrying out a system of main drainage and the purification of the Liffey. Let us hope for greater energy and promptitude than have been apparent in some other works, or the Greek Kalends will arrive before the main drainage of Dublin is finished and the purification of the Liffey effected.

MORTUARY AT BOW.

A PUBLIC mortuary and post-mortem room has to length been erected by the Vestry of St. Mary, Stratford, Bow, in the churchyard of that parish.

The plan of Messrs. Hills & Fletcher, architects, was followed, and the result is that there is a striking contrast between the wretched adder-shed, in which post-mortem examinations have been held by the aid of a dark lantern, and the present erection at the other end of the churchyard.

The erection of a mortuary being determined upon, much trouble is frequently experienced before a suitable site can be obtained, so strong a feeling existing in many localities against such buildings being prominently situated, that owners of houses in any street in which one might be erected would consider their property greatly deteriorated in value.

The selection in the present instance of the churchyard for a site, whilst obviating this difficulty, yet presented others from the limited area of ground at disposal, and the desirability of avoiding any injury to the general appearance of the church and its surroundings. The church itself, though neither architecturally beautiful nor of large dimensions, yet presents an interesting and venerable appearance.

The mortuary is situated eastward of the church, and is approached by an inclined path, with a turfed slope on each side.

The building is sunk 3 ft. in the ground, and has an air-chamber running entirely round it, ventilating-grates being inserted at intervals. The walls are of Kentish rag and Portland stone; the roof is of brickwork, cemented. There is also an iron skylight, glazed with rough plate. Internally the walls are of Portland cement, with a smooth face; the floor is of planed slate, and there is a solid slatted table for post-mortem purposes. Water is laid on by means of one of Dalziel's patent regulating taps, by which a constant supply is obtained, without the uncertainty and loss of space which a cistern necessitates: arrangements for draining, of course, exist.

In the wall of the end opposite the door brackets are placed, affording accommodation for four coffins. The dimensions are but 13 ft. by 9 ft. The total cost has been about 236*l.*, the Vestry thinking it undesirable, in the first place, to make a building, chiefly set apart for the reception of the bodies of persons meeting death from accident or otherwise, present an appearance which might, from the bareness of its aspect, pain the feelings of friends and relatives; and, secondly, the situation of the building demanding some architectural effect, they very wisely instructed the architects to give the structure an agreeable appearance.

SIR JOHN THWAITES, OF THE METROPOLITAN BOARD OF WORKS.

We regret to announce the death of Sir John Thwaites, the Chairman of the Metropolitan Board of Works, which occurred on Monday morning, the 8th inst., about three o'clock, at his residence, Meaburn House, Upper Richmond-road, Putney, after an illness of a few days' duration. He was in the fifty-sixth year of his age, and was born at Meaburn, Westmoreland. He was the son of the late Mr. Christopher Thwaites, of Toddy Gill Hall, in the county of Westmoreland; his mother was Hannah, daughter of a Mr. John Smith. In early life, having received his education at a school at Reagill, in his native county, he entered business in London, and was for many years a draper and woollen merchant in the Borough and in Oxford-street. While thus engaged, he was frequently employed on Boards of parochial committees in the metropolis, and about eighteen years ago was nominated as one of the members of the Metropolitan Commission of Sewers, in which he sat as the representative of Southwark. In 1855, he was chosen the first chairman of the newly-established Metropolitan Board of Works. In that capacity it has fallen to his lot to superintend most of the important improvements in the streets, public buildings, and drainage of the metropolis; and it will be remembered that he received the honour of knighthood in 1865, upon the completion of the main drainage works, on the subject of which Sir John Thwaites had then recently published a work entitled "A Sketch of the History and Prospects of the Metropolitan Drainage Question." One of the last appearances of Sir John Thwaites in public was on the occasion of the recent opening of the Victoria Embankment, where we saw him in apparently good health. Sir John, who was a magistrate and a deputy-lieutenant for Middlesex, and also a magistrate for Surrey, was twice married—first, in 1836, to Harriett, daughter of Mr. William Bardwell, of Uggeshall, Suffolk; and, secondly, in 1861, to Eliza, daughter of Mr. Daniel Woodruff, of Harwich, and widow of Mr. B. Carington, M.D. He has left three sons and a daughter.

Sir John was essentially a self-made man, and in his passage upwards has managed to make only friends. He discharged his duties as Chairman of the Board of Works admirably, and has endeared his memory amongst the officers of the Board by his integrity, consideration, and kindness.

Opening a People's Park at Manchester.

The mayor, corporation, and people of Manchester have been engaged in opening a new People's Park for the townships of Hulme and Chorlton-upon-Medlock (south-west of the remaining part of the city). About 60 acres had been recently purchased by the corporation, and converted into this public park, at a cost of something like 60,000*l.*, which is more than the cost of the other three, namely, Peel Park, Queen's Park, and Philip's Park. The new one has been named the Alexandra Park.

ART-UNION OF LONDON EXHIBITION.

THE pictures selected by the prize-holders of 1870 are now on view in the Gallery of the Water-colour Institute, Pall-mall, where they will remain on view till the 27th inst. We have already given a list of the principal pictures bought. The highest prize, that of 200*l.*, which has fallen to the lot of Mr. C. T. Mellick, is represented by Mr. E. Crowe's well-known picture of "The Vestal," from the Royal Academy. Mr. A. B. Wyon, to whom fortune assigned the favour next in value, has chosen from the same collection a romantic landscape by Mr. C. J. Lewis, of the estimated value of 150*l.* The following are the more important of the other prizes:—"The Jungfrau from the road to Murren," by Mr. S. Hodges, from the New British Institution; and "Limberg, with the Cathedral of St. George, on the Lahn," by Mr. E. Richardson, from the Water-colour Institute—100*l.* each; "Henry II. of France and Diana of Poitiers witnessing the Execution of Protestants," by Mr. A. H. Tourrier, from the Royal Academy—75*l.*, the price of the picture being 150*l.*, and the winner paying the difference; "Highland Cattle going South," by Mr. H. Garland, from the Royal Academy—75*l.*; "The Sile," by Mr. W. Bromley, from the Suffolk-street Gallery—60*l.*; "Blue Bells," by Mr. H. Wallis, from the New British Institution, a charming picture, selected by Mr. J. Dickson—70*l.*; "Glen Elvie, near Glencoe," by Mr. J. Docharty; "Moonlight on the Coast," by Mr. A. Gilbert; and "Ophelia," by Mr. H. Solons, all from the New British Institution; "River Rance, Dinan, Brittany," by Mr. F. T. Lett, from the Suffolk-street Gallery; "A Mountain Stream, Aber, North Wales," by Mr. J. Taylor, from the Royal Academy, and "Temple Weir, on the Thames," by Mr. A. A. Glendening, from the Society of British Artists. Other pictures bear the names of Peel, J. C. Thom, Pyne, Hayllar, J. Fahey, J. A. Fitzgerald, W. Callow, E. A. Goodall, J. J. Jenkins, Nafel, Thornycroft, Weekes, J. J. Wilson, &c.

SCHOOL FOR WEST LONDON, ASHFORD, MIDDLESEX.

THE first stone is to be laid this Saturday, the 13th.

The Poor-law Board having determined to remove the pauper children at present located in the workhouses belonging to the Fulham Union, the parish of Paddington, and to the St. George's Union, and to provide for their accommodation and education in schools separated from the parent establishments, created a district Board, under the title of the "West London School District." The Board of management then called into existence advertised for a site, and after consideration of those submitted for their inspection, selected a plot of land containing 4½ acres, situated at Ashford, in the county of Middlesex. The Board next proceeded to obtain designs for the proposed buildings, by offering premiums to a limited number of architects, who were invited to send in their plans in competition; and after deliberation they ultimately selected a design prepared by Mr. H. H. Collins, architect.

According to this plan, now commenced, the frontages of the buildings are placed parallel with the railway, so as not to encroach too much on the land, which will be used for farming purposes.

The main building is approached from an external corridor by a central hall, on the left of which are the porters' rooms, contiguous to the superintendent's apartments, which are so positioned as to command the supervision of the whole establishment. On the right is the waiting-room. Adjoining the waiting-room are the clerk's and superintendent's offices, which immediately adjoin the board-room. The dispensary and an apartment for ministers of religion are situated right and left of the central official block.

The dining-hall, 100 ft. by 50 ft., is situated in the centre of the building. The culinary department (which is placed at the rear of the dining-hall) includes a kitchen, scullery, bake-house, larders, dairy, bread and cutting-up store, cook's room, &c. At the extreme end of the administrative block is the store-keeper's department, with separate approach for tradespeople.

The laundry and engineer's departments are detached from the main building, for the prevention of accident by fire. The boiler-house, coal-

sheds, pumping-room, smith's shop, &c., are placed at the rear of the laundry. The water-tower is situated over the boiler-house.

On the right-hand side of the entrance corridor are the boys' school arrangements, comprising visiting-room for friends of children, officers' and pupil teachers' mess-room, rooms for the schoolmaster, school-room (126 ft. long, 20 ft. wide, and 14 ft. high), two class-rooms, day-room, lavatories, baths, plunging-bath, water-closets, &c. The play-ground (180 ft. by 261 ft.), adjoins the school-room, enclosed by an iron railing on the south and west sides. On the left-hand side of the entrance corridor are the girls' school arrangements similar to the boys' department. The infants' department adjoins the girls' department, and is parallel with the dining-hall.

The girls' industrial training department, includes a sewing-room, cutting-out room, training kitchen and scullery, and a training laundry. In the boys' industrial department, workshops are provided (in which the boys will be instructed in various trades), together with band-rooms and tradesmasters' dwellings.

Over the boys' and girls' scholastic portion are placed their dormitories.

The dormitories for the infants, providing accommodation for 100, are placed over their scholastic department.

The chapel, a detached building to accommodate 500 children, is approached from the main building by a covered way.

The infirmary is on the pavilion principle. The wards are 12 ft. high and 21 ft. wide. Each bed has 6 ft. allotted in the length of the wards.

There is a separate building, near to the infirmary, so that children suffering from fever, small-pox, and other contagious diseases may be kept as distinct as possible from the general patients. The accommodation provided in the various buildings is as under:—

	Boys, Girls, and Infants.
Main building	790
Infirmary	72
Fever and Small-Pox Wards	24
Reception Wards	22
	818

In the main buildings the apartments are heated by open fireplaces,—“Galton's” and “Gurney's” stoves being employed. The rooms and corridors, together with dormitories, have windows ranged on each side, so as to ensure thorough currents of air permeating the same. The products of combustion and the impure atmosphere are carried away by flues built specially to convey the same from the various apartments.

The staircases, which are numerous, are constructed of fire-proof material; hydrants, with hose attached, and under constant pressure of water, are provided on each landing and in every corridor. Each block of building is completely isolated, and subdivided on “the pavilion principle” (supposed to be its first application to school buildings), so that, irrespective of sanitary considerations, the spread of fire will be in a great measure guarded against.

Messrs. Bull & Sons, of Southampton, are the contractors for the works, at the sum of 43,590l.

THE PROPOSED LAW COURTS.

A VOTE for 21,450l. has been taken for laying the foundations. The Commission, at its last sitting, approved the plan (which the Lord Chancellor signed as chairman of the Commission). The new plan is much like the one circulated in Parliament two or three days ago, but with buildings (tower staircases higher than the courts), which will protect the courts from the noise of the Strand. The chief conveniences for every court provided in the plans approved a year or two ago by the Commission, are preserved in the final plan. The general public, the witnesses, the attorneys and officers, the Bar, the jury, and the judges will each have their separate set of access to the courts. Each court will have, or be able to have, light on all its four sides, and also roof-lights. The block of courts and the central hall will run from north to south, not from east to west, as in the plan formerly approved. The central hall will be on the level of the Strand, and the courts on the floor above, i.e., on the level of Carey-street, which is about 17 ft. above the level of the Strand. This change in the line of the central hall will probably let the sun shine on every one of the courts some part of every sunny day,—certainly an advantage. The great block of

offices will be placed parallel to and adjoining Bell-yard, between it and the courts. There will have to be some offices excluded from the present (or first-erected) block. But there will be ground to the west on which further offices can be erected.

We believe we are correct in saying that the elevations for the approved plan are not yet made.

XYLOTECHNIGRAPHY.

THIS is the title given by Messrs. Trollope & Sons to an artistic process, which they have patented, for staining pine and other woods for joiners' and timber work, as well as for furniture. It applies to any design, without limit as to number of colours to the same surface, either by elaborate freehand drawing, or the simplest stencil. Although they only claim for the process the character of honest staining, the result has all the appearance and character of inlaid wood. Many attempts have been made in this direction, especially in two colours (ground and pattern only); but we have seen no results equal to the present, and by no previous process could freehand artistic decoration be applied. The specimens they have produced have a transparency and brilliancy that can be obtained by no other means except actual marquetry, which the work when polished very much resembles. The process is obviously well adapted for doors, shutters, panelling of walls and ceilings, and other joiners' work in private houses, and equally so for the roofs and timber work generally of churches and other public buildings. It is applicable for, and they have already successfully applied it to, a pianoforte case and some cabinets.

KENT ARCHÆOLOGICAL SOCIETY.

THE annual dinner took place on Wednesday at the Corn-exchange, Sittingbourne, under the presidency of Earl Amherst, after which a paper was read by the Rev. A. J. Pearman on the two earthworks known as Bayford Castle and Castle Rough, the first being an entrenchment made by Alfred the Great, and the latter the site of a fortification built by the Danes under Hasting in 893. Both places are of the same date. The Rev. F. Hazlewood also read a paper “On Some Paintings lately discovered in Marsden Church.”

The members re-assembled on Thursday morning at Sittingbourne, and took train to Queenborough, in the Isle of Sheppey, whence they made an interesting excursion about the island, visiting several ancient churches and the remains of two once famous castles. The Isle was in olden times an important grazing-place for sheep, whence it derives its name. Many of the inhabitants used to call these valuable animals “sheps,” and a sheepcot was known as a sheppy.

The first object of interest was the site of the ancient Castle of Sheppy, situate at the western mouth of the Swale, very near the present railway station at Queenborough.

On arriving there, the Rev. E. Bingham read a paper “On the History of this Castle.”

Several curious mounds, in the middle of flat tracts of marsh-land, were inspected, and it is supposed that they were artificially raised for a refuge for the sheep in the event of floods. They are known as ootterels or ootrelas.

After a very pleasant ride through a rich agricultural portion of the island, the party arrived at Minster, which is the largest parish in Sheppy.

The Rev. Dr. Willis, the vicar of the church which was visited, read some extracts relating to the history of the ancient minster or monastery. Minster Church stands on rising ground, about three miles from Sheerness, and commands from its tower a grand view over the Isle of Sheppy, the Nore, the Essex coast, and the hills of Kent.

The members paid short visits to Eastchurch and Shurland Castle, and returned to Sittingbourne much pleased with their day's trip.

A small party of the members visited the ancient town of Milton, which consists of a number of small streets intersecting each other at right angles. The church, which is some distance from the town, and is supposed to have been destroyed by Earl Godwin, stood adjoining the ancient town, which was nearer the Swale than the present one.

A museum of Roman pottery, coins, and other ancient relics, was opened during the two days at the Literary Institute for the inspection of the members.

WORKMEN'S INTERNATIONAL EXHIBITION.

ON Tuesday night last a meeting of the exhibitors was held for the purpose of appointing jurors. The chair was occupied by Mr. J. O. Buckmaster, of the Science and Art Department, who, in introducing the business of the evening, said,—Referring to prizes, it was the desire of the Council to carry out the original idea of a Workmen's Exhibition by the awarding of prizes only to men by whom the work exhibited had been actually produced. In former exhibitions the capitalist and employer of labour received the distinction; in this Exhibition it would be their aim as far as possible to give the workman full credit, and the employer and manufacturer would also receive praise and honour through the work of their own men. They must not, therefore, expect or hope to please all parties. To “be just and fear not” would be the safest and wisest policy. There were many things in the Exhibition which might be easily passed over by the jurors, and they would also find many things which would give trouble from the mixed character of the work, and the number of persons employed in its production. Excellent work was sometimes lost on a bad design, and a good design was often wasted on bad work. In several cases they would find the workman his own designer, and in such instances the jurors, he thought, should be as liberal as was fair. There were a few things in the Exhibition intensely ugly, and the jurors must look at these charitably, and it would perhaps be of service to point out where the workman or artist had failed. A man who had never seen anything beautiful was not likely to make anything beautiful. Good work before cheap work, quality before quantity, was the teaching of his apprenticeship, and there never was a time when these admonitions were more necessary. If it had not been for exhibitions, he feared some of our industrial arts, which require the beautiful to be blended with the useful, would have died out or degenerated into a rude barbarism. Look at the wretched houses built all round London, and the still more wretched furniture they contained. To elevate and improve taste, the people must be surrounded with beautiful things, and these need not be expensive; and if this exhibition only inspired in the heart of one workman a desire to produce good work, if one had not been held in vain.

It was resolved that the jury in each class should consist of five persons. Several were afterwards elected.

STATUE OF HER MAJESTY QUEEN VICTORIA, FOR THE ROYAL VICTORIA GARDENS, BOMBAY.

THE statue of her Majesty, presented to the inhabitants of Bombay and of India by his Highness Maharaja Khuderoo Guicowar Sena Khushkheyl Shamsah Bahadur, knight of the most exalted order of the Star of India, and of which we gave an engraving in our last volume,* is now on its way to India. The work, it will be remembered, consists of canopy, statue, plinth, and steps, and is about 45 ft. in height, the whole being executed in marble. The statue is Carrara; the canopy, Sicilian, with light Sienna enrichments.

The figure of the Queen is seated as if in the House of Lords, wearing her robes of state, with the decorations of the order of the Garter and the order of the Star of India, on her head the diadem, and in her hands are the sceptre and orb. The statue has been modelled to a scale of 8 ft. 6 in., and has both repose and dignity, with an admirable likeness of the august original. The royal arms are sculptured on the front of the pedestal, and the star of India is on the centre of the canopy. In the enrichments are blended the rose of England with the lions of India, and the mottoes, “God and my Right,” and “The Light of Heaven our Guide.” On panels at the sides and back of the canopy there are inscriptions in English and in three of the languages of India. About 250 tons of marble have been used in the work. Mr. Matthew Noble is the sculptor.

When it reaches its destination we have no doubt it will be admired and appreciated by the dusky millions of the sunny land over which Queen Victoria reigns.

* See p. 567, vol. xvii.

THE DANISH LUTHERAN CHURCH OF ST. NICOLAI, IN HULL.

THE first stone of a new church for the Danes in Hull was laid on the 6th inst., by Mr. C. O. Brochner. A Danish congregation has existed here for about eighteen years—nearly fourteen years in connexion with the German Lutheran Congregation, but for the last four years it has been quite separate. The present minister is also the chaplain of "The Danish Society for Propagating the Gospel amongst Scandinavian Seamen in Foreign Ports," for the ports of Hull, Great Grimsby, and the Hartlepool. The stone was laid under the sanction of the Bishop of Saaland, in the kingdom of Denmark.

The silver trowel, with which Mr. Brochner manipulated in laying the foundation-stone, has upon it the following inscription:—"Denne murste overkræft fra Danske i Hull til deres helligste og forfættede Landmand Carl Christian Brochner, R. af D. ved Grundsteenlæggningen til den Danske Sct. Nicolai Kirke i Hull, August 6, 1870."—Meaning, "This trowel is presented by the Danes in Hull to their highly-esteemed and deservedly-respected countryman, Carl Christian Brochner, Knight of the Dane-broge, on the occasion of laying the foundation-stone of the Danish Church Sct. Nicolai in Hull, August 6th, 1870."

The church is designed in the Gothic style, and is to accommodate about 250 persons. The body of the building is 28 ft. by 55 ft.; there is an apse for the altar and vestry, and accommodation is provided for a reading-room, 30 ft. by 16 ft. All is upon the ground floor, there being an open roof, the point of which from the floor is about 34 ft. The tower and spire are situated at the north-west corner, the height being 70 ft. Mr. W. Botterill is the architect of the works, and Messrs. Lison & Wilkinson are the contractors. The whole cost is estimated at 2,500*l.*, of which about 1,670*l.* are subscribed. At present the Danish Lutherans have for purposes of worship conjoint occupancy with the Germans of the chapel in Nile-street.

MENSTON-IN-WHARFEDALE, YORKSHIRE.

ON the 30th ult., the foundation-stone of the new church, to be dedicated to St. John the Divine, was laid at Menston, by Mrs. Hudson, wife of Mr. E. J. Hudson, of Moorville, Burley-in-Wharfedale. Menston is situated in the hilly district, on the south side of the beautiful valley of the River Wharfe, overlooking the village of Burley, and near to Ben Thydying and Ilkley, a district often visited by the late J. W. M. Turner, the great artist, a large collection of whose early paintings may be seen at Farley Hall, near Otley, in the same valley. The site of the church, given by Mr. Bertie Markland, of Leeds, is on rising ground near the village of Menston, on the side of the road leading down to Burley; and, from its elevated position, will be well seen from the Leeds-road, and other portions of the valley. The erection of the church is mainly owing to the exertions of the Rev. C. I. Black, and the liberality of Mr. Hudson.

The nave of the church will be entered through a south porch, and it has a central aisle with open arches on either side. The font will be placed against the centre of the west wall. The pulpit occupies the north side of the chancel arch. The nave is lighted at the sides by trefoil-headed windows, resting on a moulded string-course, that runs round the greater part of the church at varying levels. The chancel is joined to the nave by a pointed arch of two orders, the inner one being moulded, and supported on moulded and carved corbel shafts, the columns of which will be of dark red stone. The chancel will be raised two steps above the nave, and will be entered through an opening in the low chancel wall, which will be of ornamental character.

The vestry is placed on the north of the chancel, and is entered through a porch, having a W.C., or, more properly speaking, an earth closet, attached. It is lighted by coupled lancet windows, and has a fire-place, the flue of which runs that from the heating-chamber under the chancel, in the stack rising from the nave-wall over the chancel arch. A segmental painted arch, 8 ft. wide, of two orders, connects the vestry with the chancel. It will be filled with a masonry wooden screen. The vestry is so arranged as to act also as organ-room, in which the player will sit immediately behind one

side of the choir, and out of view of the congregation. All the roofs will be open, and the principals, purlins, and cornice-moulds will be varnished. The wall-posts of principals will spring from carved corbels, those in the chancel being richer than the remainder. The walls and ceilings will be finished in colour. The church will be of stone throughout, taken from Hawksworth Quarries, near Gruseley, the walling being smoothly hammer-dressed. The roofs will be covered with party-coloured slating, arranged in bands and terminated with red ridge tiles and crestings.

Through the very rapid fall of the ground eastwards, room is provided for the heating-chamber under the chancel (the hot-air system will be adopted).

Mr. Benjamin Lapius, of Hawksworth, has the contracts for stonework, excavations, and drains; and Messrs. Longley Brothers, of Leeds, for the remaining trades. The total cost will be about 1,000*l.* The architects are Messrs. Price & Linklater, of London and Manchester.

NEW CEMETERY AT BINGLEY.

THE consecration of that portion of the new cemetery for Bingley which has been reserved for the Established Church has taken place. The entrance road to the cemetery, which commences directly opposite Bingley Vicarage, on the Keighley turnpike road, is 150 yards in length. The entrance gates will consist of ornamental stone piers on each side of the carriage-way, with two passenger gates on each side, constructed of oak and wrought iron. Within the gate is a main road through the cemetery six yards wide and 300 yards long. The land within the fence covers an area of ten acres, of which seven and a half are appropriated for burial purposes, being equally divided between Dissenters and the Established Church. There will be two chapels—one for Dissenters and the other for the Established Church—built in the Gothic style of the thirteenth century, 39 ft. in length by 19 ft. 6 in. in breadth. The entrance to them will be by a porch a few feet from the main walk, fitted with wicket gates formed with open iron-work panels. The entrance door to the chapel will be within the porch. On the opposite side of the chapel will be a mortuary chapel, having a separate external entrance. A screen partition of stone and glass will separate the mortuary from the chapel, so that the corpse in the mortuary will be visible to the mourners in the chapel. The chapels will be heated with patent heating apparatus sunk below the level of the floor. A raised channel or platform will be at the east end of the chapels, and stall seats will be provided,—two rows at the west end and two rows on the north and south sides of the chapels. The roof is to be open, supported upon circular-framed bindings with cut cusps, which will rest upon carved stone brackets projecting from the wall. The main feature in the external design is the bell-turret, supported at one gable upon a shaft and bracket with carved capital and other brackets. The turret will be open stonework, surmounted by a spire at the height of 50 ft. above the ground level. The ventilation of the chapels has been particularly studied, and the fittings of the mortuaries will be of improved character. The whole of the stonework will be dressed both internally and externally. At the entrance to the ground will be erected the registrar's residence and board-room. The style of architecture is Domestic Gothic, in accordance with the style of the other buildings. The total cost of the cemetery will probably reach about 8,500*l.*

PARLIAMENTARY.

Removal of Temple Bar.—In reply to Mr. Whitwell, Mr. Ayrton said that he could not state the views of the Metropolitan Board of Works with reference to Temple Bar. In his opinion, the sooner it was removed the better for the public. If removed, it would have the effect of widening the portion of the street available for carriages 11 ft.

The Foreign Cattle Market.—In reply to Sir C. Wingfield, Mr. Foster said that the Markets Committee of the Corporation had submitted to the Privy Council a site for a Foreign Cattle Market, and inquiries were now being made as to whether there was sufficient water accommodation.

The Thames Embankment.—Mr. Ayrton informed the House, in reply to a question from

Mr. W. H. Smith, that the Metropolitan Board of Works were making arrangements to open approaches to the Thames Embankment from Villiers-street and Norfolk-street, and the work would be completed at an early period.

The Trade-Union Bill.—Mr. Anderson asked the Secretary of State for the Home Department whether before the close of the session he could give the working classes of the country an assurance that the Trade-Union Bill would be made one of the earliest and most prominent bills of the next session. Mr. Secretary Bruce had no hesitation in at once promising that a Bill would be introduced early next session.

Science Examinations.—Mr. Dixon asked the Vice-President of the Committee of Council on Education whether he had received numerous complaints from the teachers regarding the science examinations in May last, and whether these complaints had just foundation.* Mr. W. E. Foster, in reply, stated that eight complaints had been made formally. They related to two subjects—practical geometry and building construction, but he could not find that there were any just grounds for them. He did not believe that the examination papers were too difficult. In fact, the standard of marks was lowered this year. The explanation probably was that pupils were prepared to meet a purely drawing examination rather than a scientific one. The teachers had been able to obtain payment for their students under the branch of drawing instruction.

Metropolitan Improvements.—Lord Redesdale having presented a petition in the House of Lords from the vestry of Bermondsey, praying that no part of the land purchased for Southwark-park be left for building purposes, asked whether it was intended to obtain powers next session to purchase the remaining part of the west side of Parliament-street and the corresponding part of King-street; and whether the architect for the new offices had been desired to prepare plans for completing the Council-office buildings by connecting them with the new offices to be built on the other side of Downing-street, or otherwise, whereby the two blocks of building might be brought in unison. His lordship also asked in what manner it was intended to occupy the vacant spaces acquired within the new embankment, and whether it was intended to apply for powers to purchase the buildings below Graven and Northumberland streets down to the new embankment. The Marquis of Lansdowne said that her Majesty's Government had not yet directed their attention to the matter referred to in the first two questions. As to the land on the Thames Embankment, he could only refer to the recent discussion in the other House, the address to the Crown in which it had resulted, and the gracious answer which her Majesty had been pleased to return to it.

Indian Engineering College.—Mr. Plunket asked the Under-Secretary of State for India whether it was the intention of her Majesty's Government to establish an engineering college for the preparation of candidates seeking employment in the Indian Public Works Department; and, if so, whether it was the intention of her Majesty's Government to abandon or modify the present system of competitive examination for appointments in that department; and whether it was intended to abolish the system of competitive examinations for the forest service in India. Mr. Graat Duff, in reply, said it was the intention of the Government to establish an engineering college for the Indian service, to be entered by competitive examination. It was not intended to abolish competitive examinations for the forest service of India.

WORCESTER CATHEDRAL RESTORATIONS.

UP to the present time, upwards of 50,000*l.* have been spent on the works, and a further sum of about 15,000*l.* has been raised in little more than a month to insure the completion of the restorations. The works already done have been carried out under the direction of Mr. Perkins, architect to the dean and chapter, Mr. Gilbert Scott's attention having been confined to the re-arrangement and decoration of the choir. The contractors by whom the works were executed were Mr. Bennett, of Birmingham; Mr. Hughes, of Bristol; Messrs. Collins & Cullis, of Tewkesbury; and Messrs. Wood & Son, of Worcester. The decorators were Mr. Hardman,

* We have received some letters on this subject, and will look to them.—Ep.

of Birmingham, and Mr. Wall's, of Worcester; sculptors, Mr. Forsyth, of Worcester, and Mr. Boulton, of Cheltenham. The restoration committee have decided on proceeding at once with the remaining work. The necessary fittings for lighting the cathedral with gas, and the oak carving for the choir, have been ordered to be proceeded with at once. The choir roof is also to be looked to. The carvings in the choir will be elaborate and costly, and will include a lofty throne for the bishop, the cost of which is to be defrayed by the present diocesan. A correspondent of the *Worcester Herald* suggests the construction of a handsome terrace, stretching from the west door down to the banks of the Severn.

PORTLAND CEMENT.

MESSRS. W. GOREHAM & L. WHITE, Swanscombe, have patented a method for making Portland Cement. By the ordinary mode of making Portland cement as practised in England, and usually called the "wet way," the chalk and clay are intimately mixed together in suitable proportions in wash-mills, with the addition of a large volume of water, so as to yield a liquid sufficiently thin to admit of its being pumped into reservoirs or bores. The chalk and clay then settle (remaining mixed) to the bottom, and as much water as possible having been drained off, the mass is then allowed to dry as far as the weather will permit, and is then dug out; and in order to complete the drying process, it is spread on stoves heated with coke or otherwise. When sufficiently dry the mixture of chalk and clay is broken into pieces and conveyed to the kilns for burning as usually practised. This is accomplished by introducing the lumps of dried chalk and clay into the kilns alternately with pieces of coke, the pieces of coke being either of the size as they come from the gas-works, or almost broken down with a hammer. The product obtained from the kilns is then ground.

SOCIAL SCIENCE CONGRESS.

The preparations for the Fourteenth Annual Congress of the Social Science Association, to be held at Newcastle-upon-Tyne, from the 21st to the 28th of September next, are progressing satisfactorily. His Grace the Duke of Northumberland, K.G., will be president.

In the Jurisprudence Department, under the presidency of the Hon. Lord Neaves, the following will be the special questions for discussion:—

MUNICIPAL LAW SECTION.

- 1.—Ought Railway Companies to be liable to an unlimited extent for the acts of their servants; and is it desirable to impose any check on fraudulent claims?
- 2.—Is it desirable to establish tribunals of commerce; and, if so, with what powers?
- 3.—Would the local administration of criminal justice be improved by the appointment of additional Stipendiary Magistrates, and the enlargement of the Jurisdiction of Quarter and Petty Sessions?

The question of the relations between England and the Colonies, it is expected, will be again discussed.

REPRESSION OF CRIME SECTION.

Under the presidency of the Right Hon. Sir Walter Crofton, C.B., the following special questions will be discussed:—

- 1.—In what manner may the provisions of the Habitual Criminal Act and its administration be improved?
- 2.—Is the working of the Prisons Act, 1855, satisfactory, specially with reference to productive prison labour?
- 3.—What measures may be adopted with a view to the repression of habitual drunkenness?

In the Education Department, president, Dr. Lyon Playfair, the following are the special questions:—

1. Can better educational results in primary schools be obtained by the amalgamation of such schools?
2. By what means can a direct connexion be established between the Elementary and Secondary Schools and the Universities?
3. Is it desirable to teach science in elementary schools; and if so, what branches of science?

In the Health Department, president, Mr. Robert Rawlinson, C.B., the special questions are:—

1. What is the best method of disposing of sewage and excreta?
2. What modifications are desirable in the existing sanitary laws and administration?
3. What legislative measures ought to be taken to prevent the adulteration of food, drink, and drugs?

And in the Economy and Trade Department, president, Sir William G. Armstrong, C.B., the special questions are as follow:—

Section A.

1. Is it desirable that the railways should become the property of the State?
2. By what means may the labour market throughout England be more equally supplied; with special reference to local and temporary distress?

Section B.

Chairman: Mr. Rupert Kettle:—

1. How far is it desirable and practicable to establish Courts of Conciliation or Arbitration between employers and employed?
2. How far is it desirable and practicable to extend Partnerships of Industry.

A Ladies' Conference will also be held in connexion with the Congress.

THE COST OF FEVER AT WHITEHAVEN.

At the usual weekly meeting of the Whitehaven Board of Guardians, Mr. Hamilton, the registrar of births and deaths for the Whitehaven District, handed in a return, moved for at the last meeting of the board, relative to the cost of fever patients to the union, from midsummer, 1869, to the 3rd of August, 1870. The cost of fever patients during that time was as follows:—Infirmaries patients—Preston Quarter, 811. 7s. 9d.; Whitehaven, 3601. 13s. 6d.; making a total of 4422. 1s. 3d. Out-door patients—Preston Quarter, 451. 13s. 2d.; Whitehaven, 1261. 10s. 7d.; making a total of 1722. 8s. 9d. The cost to the union of infirmaries and out-door fever patients added together, amounts to 6144. 5s. Mr. Hamilton further reported that there had been no deaths from fever in the town since the 14th of July. A resolution was passed by the board that the returns be published. Mr. Muegrave said that the matter was one that should be considered as regards expense, if it was not worthy of consideration as regards the general health of the place. Mr. H. Jefferson said, if the trustees would do nothing for them, there were other sources to which they could apply. There was the Poor Law Board, and the Home Secretary, who, they might depend upon it, would not allow an important town like Whitehaven to continue in its present state. An order would very likely be made that a municipal corporation should be established; and then the town would have the same chance of electing its representatives that it had of electing members of the board of guardians.

THE NATURAL HISTORY MUSEUM, BROMPTON.

In the press of matter last week, we omitted mentioning that the House of Commons had granted a vote of 6,000*l.* for the commencement of the Natural History Museum, on the site of the Great Exhibition building of 1862, South Kensington. The Chancellor of the Exchequer said, in his explanatory speech, that some persons had proposed to increase the British Museum; but the land there was worth 50,000*l.* an acre, and that scheme was given up. Then, another plan was, to take the land between Westminster Bridge and Charing Cross; but that would not be sufficient. The only land large enough was a piece of 16½ acres at South Kensington, which was bought from the Commissioners of 1851 for 7,000*l.* an acre, or for 120,000*l.*, and which is worth 100,000*l.* more at this time. This land must be used for science and art purposes. It was now a sort of "potters' field," and a scandal to the locality, and they ought to do something with it. The Metropolitan Railway had a station near the spot, so that communication would be easy. The whole sum required would be 350,000*l.*; but he did not ask now for more than was necessary to clear the land and put it in order.

AN ORGANISATION OF LABOUR: SALTIRE.

SIR,—I have just returned from a visit to Bradford and Saltire, to read your article on "The Organisation of Labour." What can I do but mentally revert to the work done by that great captain of industry, Sir Titus Salt, whose two sons and partner so ably act as his lieutenants? At Saltire truly, if anywhere, we may see what can be done by properly-organised industry. Established as a manufacturing enterprise, the works are traversed by road, rail, river, and canal. The mills, of enormous size, are of the most approved construction, and designed by architects on true principles; the machinery contained in them is of the latest and best construction; so that it is really a

pleasure to the operatives to watch them as they produce the best possible work, and at the most rapid rate. For these operatives there is abundant scope for their abilities and energies, opportunities occurring by which they may rise in position, until they become leaders under their chief. For them are built, adjoining the works, on the slope of a hill, more than 800 houses of first-rate construction. For their children are provided large day-schools and play-grounds, fitted with apparatus for every gymnastic exercise, so that their bodies may be well developed. Large and beautiful places of Christian worship are built and well supported. What would be "almshouses" anywhere else are here tasteful and comfortable homes provided for the aged workers of both sexes, who receive a weekly allowance sufficient for their needs.

A large park is now in course of formation, and a literary institute and class-rooms, of large size and lofty proportions, are in progress, and will be completed before winter. Co-operation provides food and clothing for all who desire it; a large dining-hall also supplies cooked food and drink at such prices as make us of the metropolis and elsewhere stand amazed with delight. Humanity in blouses may here get the needful material to make flesh and blood, without being compelled to waste their money on mere ornament. And, lastly, a regiment of Volunteers is organised for the protection of their hearths and altars, in which each man takes his station.

Surely this is an industrial organisation, which is working a great social change, and culminating in a patriotic union for protection and peace. Would to Heaven we had such an organisation in the building trade, where each man should endeavour to excel his neighbour in the honesty and value of his productions. Let the great captain once arise, however, and I believe I can answer for it that he will not want a following. E. G.

CONCRETE AND FACING BRICKS AT MARGATE.

THREE or four cottage villas, built of concrete, and faced with Taylor's patent bricks, the roofs covered with Taylor's patent tiles, may now be seen on the railway line between Margate and Birkington, standing in a most exposed position, with a north aspect, and close to the sea-side. They are of the bungalow style of architecture, with wide projecting roofs. They are said to have been erected at the cost of the above patentee, who last week, it is said, purchased a portion of the Neame estate, at Birkington, whereon to erect some other villas of the same class.

Seeing that many practical architects have hitherto hesitated to employ these patents in such very exposed situations, some detail of cost, construction, and particularly of ability to resist heavy driving rain and storms of wind, such as are known occasionally to try the best slated roofs, and thickest walls along the Margate coast, would be acceptable to a numerous class of the profession practising at the sea-side.

By-the-by, is not 1,200*l.* to 1,500*l.* per acre for plots of building land on this Westgate estate, a very remarkable increase upon the value of land that would not, a few years ago, have brought 80*l.* per acre? S. L.

IMPROVED INDUSTRIAL DWELLINGS COMPANY.

THE report to be read at the half-yearly meeting this Friday, the 12th inst., shows that the whole of the share capital, viz., 125,000*l.*, has been subscribed, and a further sum of 125,000*l.* will be borrowed at 4 per cent. from the Public Works Loan Commissioners, which will represent a total capital of 250,000*l.* The gross rents received during the half-year amount to 6,878*l.* 0s. 7d.; interest allowed by bankers, and other items amounting to 68*l.* 15s. 8d., making the total income 6,946*l.* 16s. 8d. The total expenditure, including the contributions to the reserve accounts, amounts to 3,169*l.* 4s. 8d., leaving a profit of 3,777*l.* 11s. 7d., which is equal to 8*l.* 0s. 10½d. per cent. per annum on the subscribed capital. The profit for this half-year, added to the balance, viz., 2,284*l.* 19s. 10½d., brought forward from last half-year, gives a total for the

credit of revenue account of 6,062l. 11s. 5½d. The directors recommended that as heretofore, a dividend at the rate of 5 per cent. per annum be paid, which will absorb 3,125l.; and that the balance remaining, viz., 2,937l. 18s. 2½d., be carried forward. The directors have, since the late of last report, completed the purchase of the Bethnal Green Estate. The five blocks of buildings at Ebury-street, and Queens-street, Piccadilly, are approaching completion; but the directors have no reason to think that they will be ready for occupation before October next. At Ebury-square, however, the dwellings are in a more forward state, and the directors believe that these buildings will be occupied before the end of August. The fifty-four dwellings on the Bethnal Green Estate have been completed, and fully occupied for upwards of five months; and thirteen additional blocks of dwellings, which will afford accommodation for 180 families, or about 500 persons, are now in course of erection on the same principle.

THE LINCOLN ARCHITECTURAL EXCURSION.

The following is the programme:—

Monday, August 22nd, 2 p.m., Mr. Sharpe will deliver his introductory lecture, on the cathedral, in the Assembly-rooms; 8 p.m., evening meeting in the Assembly-rooms. Tuesday, 23rd a.m., Mr. Sharpe will accompany the members over the cathedral; 8 p.m., evening meeting at the Assembly-rooms. Wednesday, the party will leave Lincoln by train for Caythorpe, at 8.15 a.m., and will return by carriage, visiting the following churches:—Caythorpe, Fulbeck, Leadenham, Well-Source, Wellingore, Navenby, Coleby, Harmanston, Waddington, St. Peter Gowts, St. Mary-le-Wigford. Thursday, the party will leave Lincoln by train at 8.35 a.m. for Sleaford via Boston, and will visit by carriage from Sleaford the following churches, returning to Boston by train from Sleaford, at 2.22 p.m.: Sleaford, Silk Willoughby, Osberton, Freckingham, Buntingford, Horbling, Swayton, Helpringham, and Heckington. Friday, the party will leave Boston at 7.50 a.m., by train for Sutton via Spalding, and will return by carriage to Peterborough at 7.36 p.m.; and Saturday, August 27th, 11 a.m., Mr. Sharpe will accompany the members over the cathedral, describing its architectural history.

Attendance at these meetings and excursions is open to all existing architectural societies, as well as to the pupils of architects in connection with the Royal Institute of British Architects, the Architectural Association, and all other local professional societies.

FALL OF THE NEW COVERED MARKET, PRESTON.

On Saturday morning, the skeleton of the new covered market for Preston, consisting of massive cast-iron pillars, wrought-iron principals and girders, gave way, and fell inward, with a tremendous crash. The market is of considerable extent, and the greater portion had been made ready for the roofing. It is supposed that one of the spans had been insecurely bolted, and that it had hitched to one side, and that its weight and pressure gradually drew over the whole erection. What on the previous day was an imposing structure is now a wreck and ruin.

TENDERS.

SOME little time ago the Westminster District Board of Works, astonished by the sudden rise in the tenders for slopping and watering, resolved to try the experiment of doing the work themselves, and at the end of twelve months discovered that, whereas the lowest tender for the work was 8,000l., the Board in its first year, with much to learn, managed to do the work for 5,000l. odd, being a saving of 3,000l. or so. The explanation of all this was most probably that the contractor, for being remiss in his work, was fined most royally, and most royally took his revenge in turn by increasing his tender. A case has occurred at Chelsea, in which the difference between the highest and lowest tenders was so marked as to be the subject of somewhat strong comment. The Chelsea vestrymen, about to rise for the recess, determined to have the Board-room cleaned and repaired, suggesting an elderly charwoman scrubbing the boards from rosy down to dewy eve, a vigorous carpet beating, and so forth. But, being convinced there was no use in doing a thing by halves, and the classical readers remembering that a soul's sacrifice to the Lares and Penates of the Chelsea Vestry-hall would be

shabby even in these days of economy, they resolved to launch out, regardless of expense, and have the whole building painted and renovated. The local tradesmen were then invited to tender for doing the work, and about a dozen responded. The tenders being opened, the Board began to stare, for such a difference in price is not seen every day. The highest tender, as given in the *Builder*, was 226l., and the lowest was 53l. All the parties tendering were respectable tradesmen, well known to the vestrymen, ratopayers for years, and from a parochial point of view, unexceptionable. But the question went up and down the Board seeking whom it might get to answer,—If one tradesman tendered for 226l., how came another to tender for 53l.? This question of finance puzzled the vestrymen. Both the parties tendering are old-established tradesmen and above suspicion; so that this question is a Chelsea mystery, solvable, of course, but by what means the questioners perceive not. The Vestry took the lowest tender; but the mystery remains as yet unsolved. The Vestrymen ask what is the reason of this great difference in the tenders, and echo answers, "Don't know."

THE CHEESEWRING.

MESSRS. JOHN FREEMAN & SONS do not inform you that, practically, the Cheesewring is already destroyed; but this is really the case; for, although it still stands, it has been propped up with a pile of stones; and its singularity and picturesque appearance are now, therefore, things of the past.

Messrs. Freeman say that there is no danger to the Cheesewring; but those who have seen how near the quarry is will differ from them; and those who saw the necessity of placing stones under it, in order that it might not topple over, would not be likely to recognise Messrs. Freeman's views of its safety. H. B. W.

ROTHERSAY.

THE ancient and royal burgh of Rothersey bears something of the same relation to the Island of Bute that Windsor Castle does to the town of Windsor. It is the capital of the island, so to speak, the only town of importance within its boundaries, the site of its old feudal castle, the locality of its modern gaol; and it is, moreover, at once the busy little seaport, the herring-fishing station, the manufacturing town, and the fashionable watering-place. A curious place on the whole, we venture to say, and more deserving of keen observation than many a midland town ten times its size and population. For, although Bute is only separated by a ferry of a few furlongs, across "the Kyles" from the coast of Argyshire, and is within easy distance of Ayrshire and Dumbartonshire, it is, nevertheless, a genuine and unmistakable island. Communication with the mainland is sometimes difficult and occasionally impossible. Hence its little capital may be supposed to contain within itself all the resources which are necessary and even indispensable to the well-being and progress of an independent community.

The origin of the name is lost in the hopeless obscurity of the Celtic etymologies. Holinshed, upon the authority of some previous historians equally reliable, assigns the mythical year 564 before Christ as the time when certain Scottish men settled in the Western Islands under "Rothersey, the son of Nothilus," who, he continues, "named that isle in which he began to possess Rothersey, after his own name." "But in regard to the authenticity of this statement," says Mr. Read, a more recent authority, "it were quite needless to inquire, it being chiefly on account of the coincidence of the name that I have quoted the passage at all."† In point of fact, Rothersey seems to possess a cognate etymon to the patronymic of Lord Rothes, which signifies, we believe, in the Gaelic root, a tower, a place of strength, and, by induction, a fortress or castle.

Of the ancient castle we have already had, perhaps, enough. Time and civil wars have told heavily upon it. But its unique, and, in one sense, sacred historical interest has not of later years saved it from encroachment, and even from debasement. More especially it has

suffered greatly at the hands of the burgh feuars, or freeholders, from those, at all events, who have, without the slightest regard to consequences, erected a perfect colony of dirty and disreputable-looking tenements up to the very verge of its beautiful moat.* The Castle of Rothersey, indeed, is at this moment absolutely buried in the centre of the very worst quarters of the town, and is now quite concealed from the view of the tourists entering the bay, or passing in the numerous steamers, through the estuary of the Clyde. Formerly it approached from the bay, it might be seen towering conspicuously above the squalid dwelling-houses which surround it; but within the present century higher houses have been built, and new streets, such as Montague-street, formed between its site and the sea. Such a case of pure and simple vandalism we have not met with for many days, and almost never beyond or without the privileged precincts of a royal burgh. It should have been remembered that although Rothersey is an ancient and royal burgh, yet it was from the royal castle it originally derived its charter and its immunities; and long before the provosts and bailies had intermingled with the lives and property of the lieges, the castle reposed in its pride and strength in the green bosom of that lovely valley which forms the natural approach to the bay.

Before passing from the consideration of this Mediaeval relic, we may just mention,—although it is hardly necessary, we presume, to do so,—that it is from this same old castle his Royal Highness the Prince of Wales derives his second hereditary royal title—the Duke of Rothersey. Rothersey was the first dukedom created in Scotland (Albany was the second), in the person of the ill-fated son of King Robert III.; and the heir apparent to the Scottish throne has ever since borne the title.†

We must now proceed to take what we are afraid, can only be regarded as a cursory survey of the modern burgh,—first, just glancing at its external appearance. Unquestionably Rothersey shows to the best advantage when seen from the bay. At any given point on the line of the steamboat track between Toward Point and the anchorage off the pier, the view is really superb. The bay itself has often been compared to that of Naples, to which we can fancy, however, only a very distant resemblance; it rather recalls to our recollection the bay of Dublin on a smaller scale, as we have previously indicated. On both sides the land recedes from the shore in abrupt towering eminences, exuberantly wooded and glistening with foliage; but in the centre it passes away into that gentle valley which we can never cease to admire. The whole sweep of the coast, in the immediate foreground, up to Port Bannatyne, which may be said now to form a continuation of Rothersey, is filled in with clusters of rather neatly-designed marine villas, built, for the most part, with the dark-coloured native green stone, enlivened with courses and quoins of very white sandstone, also indigenous to the neighbouring quarries. These villas, we were informed, are chiefly composed of lodging-houses. The centre group is occupied with hotels, right in front of the pier and small harbour and docks which occupy the centre of the bay. On the terrace immediately above this are situated, pretty much on the same altitude and level, all the spires and public buildings of which Rothersey can boast, including the Free Church, the United Presbyterian Church, and, above all, the Rothersey Academy, just finishing, which, although, somewhat not conventional in its aspect, occupies, not altogether unworthily, the best site in the town. Then, in the distance, upon a third terrace, rising still higher from the shore, are to be seen cropping out, the indications, rather than the full outline, of another range of buildings, chiefly villas and cottages, the picturesque and secluded residences of the local magnates and retired Glasgow merchants, who seek in this retired and lovely spot to look upon a prospect and to inhale

* We were also credibly informed that much of the building materials employed was scandalously abstracted from the ruins.

† A little incident occurs to us here connected with her Majesty's first or second visit to Scotland, which we may be pardoned for repeating. Upon one occasion—at a levee—a Scotch nobleman was announced by the Lord Chamberlain under the style and title of—the Duke of Rothersey! Her Majesty was for a moment puzzled—the name did not occur to her as that of any living duke; but before explanation could be had, in marched H.R.H. the Prince of Wales (then a boy of four or five), in full Highland costume of the Royal Stewart tartan, with a philiare above his knee, a claymore at his side, and an eagle's feather in his bonnet!

* Holinshed's Chron., ed. 1577, p. 5.

† Hist. of the County of Bute, p. 26.

an atmosphere in their old age to which their laborious youth has been a stranger. On the whole, the *mise en scène* is singularly striking and effective, and possesses, no doubt, nearly all the elements of picturesque beauty which it is possible to desire, or at all events to obtain, in this northern latitude. A visitor to Rothesay for the first time will, especially after passing through Glasgow or Paisley, be apt to suppose that he has at last had a glimpse of one of the most favoured spots in nature.

Yet all this and more, if we had space to spare for panegyrics, we must admit, with what qualified admiration we choose, so that we leave ourselves free to confess that the royal burgh of Rothesay does actually and in point of fact look best at a distance. If we except the splendid circle of the shore, kept clean and airy by the incessant action of the waves on the rocky beach of the bay, the public square, between the pier and the Bute Hotel (where the fountain is placed) and the long street (Montague-street) immediately behind this, it appeared to us that no other streets would bear the most slender scrutiny or examination; and as to the public buildings, we were sadly disappointed.

There can be no doubt that certain sums of money have been freely squandered on the erection of the gaol, as it is popularly called by the inhabitants, or the county buildings, which being got, of course, from the proceeds of an assessment levied over the entire county, we are not, perhaps, called upon to criticise it too minutely. But of the churches, so recent and so pretensions as some of them are, what must we say? The Free Church of Scotland, at least, should have tried to do something here in the shape of creditable architecture; and for one obvious reason, among others, that there is a little Roman Catholic chapel in "Columkill-street" (how suggestive the name!) which is the only piece of modern ecclesiastical architecture in the island worth a moment's notice or consideration. It is painful and rather discreditable to the community, by the way, to observe the necessity for preserving the stained-glass windows of this chapel from violence, obviously, by trellises of galvanised iron wire. As to that painfully obtrusive and barn-looking building which overlooks the picturesque cemetery of Rothesay, and which stands in such close juxtaposition to Lord Bute's mausoleum, on the one hand, and to the ruined chancel of St. Mary's, on the other, we must really preserve silence.

The Episcopal chapel, which is situated at the corner of the Gallowgate, right over the outlet of the mill-lake (which is now also the principal common sewer of the place), has not, we are afraid, done very much to redeem the ecclesiastical architecture of Rothesay. Not to speak of the design, the building has quite a stunted appearance. The chancel is disproportionately large; the windows are far too small (gas has to be lighted during morning service, a very gross sanitary blunder); and the pews, let us add, are decidedly uncomfortable. A snobbish and clearly un-Christian practice seems to prevail, of not supplying the back pews, which are of course meant for servants, either with cushions, hassocks, or even with floor matting! Hence, it is impossible to kneel at prayers without bringing the knee-joints in actual contact with the cold stone pavement.

The general character of the domestic architecture may be separated into two well-marked classes, that of the town and that of the suburbs. The first is, on the whole, very good; the second, almost wholly very bad. The villas and suburban residences are just as good as any of those we may see any day in the neighbourhood of Glasgow, or in fact, in any watering-place on the Clyde; while the town properly so called (toan), is made of a congeries of dirty little streets, and small two-story tenements filled with the cotton-spinning population, and their numerous progeny, and constituting, as a whole, we must really say, the most disgraceful little town, in a sanitary point of view, we have seen in the whole of Scotland. The fact is, a watering-place and a manufacturing town are theoretically ill-suited to each other; it is only, however, when we see them in combination in practice, as we do in the present case, that we get fully alive to the errors of the arrangement.

Rothesay, considered as a watering-place, need not take up much of our attention. The season commences about the beginning of June, and is supposed to last till the end of October. Of course, the people who go there are chiefly Glasgow people, or at least Scotch people gene-

rally—Edinburgh now contributing its quota since the extension of railways and cheap trips. During the height of the season an immense quantity of iced champagne and cold whisky-and-water is disposed of. Steamboats are everywhere. Yachts of every description sail in and out of the bay. Pinnaces, punts, fishing-boats, yawls, cockle-shells one might almost say, are to be seen scuttling about with their crews of boys and girls; and during the season in which the herring-boats are disengaged, the proprietors also try to eke out their scanty and precarious income by fitting them out as pleasure-boats. In fact, the population of such an island is necessarily of an amphibious character. Every villa has a boat, every cottage a cockle-shell; idle boys a punt. More particularly this may be affirmed of the upper ranks. The present Marquis of Bute, for example, has lived almost literally aboard his yacht since he attained his majority; and again, we may mention, on the day Lord Glasgow came down to reverse the foolish decision of the Rothesay magistrates, we saw a splendid specimen of the British nobleman's yacht in the bay. But the spirit seems to go further than that. Mr. Lamont, the late M.P. for Bute, who is a distinguished member of the Geographical Society, had a yacht built for the purpose of Arctic explorations.

It may be worth pointing out in this connexion that Rothesay, like all fashionable watering-places, has its medicinal spring, as a matter of course. Somewhere about forty years ago, at a time when much greater importance was attached to the pathological action of mineral water than there is in the present day, a spring was discovered at Bogany-point, about a mile eastward of Rothesay; and it soon, we believe, acquired much reputation as a remedy for cutaneous and glandular diseases,—a thing, we should venture to say, of great practical importance in that district. It was also tried in cases of rheumatism, but not so successfully: it could not stand comparison here with Buxton or even Harrogate, probably owing to the peculiarities of the climate as much as to the chemical differences of the springs. According to the late Professor Thomson, of Glasgow, the Bogany water contains in the form of soluble solid ingredients muriate of soda, sulphate of lime, chloride of magnesia, together with a minute quantity of silica, and the gas is sulphuretted hydrogen. We cannot speak of the virtues of this water from experience; for the real and genuine truth of the matter is that Rothesay does not depend upon its mineral water for its reputation. The whole hygienic virtue of the place rests, and must ever rest, upon its pure air. And the grand secret of the purity of the air in Bute (as well as its freedom from fogs) is explained simply enough by the direct and unimpeded action of the sun's rays on its surrounding atmosphere. Compared with that of Glasgow, it is something like emerging to a sunny surface from the bottom of a stifling coal-pit. Glasgow is always enveloped more or less in a dense and sometimes impenetrable cloud of noxious gases. Rothesay, on the other hand, unless it rains (which it does, however, 196 days in the year), has an atmosphere which, for mildness and purity, is rarely excelled. Something is also due to the prevailing direction of the winds, and on this point we find, in the fifth volume of the statistical account of Scotland, a valuable table of seven years' close observation, made by Dr. Meek, of Glasgow, in which the average current of the winds are stated as follows:—

Winds.	Days.	Winds.	Days.
S.W.	174	N.E.	104
N.W.	40	S.E.	47
	214		151

The fatal, acrid, and biting north-east wind blows only at a comparatively small ratio (1 to 3 nearly), therefore, to the other mild winds, including the gentle zephyr; and it may be added that western-coast districts are, of course, always warmer than inland districts, not only because of the gulf stream, and the comparatively lower level, but also from the circumstance that the sea preserves a more equable temperature, which it communicates to the adjoining land. As another example, we may again quote the instance of Bergen, in Norway, which enjoys a milder climate under the 60th parallel of latitude than certain places in Central Germany do under the 50th. For similar reasons, however, it should never be forgotten that Bute, as well as Bergen, is subject to more rapid changes of weather, and particularly to storms

and high winds; and it may be this reason which accounts for the very large proportion of the native islanders and population of Rothesay we observed with weak and inflamed eyes. We must not forget, however, that this might also be due to the cotton manufacture.

The introduction of cotton spinning into Rothesay, which we have more than once referred to, was an accident, but a very curious accident, as it was also, at the same time, the introduction of the cotton manufacture into Scotland. It occurred in the year 1788. The story is told at great length, and with much admiration, in the local histories into which we do not care to follow it in all its details. Briefly, it is something like this.—The Marquis of Annandale of that day had agreed to give a spot of ground, with water-power, on the Annan to a company who came from Oldham to introduce the cotton trade into the south of Scotland, attracted, no doubt, by the superabundance of the population and the low wages of labour. But when the company appeared on the ground, with their formidable show of machinery and spindles, the Marquis, terrified at the prospect of another Manchester in his territory, withdrew the permission. Fortunately, the agent of the Marquis of Bute happened to be on the spot. He, it soon appeared, was not so squeamish. He had also ground to let and water-power to dispose of; and so the cotton company was established at Bute.

But why a cotton factory should have been—evidently without consideration—planted in the very centre of the little town of Rothesay, close to the castle, and in one of the loveliest spots on the island, can only be accounted for, we imagine, on the same principle somewhere pointed out by Mr. Ruskin, which makes the European monarchies select the neighbourhood of Verona and Milan for their battle-fields! As the world gets older it will, we suspect, be more careful of its beauties! Originally, the motive power depended exclusively on the water power derived from Loch Ford, which is extended nearly a mile in its natural length by means of an ugly embankment stretching across the valley close to the cemetery, and spoiling much the beauty of the prospect. A continual source of danger to the lower levels exists, of course, in this embankment; although we could hear of no special provision for its regular inspection. Superadded, however, to this water power, there is now the force of the steam engine, if we may judge from the numerous tall chimneys vomiting forth as a matter of course, or, rather, as a dictate of conscience, their regular, systematic, and indisputable quota of vile and disgusting smoke! Surely the 500 people who are employed at these works might be employed without doing such damage to the other 5,000 odd who live in or near the town. But, of course, the local cotton-spinners are the local authority, and it is in consequence difficult to put the Smoke Act in force! We ought to state in all fairness that the produce of these mills (chiefly water-twist) is of a very high order, and commands the highest prices in the market.

We must, however, try to say something more of the local authority. The royal burgh of Rothesay is, at this moment, governed by a provost (Mr. Daniel Macbeth), three bailies (whose names we need not quote), several town councillors, and, of course, a town clerk (Mr. John Wilson). The last of these officials has always, we believe, been the most important personage within the boundaries of the burgh; and to the late Mr. John Blain, town clerk of Rothesay, the world is indebted for almost all we know of the history of the island.

A very good story is told of this Mr. Blain & propos of pluralities. It is said that upon one occasion an extensive proprietor in the neighbouring county of Argyshire issued invitations to dinner to all the official persons in the island of Bute. These were:—(1). The commissary. (2). The town clerk of Rothesay. (3). The sheriff's substitute. (4). The justice of peace clerk. (5). The surveyor of taxes. (6). The collector of customs. (7). The factor on the Bute estate. Having ordered dinner for this number of guests he was astonished to find only one solitary individual make his appearance at the hour of course—to wit, the aforesaid Mr. John Blain! who innocently explained that in this case he was in propria persona absolutely seven gentlemen rolled into one; and had actually received the whole cards of invitation himself! (See the preface to the "History of the County of Bute and Families connected therewith." By John Eaton Ried. Glasgow. 4to. 1854.) The Bute officials have

still a strong affinity for the plural number. For example, Provost Macheth (who recently immortalised himself in the pages of *Punch* by attempting to put a stop to playing billiards in the Bute Arms Hotel) is also sheriff clerk to the county—two officials which one might suppose ought to be incompatible.

In addition to their ordinary official duties the magistrates creditably discharge their functions as managers of the poor. The lunatic paupers in Bute are much above the average of inland parishes; and they are placed, we believe, under the able charge of Dr. Sibbald, at Lochgilphead. A ragged school has also been established in Rothsay; and we must say that it was really a pleasant sight we had of the "scholars," male and female, marching up the Barone-road on the morning of her Majesty's birthday,—the boys smartly dressed in blue Guernsey trimmed with white braid, and Glenargy bonnets; the girls with plain blue jackets, straw hats, short skirts, and thick boots, and the flute band playing with much spirit and precision,—

"Over the water, and over the seas,
Over the water to Charlie!"

They were on their way to an annual feast at the neighbouring rifle range; and strongly suggested to us the thought, how easy it is to change wild and even criminal boys into good sailors and fishermen! This ragged school procession was one of the pleasantest sights we saw on the island.

Having said so much of the municipal duties, we must, as faithful historians, advert to what we saw of neglect. We do not know under what police bill the sanitary business of Rothsay is administered (under which King Bezanian?), but, whichever it may be, the sanitary condition is very bad. That mill-lake of itself is quite enough to corrupt the whole atmosphere of the town. The water may be pure enough as it leaves the reservoir (although we question that very much). But here, at the very outset, it receives the drainage of the graveyard, and the sewerage of Barone-terrace. It cannot be so very pure, therefore, as it glides beneath the under-shot wheels; and here, again, it receives the artificial sewage of the manufactories. A tank-work or skinnery comes next in order, and this institution not only seems to hold the poor mill-lake to be the proper receptacle for its waste animal matter and superfluous viscera, but also as the proper duct for its impure hot water! It is almost incredible to relate, but it is nevertheless true, that the miserable inhabitants of the adjacent houses may be seen at every stage drawing water out of this dirty sewer for domestic purposes. We do not say that they really drink it (for Rothsay is now plentifully supplied with public wells), but we have certainly seen them washing their clothes with it! So open sewers seem to be little thought of in Rothsay.

We do not refer so much to the fashionable district surrounding the shore; but even at the equally pleasant and naturally far more salubrious quarter of Barone-road the evil is quite as great. Some of the visitors to the island complained bitterly of the open and stagnant sewer we have mentioned, which drains the whole of Barone-terrace. It lies, we may say, under their very nostrils, and is in fact not more than four or five yards at its commencement from the bedroom windows. The smell proceeding from it, especially during hot weather, is most offensive; and there can be no question at all about its dangerous condition. Strangers who come to live in Rothsay, and invalids who come in quest of pure air, immediately discover it, and point out its evil influences; and it has actually been the means, we were told, of depreciating the value of the property. The proprietors say, of course, they are not to blame, as their title to this sewer was conveyed to them in their feu charter and disposition. And not only does it destroy this property as a place of residence, but on its way to the mill-lake it spoils one of the prettiest walks in the neighbourhood,—the meadow walk to the cemetery,—so much frequented by tourists and strangers. Its bad effects are not, we may add, at all hypothetical; on the contrary, there were several cases of fever last year on this very spot, one or two of which were fatal.

Now, we do not see why the people of Rothsay should submit to these things much longer; and clearly the remedy is in the hands of the local authority. If they should not act, there is, we suppose, an appeal to the sheriff, whom failing, to the Home Secretary. And let us point out

that we do not speak exclusively on behalf of the people of the town. Indeed, Rothsay is made up of a variety of people; and Bute is quite overwhelmed with invalids. It is painful, in truth, to see the number of poor invalids—dying consumptives and asthmatic valetudinaires—going about in all directions. This, of course, is a thing which may be expected. But there seems also to be an uncommonly large native increment of maimed and disabled men and women—here wanting an arm, there a leg, obviously the produce of the accidents at the cotton-mills. A great many people of the lower class of inhabitants are also, as we have mentioned, afflicted with sore eyes. We heard, too, something of scrofula and congenital disease proceeding, it was feared, from too close a consanguinity in marriages.

All such cases imply a depressed circulation, and demand imperatively pure air. Of course, the country people, properly so called, as far as we observed, look uncommonly healthy, the farmers and ploughmen especially; but the country air is almost quite pure, while Rothsay air is, as we have seen, much contaminated. For the sake, therefore, of the town itself, and of the hospitable character of the island, but especially in the interests of the invalids and young children, we write these things, under the hope that something will be done, and that speedily, in the shape of improvement and amelioration.

AUSTRALASIA.

Telegraphic Progress.—A scheme for bringing the Australian colonies into telegraphic communication with the mother country has been introduced. It is to be styled The British-Australian Telegraph Company, Limited, and is created in connexion with the five companies by which the various sections that will constitute the great through line from England to the East have already been put in active progress. The present work is to consist of a cable of 563 miles from Singapore to Batavia, to join the Dutch lines which run to the south-eastern extremity of Java; whence another cable of 1,163 miles will be laid to Port Darwin, in Australia, where a land line of 800 miles will connect the system with Queensland, New South Wales, Victoria, South Australia, Western Australia, and Tasmania. The capital is to be 660,000*l.* The making the entire lines is to be confided to the Telegraph Construction and Maintenance Company, at the contract price of 634,000*l.*, of which 120,000*l.* are to be in paid-up shares.

VICTORIA.

Melbourne.—The members of the Church of England have been the first to move in the matter of erecting a college in affiliation with the Melbourne University. Trinity College is to be the name of the new institution—of course designed for the purpose of imparting special training and instruction to Church of England students. It is expected that the building will cost between 7,000*l.* and 8,000*l.*, and the projectors have held a meeting, Sir William Stawell in the chair, for organising means to raise the sum required to complete the first portion of the building,—about 3,000*l.* The college is not only intended for theological students, but as a place of residence for lay students whose parents do not reside in Melbourne.

Considerable success has attended the establishment of schools of design. The benefits experienced from the original school in Melbourne will ere long have been carried into all the large suburbs around it. The schools opened at Carlton, Emerald-hill, and Brunswick each report a good average attendance. The requisite steps have been taken for opening schools at Fitzroy, Sandridge, and Richmond. The Artisans' School of Design at the Trades' Hall, Lygon-street, has commenced a new quarter, with 182 students. The classes were under the superintendence of the usual staff of honorary teachers. The geometrical class was commenced under the tuition of Mr. Ingamelle, with twenty-two pupils. The schools were visited by the hon. secretary and some of the teachers of the newly-established school at Fitzroy. It was also visited by some of the leading decorative artists of Melbourne. This school is now a model for others who wish to forward technical instruction.

The ceremony of solemnly blessing and opening the Roman Catholic Church dedicated to St. Ignatius, in Church-street, Richmond, took place on Sunday, 13th March last. The plans were presented to the Society of Jesus by

the sons of Mr. Wardell, two old pupils in the society's college at Stonyhurst, Lancashire. The style of architecture is the Early French, of the thirteenth century. It is built of bluestone, with freestone dressings. The arches supporting the nave are of freestone, and the pillars of bluestone. The floor of the church is to be inlaid with encaustic tiles, and the present altar, which is in French wood, inlaid with gold, will be only temporary, a more splendid one having to be substituted for it when the whole of the church is built. When completed, the building will be 130 ft. in length, but the portion finished and opened will accommodate 1,000 persons. Over the principal entrance the motto of the Jesuits, "*Ad Maiorem Dei Gloriam*," is engraved in freestone. It is proposed hereafter to complete the nave and aisles to their proper length, and to add a chancel, choir, lady chapel, sacristies, and to carry up the tower and turret to their proper height. An illustration in the spirited *Illustrated Australian News* gives the church as it will appear when finished. The cost of the portion just finished has been 9,000*l.* On the south side of the church the presbytery will be erected, in which will reside the Jesuit fathers connected with the mission. Mr. Denny, the architect, of Collins-street, was the gentleman selected to carry out the building.

The labourers who struck work at the Alfred Graving Dock, Williamstown, had not been able to arrange the difference between themselves and Mr. Irons, the contractor. They struck for the eight-hours system, which they saw had been adopted in branches of the public service, where day labourers were employed, and which was to be adopted under the contract about to be commenced for the construction of the first fifty-six miles of the North-Eastern Railway. They would not agree to a corresponding reduction in wages until the work was finished. They had come to words with the Short Hours League, which disapproved of their conduct. The case of the firemen and stokers employed at the metropolitan gasworks has recently been brought under public notice. They have at present to work twelve hours a day, at a very laborious occupation. The eight-hours system is gradually extending; the masons, bricklayers, carpenters, and others of the same class have long enjoyed it; and ordinary labourers and persons engaged in indoor trades are now beginning to assert their claim to a share in the benefits of the system.

In Brunswick, a mechanics' institute has been erected and opened. The designs and plans for the building were prepared by Messrs. Kelly & Bewick, architects. The estimated cost is about 2,000*l.* At present, the committee have been restricted to building the concert-hall, which externally does not present a striking appearance. The hall is 60 ft. by 30 ft., and 22 ft. high, with a capacious platform, a coved ceiling rising from a moulded cornice, with ornamental snailights, and ventilation obtained by Watson's cupola vents. The acoustic qualities are said to be good. Mr. B. Crooke is the contractor, and this portion has cost about 700*l.*

Clunes.—Two tenders for the supply of pipes for the Clunes Water Commission have been provisionally accepted,—viz., the tender of Messrs. Walker & Co., ironfounders, of Ballarat, to supply 2,672 tons of pipes and castings, for 27,497*l.*; and the tender of Messrs. McEwan & A. Macfarlane, to supply 2,067 tons of pipes, at 21,108*l.* There is a difference in the size of the pipes, and the commissioners have reserved to themselves the power of finally accepting which of the two tenders they please.

Birregurra.—Christ Church is an edifice about to be erected in Birregurra. It will be built of bluestone, in the Decorated style, the windows having freestone tracery and mullions. The church will consist of a nave, 47 ft. long by 24 ft. broad. The chancel will be 16 ft. square. The tower will be 15 ft. square, and the height will be 57 ft. to the parapet. The size of the vestry is 13 ft. by 10 ft. The contract has been taken by Messrs. Trevena & Gubly, of Geelong, at 1,998*l.*, without fittings. Mr. Terry, of Melbourne, is the architect.

Victorian Railways.—Tenders for the construction of the first four sections of the North-eastern Railway have been accepted, at the rate of 5,320*l.* per mile. As the work will be commenced almost immediately, there will be a demand for labour far in excess of what is at present available in the colony, and should Sir James McCulloch succeed with his plan of making at least thirty miles of railway every year, this demand will be pretty fairly maintained.

MR. THOMAS HAYTER LEWIS, *Professor of Architecture, University College, London.*

TASMANIA.

Mona Hall, the residence of the Hon. R. G. Kermode, is a mansion illustrated in a recent number of the *Illustrated Australian News*, which states that it lies half way between Hobart Town and Launceston, about a mile from the high road. There is nothing remarkably picturesque in the site, but the house itself is quite like an English mansion of considerable pretensions to architectural display, with porch and corridor, turret, &c. There are pleasant gardens and green-houses full of fruit and flowers, a goodly number of English trees, and a clear rapid stream running across the lawn, and forming beyond it a tolerably large pool, edged with willows of great growth. The proprietor is a Manxman by birth, and, it is said, must be the richest Manxman, not excepting the Goldie family, now in existence. His property on this spot is about 50,000 acres, and on it he has 20,000 sheep.

FREIBURG MINSTER.

The minster or cathedral at Freiburg in Breisgau is one of the finest (and was, until the recent completion of Ratisbon, the most perfect) cathedral in Germany. Although this church is of various dates and styles, there is a general harmony about the whole building, and its outline is so singularly beautiful, that this variety adds to its interest, without causing that want of unity which is generally so noticeable in buildings erected at different periods.

The earliest portions of the existing cathedral at Freiburg are the transepts and the lower stories of the towers, which rise on their eastern sides over the first bay of each choir aisle. The date 1152 is given to this part of the church, the style of which is late and rather rich Romanesque. Undoubtedly the whole church was once of the same style, but the original nave was burnt or destroyed in 1226, and was rebuilt as we now see it between the years 1230

and 1272. The lower portion of the great western tower is of the same date. The upper portion, or lantern, of the western tower (of which we give an illustration) is a work of the first half of the fourteenth century; but neither the exact date nor the name of the architect of this glorious work is known. The upper stories of the eastern towers and the spires with which they are crowned are probably of the same date. The present choir, with its aisles and beautiful ring of chapels surrounding it, was commenced in the year 1471, and consecrated in the year 1513. It was erected from the designs of Hans Neisenberger, of Gratz. The open porches at the ends of the transepts and the internal galleries in that portion of the church are works of the latter part of the sixteenth century. They are a strange but not unpicturesque jumble of Gothic and Italian architecture. This cathedral has escaped the fury of wars and revolutions, and has suffered less from modernisation than perhaps any other church in Germany; and thus it has been handed down to our time a perfect and most beautiful monument of the Middle Ages.

The exterior of this cathedral is hardly to be surpassed for richness and elegance. It possesses what is not to be found in any other cathedral in Europe,—three open-work spires. The western one, which is by far the largest, is 386 ft. high from the ground; the others are about 170 ft. each; so that when viewed at a distance they appear rather to form appendages to the western tower than separate spires. We think it cannot be denied that of all "open-work" spires in existence the western spire of Freiburg is by far the most beautiful; its outline is far more graceful than those of Strasburg or Vienna, and its details are much earlier and purer than that of Chartres. The two open-work spires at Bourges are ruined by the "pepper-boxes" which crown them. The spire at Thann is too open, that at Merseburg too clumsy. St. Gertrude's, Louvain; St. Mary's,

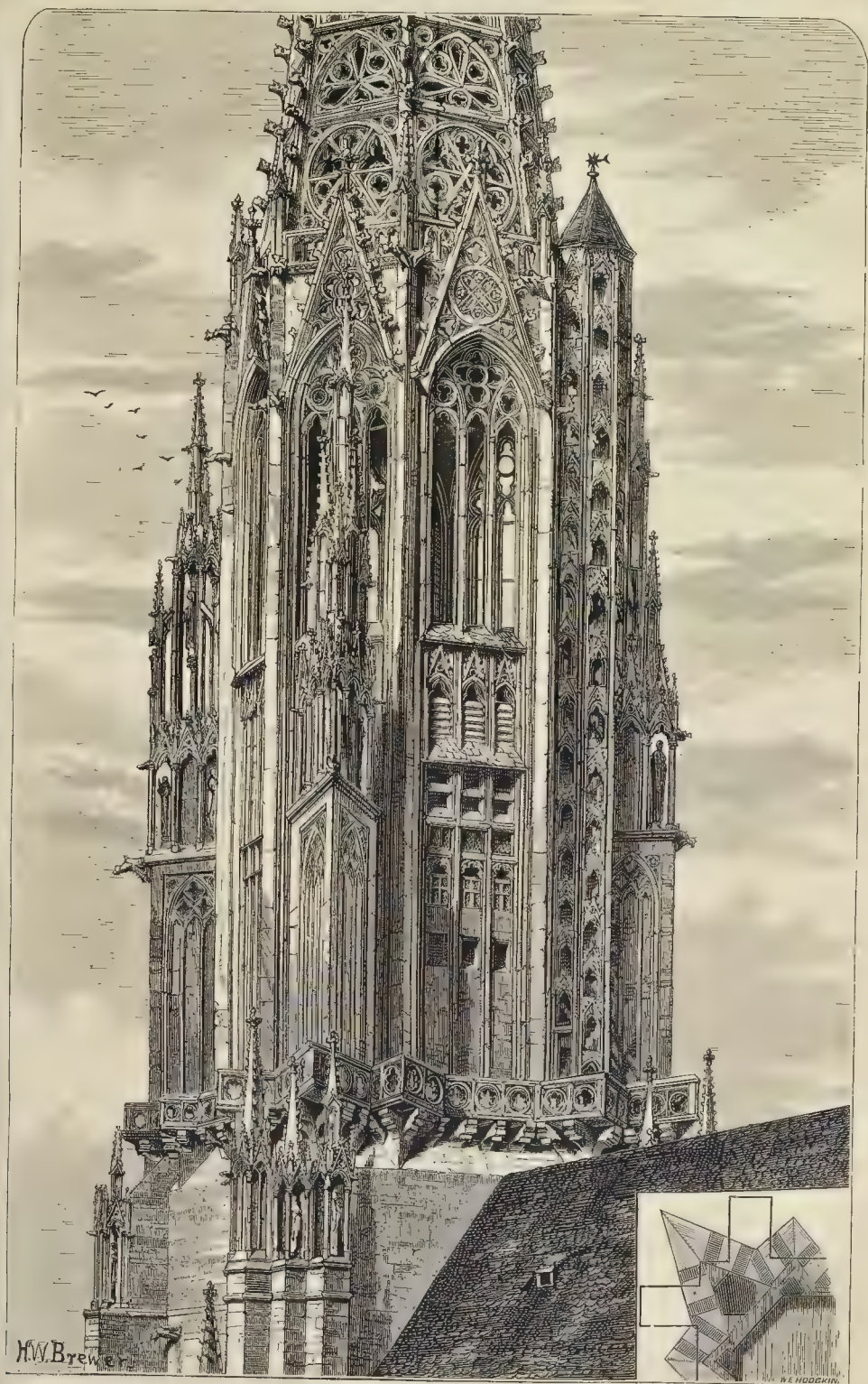
Würzburg; St. Mary's, Esslingen; and St. James's, Rothenburg, are nearly ruined by the size of their finials and crockets. The spire at Maria Zell is nearly as beautiful in outline, but is inferior in detail to that of Freiburg. Another reason why the spire at Freiburg has such a much more satisfactory appearance than any other open-work spire, is the fact that the tracery composing the Freiburg spire is so very thick and solid, that, when seen from below, no light is seen through the spire, and all the openings tell dark instead of light, which gives great richness to the spire without producing that weak birdcage-like appearance which is so fatal to Strasburg and Antwerp.

The flying buttresses supporting the clearstory walls of the cathedral at Freiburg are very fine examples: it is singular that they nearly all differ in design. We will hereafter give illustrations of two of them.

The arrangement of the apse and "chevet," also demands notice. Each face of the apse embraces two chapels instead of one; and the flying buttresses are carried up in pairs, so that two support each angle of the apse. The arrangement is very original and picturesque, and overcomes the great difficulty of the radiating bays of the aisles which generally cause the chapel spaces to be of a greater width than is either necessary for convenience or picturesque.

The whole church is built of a most beautiful red stone, which has assumed a charming tint, and is overgrown with rich golden lichen. The roof is composed of glazed purple and green tiles, arranged in a lozenge pattern.

It is not our purpose to give any description of the interior of this beautiful church, as the interior, together with its fine old altars, pictures, and stained glass, is described in a previous volume of the *Builder*, which also contains a view of one of the beautiful fountains, near the cathedral, and a few observations upon other buildings in the same town.



FREIBURG MINSTER, GERMANY.

THE THEORY OF "RESTORATION."

SIR.—It is, perhaps, rather late in the day for the discussion of this subject, seeing that a very large proportion of what we can possibly do in the way of architectural restoration, within the boundaries of this country at least, has already been accomplished. This section of architectural practice is strictly limited, if by no other prior consideration, at all events finally by the number of old buildings existent to be restored.

A great majority of our principal Mediæval structures have been, or are now being, passed through the crucible, and the army of restorers are already beginning to feel the deficiency of material on which to operate, and (like the children of Israel, compelled to gather stubble instead of straw), have shown symptoms of turning their attention to the structures of the Renaissance period (the City churches of Wren, for instance), which some years since it would have been considered evidence of infatuation on the part of a Gothic architect to regard with any intentions short of utter demolition. Indeed, it may be doubted whether, considering the nature of the operations sometimes included under the general term "restoration," the restoring of classic structures may not be compatible with the purest Mediæval enthusiasm, and be looked upon as a new and ingenious method of carrying the war into the enemy's country. The possible onslaught upon the City churches by an army of shamers, darkly hinted at not long since at a meeting of the Institute, is at least an alarming prospect for the admirers of Wren; and it is to be hoped that, in the event of such onslaught, the attacking party will remember the advice given to Caleb Balderstone, when about to commence his destruction of the best crookery in Ravenswood:—"Lord-sake, try your hand on the devil-ware!" And the Mediæval restoration, so actively carried on for some time past, has certainly had its own abuses to answer for. With the recognition of the fact that the Mediæval period, though far removed from our present life and thought, had in it really much that was of value, and not to be forgotten, here naturally came the wish to render safe and stable such of its monuments as were tottering, and to restore to their original aspect such as had been disfigured. There was a large field for what had to be done must be done quickly; and some zealous and industrious spirits, who went into the matter heart and soul, soon found themselves floated thereby into reputation and prosperity on the tide which they had taken at sea flood. Restoration was speedily established as a good speculation, and, like most other things which had proved a success to individuals, soon became a matter of fashion with amateurs, and of business with architects. How much this latter has been the case, how many "jobs" in the way of restoration have been invented and carried out by enterprising architects, has, probably, not been suspected by the amateur committees who have been the willing dupes of self-foisted enthusiasm. As a matter of fact, however, the "reports" of architects wishing to restore a church have sometimes displayed as much imaginative faculty as would set up most contemporary poets. One such document, for instance, sent to the writer with the (futile) object of coaxing a subscription, set forth, in flowing language, the former condition of the edifice, comparing it to "the king's daughter, glorious within," and dwelling upon its rarer beauties in language that would certainly have led any reader to suppose that a noble thedral, slightly dilapidated, was the object of the call on his purse. The building to be operated upon was, in fact, a small village church, possessing not the slightest feature of trend beyond two small and dilapidated windows of late fourteenth-century date, all the rest of the most debased Gothic period, scarcely mingled within the range of "Gothic" at all, and which hardly a stone to indicate what might have been on the site formerly. To offer to "rebuild" such an edifice would have been reasonable enough; to talk of restoring it was an absurdity, by no means uncommon, misuse of language: it most of us are more or less governed by words; and to "restore" was the order of the day. I cannot help thinking, however, that, before carrying the restoration movement into new fields, it might be as well to consider for a moment what the object of restoration is, or ought to be.

There are several possible objects in such a case. One, of course, is to make a purse for the architect; a second (which is like unto it), is to

gain credit for those who have filled the purse, who can then see it stated, on a brass plate, how John Smith and others restored this church in the year —, at their sole expense, and "to the glory of God." A third object is, to render safe and more permanent an old building which is falling to decay, both with the view of rendering it habitable and of preserving it as a monument of interest; and a fourth is, to render it exactly as it was, or as it may be guessed to have been, at some particular former period. These two latter motives are not unfrequently combined to some extent, in an illogical and inconsequential manner. What may be called more "constructive restoration"—i.e., where a building is in the main stable and in good preservation, and only partially decayed here and there,—is a comparatively simple matter. The manifest course then is merely to reinstate, or (in builder's phrase) "make good" the parts that are decayed, in their original form; renew a few stones here, a beam there, and so on, only to the extent demanded to insure the requisite durability; the more sparingly the better, so long as this end is attained. But it seldom happens that a building of any interest is found in this comparatively well-preserved condition. In most cases, some portions are in such a condition that absolute pulling down and rebuilding are necessary, or, at least, prudent; and here the duty of the restorer becomes much more complicated. It is necessary in such a case to discriminate between those of architecture and those of archaeology.

Where, as in rare cases, these coincide, the problem is again a comparatively simple and straightforward one. Were such a work to be undertaken, for instance, as the restoration of the Parthenon on its present site, the object in such a case, where the original building is a homogeneous design, complete in itself, and of which we are in possession of data for nearly every detail, would plainly be to reconstruct the building after the design of and in the material employed by the original designer. But among the monuments of the only age of great architectural invention in our own country, it is rare to find a building thus complete in itself, or with the original design left intact. Built in an age which was, by comparison, scientifically, as well as intellectually, barbarous, some of the best structures of ancient English architecture have probably never existed as homogeneous and complete designs at all; very few have been left so, or with sufficient data to show us what the original design may have been. In some cases, from lack of funds, and from the time occupied in building, in what we may term the "pre-contract period," only a portion of the projected edifice has been planned and erected, the remainder being left to be added at a future period, before the arrival of which the style in practice had materially altered. In other and more numerous cases, failure of the foundations, bad masonry, or other sources of decay, have necessitated the rebuilding of parts of what may have been once a homogeneous design; and, as we all know, such rebuildings have almost always been carried out in the style or manner in vogue at the period of their re-erection, with careless and almost defiant neglect of anything like harmony of design with the portions left standing. This system has deprived our national architectural monuments of some degree of artistic beauty and completeness, compensating, however (in the eyes of some of us, more than compensating), for this defect by a consequent increase of historical and associated interest, not to say even of picturesque effect. Now, how should an architect treat such a building when it becomes necessary, through dilapidation and weather wear, to restore portions of it? When the repair is only such as to effect isolated details of the building (tracery of windows, &c.) such details must, of course, be restored in the style harmonising with that portion of the building to which they belong, or with which they are most closely connected; and it may be quite legitimate in such a case to place new tracery in the thirteenth-century style in one portion of a building and tracery of the fifteenth-century style in another portion. But in a case where, for instance, there is a transept of a different date and style from the rest of the church, which it becomes necessary entirely to rebuild, how should it be treated? Surely it is the modern architect's duty in such a case to rebuild the transept as nearly as possible in the style and manner of the bulk of the building. This applies equally in cases where the portion to be rebuilt has been older, or where it has been later

than the rest. For consider a moment how this discrepancy of style in the same building has really arisen.* Suppose a church of thirteenth-century date with a Norman transept; why has that transept been left by the thirteenth-century architect who rebuilt the rest? Almost certainly, from mere motives of economy; it has probably been the portion of the old building in better preservation than the rest which has been pulled down; just, as at present, a man who is building a house on an old site frequently leaves a part of the old house to be worked into the new, not because he thinks it will look better so, but because it is not worth while to pull down and rebuild what is still solid and durable. It must be remembered that there is very little evidence that the feeling and the science which we call "archæological" existed at all in the Middle Ages; there was too little knowledge of history, and the every-day needs of the rough and turbulent life of those times pressed too closely on men to allow of much opportunity or temptation to antiquarian study. Then (to return to our imaginary restoration), suppose our transept to be rebuilt has been a piece of fifteenth-century work added to the rest, is the architect who has to rebuild it to affect also to be a fifteenth-century man? Was it not, in fact, a certain want of good taste on the part of the late architect, who had to complete the work of his predecessor, to make a piece of patchwork of it in order to suit his own ideas of detail, instead of carrying out the design as its original architect or architects would have carried it out? And why is the modern architect to imitate him in this? The plea put forward for such a proceeding always is that of archæological interest—of preserving the traditions of the building, &c. This is a manifest fallacy: you cannot preserve the archæological interest. Once take away the actual building, the actual stones which the fifteenth-century workman passed under his chisel, and the real archæological interest is gone for ever; you cannot possibly revivify it by a modern copy. But the architectural beauty of a design is indestructible; you may build the same design twenty times, and if it be a really fine architectural conception to begin with, it will be equally fine on the twentieth repetition; whereas to reproduce the architectural discrepancies arising from admixture of various dates of architecture is simply to perpetuate an architectural defect, while withdrawing from it the only element of interest, that of historical truth, which could atone for the discrepancy.

In illustration of this point may be adduced two instances (among many), in two of the largest parish churches in England, where this method of treatment has resulted in architectural defect of a serious nature. The splendid church at Nantwich, in Cheshire, the nave of which is of early thirteenth-century date, had originally a very low clearstory (if any), and a high-pitched roof over the nave; but at a very late date the clearstory walls were raised to carry a low-pitch roof, and pierced with singularly ugly windows, with a flat three-centred arch. When the church was restored, a good many years ago, the clearstory walls were, it must be supposed, very dilapidated (I never saw the church previously to restoration), and they were, if not rebuilt, entirely refaced at considerable expense, and a new roof of corresponding "date" placed over; and thus, with the best possible excuse for getting rid of it, the only blot on this beautiful church has been deliberately perpetuated, and the chance lost of restoring it to its original completeness and unity of design; for the chancel, though of later date than the nave, is only so much so as to give that greater degree of richness of style which is quite fitting in such a position. Recently the reverse mistake has been made in restoring the large Church of St. James, Bury St. Edmund's, a building of a late date, and mostly bad in detail; but the nave arcade of which is striking, from its length and lofty proportions. Over this has been placed a high-pitched hammer-beam roof, looking exceedingly heavy, and the lines of which are absurdly out of keeping with the four-centred west window below. The same view of the subject, which would condemn such restorations as these, is also the condemnation of the numerous instances in which restorations are made of some eccentric or unusual feature of a building, which sometimes is not even visible at the period of the restoration, but which it is supposed must or

* Our correspondent is speaking only for himself.—Ed.

Evidence having been taken on both sides, the judge said there were two questions for the jury to consider, first, whether the invention was new; and second, whether the defendant had infringed it. They had to consider whether the invention was new in its structure or in the arrangement of its parts, so as to become more beneficial to the public than any other that was known before. If it was new in that sense, then it was a proper subject for a patent, and if they were satisfied of that, then they would find

for the plaintiff on that issue. If it was not new in that sense, there was an end of the case. If it was, the jury would then compare Mr. Newton's stench-trap with Mr. Halbard's, and say whether the two were alike or different in construction and plan.

The jury gave a verdict for the plaintiff on both issues, stating that they were agreed that the principles of Mr. Newton's plan were such as to make it a new invention, and advantageous to the public; and that Mr. Halbard's was inferior, but differed so little in its mechanical arrangement as to make it an infringement of Mr. Newton's patent.

FALL OF A CORNICE IN NEWCASTLE.

MR. CHRISTIE writes to question the correctness of an account in the *Builder* of the 23rd ult. of an accident which occurred at a new block of buildings in course of erection in Gallowgate. He says:—

"It is not true that the 'foreman receives his instructions from the printer and stationer for whom the building is being erected.' On the contrary, there is an experienced clerk of works employed on the building, appointed by, and directly responsible to the architect who prepared the plans. Whether proper instructions were given him, and, if proper, whether they were carried out, is another matter; but the 'printer and stationer' referred to took no supervision of the building (if by any perversion of language it can be so called), other than supplying the requisite funds to carry it on."

STATE ARCHITECTS.

Sir,—The result of recent deplorable acts as to the architect of the Houses of Parliament is this, that instead of an architect being appointed to carry out the proposed alterations and additions to the Houses of Parliament, an engineer has been called in, and the late architect's designs and drawings are availed of. It is not my purpose to pass censure or comment on any military man or engineer, but it is distressing that in a country like England you have no established State architect attached to the Crown, as was formerly the case as regards Sir C. Wren, Inigo Jones, Vanbrugh, &c., although you have distinguished men attached to the Royal Academy. How different is this from France, the German States, and elsewhere. We are living, it is true, in a more enlightened age than fifty years past, and the study of the fine arts is better cultivated than it has been for the last century, and the step now taken by the Royal Academy is a step in the right direction, whereas architecture as an art has been so much neglected.

The laudable and affectionate undertaking of her Majesty in the Royal Mausoleum at Frogmore, convinces me at once that had we a palace worthy of its name, neither her Majesty nor the Royal Highness the Prince of Wales would be wanting in good taste to patronise every branch of art; but so long as the parsimonious feeling exists of dispensing with what is just and right, and the place of an architect is supplied by a military engineer or clerk of the works, so long will there not be any proper encouragement given to art.

AN OLD SUBSCRIBER.

THE BELLS OF THE CHURCH OF ST. NICHOLAS, LIVERPOOL.

I AM glad to find that "An Architect," whose communication on "Bells at Liverpool" appeared in the *Builder* recently, takes a lively interest in the subject. But, in very properly correcting the error of another writer, he has himself made a mistake. The present twelve bells at the parish church of St. Nicholas were supplied partly in 1628 and partly in 1725, as your correspondent intimates. They were all made in the present century.

As a most lamentable catastrophe associated with bull-ringing, occurred at this church about thirty years ago, the following particulars, including a brief history of the bells, may be acceptable:—

It appears that a peal of six bells—weight of 15 cwt. 1 qr. 12 lb.—was placed in the old tower of the church in March, 1725, where they remained in use for many years. But on Sunday, February 11, 1810, during the ringing of that peal for morning service, the spire suddenly fell with a tremendous crash into the body of the church, and thus upwards of twenty persons were killed. The fall of the spire was accompanied by that of a portion of the tower containing the bells. It is, I think, important to add, that the tower was a piece of patchwork.

The foundation, it is said, was at least as old as 1860, and upon this foundation the upper part of the tower and a lofty spire had been built in the year 1746.

A new tower was subsequently erected, and furnished with the present peal of twelve bells in the key of C, the weight of the tenor being 41 cwt. These bells were cast in 1813, by William Dobson, of Downham, Norfolk, and severally inscribed as follows:—

1. [This bell had no inscription.]
2. GIVE NO OFFENCE TO THE CHURCH.
3. MY TOWER I'LL RAISE THE LORD TO PRAISE.
4. W. DOBSON, FICHT, DOWHAM, NORFOLK, 1813.
5. CAST BY W. DOBSON, OF DOWNHAM, NORFOLK, A.D. 1813.
6. OUR VOICES SHALL WITH JOY RESOUND.
7. PROSPERITY TO THIS TOWN. W. DOBSON, FICHT, 1813.
8. MY SONG SHALL ALWAYS BE OF THE LOVING KINDNESS OF THE LORD.
9. I WILL GIVE THANKS UNTO THE LORD.
10. BLESSED IS HE THAT TEMPERETH MERCY WITH JUSTICE. SAM'L STANFORD, ESQ., MAYOR.
11. GEORGE NELSON AND JOHN CARTER, CHURCH-WARDENS; JOHN SWAINSON AND CHAR. CLEMENTS, JUNR., SIDEMEN; ANTHONY BLACK AND JOHN ALDERSON, OFFICERS.
12. MAY ALL THAT GO TO THE SILENT TOMB, BE CROWNED WITH GLORY IN THE WORLD TO COME.

The new bells were opened by fourteen members of the Birmingham and Sheffield societies of change-ringers, with a fine "touch" of 3,000 grandiose cinquos, on the 4th of June, 1814.

THOMAS WALESBY.

CHURCH-BUILDING NEWS.

Great Ashfield.—The parish church has been renovated and reopened. The work already completed has been done by Mr. Simpson, of Stowmarket, under the direction of Mr. Jackaman, of Bury; and its most important feature is the almost entire rebuilding of the chancel, in which the original design has been generally adhered to. Lord Thurlow, the lay impropror of the rectorial tithes, superintended this portion of the work himself, and is, we believe, the designer of the new east window, of three lancet-shaped lights, which supersedes one in a different style, but accords to some extent with those on the south side of the chancel. A new roof of pine, at present unstained, has been placed on the chancel in place of one which had fallen into such a state of decay that repair was impracticable.

The unbattled cornice is, however, retained. On the north side of the chancel a narrow lancet window, filled with coloured glass, has been inserted; and on this side also a vestry has been erected in line with the north aisle, at the west end of which a space has heretofore been enclosed for the use of the minister, &c., but this has now been thrown into the body of the church. The vestry is entered from the chancel, and is lighted by three windows, on the east, north, and west, the latter having been one of the exterior windows of the church prior to the recent alterations. The vestry (which is roofed with some of the old timber from the roof of the chancel) contains two parish chests, the more ancient of which is of unusual dimensions, being more than 6 ft. in length. The south wall of the nave had departed considerably from the perpendicular, and it has therefore been entirely rebuilt from the chancel arch to the south porch. The whole of the interior stonework has been cleaned of its many coats of whitewash, and many of the windows have been newly glazed, but there appear to be no remains of ancient glass. The pews that remained in the interior of the church, some of them of ponderous dimensions, have been cleared away, with other incongruous lumber, and open benches (a few of them of oak and the rest of pine) have been erected in their stead. The organ, which up to the present time has blocked up the entrance to the tower, now stands in the south-west angle of the nave, between the porch and the tower arch. The tower, which contains a peal of five bells, is thus thrown open to the church, and a decorated window, of bold tracery, is disclosed to view. The floor of the nave and chancel (without the altar-rail) is of common brick, and uniformly level. The roof of the chancel is covered with red tiles; the roof of the nave, which is covered with lead, did not, we believe, require repair. The churchyard has been levelled where necessary, the paths are newly gravelled, and the ground adjacent to the church reduced to a uniform level. The expense of the restoration (leaving out of the question such portions thereof as are the result of private munificence) has been met partly by a voluntary

rate on the parish, partly by Mr. H. Milbank, and partly by Lord Thurlow.

Conington, Cambs.—The parish church has undergone a reparation, and been re-opened for divine service. The restoration (with the exception of the chancel) is confined to the interior. Commencing at the east end, the chancel has been entirely rebuilt, and on the extreme eastern end is a stone cross—the *fac simile* of one found in the walls of the old chancel. All the outside stone or rubble was formerly the filling up of the interior wall of the chancel. The new chancel (which has been widened 2 ft.) is, in point of fact, intended as the nucleus of a new church. This part of the restoration is adorned with stained glass windows by Wailes, of Newcastle. The east window has three lights, and the representations are the Crucifixion, Resurrection, and Ascension. Another design is intended to picture Christ walking on the sea. The Bishop of Grahamstown presents a stained window, representing Christ blessing little children. The other is a scrap window, which is explained by the inscription, "Vitrum antiquum hujus ecclesie," encircled in the centre of each light. The roof of the chancel is of stained deal. On the south of the chancel, in a recess, stands a small organ. The communion-table was executed by Messrs. Rattee & Kett, of Cambridge, as likewise the reredos, which is made of alabaster, and designed by Mr. W. M. Fawcett, of Cambridge. The oak seats, communion-rails, and choir benches, were also the work of Messrs. Rattee & Kett. The flooring of the chancel is of plain tiles, with the exception of that portion in front of the table, which is composed of encaustic tiling. The nave is the next feature, and to complete the work it is thought that the facing of the outer walls ought to be removed and supplied by rubbing, so as to correspond with the remainder of the structure. The nave has been newly floored, partly re-seated with oak benches, and partly with chairs, and the walls have been renovated. An organ gallery, which formerly stood at the west end, hiding the western arch, has been cleared away, and other alterations made as to the means of ingress. This has brought to view two marble monumental tablets. A feature of the nave is the display of monumental marble tablets of which there are eight, the most remarkable being that by Gibbons, to the youthful grandson of Sir Robert Cotton. The restoration has entailed an expense of about 600l.; but 600l. excluding the windows. A considerable sum is yet needed to complete the seating, and (what is contemplated) to replace the nave roof. The architect for the restoration has been Mr. W. M. Fawcett; the builders were Messrs. Bunting & Son, of St. Ives; whilst Mr. Wrighton, of Godmanchester, did the stone work.

Haikham.—For some time past the vicar of this parish, the Rev. G. G. Harvey, has been making great efforts to raise the funds necessary to completely restore the parish church, which had gradually fallen into a sad state of dilapidation. Last year, with the assistance of others who have also devoted themselves to the good work, the rev. gentleman succeeded in collecting the sum of 1,000l., which has already been laid out on the work. The church consists of nave, aisle, north and south chapels, chancel, &c., with a tower at the west end; but it is evident from the present state of the edifice that a very large sum of money will be required to restore it to the condition in which it existed about four centuries ago. At the present time the tower is blocked up, and the roofs of the nave, chancel, and chapels, &c., are all plastered. The traceried heads of all the north aisle windows in past years were destroyed, and a lean-to roof erected; possibly the walls were in such a bad state that all that portion was taken down and covered over, regardless of everything except expense. The old south aisle was even in a worse condition, being merely brick walls, with huge square openings, filled in with wood frames and glazed. The committee have carried out the restoration of the south aisle and porch; the walls of this part are erected with Eastbourne local stone, and pierced with No. 3 three-light perpendicular windows; the walls are covered with an open-timbered tie-beam roof, with battlemented cornice, and match boarded, the whole stained and varnished, and externally is covered with milled lead. The porch is carried out with a feeling for old work. The architect proposes that the tower should be opened, all the sittings re-arranged, the roof raised, and coupled clearstory windows formed, the chancel, which is now nearly filled with sittings, made in union

with other work, and the lath and plaster partitions, which at present disfigure some of the arches, give place to oak screens. The work has been carried out from the designs of Mr. H. Eucan Rumble, architect, Eastbourne, and under his constant personal supervision, has been done by Messrs. Avis & Roe, builders, Hastings. It is estimated that to thoroughly restore the edifice, according to the plans of the architect, the further sum of 2,000*l.* is still required to be laid out.

Ipswich.—A meeting of the parishioners of St. Margaret's, Ipswich, has been held to consider what steps should be taken with reference to the tower of the parish church, the upper portion of which has been found in a very bad, and even dangerous, state. It was resolved to obtain the money requisite by borrowing, repaying by instalments from the offertory. The cost will be about 310*l.* in all. A building committee was appointed.

Dorking.—The chancel of St. Paul's Church has been re-opened for divine worship, after having undergone a change in its architectural and decorative appearance. A new arch has been erected between the chancel and nave, with mouldings and foliage, supported on Devonshire marble columns with foliated capitals. A new east window of the Decorated period has been substituted for the one removed, containing five lights. The north and south windows have all moulded internal arches supported on stone columns in lieu of the plain splayed jambs. The reredos is in Caen stone, supported on Devonshire marble columns, with foliated caps. The interval walls are all ashialed with polished alabaster. The pulpit is carved in English oak, supported on a base of Caen stone, with carved capital supported on a centre column of Caen stone, surrounded by four smaller columns of polished marble. The reading-desk is in English oak, with carving in relief. The altar railing consists of a series of arches, supported on spiral shafts terminating with foliated caps; this is constructed of English oak. The floor of the chancel has been laid with Maw's encaustic tiles. The roof has also undergone some improvements, by having a new perforated carved wood cornice at the top of the wall plate, and several cusped wind braces have been introduced. The stained glass is by Clayton & Bell. The east window consists of five lights, with tracery of Decorated character, the five principal openings containing representations of the Nativity, with magi and shepherds in the act of adoring the infant Saviour, while the upper or tracery lights are figures of angels, and ornaments of a suitable character. The three small windows contain the Raising of Jairus's Daughter, the Agony in the Garden, and a figure of St. Paul (the patron saint of the church) respectively. The existing old deal stained seats looked very poor by the side of the oak work. The entire cost of the work, somewhat exceeding 2,000*l.*, has been defrayed by Mr. Thomas Stillwell, of Trarshurst. The architect was Mr. Benjamin Ferrey, of London; the builder, Mr. William Shearburn, of Dorking.

DISSENTING CHURCH BUILDING NEWS.

Beaumaris.—An English Presbyterian chapel, the cost of which has been mainly defrayed by the Calvinistic Methodist Home Mission Fund, has been opened here. The building stands upon a site in Church-street, adjoining the market, given by Sir Richard Bulkeley, bart., who also was a liberal contributor in money to the cause. The ground upon which the chapel stands has historical interest, as the site of the old palace (Hên Bîs) which, until Baron Hill was erected, was the residence of the Bulkeley family, having been built about the year 1496. This relic of antiquity having become in a very dilapidated state, was pulled down about a year since. The chapel was designed and carried out under the superintendence of Mr. R. G. Thomas, of Menai Bridge, architect, and the style of architecture adopted is Early English. The walls are built of rubble work, faced internally with bricks, and plastered; faced on the outside with Pennsylvanian stone, all the dressings being of Bath stone, from Messrs. Bandel & Sanders's quarry. The carving was done by Mr. Robert Evans, of Menai Bridge. Externally there is a dwarf wall, with stone coping and light iron railing to the front and one side. The east end of the building, which fronts to Church-street, has an entrance-porch in the centre, over which is a large four-light window, having foliated caps and bases, and one single-light

window on each side of the porch: the sides are divided into four bays by buttresses, with a two-light window in each bay, with moulded labels and carved bosses. The gables are surmounted with iron Medieval finials. Internally, the dimensions are 47 ft. by 28 ft., and will seat about 200. The roof is divided into four bays. The ceiling, which is of wood, is diagonally framed with moulded ribs or pendant moulds, planted on, and follows the curve of the inner principal. The seats, which are of pitch pine, are open, with low sloping backs, and divided by a broad aisle, in which loose benches are placed. The windows are glazed with rolled plate glass, of greenish tint, supplied by Mr. Forrest, of Liverpool. The porch, which is in the east end, is 13 ft. by 5 ft., and is paved with Messrs. Muir & Co.'s encaustic tiles. The cast-iron work was supplied by Messrs. Macfarlane, of Glasgow, and the gas standard and ornamental wrought-iron work by Mr. J. W. Dovey, of Manchester. The contractor for the whole of the works was Mr. John Pritchard, of Gaerwen, the mason being Mr. John Jones, of Beaumaris. The cost of the building and wall in front and side was under 900*l.*

Great Yarmouth.—The new church recently erected by the Congregationalists at the entrance to Middlegate-street has been formally opened. The total cost of the building, with furniture, adjoining land, &c., was 3,515*l.* A balance of 457*l.* 14*s.* 6*d.* has to be provided, after mortgaging the building for 1,000*l.* The pulpit was presented by the architect, Mr. J. T. Bottle. The contractor is Mr. William Hood, of Norwich. The sub-contractors being Messrs. Burgess, Dumbarton, Sargeant, and Barge, all of Yarmouth.

Low Moor.—The foundation-stone of a Primitive Methodist chapel has been laid at Low Moor. The edifice will be in the Italian style of architecture, from the designs of Mr. Mark Brayshaw, at the estimated cost of about 2,000*l.*

Reading.—The foundation-stone of a new Baptist chapel has been laid in Tappend-street, by the Mayor. Mr. C. G. Searle, of London, is the architect. The site is on the eastern side of the street, and comprises a frontage of about 50 ft., and a depth of nearly 100 ft. The foundations of the outer walls are in course of construction, so that the proportions of the building could be easily seen. It will seat about 450 persons. The total cost of the erection will be 2,247*l.*, and of the site, 365*l.* If galleries are erected, 150*l.* more will be required for the erection.

Walthamstow.—The memorial-stone of the new Congregational church, Marsh-street, Walthamstow, has been laid. The church will cost about 4,500*l.* Most of the money is promised or paid.

Swansea.—The Zoar Chapel, just erected by the Welsh Congregationalists, at the top of High-street, Swansea, has been opened. The style of architecture adopted is Grecian. The architect is Mr. John Humphrey, of Morriston; and the builders are Messrs. Thomas, Watkins, & Jenkins, of this town. The total cost of the whole building is about 2,400*l.* The interior length of the chapel is 63 ft.; width, 36½ ft.; and it will seat about 1,000 persons.

SCHOOL-BUILDING NEWS.

Shawfoot (Carlisle).—The foundation-stone of Shawfoot Schools has been laid. The schools are to be built from a design by Mr. J. Stewart, of Carlisle, architect. The schoolroom, classroom, and master's house will form one line of building facing the road.

Hackney.—The memorial-stone of a school, which has just been erected in the rear of Grove-street Chapel, South Hackney, has recently been laid. From the report of the building committee it appeared that the sum of 210*l.* 12*s.* 6*d.* had been "lying in a napkin" for some time, when, at a church meeting held in November last, certain friends were nominated to act with the pastor, teachers, and committee, for the purpose of erecting Sunday and day schools. According to the estimate of the architects, Messrs. Searle & Son, accommodation had been provided for 350 scholars. It was estimated that the entire cost of carrying out the work would be 520*l.* towards which 273*l.* 8*s.* have been given or promised.

Highgate.—Miss Bardett Coutts has laid the foundation-stone of the National Schools for St. Anne's, Highgate Rise, the site for which she had herself presented to the promoters.

Leek.—A new boys' school and lecture-room

is about to be erected in connexion with St. Luke's Church, and the existing school-buildings will afterwards be used for girls and infants only. The total outlay will be about 1,200*l.* Mr. Saggden, of Leek, is the architect. The corner stone of a new building, intended to serve the double purpose of a ragged school and mission chapel, was laid in Leek on the 30th ult. The design is of plain Early English character, and to be executed in red brick, with stone dressings. The building will be two stories in height, the lower story for school purposes, and the upper for the chapel, the latter with a gallery at one end, and class-rooms under. The chapel will be mainly lighted from the roof, which will be open for about two-thirds its height, and a platform will be substituted for the usual pulpit. The works are being done by local builders.

Islington.—The foundation stone of St. Bartholomew's New Schools, Shepperton-street, New North-road, have been laid by the Earl of Harrowby. The schools will be Gothic in architecture, with a bell turret, and will afford accommodation for between 400 and 450 children. There will be a class-room in the basement, 17 ft. by 33 ft., and a private room adjoining, 17 ft. by 12 ft. Over this class-room will be the boys' school-room, 35 ft. by 45 ft., and at the top, the girls' school-room, of similar dimensions. There will be a separate entrance for boys and girls, one on each side of the building. The contract price for the building is 1,800*l.*, but with furniture it is estimated to cost 2,087*l.* 10*s.*, of which 1,380*l.* have been subscribed. The schools will be ventilated by air flues below the floors, and for heating the place the apparatus of Messrs. Pearce & Co. will be used. The church of St. Bartholomew, with which these schools are in connexion, was consecrated about three years ago. Mr. Clare is the architect; Messrs. Hill & Son are the builders.

FROM SCOTLAND.

Braemar.—The new church at Braemar, which was commenced about a year ago, has been opened for divine service. The cost of the church and spire is about 2,212*l.*, but the subscriptions are about 1,000*l.* short. The building is in the Early English style, cruciform in plan, with semicircular apse, north and south transepts, north circular apse, and west porches, and tower and spire. The length of the church inside is 84 ft.; width, 31 ft.; and breadth across transepts, 44 ft. A small gallery is placed across the west end; and the church and gallery will seat 450 persons. The nave and transepts are separated by double arches, supported on columns of polished red granite, with grey granite moulded capitals and bases. The apse is divided from the nave by a moulded arch springing from ornamental brackets in Parian cement. A carved pulpit is placed at the entrance of the apse, with a Communion-table and railing in front of it. The sittings are in the latest style, with low sloping backs. The ceiling is wagon-headed in form, and divided into panels, each of which is tinted of a light cream-colour, with a stencilled border in colours. The windows are simple trefoil-headed lancets, filled with cathedral glass, and with a border of dark red stained glass. The tower and spire, which together rise to the height of 112 ft., contain vestry and belfry. Above the belfry the spring of the spire is marked by four granite pinnacles and four gables, containing the clock-faces. The materials used in the construction of the building are blue "trap" and grey granite, a contrast in colour being thus obtained. The church has been fitted with a patent hot-air apparatus; and arrangements are made, so that in winter the greater portion of the nave may be shut off. The architect is Mr. Robert Lamb, of Darlington.

Books Received.

A Treatise upon a Simple Method of Constructing Fire-Proof Buildings; also showing how to Build without Timber or Girders of Iron. By G. BURCHETT. London: Houlston & Sons. 1870.

RATHER more promise than performance. Mr. Burchett complains that in all the fire-proof schemes in vogue, the immense expense connected with their construction, together with the great weight thrown upon the walls, prevents their application to any common build-

ings: that the use of iron girders and joists filled in with brickwork has been found to prove very insecure, and when filled in with concrete, far too heavy and cumbersome for general use. Further, that all the various combinations of the above materials used are more or less cumbersome, not to say clumsy,—and most costly.

His own scheme, as he calls it, is,—

"To turn a brick or tile arch under every floor, impervious to fire, and to form the staircases upon segmental arches springing from the floor-arch up to the walls, or to the next floor, as may be required, according to the size or plan of the building. In detail, for a first-class house, I propose to arch over the basements either in the way I recommend for the other floors or in the old-fashioned way with groined arches.

The other stories arch over with a graceful, semi-elliptical curve, springing where practicable from each of the walls in the same way as a coach-head trimmer."

The best materials at hand for this, he considers, are the common vertically-perforated bricks; laid flatways, or, better still, hollow terra-cotta or stoneware, in two plates with ribs, and the lower plate perforated, jointed with Portland cement; and in large rooms one or more courses of plain tiles on the top.

Where boarded floors are desirable, "the arches may be turned, as before described, and the spandrels levelled out, well tied into the walls, and built up with them, so as to make the arch as much as possible like a bracket from each wall," and then small soundings may be laid to attach the floor-boards to. When speaking of forming wholly fire-proof buildings, he suggests the use of iron ties across the structure, 2 in. to 3 in. wide, by from 1 in. to 2 in. thick, placed immediately upon the arches (?).

Very few of our readers will need telling that there is nothing new in what is good of this plan, and that the objections to the other modes mentioned by the author apply against his; but these ought not to be fatal: the walls should, if needed, be prepared for the strain that will be put on them, the extra height required to admit of the vaultings should be given, and the increased cost incurred; and we notice his pamphlet to keep before the eyes of those about to build the necessity for improving our ordinary mode of building, in order to avoid the now too common disasters of fire.

VARIORUM.

"Laws affecting the Public Health in England. By Henry W. Ramsey, M.D." In this reprint from the *British and Foreign Medico-Chirurgical Review* of July last, Dr. Ramsey gives a sketch of the statutes which apply more or less directly to the health of the community. He divides these laws into three great classes:—1st, special and municipal, having for their direct object the improvement of the public health in towns and districts; 2nd, Social and Industrial, having other primary objects, yet determining, in many respects, the methods of sanitary administration; and, 3rd, Medical and Dietetic, applying to the profession itself, to particular diseases, and to other matters of state medicine. The summary, though very brief (only eleven pages), is a useful one to all interested in sanitary progress.

Miscellaneous.

Condensed Telegraphic Messages.—It is stated in *Chambers's Journal* that Mr. J. Gall, of Kingston, Jamaica, a son of Mr. James Gall, of Edinburgh, publisher, to whom reference was lately made by a correspondent in the *Builder*, has invented a method of condensing telegraphic messages, and at the same time of keeping their import and content from all persons except the sender and receiver. He has drawn up a lexicon of telegraphic words, and any one wishing to send a message as fast as to choose from his lexicon a single word, according to the nature of the message. In this word he conveys his whole meaning to his friend's correspondent; but to the telegraph clerk, or any one else, it is an impenetrable secret. The combinations are so numerous that Mr. Gall himself would be unable to discover the key which other persons had agreed to use out of his lexicon. When a long message can be confined in one, two, or three words, the saving will be great as regards both money and time. The pre-arrangement of messages is described as remarkably easy.

The Meat Market Clock.—The clock in a central roadway of the New Meat Market, St. Hilfield, was made by Messrs. Thwaites & Co.,

A House Built by One Man.—The *South London Press* tells a story of perseverance. About four years ago an eccentric personage, who follows the pursuits of bird-catching, purchased a small plot of land on the eastern side of Nunhead Cemetery. Here he resolved to build a good-sized six-roomed brick house with his own hands. He at once set to work, and, strange to say, has nearly finished his task. He has been his own architect, his own bricklayer, his own labourer, his own joiner, his own plumber and glazier, and, what is still more strange, has built the house without one particle of scaffolding, and even carried his own bricks from the maker by the armful as he was able to afford them. The work is said to appear very substantial, and to do him great credit. During the operations he has been living in a small brick hut, built by himself on the plot at the outset, in company with a little son and a loquacious parrot. He probably thought himself a second Crusoe on an uninhabited island, and behaved as such.

Newcastle Antiquaries.—A meeting of members of the Newcastle Society of Antiquaries was held on Wednesday evening, in the library of the Old Castle, Dr. Bruce presiding. Mr. Longstaffe intimated that he had purchased an old map of the county of Durham, on which occurred an old name—Werewickshire, from which he gathered that a certain portion of the county had formerly been called by that name. Dr. Bruce stated that another altar had been found in Maryport, and it was dedicated to Vulcan. It was peculiar, inasmuch as it was the only altar in Britain which was dedicated to that deity. It was further peculiar, because, instead of the name of the deity to whom it was dedicated occurring first, it occurred last. He supposed that would be because Vulcan was considered a minor or inferior deity. A stone of peculiar character was also found at the same place. He had heard subsequently from his correspondent at Maryport that another altar had been found.

Stamp Duty on Leases.—An Act of Parliament has just been printed to declare the stamp duty chargeable on certain leases. The law has been altered in consequence of a decision in the Court of Exchequer, to which attention was first drawn in our pages. It is provided that no lease already made or hereafter to be made for any consideration in respect whereof it is chargeable with *ad valorem* stamp duty, and in further consideration either of a covenant by the lessee to make, or of his having previously made, any substantial improvement of, or addition to, the property demised to him, or of any usual covenant, shall be deemed to be, or to have been, chargeable with any stamp duty in respect of such further consideration.

Workmen's Dwellings in Holland.—An experiment, which appears to answer, has been tried by some of the companies for building improved dwellings for the working-classes, viz., that of introducing the "flat" system, by which the lower portion of the house is occupied by one family, with exclusive use of a garden on one side of the house; while another family tenants the upper story, which is entered by an outer staircase on the other side, and entails the garden on that same side. As the occupants of the lower part have to go outside their plot, round the corner, and up the staircase, if they wish to communicate with their topmost neighbours, it certainly gives a far greater degree of privacy than if they were simply next door.—*Food Journal*.

Working Men's Club and Institute Union.—The forty or fifty metropolitan working men's clubs and institutes which are comprised in the Union had their annual meeting on Monday last. On the representation of Mr. Herbert Praed, the Marquis of Salisbury offered the use of Hatfield-park for the purpose of a general picnic, adding to the offer an invitation to such as chose to inspect the fine Elizabethan mansion. About 1,000 of the members of these clubs and institutes availed themselves of the facilities kindly afforded.

Royal Gallery of Illustration.—We see with great pleasure that this is not to be the last season at this popular place of amusement, but that Mr. Reed, having unexpectedly been enabled to renew his lease, he and Mrs. Reed will appear in a new entertainment in November next. The public would have sadly missed the agreeable evenings passed in Regent-street for many years.

The Spade in Defensive War.—Mr. Edwin Chadwick, C.B., has been recalling the public attention to a subject heretofore treated of in the *Builder*. This he does in a paper on "What Art and Science in the new Arms of Precision give to Defence against Attack in War." The paper is printed in the *Journal of the Society of Arts*. Mr. Chadwick is of our opinion, that the importance of the spade is greater than ever in connexion with arms of precision; and as for the bayonet and sword they may be thrown away. In America it is proposed that soldiers should carry spades in place of bayonets. Neither the French nor the Prussians, however, are as yet very favourable to the use of the spade in defensive warfare. They still dislike to "turn their troops into armies of sappers." The time anticipated by the *Builder*, however, is evidently at hand, when bayonets will be turned into spades, preparatory, doubtless, to the happy time when spears shall be turned into pruning-hooks.

Berks Archaeological Society.—The annual excursion of the members of this society took place on Thursday, the 28th ult. They started from Marlow-road to Marlow, where a boat was in readiness to convey them to Medmenham Abbey; on the way a visit was paid to Bisham Abbey, the seat of Mr. G. H. Vaneitart, which is said to have been formerly the residence of Princess Elizabeth, and the burial-place of Earl Warwick. Lady Place Ruins, formerly in the possession of Lord Lovelace, were next visited. On arrival at Medmenham, the Abbey was inspected. Danesfield, the seat of Mr. C. R. Scott-Murray, was also visited, and its Gothic chapel and the Horse-shoe entrenchment, thrown up by the Danes (hence the name Danesfield), were objects of interest. The company returned by water to Marlow Bridge, and proceeded to the residence of Mr. James Carson, at Spinfeld. The scenery along the Thames was much admired. After partaking of a liberal repast, the members and their friends, numbering about sixty, departed homewards.

Castling a Steel Ingot.—A casting designed for the beam of the screw steamship *Munster*, belonging to the City of Dublin Steam Packet Company, has just been made at the Norfolk Works, Saville-street, Sheffield. The mould in which the ingot was cast was upwards of 14 ft. in length, and 3 ft. in diameter, and was fixed in the middle of the principal melting furnace. About 300 men were in attendance, under the personal superintendence of Mr. Mark Firth. Almost military precision was observed in bringing from distant parts of the works the crucibles containing molten steel ready to be poured into the mould. This was fixed in a central position, and close at hand were 150 "holes," with tributaries from many other parts of the premises, and we believe that altogether there were 270 in operation. In about half an hour the contents of 544 crucibles, of 64 lb. each, were poured into the mould, making a total of 34,816 lb.

Statues.—It is said that a statue of Lady Godiva, belonging to the Liverpool Town Council, has been offered to the Council of Coventry, and declined. Surely no fitter place for such a statue, unless it be unfit for any place, could be found than Coventry. The association of Godiva with Coventry cannot be ignored; and as for the objections taken to the occasional procession in remembrance of her, the possession of her statue might tend to obviate this mode of keeping her in remembrance. If Lady Godiva is to be ignored, Peeping Tom and the Knave's Post had better be destroyed.—A colossal and clever statue of William De La Pole, the first mayor of Hull and founder of the Charter-house, has been presented to the town of Hull. Mr. M. D. Keyworth, the sculptor of the Leeds Townhall lions, was the artist. The donor was Alderman R. Jameson, ex-sheriff of the town.

An Exhibition in the Arctic Regions.—Early in the month of August a general exhibition will be opened in Tromsø, the capital of the northern province of Finnmark, lat. 69° 30', the programme of which is full and interesting. It is the first time this modern expedition for the encouragement and development of industry has been attempted in these northern regions. The exhibition will contain the products and appliances used in the several fisheries, those of agriculture, and of mechanical and domestic industry, together with objects and products illustrative of the mode of life and state of civilisation of the inhabitants of those regions.

A Great Western Ship Canal.—Mr. Adolphus Owen, of Exeter and London, proposes to construct a ship canal between the Bristol Channel and the mouth of the Exe, which would place the coal-fields of South Wales in direct communication with Portsmouth. The distance between Cardiff and Exmouth is now, by the ordinary sea route, 370 miles. The proposed canal would be 59 miles, reducing the sea passage to only 80 miles. The dangers of the Land's End would be avoided, and coal would be rendered far more accessible to the metropolis itself. The projector estimates the cost of the work at 3,500,000*l*. Telford designed a similar scheme some half-century ago.

New Esplanade, Bognor.—The new and repaired works of the sea-wall, at Bognor, have been completed and opened. The last two contracts were taken by Mr. Green, of Lewes, and Mr. Harris, of Portsmouth, a portion of groyne work being executed by Mr. Lawrence, of Portsmouth, and others. The result is the formation of one of the finest esplanades in the South of England. It extends continuously from one-half to three-quarters of a mile, the average width being 20 ft., the surface consisting of brickwork. The opening has been celebrated by a holiday festival.

The Mont Cenis Railway Company.—Vice-Chancellor Malins has had before him a petition to wind up this company, on the ground that their railway has been worked at a loss, the expenses of working it in the winter months being greater than the profits earned by working it in the summer months. By consent of the parties, Mr. James Atkinson Longreach, the present manager of the company, has been appointed provisional liquidator, and the rest of the petition has been ordered to stand over till November.

Staines Bridge.—Mr. Under-Sheriff Staunton, in the case of "Colonel Challoner and others v. the Corporation of London and the Metropolitan Board of Works," to assess the sum to be paid to the proprietors of Staines Bridge to throw it open to the public. Evidence was given that the receipts were about 1,000*l*. a year, and expected to increase. It was worth about twenty years' purchase. By arrangement the jury assessed the compensation at 20,125*l*.

New Bridge at Peterborough.—A public meeting of the inhabitants of Peterborough and its neighbourhood has been held to consider a proposal of the magistrates of the counties of Northampton and Huntingdon to erect a new bridge at Peterborough, instead of repairing the old one, on the condition that the liberty and city of Peterborough would contribute the sum of 2,000*l*. towards it. The chair was occupied by the Custos Rotulorum (the Hon. George Fitzwilliam), and appropriate resolutions in favour of the proposal were passed, a committee appointed, and various subscriptions promised or paid.

Ilchester, Somerset.—The chancel of the old parish church of St. Mary, Ilchester, is undergoing a course of repair. The present church is the only one now existing in the old Roman town which, according to Camden, Leland, Stokely, and other antiquarian authorities, once contained seven. Ancient and Mediaeval Ilchester was a place of important note, though now a greatly decayed town. Concerning its Roman fosse-way, walls and remains, and its early English ecclesiastical institutions, we may shortly speak.

St. David's Cathedral.—The committee appointed to superintend the restorations have determined to at once commence the rebuilding of the roof and ceilings of the nave and aisles, postponing for the present the restoration of the pavement of the nave, also the west end and porch. The repair of the transepts and chapter-house have also to be postponed.

Green Slates.—Messrs. Roberts, Adlard, & Co. have sent us some specimens of the "Eureka" green slates. They seem very good, both in quality and colour. In size these slates will range with those from the Bangor, Festiniog, or Carnarvon quarries for ornamental roofing.

The Slade Bequest to the London University.—With reference to the Slade bequest to the London University, it is determined immediately to begin building the schools which will be required for the purpose. The election of a Slade Professor will take place in November next.

Steam Roller.—The Islington Vestry at their last meeting decided by a large majority to purchase the steam road-roller which for the last seven months has been employed in making the roads in that important parish. Any one who has observed the roads constructed under the new system will at once perceive the vast improvement upon the old method, and will be disposed to endorse the decision of the Islington authorities.

Temperance Hall for Gulsbro'.—On Monday, the foundation-stone of a temperance hall was laid at Gulsbro', by Mrs. Chaloner. In the afternoon there was a *fête* in the Priory Grounds, kindly thrown open by Admiral Chaloner for the occasion.

Whitworth Scholarships.—The practical examination of workmen and students for these scholarships has been fixed by Sir Joseph Whitworth to take place at his works, at Manchester, on the 30th of August and the 1st of September next.

New Lambeth Workhouse.—At a meeting of the board of guardians of St. Mary, Lambeth, held on Wednesday, the 10th inst., Mr. T. Nixon was appointed to prepare the bills of quantities for the above buildings by a large majority.

TENDERS.

For proposed new wings to the Printers' Almshouses, Wood-green. Mr. C. Bell, architect.—

Lawrence	25,134 0 0
Gammann	4,758 0 0
Thompson	4,887 0 0
Browne & Robinson	4,425 0 0
Hill, Keddell & Co.	4,386 0 0
Henshaw	4,369 0 0

For proposed rectory house and stabling, Stoke Albany, Northamptonshire, for the Rev. W. R. F. Wandy, Mr. E. Browning, architect.—

Thompson	23,698 0 0
Bagnall	3,310 0 0
Perkins & Sons	5,313 0 0
Halliday & Cave	3,465 0 0
Richardson, Son, & Roberts	2,961 0 0
Law & Son (accepted)	2,929 0 0

For reinstating 113, Shoreditch. Mr. L. Tanner, architect. Quantities not supplied.—

Greenwood & Sons	£965 0 0
Park	783 0 0
Blackmore & Morley	758 0 0
Easton & Chapman	770 0 0
Marr	745 0 0
Larke	737 0 0
Forrested (accepted)	657 0 0

For alterations of, and additions to, farm buildings, at Cliff Park and Marnell Park, Holland, Derbyshire, for Mr. J. C. B. Borough. Mr. Sugden, architect.—

Smith (accepted)	£2,965 0 0
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For new farmhouse and buildings at Cair Hall, Derbyshire, for Mr. J. C. B. Borough. Mr. Sugden, architect. Quantities supplied.—

Smith (accepted)	£2,324 0 0
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For rebuilding George-street Congregational Church, Ryde, Isle of Wight. Mr. K. J. Jones, architect. Quantities by Mr. L. C. Riddett:—

Allen	2,621 0 0
Young	5,620 0 0
Hall	5,400 0 0
Sibley	5,351 0 0
Jackson & Shaw	4,887 0 0
Stevens	4,841 0 0
Couper	4,632 0 0
Barton	4,549 0 0
Burridge	4,643 0 0
Meador	4,263 0 0
Newman	4,109 0 0
Smith	3,917 0 0

For building private baths, at St. Leonard's-on-Sea. Messrs. Habersham & Brock, architects.—

Avia & Roe	£1,836 0 0
Nightingale	1,563 0 0
Howell	1,547 0 0
Rodds	1,470 0 0
Huges	1,467 15 0

For alteration to a warehouse, Wood-street, City, E.C. Mr. H. Ford, architect:—

Henshaw	2,470 0 0
Kiddle	443 0 0
Brass	438 0 0
Shaw	394 0 0
Corder	375 0 0
Browne & Robinson (accepted)	362 0 0

For Wesleyan chapel, Wood-green. Mr. J. P. Johnson, architect:—

Donahue	24,893 0 0
Dore, Brothers	4,975 0 0
Carter & Son	4,970 0 0
Winslip	4,470 0 0
Forcock	3,990 0 0

For the erection of stables, living-room, &c., in Camden-road, for Dr. Andrews. Mr. H. Spalding, architect:—

Brass	£785 0 0
Beaves	729 0 0
Kiddle	715 0 0
Phillips & Son	675 0 0
Carter & Son	675 0 0
Woods	620 0 0
Patman & Fotheringham	594 0 0
Sorrensen & White (accepted)	573 0 0

For the erection of a building, No. 3, Bartholomew-lane, E.C., for the Estate Company, Limited. Mr. E. A. Gruning, architect. Quantities supplied by Messrs. W. R. Gritten & Son:—

J. & J. Coleman	£2,260 0 0
Mansfield & Price	8,130 0 0
Ashby & Sons	9,050 0 0
J. & C. T. Anson	8,980 0 0
Brass	8,993 0 0
Holland & Hansen	8,873 0 0
Trollope & Sons	8,854 0 0
Hill, Keddell, & Co.	8,689 0 0
Henshaw (accepted)	8,475 0 0

For the erection of new premises for the National Provincial Plate-glass Insurance Company, 66, Ludgate-hill, E.C. Mr. T. T. Smith, architect. Quantities supplied by Mr. F. Dobson:—

Rayment & Son	£4,575 0 0
Henshaw	4,355 0 0
Ennor	4,261 0 0
Scrivenor and White	4,217 0 0
Hill, Keddell, & Waldrum	4,068 0 0
Kelly, Brothers	4,064 0 0
Brown & Robinson	3,937 0 0

For building a house at Woodlands, near Southampton, for Mr. Henry Tunson. Messrs. W. & J. Jurd, architects. Quantities supplied:—

Harvey	£2,015 0 0
Rowland & Laver	1,980 0 0
Togood	1,900 0 0
Briston & Bone	1,875 0 0
Stevens	1,769 0 0
Richards	1,793 0 0
Sanders	1,620 0 0
Martin & Son	1,605 0 0

For the erection of public hall, at Bexley Heath, Kent, for the directors of the Bexley Heath Public Hall and Institute Company, Limited (first contract). Mr. Joseph Hewitt, architect. Quantities supplied:—

Atkinson	£1,367 0 0
Parthorne	1,250 0 0
Harrison & Sons	1,187 0 0
Rhodes & Roberts	1,179 0 0
Fulford	1,145 0 0
Howler	1,092 0 0
R. & J. Butler	1,084 0 0
Nightingale	1,063 0 0
Kirk	1,047 0 0
Whit's	1,038 0 0
Sonergan	1,025 0 0
Parsons & Telling	1,021 0 0
Muller	1,019 0 0
London Building Company, (Limited)	997 0 0
Payne	995 13 0
Blake	945 0 0

* Late.
For erecting two houses and stables in the Seven Sisters-road, for Mrs. Sadgrove and Mr. Golding. Messrs. Woodzell & Callcut, architects:—

Pritchard	£3,953 0 0
Golding	3,799 0 0
Ennor	3,711 0 0
Brown & Sons	3,700 0 0
Woodward	3,700 0 0
Cooke & Green	3,651 0 0
Chesnum	3,633 0 0
Smith	3,478 0 0

For building two houses, Stoke Newington. Mr. H. Ford, architect:—

Brass	£495 0 0
Kiddle	298 0 0
Caughy (accepted)	270 0 0

For the rebuilding of infants' school-room, &c., to the Broadway Congregational Church, Hammersmith. Mr. H. Spalding, architect:—

Scrivenor & White	854 0 0
Adamson & Son	334 0 0
Bird	330 0 0
Brathwaite	330 0 0
Adams	330 0 0
Woods	325 0 0
Chamberlain	324 0 0
Hans (accepted)	270 0 0

Gresille House, Kilburn.—For "Phillips & Baker," read Phillips & Son, Baker-street.

TO CORRESPONDENTS.

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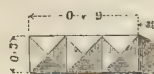
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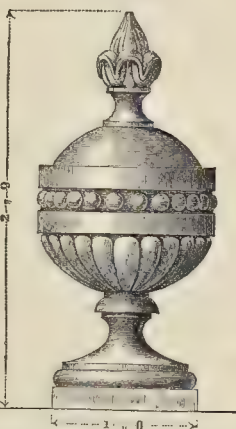
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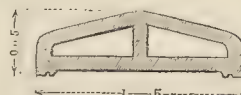
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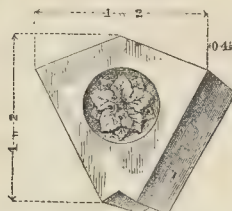
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The Builder.

VOL. XXVIII.—No. 1437.

Town Death-Rates in Spring, 1870.



PUBLIC health and sanitary questions command more general attention than they did; there is a growing interest in them; but it is equally certain that the subject is still generally voted dry, uninteresting, and, above all, unsavoury. The disposal of sewage, the pollution of rivers, and such like, do naturally and inevitably crop up in all discussions of the first principles of sanitary science;

but we may venture to assert that even these branches of the subject are delicate and clearly compared with one which has recently been engaging the public and lively attention of no inconsiderable portion of the usefully-inclined ladies of England. As it is essentially necessary and important to popularise sanitary matters, might we not, therefore, hope and expect that ladies should give us some of their valuable assistance,—first, by devoting their own attention to the various branches of the subject, and then by using the now very general parochial “visiting” system, as a means of disseminating a knowledge of its elements among the uneducated classes? How much sanitary good might be effected by teaching the importance of, nay, necessity for, cleanliness of person, purity of air by ventilation, and of intelligent management of children as to dietary and medical treatment, it is impossible to say. It is no longer disputed that injury to the respiratory organs from breathing vitiated atmosphere, and the neglect of early treatment in cases of summer diarrhoea, result in the wholesale death of infants in English towns, in our cold and hot seasons. Ladies have opportunities for this useful and desirable task which does not fall in the way of men. Before proceeding to notice the signs of slow but positive progress, in the shape of results from the growth of interest in sanitary matters, and while, on the subject of the obstacles in the way of more rapid progress, let us notice one which must frequently have commanded the attention of sanitary students. The medical profession have not generally identified themselves with the cause of sanitary progress; nay, more, the progress that has been made may be said, in the main, to have resulted without the active co-operation of the profession. We are loth to suggest such a possibility, but can it be possible that, indirectly and almost intuitively, the profession have felt that sanitary progress was antagonistic to their self-interest? The possibility of such a construction should alone urge them to take most decidedly the initiative in this movement, for which their scientific acquirements ought to give them special qualifications. The most earnest thinkers of the day, however, agree in pronouncing that medical science and knowledge scarcely keep pace with the times. Lecky, in his introduction to the “History of European Morals,” says:—“Of all the branches of human knowledge, medicine is that in which the accomplished results are most obviously imperfect and provisional, in which the field of unrealised possibilities is most exten-

sive, and from which, if the mind were directed to it, as it has been during the past century to industrial inventions, and especially to overcoming space, the most splendid results might be expected. Our almost absolute ignorance of the causes of some of the most fatal diseases, and the empirical nature of nearly all our best medical treatment, have been often recognised.” We have said, and we firmly believe, that sanitary progress is being made, but we want the more earnest co-operation of the medical profession, and, perhaps, more than all, the earnest assistance of English ladies, before this progress can proceed at the rate that we consider to be possible.

The Registrar-General has recently published his quarterly return for the second quarter of this year, for the three months ending June last. This publication, in its recently enlarged and improved form, affords much more ample means for forming a correct opinion of the sanitary condition of the country than was possible previous to the commencement of the present year. Last spring was remarkable for its high temperature, and for the unusually small rainfall. Excessive cold in winter, or heat in summer, most undoubtedly exercises a direct influence upon mortality, but the exceptional meteorological conditions of last spring do not appear to have affected the public health to any considerable extent, as the annual rate of mortality in England and Wales during the three months was 22.1 per 1,000 of the estimated population, exactly corresponding with the mean of the rates in the ten previous corresponding quarters. This national rate, however, somewhat exceeded that in the spring quarters of each of the three years 1867-8-9. Roughly speaking, rather more than half the entire population of England and Wales live in the principal town districts, and the remainder in the smaller towns, villages, and country parishes. In the entire urban population the death-rate last quarter was 22.8 per 1,000, against 23.4, the mean of the previous corresponding quarters; in the rural districts the rate was 21.0, against 20.3, the corresponding average in previous quarters. It is evident, therefore, that while in the large towns the rate was below the average, an excess prevailed in the rural population. May we not safely attribute a portion of this result to the continual increase of sanitary activity in our large towns, which has not yet made so much progress in the smaller towns and villages of our rural districts. In the seventeen largest English towns furnishing weekly returns, the death-rate last quarter averaged 22.3 per 1,000; and in the fifty towns ranking next in size, with populations ranging for the most part between 30,000 to 100,000, the rate did not exceed 21.9. Both these rates, it will be seen, were lower than the general town death-rate, which, as above-mentioned, was 22.8; it follows, therefore, that a considerable excess must have prevailed in a large number of the smaller towns, with populations under 30,000, in which there is less chance of sanitary matters receiving due attention, from the fact that the local papers, if any exist, have less influence, and are, as a rule, less ably conducted. Moreover, there is a necessity, as has been often urged, for the division of the country into sanitary districts, in order that small towns and villages may share with the larger towns, the great advantages of efficient health officers, and a thoroughly organized sanitary staff. It is evident that in the decline of town death-rates, they are approaching those prevailing in our rural districts, because they do not show a relative improvement; but it is also more than probable that if we could once solve the great problems affecting sewage and water supply, the death-rates in these two sections of our population would be permanently more nearly assimilated, for there are many advantages to be derived from sanitary regulation in

towns which are scarcely attainable in small villages and country parishes.

Among the seventeen largest English towns the death-rate last quarter, in a population estimated at rather more than six millions, was at the annual rate, as above stated, of 22.3 per 1,000. In the several towns the lowest rates were 16.9 in Sunderland, 18.1 in Birmingham, 18.6 in Leicester, 19.1 in Portsmouth, and 19.8 in Hull; the highest rates, 23.9 in Liverpool, 24.7 in Leeds, 25.7 in Manchester, 26.1 in Bristol, and 27.7 in Bradford. These rates of mortality are governed to a very great extent by the proportion of deaths resulting from zymotic disease; as we shall presently see, the rates were low in the first five towns because few deaths were caused by scarlatina, measles, fever, &c., and excessive in the last five because these and other diseases of the same class were fatally prevalent. Compared with recent corresponding quarters, there was a marked decline in the death-rate of Liverpool, Manchester, and Newcastle, while there was fully as large an increase in those of Bristol and Bradford.

In the improved form of the Registrar-General's return, not only is information given for each of the 2,197 registration sub-districts, as well as for the 627 superintendent registrars' districts, but the information, instead of being almost confined to the bare numbers of births and deaths dealt with the causes of death, the deaths of infants and elderly people, the deaths in institutions, the deaths from violence, and the number of inquest cases. In the first quarter of this year rather more than 20,000 deaths were referred in England and Wales to the seven principal diseases of the zymotic class; that is, to small-pox, measles, scarlatina, diphtheria, whooping-cough, fever, and diarrhoea. In the second quarter these deaths did not much exceed 18,000; speaking in round numbers, 6,000 of these resulted from scarlatina, 3,500 from different forms of fever, 3,000 from whooping-cough, and 2,000 each from measles and diarrhoea. Scarlatina continued, as in the first quarter of the year, very generally prevalent, and showed an increase in the south-western and midland counties, but had declined in most of the other divisions. In the seventeen largest towns, for which the information has been specially analysed, 5,887 deaths were referred last quarter to these seven diseases, against 6,636 in the first quarter of the year; there was a decline of 700 in whooping-cough, 500 in scarlatina, and 100 in fever, while the fatal cases of diarrhoea showed an increase of nearly 500, representing the commencement of the usual summer epidemic of this disease, which is for the most part confined to the infants of the labouring and uneducated classes. The average annual death-rate from these seven diseases in the seventeen towns last quarter was 3.8 per 1,000; in the several towns the lowest ratio was 1.1 in Sunderland, 1.4 in Leicester, 2.1 in Nottingham, 2.3 in Norwich, and 2.4 in Birmingham; the highest rates were 4.0 in London and Liverpool, 4.1 in Manchester, 4.8 in Sheffield, 4.9 in Bradford, and 5.6 in Bristol. Of the 155 deaths from small-pox in these towns, no less than 118 occurred in London, and 25 in Manchester and Salford. Compared with the 2,162 fatal cases of small-pox in Paris during the three months under notice, the 118 in London appear favourably few, but when we consider that in the sixteen other English towns, with an aggregate population about equal to that of London, only 47 occurred, it is hardly creditable to the metropolitan health officers. Deaths from small-pox signify invariably neglect of vaccination; thus, therefore, the excess of deaths from this disease in London signifies that the anti-vaccination party has more deadly influence in London than in our provincial towns. Measles were also proportionately far more fatal in London than in the other towns. Scarlatina was

most fatally prevalent in London, Liverpool, Bristol, and Sheffield. The sanitary condition of Sheffield appears anything but satisfactory, as this severe epidemic of scarlatina has followed very closely upon one of small-pox, and the mortality from infantile diarrhoea in recent weeks has also exceeded that in other towns. The excessive mortality from zymotic disease in Bristol since the beginning of this year is the more remarkable, because the attention to sanitary matters in Bristol has in late years been unremitting, and in the main so successful as to be made the subject of very general comment. Different forms of fever, which after small-pox may be pronounced most directly amenable to sanitary control, were proportionately most fatal in Manchester, Sheffield, Bradford, and Liverpool.

A word or two as to the ages at death in these seventeen towns. A more satisfactory condition of the public health than now exists would naturally increase the mean age at death; fewer children would die in their infancy, and a larger proportion of deaths would occur at the ripener ages. Of the total deaths in these towns last quarter, 19.1 per cent. was of persons aged sixty years and upwards. This proportion was 14.5 in Sheffield, 15.8 in Bradford, and 15.9 in Manchester; highest, 21.3 in Birmingham, 21.5 in Sunderland, 21.6 in Hull, 22.0 in Nottingham, and 28.1 per cent. in Norwich. Really infant mortality may be most usefully considered by observing the proportion of deaths of infants under one year of age to births registered. In our present state of civilisation it appears inevitable that a considerable proportion of infants should die within a few weeks of their birth; the number of these deaths under one year is therefore to a great extent governed by the birth-rate, and the above method takes this into consideration. In the seventeen towns last quarter to every 100 births registered 14.7 deaths occurred among infants under one year of age; this proportion was 10.9 in Portsmouth, 11.0 in Sunderland, and 12.7 in Sheffield; while it was highest, 17.1 in Manchester, 17.5 in Liverpool, and 18.0 in Bradford.

The proportion of deaths in large public institutions from a sanitary point of view is far from unimportant. Of the total deaths in the seventeen towns, 14.5 per cent. were so recorded last quarter; the percentage varying from 8.0 in Bradford and 8.4 in Norwich to 14.9 in Manchester and Salford, 16.0 in Liverpool, and 16.7 in London. These deaths, for the most part, consist of those recorded in workhouses and hospitals. The soundest method for computing the mortality in institutions of this character, in which the number of inmates is continually varying, and in which the mortality depends so much upon the condition of the inmates when admitted, is still a moot question; neither does means yet exist for satisfactorily comparing the relative mortality from epidemic diseases when treated in public institutions, and when in private practice. The balance of evidence is at present in favour of the latter.

Whatever may be the general conviction as to the control which sanitary regulation will eventually exercise upon deaths from epidemic and other diseases, no doubt can reasonably be felt that the waste of life from violent and mechanical causes might be most absolutely controlled by more complete police regulations, and a higher standard of education and intelligence among those classes having the superintendence of and employed in great industrial works and factories, and those having charge of horses, carts, and vehicles for public conveyance. In the seventeen towns last quarter no less than 1,178 deaths resulted from violent causes, including all cases of accident or negligence, manslaughter, murder, or suicide. These deaths showed a proportion of 3.4 per cent. of the total deaths, in the different towns. The proportion of these deaths was lowest, 0.7 in Leicester, 1.4 in Norwich, and 1.5 in Bradford; it was highest, 3.7 in London and Sunderland, 4.8 in Liverpool, and 5.1 in Birmingham. Inquests were held upon 5.9 per cent. of the total deaths in the seventeen towns; upon 3.3 and 3.4 per cent. in Bradford and Wolverhampton, and 6.6 and 11.1 per cent. respectively in Manchester and Birmingham. The excess of inquest cases and of violent deaths in Birmingham is somewhat remarkable.

Among the fifty towns of the second magnitude, Birkenhead, Dover, Southampton, Coventry, Ashton-under-Lyne, and South Shields, were remarkable last quarter for their low death-rates; Oxford, Exeter, Bath, Stoke-upon-Trent, Macclesfield, Wigan, Bolton, Huddersfield, and

Halifax for their high rates. In Exeter the rate was 27.0, and in Halifax 31.6.

On the whole, the sanitary condition of our towns, as may be deduced from the figures of the Registrar-General in his last Quarterly Return, shows progress, and, generally speaking, their recent health appears to have been satisfactory, although it is needless to point out how large a field is yet open for the further development of sanitary science and control. Public interest in these matters must not be allowed to flag, and the timely accession of ladies, and more generally of the medical profession, to the ranks of sanitary reformers, would just now be of incalculable value.

THE WORKMEN'S INTERNATIONAL EXHIBITION.

LITTLE by little, and day by day, since its opening on the 16th of July, has the Workmen's International Exhibition assumed more important proportions. The large space which was empty on the occasion of her Majesty's visit, has received tenants of different classes; and the daily attendance has increased, until it has attained the respectable total of 10,000 visitors. It is a matter of great interest and significance to observe that by far the largest number of these visitors avail themselves of the evening leisure, and of the low charge of admission, between seven p.m. and ten p.m.

We cannot, however, disguise the fact that the Exhibition is likely to prove more important for the suggestions offered by the experience it affords, than for its actual magnitude or variety. Its value is rather for the future than for the present, rather for the reflective thinker than for the sightseer, or even for the exhibitor.

It must be borne in mind that the council have had to contend with unusual difficulties. The case was not one in which the lustre of Court favour, or the pomp of provincial magnates, commanded an ample guarantee fund, as in the instance of the Great Exhibition of 1851. Some eight score names alone form the list of guarantors; and among these, while the King of Wurtemberg, the Lord Lieutenant of Ireland, the Duke of Devonshire, the Earl of Rothesby, Mr. Digby, and three commercial firms, are set down for 100l. each, there are the names of twenty operatives, who assure the modest but welcome sum of five shillings apiece. While a healthy interest is thus known to be spread over every class of society, the depth, so to speak, is very small for the extent of surface; the total guarantee fund not quite reaching the sum of 2,500l. So small an amount precluded much recourse being had to those ordinary means of advertisement which have become so necessary, in the present day, for attracting public attention; and the gratuitous services of the honorary secretaries and of the members of the council, who, in their different stations of life, freely gave up time of great value, could do but little to supply the want of the great medium of notoriety. There is a want, too, of organizing talent apparent.

Add to this the fact that the principal manufacturers, both in the United Kingdom and abroad, are becoming less inclined to sacrifice either money or time for the sake of sending articles to exhibitions. The feeling is becoming generally prevalent that, although the first exhibition amply repaid, by its results, the cost and trouble of the exhibitors, it was the only one that thoroughly did so, as, under one title or another, at London, Paris, Dublin, and numerous other cities, exhibition succeeding exhibition, the advertising value of each diminishes, as the novelty decreases; and the project of opening a permanent International Exhibition at South Kensington may be fairly expected to knock all rivals on the head, at all events in this country.

To these general obstacles, to the slowness of trade, the long-continued and instinctive apprehension of war, which has cast the shadow of the Black Monday of May, 1866, over three years of our history, and the hesitation of the operatives to believe that a hall of exhibition was in good faith, and for no interested motive, open to their productions, has to be added the special consideration that an exhibition which should, at the same time, include the civilised world in its area, and descend to the particularisation of the individual workman (even in the case where four or five processes had to be conducted, in order to produce a single article), comprised features

that were absolutely incompatible, on any large scale. If only a hundred countries and cities each sent from their principal establishments, and from a proportionate number of independent workmen, contributions under each of the eighteen classes invited to the exhibition, the number of individual names would be so great that none could be distinguished in the crowd. In England even distinct individuality would be lost in the cloud of detail, although those interested in any special branch of industry might pick out the most deserving names. But to suppose that the names of foreign workmen should thus become known in England, that any visitor should care to understand whether Gennaro Rosa or Gaetano Vecchio was the actual workman who executed a particular small wooden medallion for Grandville et Compagnie, is obviously quite out of the question. There is a limit to the power of observation; and if it is intended to descend to the minute detail of the names of individual workmen, the classes of objects to be exhibited, and the localities from which they are sent, must be limited in a corresponding degree.

The mode in which these opposite conditions have balanced one another in the case in point, is by an irregular and inadequate supply from the area from which contributions have been invited. In some instances producing countries are chiefly conspicuous by their absence. Thus, our nearest neighbour, France, with its 37,000,000 of inhabitants, sends a mechanical carriage (Class 3), improved fishing-tackle (Class 10), samples of thuga-wood, wine, maize, and cotton from Algiers, and liqueurs from Nice. This is all for which the empire figures in the catalogue. On the other hand, Italy, Denmark, and Bombay contribute the most complete and interesting series of industrial productions that are to be found in the Agricultural Hall. Germany, Austria, Bavaria, and the Netherlands, together with Italy, France (for the objects named), and Bremen, are the only names of contributing countries or states included, together with Great Britain, in the official catalogue.

Of the more brilliantly represented foreign countries there is this essential difference between the contributions. Denmark and Bombay, while each occupying a considerable proportionate space with objects of great beauty and interest, are already independently represented in London; the former at the Danish Gallery, 142, New Bond-street, and the latter at the Indian Office. Very little is to be seen at the Agricultural Hall of the productions of these two contributing countries which is not more accessible to a large proportion of the purchasing population of London, within a short distance of Charing Cross. Italy, on the contrary, has set herself earnestly and thoroughly to work to send to the Workmen's Exhibition a fair display of the industrial productions of her principal cities and towns. The Roman *cameo*, in shell, so effective when they are not compared with their prototypes in agate and onyx, we mentioned in our former notice, as well as the marble and Byzantine mosaics of Florence, the exquisite filigree-work familiar to the loungers in the Strada de' Orfeci at Genoa (which may be obtained at No. 224, Regent-street), the wooden mosaics of Sorrento, resembling our own Tumbler ware, and the sculpture and wood carving of Florence and of Venice. There is a large assortment of jewelry, from the Italian capital, valuable for its permanent and durable nature. The mosaic brooches, in fine marbles and coloured stones, are by no means unknown in this country. More rare, as far as we are aware, are those ornaments in glass mosaic, which the exhibitor terms *Byzantine*. There are representations of beetles, or other objects, formed of very minute tesserae of variously coloured glass, which, instead of being flat, are embossed on the surface, so as to resemble very closely the diamond beetles which ornament the jewelry of Brazil. The exquisite taste with which the hues of flowers and of shells are reproduced on the larger specimens of inlaid marble, is rivalled by the cunning which represents form as well as colour in the glass mosaic. P. Bozzanti & Co., of Florence, exhibit the jewelry in question; and the enterprising exhibitor of the larger and more splendid mosaics, the cabinet which, referred to in our former article, twice attracted the attention and admiration of the Queen, and some tables which, in addition to groups of flowers and of shells, had transparent gems, such as topaz and emerald, inlaid in the solid marble, is Sigior A. Civita, of Florence. We trust that

these enterprising tradesmen will find a sale for the very beautiful objects which they have sent over in such a spirited manner. We fear that the want of salesmen or attendants who can speak English will sadly militate against this. Nor can it be denied that these costly and precious articles are very unlikely to find purchasers among the majority of those whom the Exhibition is organised to interest. For the English goldsmith, jeweller, and decorative artist the opportunity of closely inspecting the Danish and Italian goldsmiths' work and jewelry is most valuable. But he will go to look, not to purchase, and our foreign visitors will be but poorly remunerated unless a more wealthy class of purchasers are attracted by the fame of their wares.

The range of the Danish work is fully equal to that of the Italian. There exists a natural tie, dipped in that blood which is stronger than water, between this gallant little sea-kingdom and our own. In some of our towns, and those among the most noted for handsome men and noble-looking women, the Danish element has left an abiding mark. No foreigner acquires our tongue with more ease, or speaks it with less foreign accent, than the Dane. No less truly may it be said that no foreign workman so closely resembles the very best class of English operative in that solid and patient finish which forms the pride of our workshops. The Danish jewelry, formed on old Norse patterns, is remarkable for the good colour of the metal, for original elegance of design, and for admirable execution. The collars, bracelets, brooches, and earrings which M. Borgegn exhibits, together with the true form of the Dagmar cross (which has been printed in so inferior a copy), leaves the impression that only one thing is wanting, namely, a full purse to buy them.

With regard to machinery and inventions, comprising between 600 and 700 exhibits in the original catalogue, the great want which we have encountered in almost the entire Exhibition forms a special disqualification in face of the inquiring visitor. This want is that of exhibitors. The cases are left to explain their contents by themselves. In four or five repeated visits we failed to find any one who could answer a question out of the great majority of those which we wished to put. In "Italy" no language was audible but Italian. In "Denmark" we failed to find an interpreter. In "India" we found no attendant whatever. In some cases of English display we only met some very young man or woman who could do little more than watch that no one broke the glass, or perhaps could quote a price. If this almost universal abandonment of the articles exhibited to the sole care of the invisible police, or of the honourable fear of the visitors, has thus acted as a wet blanket in the case of those who have visited the Exhibition with the express purpose of aiding its objects by describing them to the public, what must be the case as regards intending purchasers? In one or two instances we actually left written inquiries, but with no better results. No conscientious critic can say much of objects at which he merely has a peep through a glass, without, in many cases, even a descriptive label. We think that manufacturers, whom we might specify, have made a great mistake in merely sending the contents of a shop-window, without having the shopman inside.

On the other hand, there are stalls which are no other than those of a bazaar, with the eager invitations to buy which prevent timid people from even daring to look. One exhibitor, in the gallery, performed the not very advanced conjuring trick of making an egg disappear in a red bag, and then offering egg, bag, and secret for the sum of 1s. This is no more a subject for a workman's exhibition than are cases of electro-plate or of leather work without attendant. We do not wish to be hypercritical, and are not hard to please; but in instances where it is proposed to illustrate an important local industry there ought to be some medium between the dummy and the tout—some one to explain to those who seek for instruction, the object and intent of the exhibitor.

One great lesson to be drawn from the present state of the Exhibition is, that organisation and proportionate arrangement must underlie any very successful attempt to bring the workman face to face with the purchaser. It is useless to attempt all at once. For local exhibitions, such as those of the industry of a town or of a district, or for classified exhibitions, such as one of goldsmiths' work, jewelry, and electro-plate, or of woodwork and wood-carving, or, again, of glass moulding, cutting and engraving, prominence

may be given to the name of the individual workman with great advantage. When the world is invited to compete this cannot be done,—at least, it cannot be done so as to do justice to the expectations of the workman, if the world comes, when invited, in anything like force.

Another very important lesson may be drawn from the relative emptiness and fulness of the Hall in the day and in the evening. The locality, no doubt, goes for much in this. All the more are we bound to note the fact. We find that if, in an industrial locality, a place of evening resort is opened, which is devoid of any of those attractions which captivate the senses—music, dancing, theatrical display, wine, spirits, or beer, or even pure, exhilarating fresh air—if we only give them a room in which to meet, light, opportunity for circulation, and objects, not in overpowering numbers, to interest the eye, by their beauty, or the mind by their industrial value, the operatives will come in crowds. Well conducted, easily pleased, ready to be taught, glad to be kept out of idleness or mischief—such are the thousands who throng these nightly *conversations*. No need to give them an Italian name; they fulfil a great want of a large portion of the English public.

This, then, is a hint which we hope some of those men whose respected names we read on the pages of the Official Catalogue of the Workmen's Exhibition will not be slow to take. A comfortable, quiet, cheerful evening resort for the working-classes would be a self-supporting institution. In attractions, in the way of permanent objects of interest, we might rely on the operation of the great moving power of the day, the spirit of advertisement. Well-arranged cases of the various wares, the salesmen of which keep alive so many newspapers by their advertisements,—would not be wanting. If the genius of selection and of organisation (the genius of South Kensington) presided over this part of the scheme, and if the period of exposition for the same articles were limited, tradesmen would readily adopt so admirable a mode of advertisement. There, however, sale should be prohibited. Reference should be distinctly made to the place of sale. Then the organ need not be dumb; but, with solemn or lively music, would add to the attraction of the place. And if to that were added a series of popular lectures,—not dry preachments, but illustrated teaching, given in language like that of Faraday, and lighted up by the magic transformations of chemistry, by the glories of electric light, by the wonders of the spectroscope, or the luminous geometry of the transparent orrery; or, tales of travel, illustrated by the presence of grim idol, or rude canoe, or, perhaps, some vagrant and half-lamed savage. These lectures to the working classes, in which the most educated and able men the country can boast would soon be proud to take a part, would be a great national boon, and would be calculated to draw together the several grades and orders of society. Whether once or twice a week, or even nightly, if an hour's lecture of this kind intervened, with perhaps some half-hour's music, the Hall being opened, say from half-past six to half-past nine, at a low charge, it is not unlikely that such an institution, if the management were adequate to the scheme, would prove one of the most popular in the country.

SHAKESPEARE'S THEATRES AND OUR OWN GAFFS.

So much has been written about the life and doings and works of William Shakespeare, that it would seem to be almost, if not quite, impossible, to say a word about either him, or his doings, or his writings, that has not been already said. But the public interest in the immortal bard seems endless, and the curiosity of the public about him and his wonderful writings insatiable, and it would even appear that the foreigner is yet more curious about the matter than we are, for almost no end of famous German professors in and out of universities have lectured, or are about to lecture and speculate on the meaning and mysteries of the great plays which he wrote. Indeed, if the reader will but go into the reading-room of the British Museum, he will there find, to his consternation, no less than three folio volumes of catalogue devoted wholly to a list, a mere list, of the names of the writers and titles of the books which have been written by all sorts of people to explain him, and to develop the meaning of the plays which he wrote. But one thing more there yet is which

all these learned people have said nothing, or next to nothing about, and are certainly not at all likely to say anything about—the German professors with all their monster research will not, it is quite sure, touch on it, and yet it is, we had almost said it, the key-note to the understanding of the man, and what he did, and his fair starting-point. It may be specially addressed to our readers, inasmuch as it has to do with "building." This, then, is the problem, a twofold one,—*What sort of place was it in which Shakespeare played, as a player, and afterwards wrote for; and is there now in this, our present day and hour, any such place to be found, and if so, what is it like?* Conceive the curiosity of the public and of the learned if, in digging for the main drainage, or for a new subway, the very ruins of the "Globe" or the "Blackfriars" should be come across, so that out of its ruins and its decayed timbers the Globe Theatre might be re-erected and presented to the wondering eyes of this modern generation. Why, it is quite certain that the whole nation would flock to see it, and perhaps even the German professors themselves might go there for help and hints in the composition of the forthcoming lectures and accounts of the "life, character, and dramatic genius of Shakespeare." Alas! for the great men and the big giants of this world. If the Homers, Dantes, Miltons, Michaelangelos, and Shakespeares could but be seen at their work, as they really did in their own days, how startled and disappointed the world would be, and how low it would be all of it thought. Our present business is not with the poetic, but with plain facts and common matters. What kind of place, then, was the Globe Theatre or the Blackfriars, and what kind of actors were they who performed in them, and how did they act, and what kind of audience was it who listened, and applauded, and condemned?

But a word or two just to make a new thought intelligible as to the position of Shakespeare and his acting capabilities, when he found himself, on some chill morning, at the stage entrance of the Blackfriars, and compelled by dull necessity to ask for something to do in it; surely the most wonderful and sensational morning in his life, far surpassing anything he could ever have felt in the writing of Hamlet, or Othello, or even in the rewriting, without a blot, the whole batch of his plays. Mr. Charles Knight says that the door of the theatre was not a difficult one for Shakespeare to enter. But, alas, again, for the facts of poetry. Shakespeare came to London, and presented himself at the door of the theatre, in search of employment, simply because he could not help it. His father and he himself were in difficulties, and all the well-known story of the deer-taking, and the very reasonable indignation of Sir Thomas Lucy, of Charlote, is as veritable a piece of history as any that exists. Mr. Knight says it is fiction, but it is necessary truth. Shakespeare came to London town because the little village of Stratford was too hot to hold him, and because he must needs live somehow or other. To London, therefore, he came, and to the door of the Blackfriars also, as the readiest thing that offered, and from the fact of his knowing nowhere else to go to, and from the likely fact of his passing acquaintance with some of the strolling players who occasionally passed through Stratford. This brings us to the very starting-point of his dramatic career and future life as a player and writer of plays, how he acted, and how and why he wrote, and to the kind of place he had got to. Theatres, in Shakespeare's day, were managed pretty much as they now are; there was a principal man and manager, and a principal actor, and subordinates, and "supers." The magnificent man in poor Shakespeare's day was James Burbage, the head of the company, and the future master and manager of the immortal bard himself. We can imagine vividly the scene enacted on that most eventful morning; for had things turned out less favourably than they did, the world might never have seen the plays themselves. What were the plain, every-day, not at all mysterious, facts of this very simple case? Why, the said James Burbage, the manager, must have been struck with something very much like surprise at the application of the would-be tragedian, or comedian, at the strangeness of his request. With a countryfied manner and voice, and even face, and with little or no histrionic or actor's faculty in him, Mr. Burbage must have asked him (how could he help it?), what it was he

thought he could do? and it is quite certain that William Shakespeare then and there must have been fairly driven into a corner, and at his wits end for an answer. Nature had, indeed, been prodigal of her gifts, almost without measure, to this her favoured son; but the talents of an actor she had denied him. He could not act any of his own characters; for it is said, significantly, by those who knew him, that he was "good in those parts that he took to." The fact really is, or was, that Shakespeare was good for nothing in the Blackfriars but the part of a "super." What followed? (what Mr. Knight and others will say we dare not think of). Why, dismal to say it, this; that in all probability he but too gladly accepted this very humble birth, and but walked on the stage to stand there at the back of it for a minute or two, and then moved off again. The precise way in which this simple manoeuvre is accomplished, and the way in which it is made to tell, and becomes a sort of dull necessity, is, and can be fully seen nowadays only in a "gaff," as it is called, a remnant of things as they were in the days of Shakespeare, and which would seem to have come down from his day to ours with but little change, and making appeals, with occasional exceptions, to much the same sort of audiences. In solemn truth then, Shakespeare, whose words, Mr. Emerson says, will "reverberate through all coming centuries," and whom Mr. Carlyle says, "No Englishman would exchange for our Indian empire,"—this man, William Shakespeare, was nought but a "super" in a gaff! We consider this, strange as it may sound, as a matter of absolute certainty, and open to absolute proof. This, of course, is not the occasion on which to go at length into this proof; we only state the fact, for fact it is. But what was the next move, what more was to be done by Mr. Shakespeare, this engagement producing, as is obvious, so little towards the fell necessities of himself and wife and children, why, still more horrible to relate, comes the next yet more frightful fact in this little biography? It was the custom of the time to ride horseback to and from one place to another, there being but very few vehicles of any kind, or, perhaps, none, in this order of society; and there must have been, therefore, quite a little trade done in the caring for these horses, while the masters of them were otherwise occupied than in the riding them, and no little confusion and loss at times; what more likely, therefore, than that Mr. Burbage, the manager of everything, and with all his eyes open to the wants of the theatre, should have proposed to our Shakespeare, seeing that acting would produce but little, that he should, being used to such matters in his native farming village, look to the waiting horses, as Rowe writes he did; and that he, not being able to do all the work personally, should, as we are told he did, in the plain matter-of-fact histories, hire boys to do this, under his management and direction. Nothing ever was more likely, though Mr. Knight, his enthusiastic biographer, in his mythical life of him, will not hear of it. Rowe says that these youthful assistants were called "Shakespeare's boys," and seem to have been preferred on that account, and to have been consequently more readily trusted with the care of the more valuable horses, and it is not a little curious to find how this so much-disputed fact is open to confirmation at the present day, and palpable to all who will go low enough for it. The fact is proved by the naturalness of the language used to express it. It was not invented by Shakespeare; it was the talk of the street boys themselves, and goes on at this hour, for, if visiting one of these remnants and living remembrances of Shakespeare's life and day, you should happen imprudently to take the least notice or enter into a little friendly talk with any member of the gallery, of the tribe of the unwashed, and then, forgetting it all, on a succeeding night,—say, next week,—when a new piece is on, you should incautiously look about a little inquiringly, the chances are a hundred to one that somebody bawls out, "Looking out for your boy, sir?" and, before you have time to recover from the momentary surprise caused by the directness and vigour of the question, you will be told with equal plainness, "cause he's down stairs outside a waiting for you." A true story; no invention is called for in it. Poor Shakespeare, how we must sympathise with him. Mr. Carlyle says, looking at the surroundings of the man and his faculties at this time, it must be apparent to most that he had his difficulties. Indeed he had; we can appreciate them; for what with the crowd of thoughts in him in vain seeking for some public utterance—and there was

none at first—and his awkward wife at home, his stupid work at the playhouse, his boys not to be got rid of, and his small means, his surroundings must, indeed, have been tremendous, and one fairly wonders how he ever did get over them or through them at all. He never would have done so, and we—the world—would never have seen the plays but for one thing, and this again takes us into the gaff. Mr. Knight says that Shakespeare became an actor because he was a writer of plays, and not a writer because he was an actor; surely the direct opposite of the plain and evident facts which are as vivid as daylight. It was the sole thing left for him to do. The acting "super" brought next to nothing, his youthful assistants took the horse-holding ready cash, and spent it, or coaxed him out of it, and there was nought else but—and this was the opening fate offered him. The stuff that the players had before them to talk was so dull and of such an intensity of stupidity, as it is now at this hour in the gaffs, that he could not but think how very little it would take to throw, even if it were but now and then, a word or two, or a sentence, into the dialogue, which the gallery could at least understand the simple meaning of. And he began to write. Not, perhaps, even short plays, but adding a little here and there to the MS. copies of those forming the stock-in-trade of the theatre, and the manager finding these tell on the audience, he, doubtless, though we cannot prove it, did write a number, it may be of short three-act plays, just the things to catch the humour of the audience. His first efforts were, probably, never printed, and existed only for the use of the actors in MS., and are for ever lost. Wonderful things, doubtless; in some senses better than any we have,—shorter and exactly fitted to the time and audience, not so much his own pure invention as a reflex of the mind and talk of the gallery woven into some common story. This it was that made him, not a manager, as Mr. Carlyle calls him; nor an actor, as Mr. Knight dubs him; but a simple somebody in the playhouse, and on a level with the chief actors, and out of the "super" class, and the horse-holding trade. He became a necessity in the place. Apart from spiritualities, says Mr. Carlyle, and considering him merely as a real, marketable, tangibly useful possession, does it not appear that a thousand years hence we can fancy him as radiant aloft over all the nations of Englishmen, and the greatest thing we have yet produced. Yes, it may be so; but he never thought this of himself, and could not do so, for at his very best he was nothing more than on a level, by dint of useful, marketable writing, with the actors in a gaff. Let no one despise it. Some tremendous work is sometimes done in a gaff. A gaff is not a "minor" theatre; and there is a passage in "Hamlet"—a well known one on the subject of acting—which applies to this lower kind of acting which goes on in it, but not to that done in what is called familiarly a "minor house," such as the Strand or the present Globe. We refer to the passage where Shakespeare complains of the exaggerated style of the acting in his day, and to the "strutting and bellowing," and the "imitating humanity so abominably,"—a charge that could not be made against the doings in a "minor theatre," but in a gaff it is a necessity, there would seem to be no other way. Strut and bellow they must: the audience, the gallery, compelling them to do something! If the head cannot be penetrated, why the ear must be split. But let not any one suppose for a single moment that the gaff audiences are stupid, or dull of hearing, for it is quite the reverse of it; sharpness is perhaps the best word expressive of its overflowing life and unsatisfied longings. It was not, therefore, as one moving with modesty, though with conscious dignity, among the throng of wits and poets, as Mr. Knight and others have it, but as one hard driven by every adverse circumstance conceivable or well possible, that Shakespeare was compelled to do what he did—to come to London, to go to the playhouse to act, or rather move about on the stage, to attend to the holding of horses, even if he did not do the work sometimes himself, and finally, and as a last resource, to write plays! All this happened in and between the years 1585, the date of his coming to London, and 1589, the date of his becoming a part proprietor of the Blackfriars Theatre, the most memorable years of his life; for before that he was comparatively thoughtless of himself, and after it, being part owner, he stood on somewhat sure ground, and must have felt, to a certain extent at least, independent. There is nothing more wonderful in the history

of purely English doings than this of Shakespeare's work, for the place produced the man, and not the man the place, and that place was not a grand opera-house, or a Drury-lane, or even a Strand, or a Globe, but a veritable "gaff,"—a small, utterly insignificant place, filled with some dozen actors, or even less, and with an audience for the most part composed of only such as nowadays are almost proscribed, and which there is every now and then every effort made, though most unfairly and unwisely, to put out of the way altogether. Unfairly, because all, however low they be, have a right to be amused; and unwisely, because there are those who will go to no other place for instruction of any kind, but who will, and do, go to a gaff, and who may, and do, find instruction in it as well as amusement. The main and chief sin in a gaff, be it observed, lying in the fact of its charge of admission to the many being a penny, all that such can afford to pay when frequent it, and who find what their souls seek in it. The gaffs are the dying embers of the fires which burnt in the days of Shakespeare, and we may hope to record a little of their way and material surroundings while they are yet permitted to exist. They contain art elements nowhere else existing, and, for the sake of those who have nothing else, should be helped not crushed out of being.

ON THE TAJ-MAHAL AT AGRA.*

DURING A stay of three or four years in the East, one meets with so much worth describing that on being asked by friends in the cold civilised West what one has seen, it is sometimes a difficult matter to know what people, countries, customs, or buildings to tell about first; but in the spring of last year it was my good fortune to find myself in the cities of the old Moguls,—Agra and Delhi,—and of all places I have been to, either in the West or East, I unhesitatingly affirm that Agra and the Taj-Mahal stand pre-eminent in the impression made on my mind.

Venice, with its Grand Canal and St. Mark's, numerous palaces and art works,—Constantinople and the Bosphorus, with the Sta. Sophia and Suleiman Mosques,—Cairo, with its beautiful Hassan and interesting Touloun Mosques, picturesque streets, and Coptic churches and ruins, and the huge ugly pyramids,—and Bejapore, with its big dome and elaborate Ibrahim Roza, all fall into the shade contrasted with Agra and its Taj-Mahal. Its romantic situation, dazzling brilliancy, excessive elaboration, and the particularly refined, though lavish display of wealth in its ornamentation, make it beyond all others a place in which a cold-blooded Caucasian can perhaps realise somewhat of the poetical and luxurious feeling of the voluptuous Easterns.

The Taj-Mahal was built about the year 1040 of the Hijree, or 1662 A.D., about the time of the Restoration, and during the latter years of the reign of Kurrem Shah, the fifth of the Mogul Emperors, grandson of the great Akbar and son of Jehangir. He is more commonly known by his assumed title of Shah Jehan, signifying the King of Worlds. It was erected as a tomb for his wife, the Begum, Ungeman Bannoo, whose title was Moomtaz Mahal, daughter of Aziz Khan, and grand-daughter of the Nawab Etmadowla. She was also called Taj-Mahal, and Noor-Mahal, which means the Light of the Harem or Palace. She is immortalised in our own language in Moore's beautiful poem of "Lalla Rookh." She had four sons and four daughters; the youngest daughter's name was Dhanur Arra, at whose birth Taj-Mahal died. Shah Jehan was exceedingly fond of her, and on her death-bed he promised two things, first, "That he would never marry again;" and second, that he would build for her so magnificent a tomb that it should surpass all others the world ever saw.

The tomb is erected on the left bank of the river Jumna, and Shah Jehan's intention was to have erected another for himself of equal splendour on the opposite bank, connecting the two by a bridge with silver railings, so that after death their souls might be enabled to hold spiritual communion with each other. He went so far as to put in the foundations of the second, when his demise put a stop to further proceedings, and he lies, in consequence, by the side of his wife in her tomb, her sarcophagus occupying the centre position.

* From a paper by Mr. W. Emerson, read at a recent meeting of the Royal Institute of British Architects.

The Taj buildings altogether form a parallelogram. They consist of the Taj proper, placed on a raised dais of white marble, some 20 ft. high and 300 ft. square, situated in the centre of the end of the parallelogram immediately overlooking the Jumna, and flanked on each side by red sandstone buildings, separated from the raised dais by courts about 400 ft. wide, paved with marbles laid in geometrical patterns. One of these buildings is a mosque, the other is of no use but for its architectural effect in contrasting and grouping with the Taj, and is called by the natives the Jawab, which means "answer," and I think very well describes its meaning and use. This mosque and Jawab are of red sandstone and white and black marbles, and inlaid with precious stones, something similar in design to the entrance gateway I shall presently describe. On the floor of this Jawab are outlines of the dome and finials, and some other portions of the Taj, cut in the pavement for the men to work from.

As one drives into the outer courtyard, and pulls up opposite the grand entrance, the beauty and magnificence of the place immediately strike one. The gateway is two stories in height; in elevation, it has a large and deep central recess, a semi-octagon on plan, domed over and flanked on either side by two smaller recesses, those on the upper floors forming galleries, and with large octagonal turrets at the extreme angles surmounted by domes supported on columns and arches. The grand centre arch is also surmounted by a row of eleven little domes on columns and arches, and flanked by slender minarets; the effect of these is particularly beautiful. It is built of red sandstone, inlaid with white and black marbles. The spandrels over the arches are of white marble, inlaid with semi-precious stones in the same manner as the tomb itself, only the work is of much larger design and rougher execution. The gateway forms a square room with large entrance arches on two sides, the outside one being hung with gates, and on the two other sides smaller doorways leading to rooms on either side, and to a staircase which leads to the galleries over these smaller doors. A seat runs round the room, and on one side is a platform for the use of servants, soldiers, and gatekeepers. The lower part of the wall has a dado, formed of panels of white marble, enclosed by a border of inlaid white and black marble in a zig-zag pattern. Over and at the sides of the smaller side-doors are the peculiar little arched recesses used for placing lamps in at the time of a festival. The friezes are inlaid with sentences from the Koran. This gateway is domed over, faced internally with white chonam (or plaster), and ornamented with black lines, radiating from the centre, which accentuate the raised ridges dividing the little hollowed spaces, forming the surface ornamentation of the interior of the dome. The gates themselves are of teak, covered with a plating of bronze, with a raised pattern on it, in shape a mixture of a quatrefoil and rectilinear figure. Through this gateway, at the end of a long avenue of cypress trees, the centre of the avenue being occupied by marble fountains, basins, and flower beds, the Taj-Mahal dazzling the eyes with its whiteness is seen. On walking up the avenue and through the gardens, I could not help feeling it to be a more beautiful place than I ever dreamed of. There is almost every description and variety of flower, and on a hot day the cool sound of the water trickling along the little aqueducts which carry it to all parts of the grounds, the shady walks, and parts of the paths arched over by creepers, covered with flowers of most gorgeous colours, and the mango, guava, orange, lime and loquat trees, combine to make it a most pleasant resort. Leaving the gardens, and ascending a flight of marble steps and crossing the platform of white marble which in the bright sun dazzles the eyes so as to make them water copiously, and with "Salaam Sahib, 'Salaam Sahib," from the old Mussulman priests at the entrance, one finds oneself in the inside of the Taj itself.

The contrast between the bright light outside and the solemn gloom inside is so great, that for some minutes you can see nothing. Gradually this wears off, and one sees tolerably well, though to do drawings inside I was often obliged to get natives to hold candles for me. The plan is an irregular octagon outside, while the centre room is a regular octagon, recessed on each side, and about 60 ft. in diameter, and 80 ft. in height, with circular rooms in each angle of the building con-

nected by passages running all round the centre apartment. Under this centre apartment is a crypt or small chamber, in which are the sarcophagi that really contain the bodies of Shah Jehan and Taj-Mahal. The centre portion of the inner apartment is screened off and contains the show tombs, on which the natives strew flowers, &c.

The way in which light is obtained through the outer chambers and double walls, there being in no case a direct light into the principal room, and what does enter being broken by the trellis work that fills the openings, causes a wonderfully cool and solemn effect on first entering. At each corner of the raised dais on which the tomb is placed are minarets.

The building is two stories high, the centre room running up the whole height of both stories. Access can also be had to the roof which is flat, and has four smaller domes supported on piers and arches, one over each corner circular apartment. The centre chamber is surmounted by a double dome—the one forming the ceiling being about 80 ft. from the ground, and the upper one being about 260 ft. high, and is the principal feature in a distant view of the Taj group. The external elevation of the four principal sides is the same, also the four angle fronts are the same design. The arrangement of these façades is very simple. The principal ones are divided into three parts. In the centre part is a large, well-proportioned, recessed entrance arch, the height of the two stories, and surmounted by a parapet and two minarets, which being carried down to the ground as slender octagonal shafts, form the division between the main central recessed portion and the smaller parts which flank it. These side parts of principal elevations have two arched recesses much smaller than the central one, placed one over the other, and forming the two stories in height, and are exactly similar to angle elevations, being again divided from them by minarets as before described. All these recesses are square on plan, and have at back arched and square-headed openings, which are fitted with the marble trellis-work for admission of light. The domes, which are over the four angles, are supported by piers and arches, the arches being foiled after the Saracenic fashion. The domes spring from a cornice formed of plain projecting slabs of marble, supported by cantilevers.

In the centre rises the huge bulbous dome, which forms the grand central feature of the Taj. It springs from a plain straight circular shaft, which rises to about the height of the tops of smaller domes. A plain twisted bead mould marks the springing. The peculiarity of this and other Mussulman domes in India is the bulbous shape obtained by making them swell out considerably beyond the springing line. This form obtains at Benjapore to a great extent. This dome is topped by a huge gilded finial with a golden crescent. The walls are mainly built of red sandstone, but completely encased with white marble. This is not done in the veneering fashion of Italy and Egypt. Each slab of marble is 4, 6, or even 8 inches in thickness. In the construction of the dome, and other places where it would not interfere with the after ornamentation, it is built up with the walls, laying first a course as slabs of flat masonry, and then a course on edge, thereby obtaining good bond, and an external effect of alternate broad and narrow courses of about 18 in. and 4 in. in depth, so that riveting was never needed.

This method obtained in many places in India, where their building stone was wedged out of the quarries in large flat slabs. About Agra and Delhi, all the buildings, whether of red sandstone or marble, were done in this manner; the interior of the walls was filled in with rubble.

Were it not for the elaborate inlaid work which partakes more of the nature of jewelry than architecture, this building would be the simplest in the world, but very effective, nevertheless,—first, of course, owing to its grouping and proportion. Then its large broad plain surfaces are undisturbed in their repose by any projecting mouldings, while the cool delicate shadows in the large arched recesses cause quite a sufficient balance between the light and shade. The spandrels to arches and the illuminated surfaces are as a rule set back about an inch. The plinth projects about an inch, and a slender string, projecting very slightly, accentuates the parapet. I think these with the bead round the springing of the large dome, and cornices of smaller domes, and the leaves at the apex, are

the only particular lines formed by shade throughout the whole external face of the building.

One thing that lends a most peculiar charm to this tomb, is the wonderful delicacy of the shadows caused by the strong reflected lights. The pavement of the raised dais being all white marble, it reflects in so powerful a manner that it reduces the depth of all the shadows by quite a half, if not by more.

One general feature in the ornamentation of the Taj is the inlaid black marble. Every angle, arch, panel, recess, in fact the outline of each component part is marked by lines of black marble, either 1, 2, 3, or more inches in breadth, according to the size or importance of the detail requiring accentuation. This of course accounts in a great measure for the absence of any moulding, and I am inclined to think this method of ornamentation, or more properly accentuation, disturbs the grand repose of a building much less than any other method employing shade as the means.

Probably the greatest ornaments to and most perfect pieces of work in connexion with the Taj are the four minarets at the corners. They are about 200 ft. high and about 20 ft. diameter at the base; but the proportion of these is so subtle, that the slightest alteration, by either increasing or decreasing the diameter, or taper, or height, one feels would immediately spoil their effect. They are most elegant, but have not the starved appearance of the minarets of Egypt, Constantinople, and Delhi. They are three stages in height. At each stage a light balcony, supported on cantilevers, running round the tower, and they are surmounted by domes on gilt columns, and foiled Saracenic arches and gilt finials. Winding stairs take one to the summit, to which stairs access is obtained by means of square-headed doors.

I mentioned before that each course of white marble is divided by a narrow course of black, which in the distance gives an appearance of very thick joints, and makes the circular shaft tell out wonderfully in perspective.

The mausoleum itself is ornamented to a height of about 6 ft., with panels, forming a sort of dado, edged with a border of inlaid work in semi-precious stones of various colours, and each panel being carved in relief with flowers growing out of pots—the lotus, rose, &c. The carving of these is very beautiful, finished as finely and as polished in every little detail, as any Italian work, and with all the freshness of design and arrangement of Medieval art. Around the arches the Koran is illuminated in black marble. In this manner, it is said, the whole Koran is inscribed on the Taj walls. The spandrels of the arches are inlaid with a flowing ornament of graceful design, in semi-precious stones. The angle shafts, forming minarets, have zig-zag lines inlaid in black marble. Under the parapets is a running pattern, also inlaid; and in the parapet itself is an inlaid pattern of bold design, in coloured stones.

The interior is, in the same manner as the outside, ornamented with a carved and inlaid dado; but the carving is richer, and the inlaying more elaborate.

The dome, which is very dark, is covered all over with the pattern peculiar to Indian Mussulman architecture, which is formed by lines radiating from the centre, crosswise, and the spaces thus formed (which of course increases in size as the lines approach the springing of the dome) are hollowed; by this means the radiating lines are in reality formed by the ridges dividing the hollowed spaces. This is often elaborated to such an extent that it is impossible for the eye to follow the pattern.

I now come to the part of the building which is the most wonderful and elaborate part of it all, namely, the tombs and the screen enclosing them, all of purest white marble. The screen encloses an octagonal space. Each side of the octagon is divided into three bays: the centre bay of the side facing the entrance door is an archway into the enclosure: all the other bays are like to each other and of similar design to the part at the side of the arch. At each angle, and between each bay, are posts supporting perforated screens, each of a single slab of marble. It is very Italian in feeling. An eighth portion of it contains the whole design; this is reversed and turned upside down to form the whole screen. It is, I should think, the most elaborate piece of marble perforation in the world, and is polished all over; both sides are finished alike. The screens are surmounted with a sort of balustrade of carved and inlaid work.

But the most extraordinary part is the inlaid work on the pure white marble posts, rails, arch, and tomb. The tomb, both in the enclosure and in the crypt below, are simple parallelograms about 2 ft. high, with a small sarcophagus in the centre of each, on a plinth formed of two cymium members, and filets, and the top slab having an ogee mould.

The inlaid work is most elaborate, representing all sorts of flowers, worked in semi-precious stones—the stones carefully picked for each particular leaf, so that all shading and drawing of leaves is obtained by the graduated natural colour or marks in the stones themselves. At the side of the central tomb is the following inscription, in Persian:—"The splendid tomb of Unjemam Bunnoo Begum, whose title was Moom-taz Mahal, was made in 1040 of the Hijree," and on the side of the other is:—"The magnificent tomb of the king, inhabitant of the two heavens, Ridwan and Kholi, the most sublime sultan on the throne of Illeeyn (i.e., starry heavens), dweller in Firdooz (i.e., Paradise). Shah Jehan Badsha Gazee, peace to his remains, heaven is for him. His death took place the 26th day of Rujab, in the year 1076 of the Hijree. From this transitory world eternity has carried him off to the next."

In some of the roses, which are no bigger than a franc, there are thirty pieces of stone, and the jointing is generally scarcely visible. It is, in fact, jewelry. Indeed, in the centre of the flowers on the head of the tomb there were originally large emeralds and rubies, but these were stolen during the Maharatta wars. The ornament is in some places of a flowing pattern; in others, like little trees in full bloom, with magnificent flowers. The colours of the stones are arranged with such taste, and the effect is so quiet, that it is only after looking about for some time that one finds out what it is that gives the interior such a rich appearance. Not a single flower forces itself unduly on the eyes, and I have seen Europeans walk for the first time into the Taj, and go all round and out again, without ever noticing anything particular in the ornamentation of this screen and tombs. What they do notice at once is the soft echoing of every little sound. A musical note echoes and re-echoes through the dome, gradually and softly dying away. The natives believe these voices to belong to the unseen heavenly bodies, who watch over Noor Jehan and her husband. The most delicious harmony I ever heard was some singing by ladies in this tomb. The interior has the most solemn effect on one's mind,—there is an amount of pathos in it that causes feelings in a sensitive person much the same as reading an affecting melancholy love-story, so much so that it almost forces tears to one's eyes.

The whole cost is said to have been about three millions of our money. It took seventeen years in building, and the labour was all forced—the workmen being kept on a daily allowance of rice. The architect sent from Turkey to Shah Jehan for the purpose. Others say a man named Austin de Bordeaux, a French architect, designed it. As to whether purely Oriental, or in some measure European, I should be afraid to give a decided opinion. I think there is much of Italian feeling in the screen, and also in the four minarets and some details of the cantilevers. But then at Bejapore and other places in India I thought the same with regard to many details, and no one seems to doubt that the art of Bejapore is purely Oriental. Still it is possible that Italian artists may have had something to do with it in detail; and I believe in some old manuscript accounts, mention is made of payments to a foreign artist. But this may have alluded to Isa Mahmood or Persian artists. It was built at a time when Italians were to be found all over the world, fleeing from ducal tyranny, and some may have found their way into the centre of India; and they could have ingratiated themselves in no more favourable manner with the luxurious Mogul Emperors than by assistance in the art of magnificent building.

The Spade and the Priest.—In the *Débats* there is a letter from Father Hyacinthe, who offers his services for the defence of Paris. A priest, he says, is not allowed to take up the sword, unless in times of extreme peril; but there is nothing to prevent him from doing what he can with the pick and shovel. He therefore holds himself at the orders of the mayor, to whom his letter is addressed.

THE SUSSEX ARCHÆOLOGICAL SOCIETY: WORTH CHURCH.

THE annual meeting of this society, held last week at Rye, was not so well attended as the meetings usually have been. A little museum of local antiquities was exhibited, and the interesting parish church was of course visited.

There was no paper read in the church, or in the townhall, relative to the antiquities of the place; but the committee provided guides to accompany the visitors to the most notable. Some visited Ypres Castle, named from William de Ypres, a distinguished general of King Stephen's, who died in 1162. Peacock's school, alluded to in Thackeray's last novel, "Dennis Duval," was also visited, and the Mint, the fine old Landgate, and Queen Elizabeth's Well.

Whilst these places were being viewed, a large detachment proceeded in an omnibus and on foot to the castle at Camber, a military fortification, erected by Henry VIII., for the protection of the coast between Winchelsea and Rye. It is on the south side of the road between these two towns, and about the same distance from each. After a pleasant journey across the marsh, the party seated themselves on the grassy slope beneath the massive keep or central tower, and listened to a brief history of the place from Mr. Mark Antony Lower. It appears that Camber (before Rye), was a port to which the Venetians traded in very early days, but it was not till the Pope had stirred up divers kings and princes of Europe to attack the kingdom of Bluff King Hal, and utterly destroy the people thereof, that the fortification in question was built. The king and some of his most trusted counsellors went round the south coast, and ordered many defensive works to be constructed, the principal of which were at Walmer and Camber. The outer walls of Camber, the large round keep, the bastions surrounding it, the curtain walls between, and the gateway are tolerably well preserved, but in the interior the *débris* has so filled up the place that the top of the outer walls can be reached without difficulty. The castle does not seem ever to have been the residence of a family; it was only garrisoned and kept by a few soldiers, who were not very highly paid by the Government. The pay of the captain in charge amounted to the sum of 2s. a day.

At the luncheon, Mr. J. G. Dobson, M.P., presided, and various little speeches were made. We need only mention one, namely, that made by the Rev. W. Powell, one of the hon. secs., in reply to a toast to the Prosperity of the Society. The rev. gentleman, referring to an article which appeared at the latter end of last year in the *Builder*, respecting the destruction of Worth Church, is reported to have said,—

"The society had been made the butt of the editor of that journal, who had made this society responsible for all the faults of the architect, all the faults of the minister, and all the faults of the churchwardens, over whose acts this society had no control. A series of attacks had been made upon the Sussex Archaeological Society by the *Builder*, and in some way or other these gatherings had been connected with the destruction of Worth Church; for it had been said that if the members and their secretaries had spent some of the time consumed in picnics and making stupid after-dinner speeches in saving an ancient church which had been pulled down under their very eyes, they would have done some good. All that he could say, in reply, was, that there were two classes of churchwardens and of ministers, one of whom were archaeologists and the other whom he might call non-archæologists. He was not aware that there was any solidarity between this society and non-archæological clergymen and laymen; but if he or the society, could prevent the latter from destroying their churches, it should be done. If there could be a Court of Taste instituted, to which Mr. Whitechoker or Mr. Blackacre could be cited to appear, he should rejoice; but a minister and his churchwardens had the legal power to do what they liked to their church, while the society had neither legal nor equitable right to prevent what was done."

Gentlemen who teach the "Word" should be precise, not to say truthful. We never used the expression attributed to us; we never accused members or secretaries of "making stupid after-dinner speeches," though we have some difficulty in refraining from applying the epithet to Mr. Powell's last effort. We have taken the pains to look back to the article in question, and what was said was this:—

"Our regret and our anger are for the destroyed church, and our fear is for the chancel arch, a most interesting example; and for the characteristic 'long and short' work all over the remainder of the building. Some blame surely attaches to the Sussex Archaeological Society, so long with its *occasional* and *its* dinners! Did they do nothing to try and save the building, the most precious in respect of its uniqueness in the whole county? Where are the Rev. W. Powell and Mr. F. Barchard, the honorary secretaries? Have they heard nothing of these things? or worse still, have they heard, and yet not moved?"

So far as this may be an attack, we repeat it

with increased emphasis. If the secretaries had called a meeting at the proper time, and aided locally the efforts that were being made elsewhere, the ancient chancel might have been saved, and Sussex might still boast the only Saxon church in England with its enclosure walls intact. Of ourselves, we should not have referred to the matter again. We did our best, and failed, and there an end. But the least that we can expect from those who ought to have interfered in the same direction, and did not, is a truthful if not grateful reference to the endeavours we made on purely public grounds.

THE ROMFORD SEWAGE FARM.

DAY by day the opinions we have held and advocated for years as to the irrigation of land with sewage are confirmed and spread.

Bretton's Farm, Hornchurch, was purchased some time ago by the Romford Local Board of Health for the disposal of their sewage by irrigation, and let by them to Mr. W. Hope. On Tuesday, the 9th, Mr. Hope received a number of gentlemen interested in such matters, for the purpose of inspecting the result of the application of sewage to the land and crops which has, notwithstanding the difficulties that surrounded him in the first place, been carried out with a considerable degree of success.

The sewage is first pumped to the top of the engine-house, and then conveyed in sheet-iron troughing to about the centre of the farm, where it branches off in all directions, there being outlets at short intervals, which can be opened for the discharge of the liquid, or plugged up, or even set to a certain quantity, as required. The sewage eventually flows into channels of concrete or earth, and thence again into smaller off-shooting channels, which run along in the crown of the beds, the ground having been originally laid out in proper inclines; these smaller channels are then dammed up where required, and the sewage overflows the beds. Of course, there is a large amount of effluent water which percolates through the soil, and this is carried back again in a state of purity to the tank, or down to the river, at pleasure, by drain pipes, laid at a depth of 6 ft. from the surface, and at a distance of 150 ft. apart. The effluent water is clear and sparkling.

Mr. Russ (of the firm of Messrs. Russ & Minns, engineers, who designed and executed the outfall works) attended, and gave information, as did Mr. J. R. Harding, the Board's surveyor, and Mr. Avis, the bailiff on the farm. One of the crops to which attention was drawn was a piece of Italian rye grass, sown on the 19th of March, since which four crops have been cut, averaging $7\frac{1}{2}$ tons per acre, and sold for 1s. per ton on the ground. Close by was a piece of Dalmahoy potatoes, planted on the 2nd of April, which were producing upwards of $1\frac{1}{2}$ cwt. per rod, and worth about 25s. per acre. Some "Early Rose" kidneys were also shown, which produced ten or twelve at each root, many being from 4 in. to 7 in. in length. Some beans and peas, sown on the 2nd of April, produced—the former 9s., and the latter 15s. per acre, without the straw. A little further on was a specimen patch of clover, sown on the 23rd of May, which was very thick, and about a foot high. Adjoining were about four acres of transplanted mangold wurtzel, looking strong. Another crop of the same kind exhibited some very fine roots, many of the "globes" being over 2 ft. in circumference, and some of the "long" 2 ft. in length. A crop of intermediate carrots, about 4 acres in extent, sown on the 4th of April, a month later than they ought to have been. Some of these have already been cleared off and sent to market, where they fetched at the rate of 41s. per acre. Those that still remained had been sold as growing at 21s. per acre, it being worth the additional amount to prepare and get them to market.

Amongst those who after the view spoke on the subject,

Mr. Chadwick said it was a great gratification to him to see that which was the pestilence of their towns, the waste of manure, by this farm made profitable. He hoped—it was a long time ago when he predicted it—that that waste of manure, which in towns meant pestilence and disease, would, in the agricultural districts, soon mean high and enhanced production. He was quite sure that they would see, especially under such leadership as they had seen that day, that that waste which desolates towns and lowers the

condition of the population, would, in the agricultural districts, give the highest amount of production of food, and would elevate the condition of the population. He believed that this movement would lead to an enormous increase of the productive power of the soil, not only in this country, but, through the example set, to the countries abroad. He hoped, for the sake of this country and for the sake of the example, that sewage irrigation might have due support and due success.

Mr. Rawlinson would take credit for having striven to understand whether sewage ought to be treated as the waste product it had been considered, or whether it ought to be treated as he had seen it treated that day; and he had come to the conclusion that the proper place for sewage was the land. He had been a member of several Royal commissions, and sat upon one for eight years, which had been appointed to inquire into the best means for utilising town sewage. During the eight years they examined all the places in Great Britain where sewage had been or was attempting to be utilised. They reported and drew up conclusions in which they said that town sewage could be utilised; circumstances might so intervene as to prevent its being utilised for the profit of the town, that was, direct money profit; but it should always be utilised, because of the very great profit to the community at large. Rounford was so situated that they were able to get rid of their sewage without its being any burthen to the community; and some of them would, no doubt, remember that at the inquiry he held he told them that if proper means were taken to utilise the sewage on the land, instead of being a burthen, as many of them feared, it would really relieve their rates, get rid of litigation, and put them in a position of comparative comfort. From what they had seen to-day he thought there was no need to fear the result. He hoped they would soon have sewage generally applied to the land, and have that done which brought produce and food to the multitudes of our country.

Mr. J. B. Denton said he happened to be a colleague of Mr. Hope's upon a committee, which connexion necessitated his presence upon this farm occasionally. The first of those visits was several months ago, and he would declare, as a man of considerable experience in agricultural matters, that he never before had seen a more forbidding instance, or a more forbidding task for any man to undertake, than that which Mr. Hope had on this farm. Now, he came here to-day, after two previous visits, when he felt much dispirited on account of his friend, as he had thought that the most gallant spirit would be beaten,—not ultimately, but immediately. He feared the weeds would overgrow him, and that, moreover, the arrangements for the delivery of the sewage were not so perfect as they ought to be. He felt in fear that his friend would be encumbered with difficulties which he could not rationally be expected to overcome, but he was bound to tell them now that he never walked over a farm on which there were more certain instances and proofs of success. He saw the expanding growth which told him that sewage, properly applied, would do all that they had expected. These are surely three good witnesses.

ARCHÆOLOGICAL EXCURSIONS.

The Suffolk Institute of Archaeology.

The members of this institution have made their annual excursion, and this year chose as the scene of their operations a district which has not often been visited by such a society. The rendezvous was Halesworth, and about a score members assembled. An excursion had been planned, which took the party a somewhat long round, in the course of which Holt, Westhall, Reydon, Southwold, Blythburgh, Thorington, and Bramfield churches were visited. The day turned out an admirable one for the excursion, through a picturesque, well wooded, and fertile country. The first place visited was Halesworth Church. Here the party were met by the vicar, the Rev. V. J. Stanton, and Mr. R. W. Burling, who pointed out the various objects of interest. Holt Church was the next place visited, and the party were met by the incumbent, the Rev. R. S. Beloe. The church has a round tower, and is principally new; but the style of the older portions is late Norman, or a transition from Norman to Early English. The tower was originally thatched. The party then

took their seats in the conveyance, and proceeded to Westhall Church, which has many points of interest to archaeologists.

The Secretary (Mr. E. M. Dewing) said he had a paper given to him by a gentleman well known to those present, Mr. Kis, and which he read.

A long and pleasant drive through country roads brought the party to Reydon Church, a plain building, apparently belonging to the Perpendicular style. The party was about to leave, when one of them noticed in the floor of the porch what was thought to be an altar stone, and on its being examined the supposition turned out correct. The stone was 6 ft. 3 in. by 1 ft. 11 in., and had been used in paving the porch. The excursionists then proceeded to Southwold, where they visited what is said to be one of the finest churches in the country. It is dedicated to the martyr king, St. Edmund.

Mr. R. M. Phipson pointed out the main points of interest. Rev. W. Sewell gave a description of the roof-arches. The party then went to the Lecture Hall, where a small museum had been arranged by Dr. Blacket. Luncheon was provided at the Swan Hotel. The chair was taken by the president, Lord John Hervey, and the vice-chair by the Rev. S. B. Turner. After a short stroll down to the Gun Hill and the beach, the carriages were once more put into requisition, and the horses' heads were turned for Blythburgh Church, which is now almost a ruin. Mr. Truman, a resident in Blythburgh for the last fifty years, pointed out the place where the arch fell in 1863, and a part of a stone coffin which had been found, together with other matters of interest. The company then walked to the church, where Mr. Raven read a paper in the church. The next stoppage was at the little church of Thorington, which is one of those with a circular tower, round which is an arcade of shallow panel-work.

Bramfield was the last church visited. It has a peculiarity in the fact that it has a round tower which stands detached from the church. The reason for this has been discussed, and the most probable seems to be that the church was originally built without a tower, and that afterwards, wishing to have one, but not wishing to block up the west window, the tower was built away from it. The company then returned to Halesworth, after a pleasant day.

The Bucks Archaeological and Architectural Society.

The visit of this society was to Marlow and Medmenham. The company embarked at Marlow on board a barge which conveyed them up the Thames to Medmenham. There was a large party of ladies. The first point of debarkation was Bisham Abbey, which, for its historical associations, is described as the "most interesting house in Bucks." The party were met on landing by Mr. G. Vansittart, the present possessor, who conducted them over the principal apartments, and explained the various features of interest connected with them; Archdeacon Bickersteth also drawing on his archaeological lore for the same purpose.

Leaving the Abbey, the party proceeded to the church, where they were received by the vicar of Bisham, the Rev. E. Powell.

A little further up the river is the picturesque village of Hurley, surrounded by richly-cultivated woodlands, which the party next visited. Here is a very ancient church founded by Geoffrey de Mandeville, a famous soldier at the battle of Hastings, in the 11th century.

The voyagers having once more embarked, proceeded to Medmenham Abbey, a few miles further up the river on the Buckinghamshire side. In the middle of the last century the abbey was tenanted by an order of monks other than those who adopt fasting and self-denial as their motto. This was the notorious Medmenham Club, a society of wits and men of fashion, who, under the title of the Monks of St. Francis, whose habit they assumed, converted the ruins into a convivial retreat. The association comprised John Wilkes, Charles Churchill, Babb Doddington, and others. The spirit of the society was shown by their putting up over the door of their place of meeting the motto of the actual Order of St. Francis, "Fais ce que tu vaudras;" and it is understood that they took full advantage of the permission, their wild orgies obtaining for them in the publications of the day the designation of the "Hell Fire Club." It is stated that one night, in the midst of their orgies, the profligate party were overwhelmed with terror at the apparition of a huge ape, hideously attired, which

had been lowered down the chimney. They believed for a long time that the arch fiend himself had appeared among them, and such an effect had it on them that their meetings were then finally broken up. The Franciscans always slept in cradles, and a fragment of the cradle of Wilkes is still shown here as a relic. Over a door in the ivy-covered gable their motto is still to be seen.

From Medmenham the company took a detour to Danesfield, to inspect the horsehoe entrenchment, near the residence of Mr. C. R. S. Scott Murray. The company, descending the hill on the other side by winding walks, amongst woods of holly, yew, and box, which clothe the steep escarpment towards the river, soon found themselves at the side of the barge which had been brought round to await them, and having embarked once more, proceeded on their homeward voyage. Refreshments were provided in the cabin during the day.

The annual meeting of the society was then held, the company being seated outside, Mr. Du Pré in the chair. Several new members were elected.

Dr. Bickersteth then delivered an address on the River Thames; in which he assigned the source of that river to the highest ground of the watershed of the Thame in the parish of Siewkley, in Bucks.

The Rev. J. Baines, rector of Little Marlow, read a paper on the nunnery which formerly existed at Little Marlow.

The Rev. F. Ashley, of Woodburn, next read a paper on Woodburn Church.

The company soon after arrived at Marlow, where, on landing, vehicles were in readiness which conveyed them to Spinfield House, the residence of Mr. J. Carson, who entertained the society. The dinner was served *à fresco* on the croquet lawn.

The party afterwards drove back to Marlow, and from thence to the Marlow-road Station, where the 9.20 train conveyed them en route to their respective homes.

The Surrey Archaeological Society.

The annual day-out of the members of this society has also taken place. A fine day favoured the excursion. The members and their friends, making quite a large party, met at Redhill Station, where conveyances were in waiting to take them through rural scenery to the places it had been decided to visit. They drove off, party after party, to Nutfield, and at once walked off to the church, where the rector, the Rev. Dr. Briscoe, showed to the visitors some rare old books which he had collected at considerable trouble and expense. A paper descriptive of the edifice in which the company were assembled was read by Mr. Alfred Heales, F.S.A. The party then drove off to Bletchingley, where the church was visited, and a description of it was given by Mr. Granville Leveson Gower. They then proceeded by a very pretty route to White Hill, after which they took walking exercise along "The Pilgrim's Way" (from Winchester to the West of England), to the shrine of St. Thomas à Becket. Striking out of the "way," over some underwood and brambles, they reached the "Cardinal's Cap," whence there is a pleasing and expansive view of the Weald of Kent and Surrey. This spot, which is also known as War Wood or Coppice, is supposed to be the site of an old British or Roman camp and fort, all the traditions and probabilities as to which were expounded by Mr. J. W. Flower, F.G.S., of Parkhill, Croydon.

The party then retraced their steps, but on the way were invited into the grounds of Mr. W. Long, at "Arthur's Seat," from whence there is a picturesque view. Here Mr. Long presented refreshments. The next point of interest was a half-timbered house of the sixteenth century, in Brewer-street, Bletchingley. The house was described by Mr. Charles Baily, who said it was a very good specimen of a Surrey yeoman's house in the sixteenth century. The next visit was to Pendell Court, the residence of Mr. George Macleay, the president of the society, who had caused to be provided a cold collation in a spacious booth in the grounds.

The Cambrian Archaeological Association.

The twenty-fourth annual meeting of this society will commence August 23, and continue until the conclusion of the week. The objects principally visited will be those of the earliest pre-historic character, in which class of antiquities the county of Anglesea, and especially

the western portion of it, is richer than any other district in the principality. There are also numerous remains of the earliest dwelling-houses, usually called "Cyttian," some of which have lately been excavated and examined, and have thus brought to light much valuable information as to the mode of life adopted by a race probably long anterior to the forefathers of the present Welsh. Archdeacon Wynne Jones, the proprietor of the Treiorworth estate, will preside. Several interesting papers have been promised.

TIMBER IMPORTS AND PRICES, AND TRADE RETURNS.

An interesting statistical return, just published, gives the quantities of timber imported from foreign countries and British possessions, from each year, from 1855 to 1869 inclusive. The quantities show considerable fluctuations in the different years. In 1855 there were 450,714 loads of timber imported from foreign countries, and 457,800 loads from British possessions; in 1869 the quantities were 832,317 loads of foreign, and 443,130 loads from British possessions. These figures give totals of timber not sawn or split, of 908,514, and of 1,275,447 loads. From 1861 to 1868, inclusive, the quantities imported were considerably larger, reaching to 1,631,151 loads in 1865. The imports of sawn or split timber show less fluctuation, rising from 934,579 loads in 1855, to 2,329,962 loads in 1869. Of the latter quantity 1,576,695 loads were from foreign countries, and 753,267 loads, or about the half, from British possessions. The imports of teak, staves, and mahogany, show great fluctuations. The quantities imported in 1869 were, respectively, of teak, 40,062 loads; of staves, 60,450 loads, against as much as 112,385 loads in 1857. Of mahogany, the imports in 1869, amounted to 47,252 tons, against 37,954 tons in 1855. The computed real value of the timber, not sawn or split, imported in 1869, was 3,856,902*l.*; sawn or split, 6,253,072*l.*; teak, 453,856*l.*; staves, 536,068*l.*; mahogany, 359,748*l.* The average prices as fixed for the computed real value were, per load, from Russia and Prussia, in 1868,—Fir, 2*l.* 6*s.* 2*d.*; oak, 3*l.* 1*s.* 7*d.*; from Sweden, fir, 2*l.* 3*s.*; oak, 3*l.* 5*s.*; British North America, fir, 3*l.* 10*s.*; oak, 5*l.* 15*s.* 6*d.*; United States, fir, 3*l.* 14*s.* 7*d.*; oak, 4*l.* 10*s.* For deals, battens, boards, &c., per load, from Russia, 3*l.* 2*s.*; Sweden and Norway, 2*l.* 10*s.* 1*d.*; British North America, 2*l.* 12*s.*; United States, 3*l.* 15*s.* Staves, from Prussia, per load, 10*l.* 19*s.*; United States, 7*l.* 17*s.*; and from British North America, 8*l.* 9*s.*

The extraordinary growth of the trade of the United Kingdom is shown in a comparison of the imports from, and exports to, foreign countries and British possessions. In 1855 the total imports were of 143,542,850*l.* real value, and in 1869, 295,428,967*l.*; total exports in 1855, 116,691,300*l.*, and in 1868, 227,778,454*l.* In 1855 the proportion per head of the population of our imports was 5*l.* 3*s.* 2*d.*, and of our exports, 3*l.* 8*s.* 10*d.* In 1869 the proportions per head of the population were, of imports, 9*l.* 12*s.* 1*d.*, and of exports, 6*l.* 3*s.* 7*d.*

In 1857 the proportion of the public revenue of the United Kingdom was 2*l.* 12*s.* 1*d.*, including charges for collection; and for 1869-70, 2*l.* 9*s.* 3*d.* per head of the population. In 1857 the proportion per head of the population of the National Expenditure of the United Kingdom was 2*l.* 14*s.* 4*d.*, and in 1869, 2*l.* 4*s.* 9*d.* The local taxation of the United Kingdom for 1870 is estimated at 20,500,000*l.* for England; 2,000,000*l.* for Scotland; and 2,500,000*l.* for Ireland, or 25,000,000*l.* in all, which is equal to about 16*s.* per head of the population. If the amounts raised for public and local purposes be added together, the total taxation of the United Kingdom in the year ended 31st March, 1870, would be about 100,500,000*l.*, or 3*l.* 5*s.* per head of the population.

In 1857 the total amount of the National Debt was 535,676,254*l.*, it stands, in 1870, at 800,681,428*l.* In connexion with this it should be stated that, from 1855 to 1869, Customs and Excise duties and taxes have been repealed amounting to 40,609,993*l.* in all, while taxes have been imposed amounting to 17,700,684*l.*; the actual diminution being 22,609,309*l.* This relief has been given in the reduction of burdensome duties on many articles of prime importance, if not necessity, indeed, such as tea, sugar, coffee, butter, cheese, eggs, rice, fruits, &c., and in sweeping a host of articles from the tariff which greatly complicated it, hindered trade, and

involved a disproportionately-increased cost in collecting the revenue. Among the repealed Customs duties are those on grain and breadstuffs, which, although almost apparently only nominal, really imposed a tax of nearly a million sterling per annum upon the first necessities of life. Among the other taxes repealed, the "taxes on knowledge," on the light of the mind, should not be forgotten, on the one hand, nor those upon the light of the body, on the other. It was truly, as literally, an enlightened policy to relieve books, newspapers, and paper from the burden of a tax, as it was also to abolish the window-tax. It should be satisfactory to all men that this policy has been so signally successful in financial results, as well as successful in a far higher sense.

SOUTH KENSINGTON MUSEUM.

A RETURN, published annually, by order of the House of Commons, gives the following particulars relating to South Kensington Museum,—cost of buildings, cost of arrangement, purchases, estimated value of gifts, estimated value of objects on loan, and number of visitors for each year since 1860. This paper, which has just been issued, shows that the cost of buildings, including repairs of buildings and schools, from 1857 to 1860, was 41,127*l.*; the cost for 1869, to 31st March, to which date the return is made up, under this head was 43,273*l.*, a higher amount than in any previous year. The total cost under this head from 1857 has been 306,372*l.* The cost of arrangement is included with that of general management. This amounted, from 1857 to 1860, to 127,109*l.*; in 1869, to 86,520*l.*, also the highest amount for any year, by about 12,000*l.*; the total cost of management for the whole period, 630,555*l.* The amount expended in purchases of works of art and science, books, &c., was, from 1857 to 1860, 53,189*l.*; in 1861, 31,100*l.*; in 1869, 21,097*l.*; from 1857 to 1869, 224,873*l.* The gifts for the whole period, exclusive of Sir Joseph Whitworth's 100,000*l.* for scholarships, are estimated at 160,000*l.*, or, say, 260,000*l.* in all. The estimated value of the loans to the exhibition is 300,000*l.* yearly, for the last eight years. The contents of the special exhibition of 1862 were estimated to be worth above 2,000,000*l.* In 1862 there were 1,241,369 visitors; in 1869, 1,043,654; total visitors from 1857 to 1869, 9,056,818.

CAMBERWELL CHARITY ESTATE COMPETITION.

For laying out the Chamberwell Charity Estate, in the Old Kent-road, thirty-six designs were sent in, and were referred to Mr. Pownall. Mr. Pownall reported that "Specs" was entitled to the first premium of twenty guineas, and "Vigilance, No. 1" to that of ten guineas. The letters of the competitors showed that the first successful competitor was Mr. Alfred Wright, architect, No. 68, Knowle-road, Brixton; and the second, Mr. A. G. Hennell, of Southampton-buildings.

THE NEW LAW COURTS.

We place before our readers the plan which has been at last determined on for the Courts of Justice. A few brief particulars will be found in our last.*

THE REREDOS, CHICHESTER CATHEDRAL.

The central portion of the new reredos has just been erected; the two wings, together with some figures for the centre, are at present postponed. In designing the reredos, the principle kept in view by the architects, whether right or wrong, was to emphasise the choir as distinguished from the presbytery beyond, by rendering the reredos so important a feature that the eye, whilst taking in the presbytery, would at once distinguish the termination of the choir, and further, to give it such height, that, looking from the nave, the eye would rest upon it, and the throne and stalls, would be subordinate.

The work has been executed from the designs of Mr. W. Slater and Mr. R. H. Carpenter, the cathedral architects, by Mr. Forsyth, of London. It is difficult to present a clear description of the work, but a few particulars may be given.

* See p. 640, ante.

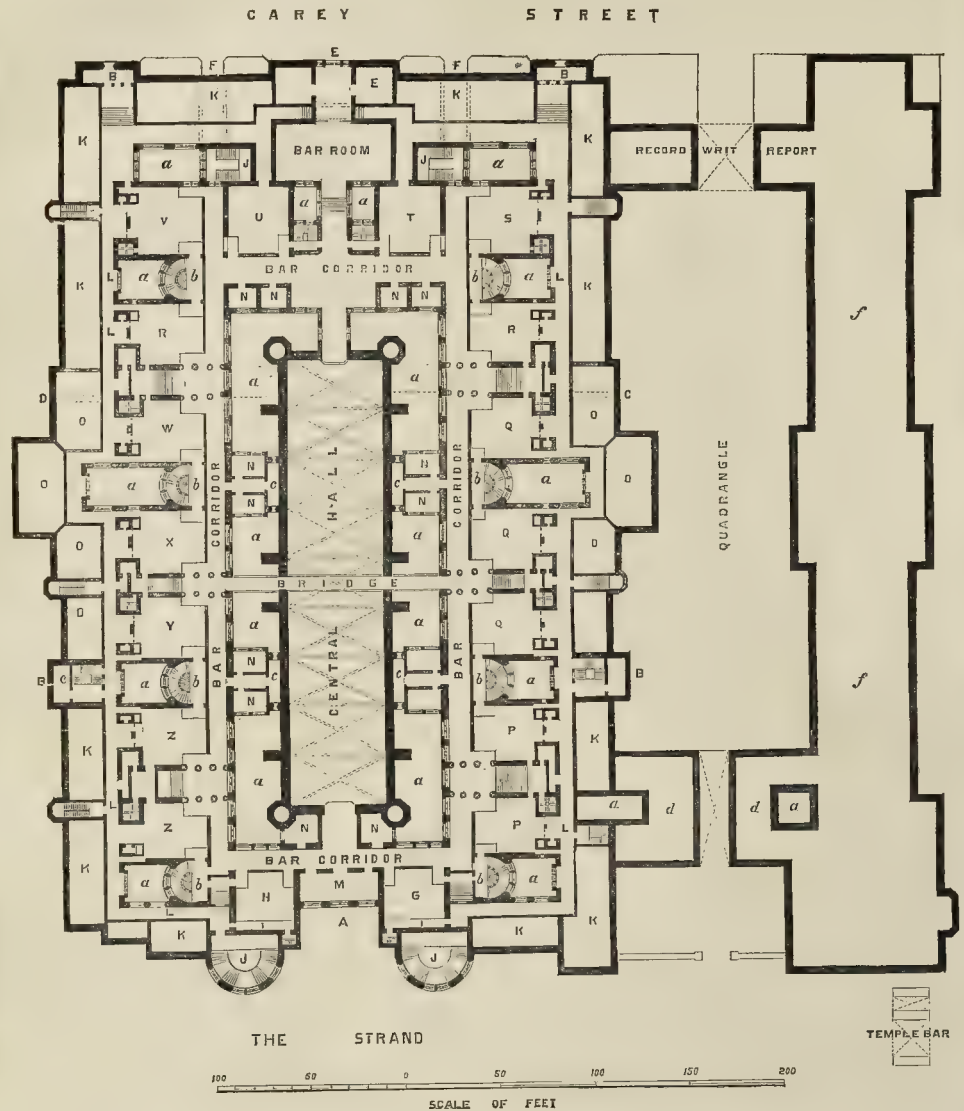
It consists of a deeply recessed arch filled with sculpture, with an inlaid and carved pediment over; the front order of the arch being supported over the communion-table by massive pillars standing on each side of it. Behind the table the arch is recessed about 2 ft., to receive the sculpture, the height of which is 13 ft., and the width 8 ft. 6 in. It represents the Ascension conventionally treated. The figures are all above life-size, and sculptured in Caen stone. The figure of our Lord is slightly raised from the surrounding apostles; his feet rest on a cloud, and a vesica surrounds him. He is looking down on the apostles, with his hands raised in benediction. The face is on the type of a figure at Rheims Cathedral, as are the flat and carefully-studied folds of the drapery. The apostles stand and kneel around: prominent amongst them is the figure of St. John. He and all are gazing, with varied expressions of countenance, on the departing figure of their Lord. On each side of the vesica are figures of angels, bearing scrolls and various instruments of music. The design for the sculpture was arranged by Mr. Clayton, who assisted in the completion of the model. The sculpture is raised about 2ft. 6 in. above the top of the table, immediately over which is a projecting alabaster super-altar supported on moulded corbels. Immediately above the super-altar and below the alabaster string course under the sculpture, are a series of panels, nine in number, formed of pure white alabaster. These will be filled with plates of gilded metal, covered with jewels and precious stones. As before mentioned, on each side of the altar-table are two advanced pillars. These have a central shaft of Scotch porphyry, with four detached shafts of green serpentine, with moulded bands and bases of dark serpentine. The caps are richly carved on the type of the beautiful work of the presbytery, and with abaci of alabaster. The arch is deeply moulded on the same type, and has on its front surface of mouldings numerous small corbels, both inlaid and with terminating bosses of alabaster and spars. The upper moulding of the pediment above is carved with a running pattern of conventional foliage, supported at the bottom by shafts of green marble, the carved capitals of which will serve as supports of figures of St. Peter and St. Paul. Springing from the sloping mouldings of the pediments are carved corbels, which will support kneeling figures of angels. The final also will support a standing figure of an angel bearing a crown over the head of the Lord in the sculpture below them, uniting the whole in one composition. The centre of the tympanum of the pediment is filled with a deeply-moulded arch of alabaster, with spars, having in its centre, on a marble mosaic ground, the emblem of the Holy Trinity, to whom the cathedral is dedicated. The spandrels are filled with porphyry, with mosaic borders of green marble and porphyry. The recess in which the sculpture stands has two orders of moulded arches resting on shafts of serpentine. The back of the reredos next to the presbytery is at present unfinished. It has a bold arch and pediment of the same form as in the front, but the carving and inlaying are at present deferred, the shafts of grey Derbyshire marble being alone inserted. It may be mentioned that the total height from the floor to the top of the final is 26 ft. 6 in., and from the floor to the springing of the arch is 13 ft. 6 in. The wings will be of the latter height. Each will have three arched recesses with carved and moulded arches, resting on a grouping of serpentine shafts, with a cornice and carved cresting above. The space below will be filled with mosaics in marble surrounding bas-reliefs, representing the principal event of the life of the saint sculptured above.

The British Hospital for Diseases of the Skin.—This institution, which for many years has maintained a crowded out-patient department at No. 56, Great Marlborough-street, Regent-street, and more recently another of equal extent at No. 13A, Finsbury-square, has lately been anonymously presented with a 1,000*l.* Bank of England note. The committee of management have devoted this addition to their resources to the purchase of the lease of their premises in Great Marlborough-street, and to the establishment of an in-patient department, which is much needed for the proper treatment of the severer cases of disease that are daily applying for relief. But they want further aid to enable them to do so.

1878

1879





INTENDED COURTS OF JUSTICE IN THE STRAND.—MR. G. E. STREET, A.R.A., ARCHITECT.
Plan of Court Floor.

REFERENCES.

- A. Position of Strand Entrance to Central Hall.
- B. Judges' Entrance.
- C. Eastern Entrance to Central Hall.
- D. Western Entrance to Central Hall.
- E. Bar Entrance and Bar Waiting-room.
- F. Entrance to Public Galleries.
- G. Court of Common Pleas.
- H. Court of Exchequer.
- I. Juries.
- J. Public Stairs to Galleries of Courts.
- K. Judges' Rooms.
- L. Judges' Corridors.
- M. Bar or Consultation Rooms.
- N. Consultation Rooms.
- O. Vice-Chancellor's Chambers, over
- P. Court of Common Pleas.

- Q. Queen's Bench.
- R. Vice-Chancellor's Court.
- S. Vice-Chancellor's, or Appeal Court.
- T. Lord Justices.
- U. Lord Chancellor.
- V. Master of the Rolls, or Appeal Court.
- W. Bankruptcy Court.
- X. Admiralty Court.
- Y. Divorce Court.
- Z. Exchequer Court.
- a. Area for Light.
- b. Witness' Stairs.
- c. Bar Water-closets.
- d. Admiralty and Probate Registrars here, or over
- e. Vice-Chancellor's Chambers.
- f. Messenger.

f. Second floor above Courts, Stationers' Department, Tasing Masters. Floor above Courts.

Exchequer Masters, Queen's Remembrancer, Registrars in Chancery. Court Floor.

Common Law Judges' Chambers, Common Law Writ Appearance and Judgments, Queen's Bench Masters, Registrars in Chancery.

Common Law Judges' Chambers, Common Law Writ Appearance and Judgments, Common Pleas Masters, Accountant-General, Record Writ and Report. Floor below Court.



REREDOS, CHICHESTER CATHEDRAL, SUSSEX.—MESSRS. SLATER & CARPENTER, ARCHITECTS.
Mr. Forsyth, Sculptor.



ART AND WAR.

SIR,—War at all times, whether it be for the most righteous cause, or the most indefensible, is a calamity. Who knows the limits of such a war as that now commenced, and the loss civilisation and mankind will sustain by its occurrence? It is the duty of all to speak forth truly, without any subtle reserve at the present moment. What loss may not the savagery of man and the barbarism of war entail upon the universe? Who knows not that history, in the course of war, is ever and ever repeating itself? Who knows not that thirst of power and despotism are never careful to discriminate; and that to preserve an enemy's monuments would only be to enrich her at the expense of her assailant? This is the war view of the question. The very same course of action that was prosecuted in the days of Alexander and Cesar was carried out centuries later; and the same warlike excesses, as were perpetrated in the Middle Ages, were perpetrated half a century since, and are still likely to be imitated, if a European war ensue.

The prospect for architecture and the other arts is, therefore, at the present moment, a rather discouraging one for us all. It is not that forts, bastions, and barracks may be tumbled, and towns and cities undergo wreck and ruin. Much more than this. Amid this inevitable destruction and terror the finest monuments of human genius and skill will perish; saintly and superb piles of architectural grandeur will be rent and shattered; and, while evil passions and bloody instincts surge rampantly, acts of violence will be committed that may affix an eternal stigma upon the nation that gave them birth. War is a foe to civilisation, and wherever architecture and art cease to progress, mankind must retrograde, for nothing in nature can stand still.

Look upon the question in any way we may, it is clear that war is not only inimical to man's best interests, but subversive of the very foundations of society. We are not speaking of the war as members of the Peace Society, but we are simply viewing it in a rational way.

In viewing the war in an architectural aspect, and eliminating for the moment Great Britain from the field, still we cannot but feel the most grave concern for all the interests involved and jeopardised on the Continent. If public institutions, libraries, colleges, churches, and schools passed unscathed through the storm, and if even in the public forum the national galleries, museums, and public stations remained unmoved and unuplifted, sufficient injury, notwithstanding, would be otherwise accomplished by the continuance of the war. The whole mechanism of society would have been unhinged, and a moral, intellectual, and commercial collapse would show itself in every channel of the countries at war. Who supposes, or can reasonably suppose, that injury would not overtake the national monuments or institutions of a nation at war with another? Would Prussia, in her present mood, if her legions got footing or entry into Paris, withhold from the work of devastation? The exclamation that Blucher was reported to have made, while walking through London, looking into the wealthy silversmiths' shops, would be heard, maybe, on the Boulevard des Italiens:—"Mein Gott! what a city to sack!"

Added to the danger that always exists from the recurrence of a war and its continuance to the injury and destruction of art and monuments, there is this second evil: War has ever the baneful effect of weaning or scaring students and workmen from their legitimate and honourable pursuits. And the patron and the employer are, if not affected in the same manner, sure to be affected otherwise by a depression in business; so what acts upon one reacts upon another member of society, and thus through endless variations of the body politic.

War is, as we have plainly stated, a calamity. In whatever manner we view it, and it should never be resorted to until every other means were exhausted to effect a reconciliation. National honour is, no doubt, a proud boast, and the preservation of this honour is worthy of some sacrifice; but kings nor emperors, no more than journalists, should be dictators of national or public opinion; they may dare to speak, but still ever hold themselves amenable to the public will.

If this course were always pursued, and this same view taken of public questions, by public

men who hold away, and have a voice in the affairs of the nation of which they are subjects, they would be supported by a mutual reciprocity of common interest, on the part of the people, that would end in peace.

An era of peace is always an era of improvement: not a slavish peace, an inert quietude, but a state of wholesome, manly watchfulness, bespeaking a conscious rectitude in our ultimate resolves. Under such a state of feeling, material progress must be made. Civilisation must exist, and no fear need be entertained that the brain and brow sweat of several generations has fallen in vain, and that the barbarism of man will destroy in a week the art-treasures and architectural triumphs of centuries. C. C.

THE SCIENCE SCHOOLS.

THE following represents several letters that have reached us:—

SIR,—On a former occasion you kindly permitted me to express my feelings as to the probable result of the late minute on the students of Science Schools in connexion with the Government Department of Science and Art, and I then ventured to predict that its effects would be most disastrous to both teachers and students, by removing incentive to effort in the one, and creating a consequent indifference and lassitude in the other. I should have been very happy to have learnt that my prediction was unfulfilled, but recent questions asked in the House of Commons, and growlings loud and deep from both teachers and students, since the publication of the results of the examinations, compel belief in its truth. What then are the results? By cutting off altogether the third or lowest grade, the examination has been rendered much more difficult, and, as a consequence, a very large number, perhaps the largest number, as being the least informed, have failed to pass, and the teachers for them get no pay at all. Then, again, for the rest, we are convinced that in setting the questions the same spirit is manifested; indeed, it is apparent, that one has only to compare them with the same stage of the previous year, to see at once that they are very much more difficult.

This has caused very many, perhaps the great majority, to be ranked in the second class, in all the stages, a position which confers no prize, but only a certificate: a cheap substitute, say they, and unworthy of a liberal government. Then as to the future. Unless there can be confidence placed in the stability of the arrangements made, we shall lose our best teachers. Already, in the school to which I belong, the most able teacher, a clever university scholar, has given in his resignation, and with him will go a considerable number of students dissatisfied. Then I should much like to see a division of the advanced students from those who are just beginning a subject. At present a teacher at the beginning of a session begins at the beginning, or most elementary part of his subject, and the advanced student, who knows it all, is obliged by the rules to sit out the lectures. It is felt that much time is thus lost. Much complaint has been made also at the Practical Geometry and Drawing Classes examinations, which really seems well grounded. Having taken one of the highest positions in those classes some years ago, I look upon later examinations with a good deal of interest, but I must candidly confess it appears to me that if, at the present time, one of this year's papers in that subject was placed before me, I should require to know, not practical geometry only, but to have a rather high acquaintance with theoretical mathematics for a successful solution of it. Then, again, in the building-construction papers, I do most strongly object to the old and happily exploded practice of setting a bad example. You have no doubt, sir, seen, in your younger days, spelling-books for the young, made up of ill-spelt words, which it was expected of the scholar that he should put right. Such spelling-books did infinitely more harm than good, for they familiarized the mind to bad spelling. We have wisely abolished them. But our examiner does not see any objection to taking a leaf out of those books, and giving us bad examples of such matters as bond in brickwork, set higgledy-piggledy, courses of slating set upside down, as though the slater began his work at the ridge of the roof, and worked downwards. Why does he not ask us in a straightforward manner to give examples of bond, slating, &c., to scale, and then judge of our performances. I say straightforward

ward advisedly, for there are, I am sorry to say, a great many questions put to us which are really catch questions, and puzzles. I have one in my mind's eye now: it occurs in the Honours paper in Applied Mechanics, and has reference to hooping guns. That question has been repeatedly asked of men eminent in science by myself and others, and it is really so ambiguous, that they all give it up unsolved. Surely it is wrong at least to ask us to waste our precious three hours of examination, or any part thereof, in endeavouring to solve a mere puzzle.

Permit me, sir, in conclusion, to say again, what I said on a former occasion, that I am sincerely desirous to see the classes to which I am greatly indebted for the scientific knowledge I possess, in a prosperous and flourishing state. I am convinced that that state is not to be attained by parsimony on the part of the Government, or even by the local committees, whom I strongly recommend to be liberal both in terms to the teachers and in the providing of apparatus for illustration.

Science will then be made attractive and pleasant, as well as instructive, and larger numbers will attend, ay, and pay too.

A STUDENT.

WHICH IS THE GROUND STORY OF A HOUSE?

SIR,—On Friday last I summoned a builder to the police court at Hammersmith for corbelling out a chimney at too low a level. Now, his contention was, that the ceiling level with the pavement was the ground-floor ceiling—mine the opposite.

The building in question is an ordinary house, of four stories or floors; one floor several feet below the pavement level; one a few inches above the pavement; and over this are two other floors. There is also a building or addition, two floors high, commencing at the lowest level of the front building, and constructed at the back.

The magistrate has adjourned the summons to Friday, the 26th of August, that evidence may be given by the profession as to which is really the ground-floor or story.

My object in writing this is to ask as many of your readers as will take the matter up, to be kind enough to write me personally on the subject, that his Worship may have the opinion of the professional and building public.

T. E. KNIGHTLEY, District Surveyor, Hammersmith.

“* The ground-floor or story is the floor on the road-level, and above the basement story, where there is a basement or sunk story. The “ceiling level with the pavement” is the ceiling of the basement, not of the ground-story. That the framers of the Act used the term in its common acceptation is conclusively shown by sec. xiv. (“Miscellaneous”), which excepts from certain provisions the doors and windows of “shops on the ground story of any building.”—ED.

TYRANNY IN THE WORKSHOP.

SIR,—In the interest of workmen I call upon you to insert the following:—As a mason I started to work in Messrs. Myers & Sons' building yard on Friday 12th, at half-past eight a.m. Soon after, a mason asked me, “What lodge my card was in.” I told him no lodge, and that I did not intend to join the society unless justice was given me for the past. I worked on very comfortably from that time until about half-past two p.m., when another mason, whom they call J. C., came and asked me “if I would pay a half-crown on Saturday to the society.” I told him no, I should do nothing of the kind. From that time until half-past five I endured continual insults and violence. About four o'clock I was called away to help lift a stone; when I came back to my work, I took hold of my mallet, and found it stuck to my hand. I looked and saw that the handle of my mallet, and other tools, were plastered a quarter of an inch thick with nastiness. I complained of it to them, and told them that respectable men would be above such dirty tricks. About five o'clock, the shop-foreman came to me, and said, “As you cannot come to terms with the men, there will be dissension in the shop; therefore go to the office and get your money.” I answered, “All right; this is the tyranny of society-men, is it?” Upon which he said it was all right, and it should be so. About a quarter past five, the men got a nail-bag, soaked in water and muck, which made it

several pounds weight, and threw it at me with such force that for a moment I could not get my head upright. After that they threw a dust-ball at me, but did not hit me. J. C. was the leader of abuse; but who messed my tools and threw things at me, I know not. I took it calmly, and went to the office, as directed, for my money, and that closed a trying and persecuting day. And now, Mr. Editor, I blame the foremen for it all, for, without their connivance, such things, could not be done, and there would be no dissension. The foreman that makes his a society-shop does an injustice to his employers, because they have not a free choice of men.

I enclose my name and address.

A MASON.

"* It is to be regretted that "A Mason" did not identify his assailants and take them before a police magistrate.

LAYING THE FOUNDATION-STONE OF BRADFORD TOWNHALL.

THE foundation-stone of the Townhall, to be erected for the purposes of the Bradford Corporation, on the piece of ground between Chapel-lane and New Market-street, has been laid by the mayor, in presence of the various official bodies of the town and great numbers of the inhabitants.

The building is intended to provide accommodation for transacting the municipal business of the borough, and will include Police Offices and Bridewell, as also a court-house, and offices for the borough justices, a court-house and offices for quarter sessions, and offices for the board of guardians.

The main object kept in view by the corporation has been to avoid the unnecessary expense incident to establishing and maintaining a large hall for the general use of the public, as that want is abundantly provided for by St. George's Hall. The new building is designed solely with reference to the business requirements of the town.

Messrs. Lookwood & Mawson, of Bradford and London, were selected as architects to carry out their plans, which, it will be remembered, obtained the first prize in a competition with others.

Messrs. Ives & Son, of Shipley, are the contractors for the execution of the works, at the sum of 43,730*l.*, and they are under terms to complete the erection by the 31st day of October, 1872.

The members of the council have for a long time past experienced great inconvenience from not having proper accommodation. The difficulty of fixing on a site has heretofore prevented the building from being erected.

THE ITEM "WASTE."

SIR,—Your correspondent "Opus," in his letter on the above subject, suggests a plan for the better consideration of the utilisation of waste materials, which I am sure is deserving of the best attention of those in authority.

I happen to have placed in my hands at this moment a matter which affords a striking illustration of how often a valuable commodity lies hid in materials, which, denominated waste, are truly so at present. It also happens, too, that the discovery I refer to directly concerns the building community.

J. M. KAY.

A SANITARY DUEL.

A GREAT duel, as it were, between the rival champions of two opposing theories of sanitary science, as applied to the prevention of disease and the preservation of health in large towns, has been fought in the lists prepared before the mayor and the corporation of Liverpool, says the *Albion*. The issue was an important one for Liverpool,—important as fixing the principle upon which the medical officer of health is to continue to discharge his duties; and especially important, therefore, in the obligation thrown upon the Health Committee in battling with disease. Mr. Whitty espoused the cause of Dr. Trench, and logically, as valorously, maintained the wisdom of the past policy of the Health Committee in the conversion of privies into water-closets, and the unwisdom of staying the hand when the town was beginning to obtain a return for its expenditure in a perceptible decrease of its death-rate. Mr. Alderman Dover, on the contrary, supported the report of the

Health Committee, the adoption of which would have practically been the relegation of the functions of the medical officer of health to a varying, sometimes an ignorant and perhaps an interested sub-committee, whom it was proposed to invest with power to order the carrying out or the rejection of orders for the conversion of privies condemned by the medical officer as dangerous to the health of the district. Mr. Whitty's complete exposure of the dangers, not to say the absolute impropriety of such a course, appealed with force to the better judgment of the majority of the council, and led to the rejection of the Health Committee's report and recommendation. His opponent has given notice of his intention to resign his position as chairman of the Health Committee.

OVERDONE DECORATION.

ST. CROSS AND ST. PAUL'S.

SIR,—Will you allow me to echo the sentiments expressed by Mr. Donaldson in his letter in a recent number of your journal; also to thank Mr. Sharpe for the pungent and eloquent words in which he has echoed the thoughts of many minds in reference to the (so called) decoration of the church of St. Cross. I visited it with some friends two years since, and we all felt the same indignant astonishment and disgust that such fantastic tricks should have been allowed in that grand old pile.

These things will continue and increase, unless architects emancipate themselves from the influence of that sacerdotal section which, having clothed itself in gorgeous vestments, would bring the fabric of the church into harmony with its own hues. They follow Rome, and Rome delights in tinsel and tawdry finery. I have lately visited Rome and the principal Italian cities, and have groaned over the splendid churches hung with tawdry drapery, not excepting St. Peter's itself, which, on St. Peter's day, also rejoiced in the bronze figure of that much-abused Apostle clothed in full pontificals—doubtless, a matchless specimen of ecclesiastical millinery. Truly there is but a step from the sublime to the ridiculous; but, as I looked up to the grand dome, and then down to this grotesque figure of the first of the Popes, and the rock on which the Romish Church is said to be built, I thought I had never seen the descent more abrupt.

The renovated St. Paul's may exhibit a pure art in alliance with a pure faith. It may afford a grand illustration of the truths of our sublime religion, but it may also sink into a feeble imitation of the Romish "Chambers of Imagery." From this may Heaven, and the common sense and good taste of the artist and laity of England, defend us.

A PROTESTANT ARCHITECT.

THE SEWAGE QUESTION.

Opening of the Cheltenham Sewage Farm.

The formal inauguration of the Sewage Farm and works at Haydon, has taken place. The scheme was officially sanctioned after an inquiry before Mr. Rawlinson, C.E. A tract of land, more than 130 acres in extent, at Haydon's Elm, was purchased, and to this site the main sewers from the tanks are extended for the sewage to be utilised thereon; and there is also a large district available for irrigation both between the tanks and the farm, and a little beyond the latter. At its outlet on the land the sewage is discharged at a point about 130 ft. above the level of the sea. The sewer from the Chelt tank to the farm is about three miles in length, having a fall of 8 ft. in a mile; that from Hatherley tank is nearly $1\frac{1}{2}$ mile long, and has a fall of 6 ft. in a mile. From the land itself there is an outlet sewer for the purified water leading into the Chelt, and a direct outfall also into the Hatherley brook, which abuts immediately upon the land. The estate has been to a certain extent laid out for the reception of the sewage. Hitherto the cost of the work has been more than 6,000*l.*, exclusive of 10,400*l.* paid for the works. The contractors were Messrs. Abell, of Worcester, and Messrs. Gibbs & Canning, of Tamworth.

Contracts for Sewerage Works at Waltham Abbey.—An adjourned special meeting of the Waltham Abbey Local Board of Health has been held for the purpose of receiving tenders for the construction of drains and other works in connection with the diversion of the sewage from the River Lee. Mr. Sonday, of Enfield Lock, who has been engaged to superintend, and who is the architect and surveyor engaged to carry out the

projected works, was in attendance. The tenders, eighteen in number, ranged from 1,378*l.* to 2,050*l.* That of Mr. J. Brown, Croydon, for 1,480*l.*, was accepted. A committee was appointed to confer with Mr. Webster as to a site in the town mead for the necessary tanks, which Mr. Webster had expressed himself willing to sell for 100*l.*

Whitshaven Sewerage.—At a monthly meeting of the trustees of the town and harbour, Mr. Robert Lumb, the district medical officer of health, was requested to send in a report to the trustees once a fortnight upon the state of the public health. It was also resolved that Mr. Hawkeley, C.E., be requested to attend to the completion of the sewerage and house drainages of the district; and a committee was appointed, with full power to carry out the recommendations of Mr. Hawkeley, and all other sanitary arrangements.

The Bristol Drainage and the River.—The foul state of the river at Bristol is exciting attention, and the local *Times* urges the complete drainage of the city, by carrying out the sewage to the opening of the Bristol Channel, at whatever cost:—

"We are spending hundreds of thousands on splendid new streets, or in enlarging old ones (says the *Times*); but a more spacious and commanding city, with a death-rate increasing against us, is but a whitened sepulchre upon a large scale,—fair without, and certainly not fair within. Before stately streets and straight thoroughfares, we should look to the sanitary condition of the city. Both economy and philanthropy call for it. Bradford and Reading obtained powers during the last session to improve their sewers and utilize their sewage; and even Dublin, the capital of a country whose people are generally supposed not to be quite so particular in these matters, is bestirring itself to carry its drainage beyond the banks of the Liffey. A large district of Bristol is inhabited by visitors and others, who, free to select their place of abode, have made this picturesque and in many respects most desirable locality their residence; if we are to keep them and attract them, we must not allow the Registrar-General's return to be read against us month after month; especially when, as we believe, a great decrease of the death-rate (that part of it certainly by which we exceed other places) may be removed by prompt and thorough attention to the matter of drainage."

FIRE AT A BUILDER'S.

On Tuesday last a fire took place in the premises belonging to Messrs. Hill & Sons, the well-known builders and contractors, No. 10 Charlton-place, High-street, Islington. The flames originated, from some unknown cause, in the steam saw-mills, and rapidly extended to the stabling, burning three horses to death; from thence to the engine and boiler houses and work shops; and in the yard about 1,000 out deals were consumed. Engines were early on the spot. There was plenty of water, but the flame could not be conquered until the whole of the buildings belonging to Messrs. Hill were destroyed, as well as others adjoining. We are asked to add, and do so willingly, that immediate arrangements have been made so that the disaster will not interfere with the Messrs. Hill business, which will be proceeded with as usual at other yards belonging to them.

RESTORATION: ST. JAMES'S, BURY ST. EDMUNDS.

SIR,—Your correspondent, "A Looker On," developing his theory of restoration, has cited as an example to be avoided the church of St. James, Bury St. Edmunds. I venture to hope that the editorial note, by which you limit the responsibility of his remarks to your correspondent himself, may be taken as applying to his statement thereon. I demur to the assertion that the church in question is mostly built in detail. Considering the date, about 1450, I think it a fair example of the style, with the exception of the window-tracery, which is poor. The arcades of the nave, in particular, not only merit the exception which your correspondent makes in their favour, but may well bear comparison with those of the sister church of St. Mary, built about the same time, or rather earlier, the mouldings which are of that *modern* character which marks bad work, and is not to be seen in the mouldings of St. James's. Your correspondent objects to the high-pitched roof, which he thinks exceedingly heavy. Here, again, I shall be to disagree with him. It will be the opinion of most persons that a high roof is in itself light in appearance than one of low pitch; and that is nothing in that of the church in question make it an exception. The absurdity which "A Looker On" finds in the contrast with the four-centred west window must rest with the

window, and not with the roof. The nave of the church, as is well known, was in course of construction from about 1450 to 1550, or later; and the time which elapsed before the western bay was completed quite accounts for the incongruity of the window. It would be hard that the restorers of a large church should be called upon to erect a roof to suit a late window at the west end. The roof is quite in keeping with the nave, and has the authority of the example of St. Stephen's Church, Norwich, where, rather singularly, a similar four-centred west window occurs. Your correspondent's dictum as to rebuilding in the style of the bulk of the work any parts of a church which it may be necessary to reconstruct must, I think, be taken with some decided limitations. A bad style may be tolerated in an old building, but can never be a fitting subject of reproduction in new work. This matter, however, I leave to able pens than mine to discuss and maintain.

B. B.

PRESTON MARKET.

With reference to the accident at the new covered market, in course of construction in this town, I may mention that the erection consists of a double row of cast-iron columns, supported of roof of iron, slate, and glass, having a span of about 90 ft. and a length of about 140 ft. The roof principals were being placed in position, about thirty of them having been kept, when, at a moment's warning, the whole roof gave way, and came down with a terrific crash, bringing with it longitudinal girders, columns, brackets, and all in one commingled heap of ruins. The cause of the fall is generally said to be the want of sufficient lateral tie and support during the erection to secure the principals as they were fixed,—an instructive caution for roof builders to make good their work as it proceeds.

J. B.

VERMIN IN NEW HOUSES.

A CORRESPONDENT, "R. W.," writes,—*"I am unfortunate enough to have a house in a terrace newly built, and the partitions are swarming with a horrid insect I can call nothing but a bug; yet it is very much larger and longer than the ordinary one is. Every house in the terrace is the same. I have stripped the walls and distempered them, but they come from the skirtings and up the floor-boards. I have put the legs of the bedstead in tin cups of water: till the insects get up the walls to the ceiling, and drop on me. Can any of your people advise me what to do, for I am in despair. I think they must be in the wood."*

HALIFAX BUILDING SOCIETY'S COMPETITION.

Sir,—The particulars of this competition were advertised in your journal last year, the building to cost £5,000.

The drawings have been sent in nearly seven months! No notice has yet been sent to the competitors that anything has been done. A poet has written something about learning "to labour and to wait." Alas! the common lot of architects; but really it is time the Halifax Building Society's directors were up and doing.

In any case, the competitors will do well to have their hearts prepared for any fate.

A VICTIM.

QUESTION OF BUILDERS PAYING COMMISSION.

HADDON & MORTON & CO.

In this case, tried at the Westminster County Court (before Mr. F. Bayley, Judge), an action was brought by the plaintiff, Mr. John Cooke Haddon, Civil Engineer, Bessborough Gardens, jointly, against defendants, Messrs. Francis Haddon & Co., extensive builders and contractors (limited), Kennington, to recover the sum of £2,000, commission on work obtained by them, through him, on which it had been agreed he was to be paid 2½ per cent. The liability was denied.

Plaintiff stated that in the early part of July, 1866, he spoke to by an architect named Davis, who is also a partner in the 18th Surrey Rifle Volunteers, as to his knowledge of a builder who could erect a military shed for a corps on their ground off the Kennington-road, when he mentioned the names of the defendants, to whom he introduced the Colonel (Brown), and heard an arrangement entered into that the work required to be done could be completed for 7584. He waited till the shed was finished, when, on applying for payment of the commission due to him, it was refused, and he was told that it was not through him the work had been done, as a contract, not being acted upon, had fallen through, and a fresh one made for 8036, at the intervention of

Captain Davis. He therefore now, with the thorough knowledge that he was the first that mentioned the names of defendants, who were consequently ultimately employed to build and fix the shed, took these proceedings.

Captain Davis corroborated plaintiff as to his mentioning defendants, whom he himself likewise knew, but denied that any arrangement was made by them to do the work for the sum first named, although it was named. Witness subsequently suggested alterations and improvements, and, consenting to do so for the amount of 8036, their contract was accepted, and the work done.

The Judge observed that plaintiff's claim had failed in being established, as the terms on his introduction were not entertained, although, as it appeared, mentioned, and his decision must therefore be against him.

Judgment for defendants.

SMOKE PREVENTION.

In the Police-court, Clerkenwell, Felix William Spiers, of the firm of Spiers & Pond, the well-known restaurant-keepers at the different railway stations, appeared before Mr. Barker to answer a summons, taken out by order of the Commissioners of Police, for unlawfully using a furnace at the refreshment stores, King's-cross Station, on the Metropolitan Railway, not constructed so as to consume its own smoke.

Evidence was given that on the 28th of May dense volumes of black smoke issued from some time from a chimney belonging to the defendant, and again on July 21, and on August 14th.

Mr. William Sanderson, civil engineer to the Government, said that the manager of Messrs. Spiers & Pond was cautioned. On the 18th of June he inspected the premises, and found a furnace and two vertical low chimneys constructed so as to consume its own smoke. Nothing had been done to the furnaces, although he had told the defendant's manager where to go in the West-end to see large furnaces, which were fixed, and consumed their own smoke.

The defendant, in answer to the charge, said he had been very busy at Wimbledon, and the engine had not had any time to attend to the furnace till last week.

Mr. Barker said it was one of the worst cases that he had brought before him, and he should inflict the full penalty of 8s. and 2s. costs, which was immediately paid.

Inspector Dunn, G division, applied for costs for Mr. Sanderson making an inspection, but Mr. Barker refused the application.

"MAN THE BOATS."

Sir,—I fear your correspondent's intentions are better than his suggestions, as, with the present appliances, the "box-wheel-of-the-lap" idea would have very little chance of success.

Being an old stager at the business, I will mention one or two things which, I trust, may lead him to a more feasible plan, or an improvement upon the present one.

The old-fashioned appliance of blocks and falls is good enough for the ordinary practice of fine weather and harbour service, giving, as it does, the labour-saving power of combined pulleys for hoisting, and reducing the drag, or more properly "force," in lowering; and, being of the same pattern and principle as the ship's rig, is easily understood and applied, and cheaper than any particularly different appliance that will be.

At the hurried time of a man falling overboard (which happens often in foul weather than in fair), the falls are very apt to foul, or when the boat takes the water one tackle (usually "taylor") is liable to get unhooked whilst the other remains fast, either accident causing the liability of capsizing the boat, and smashing her against the ship's side, in both cases endangering the lives of the crew and losing time. I have seen men lost repeatedly through both. The Admiralty had in use a short time since a patent book for the lower block of the tackle, which, as soon as the weight of the boat was taken off by the water floating her, unhooked itself. The drawback to this consisted in the fact that when a boat was lowered in a hurry one end would surely be some feet below the other, and being taken by the top of a passing wave, was unhooked and swung right round upon the vessel; result, a complete smash, and a dozen men overboard in addition to the one. It was some years before that was introduced that Mr. Cooper, a lawyer, patented his apparatus for lowering boats in any weather and without stopping the ship's way, which latter is impossible with both the above mentioned appliances.

One man sitting in the boat lowers both ends at once two and level, by one rope, the lift of the sea taking the weight off the apparatus, releases the boat from all connection with the ship, and, falling off with the wash, she drifts under the quarter as safe as a cork. Cooper, however, is obliged to fall back upon the old-fashioned tackle to hoist his boat. Here there is ample room for your correspondent's head-piece. If he can follow the example of the glove-makers, and invent the other half of the machinery, which, combined with Cooper's, shall make both lowering and hoisting safe and easy, he may make his name immortal—and possibly die of starvation.

I never knew of Cooper's apparatus being used in the Royal Navy but once—viz., when the late Captain William Peck left England in the *Shannon* only to fall in the Indian rebellion. I am not sure now whether he had the ship's boats fitted with it at his own expense, or whether the Admiralty did it at his request, but he was the cause of it, and it was the means of saving more than one life before the ship arrived at Madras. The Admiralty Pattern-book was introduced in 1860.

I have trespassed upon your space, for I feel warmly upon the subject, having run the risk.

F. T. MILLETT.

RAILWAY BRIDGES AT LUDGATE-HILL.

Whatever may have been the reasons assigned for permitting the London, Chatham, and Dover railway to be constructed as it is to the great disfigurement of the City, it is not necessary that it should continue so. The alterations now being made at the lower end of Ludgate-hill, make this a fitting opportunity for removing the bridge over that way altogether, as well as the series of arches attached to it on either side.

The bridge over Queen Victoria-street in continuation, should also be entirely removed, and instead thereof an inclined road be made from the end of the bridge, crossing the river until it reaches Queen Victoria-street, where it should enter a tunnel made under the road, which would

have to be raised about 6 ft. or not quite half the height of the bridge over it. The present roadway being nearly 5 ft. below the level of the road on Blackfriars Bridge, at the end of the last arch of it, therefore from 1 ft. to 2 ft. is all that would be required to give one uniform level to all the adjoining land from Blackfriars Bridge to Queen Victoria-street, near St. Andrew's-hill, on the east, or the street facing the Apothecaries' Hall on the north, where the land is even higher than I have stated it to be. The tunnel thus to be entered in Queen Victoria-street would be continued northward, passing under Ludgate-hill, the same to be raised 3 ft. or 4 ft., or 5 ft. to the level of the road, where the houses are now being pulled down for improvements, and which makes the present a most fitting opportunity for the alterations proposed, the tunnel to be continued northward by way of Holborn Viaduct, and thus the western portion of the City would be once more cleared from the eyesore of a bridge over Ludgate-hill and Queen Victoria-street.

Should any desponding shareholder in the London, Chatham, and Dover Railway Company wish to know how the proposed alteration will affect his interests, he might easily obtain an estimate of the expense of converting the thirty-five or more arches into one continuous tunnel, under a street of the same width, and which would give about 10,000 ft. frontage, which might be let on building leases, at its then value of from two to three guineas per foot, thus producing from 30,000, to 40,000, a year, instead of nothing as at present. The whole of this may be accomplished without stopping the traffic a single day. The above alteration might be effected by the joint expenses of the City and the railway company, both of whom would receive the benefits arising therefrom, or if only carried from the Viaduct to the station in Bridge-road, the expense would not be very considerable, and the Ludgate-hill Bridge (the eyesore facing St. Paul's), would be removed. A tunnel of a few yards from the above station to the district railway at Blackfriars, would complete a junction of all railways in the heart of the City.

Wm. PALMER.

ACCIDENTS.

Fatal Fall from a Building.—An inquest has been held on the body of a slater in Salford, who met his death through injuries he received in a fall from a building. The deceased was engaged in relating the roof of an old building in Dow-street, Chorlton-on-Medlock, when some bricks upon which he was standing gave way, and he was precipitated to the ground. He was taken to the infirmary, where he died. The jury returned a verdict of accidental death.

Two Men Smothered at Luddenden Foot.—Two men, employed by Messrs. Whitworth & Co., of Luddenden Foot, near Halifax, were smothered whilst they were effecting some repairs to the large pipe which connects the gasometer with the chief meter. They were found about six o'clock by a man who works the night "shift." Scaffolding had to be erected to do the work, and both men were on the scaffolding when they were found.

Fall from a Scaffold.—A man who lives at Attercliffe was working at Grimesthorpe, when the scaffolding upon which he was standing gave way, and he fell with it to the ground, a distance of about eight yards. Several of his ribs were broken. He was removed to the infirmary.

Fatal Accident from Defective House-planning. Mr. Bedford has held an inquest at the St. Anne's Vestry, Dean-street, Soho, on the body of Mary Pond, aged sixty-two, of 15, Chapel-place, Soho, who died from a fall down stairs. The evidence showed that the room in which she and her husband lived was situated in such close proximity to the stairs, that one stepped from the room down the first stair, there being, in fact, no landing. The deceased, who was blind, had groped her way across the room, with the intention of sitting down in an arm-chair, but, unfortunately, turned her back to the door (which was wide open), and fell backwards to the bottom of the flight of stairs, striking her head in a fearful manner, and inflicting severe injuries, from the effect of which she died. The jury strongly condemned the designer and builder of such a house, and returned a verdict of "Accidental death."

RAILWAY MATTERS.

New Eastern Station.—At the Secondaries' Court, before Mr. Potter and a special jury, a compensation case, "White and another v. The Great Eastern Railway Company," was recently heard. The claim was in respect of premises in Liverpool-street, City, required for widening the street near the new station to be erected. By an arrangement the jury awarded 1,450l. At the same court, on the preceding day, on a claim by a Mr. Bush, against the same company, for adjoining premises, for the approaches to the new station, a special jury, after a long investigation, gave a verdict for 6,000l.

North London.—From the report of the directors just issued in anticipation of the meeting on the 18th inst., it appears that the receipts of the last half-year were 168,992l., against 172,445l. in the corresponding period of 1869,

showing a decrease of 3,453*l*. The decrease in the receipt from passengers—viz., 4,010*l*., is chiefly attributable to the diversion of traffic consequent on the establishment of through train services now worked by the Midland and Great Northern Companies to the City, which form competitive routes with this company's line from Camden, Highbury, and other points. The merchandise receipt is decreased by the diversion of the Midland Company's goods traffic, and by the reduced scale of toll on the London and North-Western Company's traffic to Broad-street. These losses have been partly met by an increase in the tonnage conveyed. The net balance available for dividend being 81,399*l*., the dividend recommended by the board, at the rate of 6*l* per cent. per annum, on the ordinary stock, will leave a balance of 4,874*l*. to be carried forward to the current half-year. The widening of the line between Camden and Dalston is being pushed forward, and will, it is anticipated, be completed, with the exception of Highbury station, in the course of the present year, as well as the new stations, in course of construction by the London and North-Western Company, at Chalk Farm, and by this company at Hackney.

The Paislie Locomotive.—A new locomotive on Captain Paislie's plan having been recently completed for exportation to the opposite side of the Atlantic, a number of engineers, and other gentlemen interested in railway matters, met at the Hatching Ironworks to witness trials of the powers of the engine, especially in travelling round sharp curves. In a yard attached to the works rails had been laid down, the curves of which were in some parts not more than 50 ft. radius, and here the engine was taken round and round at moderate speed. The engine is double, and constructed so as to employ the largest possible amount of power, while possessing a minimum of dead weight. The boiler of the two engines is in the centre, and the frame on which they are placed is so constructed as to admit of its bending, as it were, on a hinge under the double engine and boiler in going round a curve. This arrangement, it seems, worked with great smoothness, and in consequence not the slightest jar or extra pressure against the rails was perceptible to those on the engine, when no motion could be noticed but that of smoothly gliding along the line. From the plan of making the engine double, no turn-table is needful, as either end can be placed in front. Captain Paislie asserts that the adoption of his system would on many lines of the kingdom diminish the working expenses by as much as 50 per cent.

CHURCH-BUILDING NEWS.

Lewisham.—The Church of St. Mark, at Lewisham, was consecrated on July 20th by the Bishop of Rochester. A sermon was preached by the Bishop of Victoria on the occasion. A notice of the building appeared in our columns in May, of last year. The building has been erected by Messrs. Carter & Sons, from the designs and under the supervision of Mr. William C. Banks. The carving has been executed throughout by Messrs. McCarthy & Smith. The pulpit is the gift of a lady, and the font the gift of the architect. The cost of the works to the present time, leaving out the upper part of the tower and spire and the boundary walls, is about 7,100*l*., the original contract being 7,050*l*. An organ, by Willis, of Camden-town, has been erected, at a cost of 550*l*. The lighting and ironwork were done by Messrs. Richardson, Slade, & Co., and the tile paving is by Messrs. Hawes. The heating of the church, by hot water, has been carried out by Mr. Ambrose Marriott, of Higham Ferrers, by his patent boiler apparatus.

Newton, near Pickering.—A new church has been consecrated at Newton-upon-Rawcliffe, between four and five miles distant from Pickering. Mr. Wyndham Farn, of London, architect, prepared the plans and drawings; and Mr. Watson, of Scarborough, was the sole contractor. The church is in the Early English style. Its internal length is 70 ft., whilst the breadth is 24 ft., and it affords accommodation for nearly 150. The walls are plain, and built of stone procured in the immediate neighbourhood. There is a bell-turret at the west end. The east end of the church is provided with three lancet windows, and the west end with two windows of the same description. The side walls are pierced with lancet lights. All the windows are glazed with cathedral glass. The roof, which is high-pitched

and open-timbered, rests upon plain stone corbels, and the height from the floor to the apex of the roof is nearly 40 ft. The porch is situate a few feet from the western extremity of the south wall, and the vestry is on the north side of the chancel. The flooring is paved with coloured tiles, and within the sanctuary the tiles of the floor are of different design, the colours being buff and black. The sittings are of deal and open, and they are fitted up with book-shelves, and stained and varnished to correspond with the timbers of the roof. The church is provided with one of Garney's stoves for warming purposes in the winter season.

Flyingdale (North Riding).—A new church has been consecrated here by the Archbishop of York. It is situate in the Whitby district, adjoining to that of Pickering. The new structure supplants an old one of small size, and the work has been accomplished chiefly through the aid of Mr. Robert Barry, of Park Hill, Flyingdale, he having given the site for the edifice and a subscription of 2,000*l*. Mr. G. E. Street, architect, was engaged to carry out the work, and he designed the style of the new structure, the erection of which was undertaken by Mr. Langdale, of Whitby, as sole contractor. The church is constructed of stone from the immediate neighbourhood. The style is Geometric Gothic, with a slight introduction of the German. The church consists of a sacarium, chancel, nave, and south aisle. Its total interior length is 125 ft., and its breadth across the nave and aisle about 45 ft. The roof is high-pitched and open-timbered, with moulded octagonal tie-beams. The height from the flooring to the centre of the roof is nearly 50 ft. The tower is saddleback, and is in height 120 ft. It has a slanting roof, covered with red Staffordshire tiles, and surmounted with a cross in ornamental metalwork. The porch is towards the west end of the south aisle. It is plain in character, but surmounted with a floriated cross. There is an organ-chapel on the north side, and the sacarium is apsidal in character, and provided with three windows of two lights each, with trefoil heads and tracery above. The chancel is divided from the organ-chapel and vestry by screens of oak, carved, and the roof is groined in stone. The chancel is approached by two steps, and the sacarium by three, and the flooring of this part of the church is composed of encaustic tiles of ecclesiastical pattern. The flooring of the nave and aisles is laid down with coloured tiles. The chancel arch is in three orders, and the nave arcade in two, the outer order in each case being included. The windows in the north wall of the nave are of large size, and of two lights each, whilst those in the aisle are of smaller dimensions, and of three lights each. The west window has four lights, with quatrefoil and cinquefoil tracery. The clearstory windows are quatrefoils and two lights alternately. All the windows are filled in with plain glass. The chancel is fitted up with oak stalls and seats for the choir, and the sittings in the nave and aisle are open and of deal stained and varnished. From the roof of the nave are suspended gaseliers of Mediaeval design. The cost of the church will be about 6,000*l*. The structure will comfortably seat nearly 450 persons.

Wolverhampton.—The increasing population of Penn necessitating an enlargement of the parish church, a faculty has been obtained for that purpose, and the plans of Messrs. Paley & Austin, architects, are about to be carried out. By these plans, the present brick chancel is to be replaced by a chancel of stone, with a chancel aisle on the south side; and the present nave will be lengthened about 20 ft. It is estimated that these changes will provide for about 150 additional persons. The church is to be heated in winter by a hot-water apparatus. The estimated cost, exclusive of a new organ, is about 3,000*l*.

Halifax.—The new church of St. Mary has been consecrated. The site is about three-quarters of an acre in extent, at the corner of Rhodes-street and Lister-lane, the ground falling rapidly from west to east. The ground plan gives nave with side aisles, north and south chapels, and a deep chancel. The tower and spire, which reach an altitude of 135 ft., are at the north-west end of the church. The style chosen is Geometrical English Decorated. The principal entrance is in the tower, and there is a doorway in a shallow porch in the second bay of the south aisle. Both these doorways are recessed and moulded, the jambs of that in the tower having shafts with foliated capitals. The interior gives a nave 47 ft. to the ridge, and a

clearstory pierced with spherical triangular traceried windows. The nave, which is 83 ft. long, and 21 ft. 6 in. wide, is divided from the north and south aisles (which are 13 ft. wide) by arcades of five and six arches. The centre aisle of the nave is 5 ft. wide, and those of the aisles are 3 ft. wide, these latter being placed against the outer walls. All the seats in the nave are open ones, of stained deal. The west window is a four-light one, with head tracery. The windows on each side the nave alternate two-light and three-light. The roofs of the nave and aisles are open-timbered, with moulded ribs and braces, and boarded throughout. The chancel roof is formed of coupled rafters, with curved ribs beneath the boarded ceiling. Advantage is taken of the fall of site to form a vestry under the chancel, adjoining which is a staircase for access to the chancel and robing-room. The chancel, which rises two steps from the nave, opens with a lofty arch, having columns, with sculptured capitals in the jambs. In the north chapel the organ will be placed when it arrives. It will cost about 500*l*., and is being built by Messrs. Hill, of London.

Bedford (Suffolk).—The chancel of Bedford Church, near Framlingham, has been re-opened, after having been re-seated and restored. A new roof of stained deal has been erected. The new seating is of oak, with carved stall elbows, and the floor paved with tiles in pattern. The new reredos is of Caen stone, with trefoiled panels and carved spandrels, containing the lily, passion-flower, oak, &c., on each side of the east window; the Lord's Prayer, Decalogue, and Belief being placed in the panels, with emblems above, in gold and colour. Below the east window the panels contain a gilded and floriated cross, in the centre, on a blue diapered ground, with emblems of the Trinity and texts on each side. The lower portion of the reredos is lined with glazed tiles in colours. The altar-rail is of oak, supported on iron scrolled and foliated standards. The builders were Messrs. Vine & Day, of Ely; and the decorators, Messrs. J. & J. King, of Norwich; the whole having been carried out under the superintendence of Mr. James K. Colling, of London.

Mole Bruce (near Shrewsbury).—The tower of the parish church has been formally opened. It is 25 ft. 6 in. wide, exclusive of buttresses, and about 100 ft. to the highest point. It is battlemented, and consists of four stages: in the upper stage are hung three bells, by Messrs. & Co.; the framing of three more being provided. Since the consecration of the church in May, 1869, an alabaster reredos, by Mr. Earp, has been presented. The central subject is the Resurrection of our Lord; on the sides are figures of St. Thomas and St. Mary Magdalene, in niches. The north-east window of the apse has been filled with painted glass: it contains nine panels, representing the Temptation, the Expulsion, the Sacrifice of Cain and Abel, the Finding of Moses, the Burning Bush, the Descent from the Mount, the Infant Samuel prophesying to Eli in the Tabernacle, the Building of the Temple, and the Angel appearing to Zaccariah. In the head of the window is a chorus angelum. The artists were Messrs. Morris & Co., who executed the east window. The total cost of the church has been about 5,500*l*.; and the work has been carried out by Messrs. Bowdler & Darlington, of Shrewsbury, from the design of Mr. E. Haycock, architect.

Hopton Castle.—The opening of St. Mary's Church, it cannot be said to be re-opening, inasmuch as the edifice is entirely new, although erected on the site of the old church, at Hopton Castle, a picturesque village about a mile distant from Hopton Heath, midway between Craven Arms and Knighton, has now taken place. The old church was little better than a barn, and, as there was nothing in it worth preserving, it was resolved some time ago to pull it down, and put in its place a better edifice. It is in the Early Decorated style of architecture, and built of stone from the neighbouring quarries. Accommodation is afforded for nearly 100 persons. Mr. Nicholson, of Hereford, is the architect; and Mr. Gough, of Bishop's Castle, the builder. The estimated cost of the new church was about 900*l*.

West Kirby.—The parish church of West Kirby, near Hoylake (dedicated to St. Bridge), has been re-opened, the edifice having been restored at a cost of nearly 3,000*l*. The church, which is in the Decorated style of architecture, consists of nave, chancel, north and south aisles, and a north chapel. The nave has an open-timbered roof, the trusses being supported on

carved corbels. The chancel, which is arched and panelled, is divided from the north chapel by an arching of three arches, these and the chancel arch being designed from the old moulded stones found during the excavations. The altar and the chancel are laid with Maw's mosaic tiles. The steps of the altar and chancel are in polished Lancashire marble. The walls and the whole of the roofs are yet not decorated, this part of the work being left until further funds are obtained. The edifice is heated with hot air by Messrs. Whitaker & Constantine, Bolton. The seats, which will be free and appropriated, are of oak, partly made from the old oak benches. The tower arch has been renewed, and the vaulted roof restored. Extraneously, nothing has been done to the tower, except that a west window has been placed in it, the church, which will seat 350 persons, has been rebuilt with stone from the Hewall Hills. The architects were Messrs. Kelly & Edwards, Chester; and Mr. John Dobson, builder, of Cock Ferry, was the contractor for the whole work. The expenditure on the edifice has been £9000. The organ, which has been purchased at a separate fund, cost about 2000.

Ryhope (County Durham).—St. Peter's church was consecrated on Wednesday last, the Lord Bishop of Durham. The whole of the walls are built of magnesian limestone from the beach, with freestone dressings. The pinnacles and arches are in alternate bands of red and white freestone. The roofs are open-benched throughout, stained and varnished. The plan consists of nave and chancel, 85 ft. long by 24 ft. wide (inside measurement), south aisle, transept, vestry, organ chamber and singing vault, with a large pearly tower on the north side (the north aisle and transept being omitted for the present). The church will accommodate 400 adults; inclusive of north aisle and transept, 534 adults. The whole of the sittings are free. The chancel is fitted with stalls, and the east and transept windows are filled with stained glass. The Ecclesiastical Commissioners have given 1,500*l.* towards the action. Mr. T. C. Ebdy, of Durham, is the architect.

SEVENTH CHURCH BUILDING NEWS.

Wem.—The memorial-stone of a new Baptist chapel has been laid here. The new chapel will be erected on the site of the old one. The additional area required being obtained by enclosing the space formerly occupied by a road, in rear of the house attached to the chapel. On the plan, the form of the building that of the letter T, the longest front being towards Market-street, and the transeptal portion, on the site of the garden, being finished to a circular end. Sitting accommodation is provided for about 250 on the ground floor, and additional sitting-room can be obtained by the erection of a gallery at any future time. The basement floor is provided with schoolrooms, baptistery-rooms, and other conveniences. The style of the building is Gothic, of the early decorated period, the principal elevation facing Market-street. The lower portico of the front consists of a porch surmounted with two ornamental gables, above which rises the main gable of the chapel which is filled with a Catherine-wheel window, containing ornamental plate tracery. A spirelet, rising to the height of 40 ft., marks the side of the main gable at the entrance. Noble-street, and will form a prominent object in the neighbourhood. The material with which the building is being erected is local dressed bricks, with dressings of Grimsby stone. The interior of the edifice will be finished with open timber roof, coiled under the spars, and designed to have good acoustic properties. The seats are of framed varnished deal, with monumental bench ends, and the windows are intended to be filled in with green cathedral glass. The contractors are Mr. T. Francis and Mr. H. Tommy, Wem; and the structure is being erected from the design and under the superintendence of Mr. David Walker, architect, Liverpool and London.

Leek.—The corner stone of a new building, to be used as a Wesleyan Chapel and ragged school, Mill-street, Leek, has been laid. The building will be of plain Early English character, in red brick, with stone dressings, two stories in height, the lower story for school purposes and the upper for the chapel, in which 400 persons can be accommodated, the latter with a gallery at one end and class-rooms under. The site inclines rapidly from back to front, and advantage has

been taken of this feature to obtain a second entrance for old people, at the rear of the chapel and at the chapel floor level, so avoiding the ascent of the staircase at the principal entrance. The chapel will of necessity be mainly lighted from the roof, which will be open for about two-thirds its height, and a platform will be substituted for the usual pulpit. The whole has been arranged with the utmost economy, the funds at disposal admitting of nothing beyond this. The cost will be 800*l.* at present; but it is intended that this sum shall be considerably exceeded at some future day by a gallery and class-room being provided. Mr. Sugden is the architect, and Messrs. Knowles & Tatton are the contractors.

Framlingham.—The Independent Chapel has been re-opened, after considerable alterations. Erected about forty years ago, it has of late years shown signs of material and gradual settlement in various parts of the building. Recently a committee was formed to take steps to ascertain the cause of these settlements, and to apply a remedy. They consulted Mr. Sugden, architect, Leek, and it was discovered that the walls, instead of being carried down to a sufficient depth to secure a hard unyielding bed (which was found at no great depth below the footings), had been set upon plates of timber, carried all round the building, the entire width of the walls, on a soft subsoil; and these plates were so completely decayed as to be scarcely distinguishable in some instances from the soil on which they were placed. On the advice of the architect, the walls have been entirely underbuilt down to a hard gravel bed. The interior has also been entirely re-arranged and reseated, and other improvements have been effected.

Ryeport.—The memorial-stone of a new Wesleyan chapel and schools has been laid in Ryeport, contiguous to the existing chapel and schools, in a line with Victoria-street. The existing chapel will, we believe, be ultimately converted into schools. The walls of the new building have been raised to the extent of several feet. The building, which is intended to take the place of the present chapel, is calculated to seat nearly 900 persons. It is in plan an oblong, measuring internally, without the gallery recess or the towers, 70 ft. by 38 ft., and from floor to ridge of roof the height is 40 ft. It is intended to be fitted with open seats, arranged in three divisions. In the rear of the chapel are two vestries, lavatories, &c., adjoining. The galleries, of which there are three, are approached by two staircases on either side of the principal entrance to the chapel. The chief entrance front is flanked by two towers, which contain the staircases to the galleries. These are carried up and made features in the elevation, being finished with pointed roofs, surmounted by finials. Under one of the towers is a space for the heating apparatus, arched over, and made fireproof. The platform for the pulpit, &c., will be constructed of pitch pine. The building, externally, is constructed of red bricks, with Bath stone dressings. In the centre of the roof is a ventilating turret, which, with the two towers, will form a flooring group, and give a varied skyline. The contract has been taken by Mr. Clutterbuck, of Gloucester; and the architect is Mr. Maberly, of London and Gloucester. The cost of the chapel will be about 2,000*l.*

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Goole.—The Chapel and Schools of St. Thomas of Canterbury, Goole, have been solemnly opened and dedicated. The new buildings are of a simple and unpretending design, of Gothic character, and are built of grey stock bricks, with stone dressings and bands of black and red bricks sparingly introduced. There are two rooms, each 20 ft. by 50 ft., which will answer the double purpose of school and chapel, till the whole design is completed by the erection of a church, for which a portion of the site has been set apart. The rooms are lofty and well ventilated, and the roofs have the main timbers exposed to view. A house, adjacent to the school, for the residence of the incumbent, is rapidly approaching completion, and promises to group well with the school building. The works are being carried out by Mr. Elliott, of Goole, under the superintendence, and from the plans of Messrs. Hadfield & Son, of Sheffield, architects. Mr. Cairns, of Leeds, is the clerk of works. **Bridlington.**—A meeting of the Bridlington

Committee of Holy Trinity Church has been held to receive plans and designs for the tower and spire, and also to accept a contract for the same. The tower has four windows with slate louvres and Gothic traced headings; the spire will have four crocketed pinnacles. The contract of Mr. Remond for 1,400*l.* was accepted, towards which sum the chairman (in addition to his former liberal gifts) offered 1,000*l.*—The foundation-stone of the new church of St. Anne and Convalescent Home has been laid. The church consists of a nave, with one aisle divided by five bays on the south side; two vestries, one for the priests and the other for the choir; apsidal chancel with ambulatory. The work is to be built of moulded bricks, yellow, white, and red in colour, and the architecture is to be in the Early Pointed style. The church will accommodate 550 persons. Chairs will be provided for them, and the fittings of the interior are to be of pitch pine. There will be a considerable quantity of grill work, and it is proposed to ornament the church with paintings on tiles in the same style as the reredos in the present temporary iron church. Mr. Charles Toft Newstead, York, is the architect. The builders have not been appointed.

STAINED GLASS.

St. Mary's, Rufford.—Since the erection of this church (which was opened for public worship in January last) several stained glass windows have been added—seven in number—viz., the east, west, and five in the north and south aisles. These latter are of double lights, or openings, and are adorned with subjects chosen from the New Testament. Commencing with the north aisle, the easternmost window is put up by the Rev. F. Chamberlain, in memory of two of his children, the subject which occupies the whole of the window, except the tracery, being the Adoration of the Infant Jesus by the Wise Men: in a quatrefoil above the light is the *Agnus Dei*. The second window has the subject of the Good Samaritan, and is the gift of the late Lady Arabella Hesketh. Our Lord calling Nathaniel is illustrated in the third window in the north aisle, this being erected to the memory of Mr. J. Bolton, by his widow. In the south aisle are two. The one near the chancel is presented by the Lady Dowager Hesketh: the subjects are *Clothing the Naked* and *Feeding the Hungry*. In the adjoining window the Saviour is represented as the Good Shepherd in one light, in the other as knocking at the door. This is a memorial window to his sister, by the Rev. J. F. Goggin, minister of the church. The east window, which is of three compartments, surmounted with tracery, is enriched with four distinct subjects. In the centre light is the Last Supper, the figures of Our Lord, with St. John leaning upon his bosom, and those of St. Peter and Judas Iscariot; in the right and left compartments are the Annunciation and the Burial, with the Ascension, in the tracery. This window is the gift of Sir Thomas Fermor Hesketh, and is erected to the memory of Sir Thomas Hesketh, baronet. The west window—the largest in the church—was completed last week. This also is the gift of Sir T. F. Hesketh, and is in memory of his wife Lady Arabella, who recently took a lively and practical interest in the rebuilding of the church. Like the east window, it is divided into three compartments, with simple but characteristic tracery. The subject is the Crucifixion, which embraces the whole breadth of the window. In the centre light is our Lord upon the cross, with Mary Magdalene. On the right is St. John supporting the Virgin, and on the left is Joseph of Arimathea and the Centurion. In the upper portions of the lights are angels ministering to the dying Saviour. The tracery is entirely filled with angels bearing upon scrolls the words of our Lord, "And as Moses lifted up the serpent in the wilderness, even so must the Son of Man be lifted up, that whosoever believeth on Him might not perish, but have eternal life." The whole of these windows are from the studio of Messrs. J. A. Forrest & Co., of Liverpool.

Bromsgrove Church.—The best window of this church has just been filled with stained glass by M. Capronnier, of Brussels. The subject is the Ten Virgins. The window is in memory of the wife of the Rev. Walter More-Molyneux, and daughter of the vicar of the parish. This is the sixth painted window that has been placed in Bromsgrove parish church since its restoration in 1858 by Mr. Gilbert Scott. In style and in the treatment of the subject the work resembles Bavarian glass.

Bampton Church.—There have been recently erected in this church, the restoration of which is now almost completed, two memorial windows, one to the memory of Mr. Edward Frederick Whitaker; the other to the memory of the wife of Dr. J. Sherwood Stocker, and their infant son. The former of these, executed by Messrs. O'Connor, is placed at the north side of the west entrance to the church, the subject chosen for illustration being Christ bearing his cross. The latter is situated at the south-east corner of the chancel. The subject is that of Our Lord blessing little children. The picture is carried through the three lights, and the central figure is surrounded by Apostles and others. The whole is arranged under a simple canopy form, surmounted by foliage. This window has been designed and executed by Messrs. Lavers, Barraud, & Westhall, of London.

East Church, Stirling.—Two windows in this church have just been filled with stained glass. The workmanship is by the Messrs. Ballantine & Son, of Edinburgh, from designs submitted to and approved by Sir William Stirling-Maxwell. The largest of these windows, which occupies a central position, measures about 30 ft. by 12 ft., and is divided in three tiers in height, each tier having six lights. The window is a memorial of John Cowane, erected by the trustees of Cowane's Hospital; and the six lower lights contain, as illustrative of that charity, representations of the acts of mercy—"I was hungry and ye gave me food," "Thirsty and ye gave me drink," "A stranger and ye took me in," "Naked and ye clothed me," "Sick and ye visited me," "In prison and ye came unto me." The middle tier of lights contains representations of our Lord's Sermon on the Mount and the Last Supper. In the central lights of the upper tier are figures of John the Baptist and St. Paul in the attitude of preaching, while in the other lights are the four Evangelists. In the top tracery are angels with scrolls in their hands. The groups are surrounded with foliated ornamentation in harmony with the architecture of the structure. The other apse window, next to and north from the large window just described, is erected by the Glasgow Stirlingshire Charitable Society and the Glasgow Society of the Sons of the Rock, in commemoration of a visit to Stirling in 1868, on the invitation of Provost Rankine and the magistrates. The window measures about 24 ft. by 6 ft., and is divided into two tiers, having three lights in each. As emblematic of the objects of the societies, in one of the under-lights Paul is shown, with Timothy at his feet, dictating to Epaphroditus words (Philippians iv. 8) which express the aim of the Sons of the Rock Society. In the central panel is the Good Samaritan, and in the other sidelight the Marriage of Cana. The three lights in the upper tier represent Christ teaching in the Temple, and in the top tracery are angels adoring the youthful Saviour. The glass, it is said, has all been made in the pot, and is free from enamel colors. The treatment is that of a mosaic.

St. Martin's, Scarborough.—Four new clear-story windows have been inserted in the south side of this church. They are by Messrs. Morris & Co., Queen-square, London, who have supplied all the stained glass in St. Martin's, and, like the clear-story windows on the north side, they represent angels as "ministering spirits." All the windows are the gift to the church of Miss Mary Craven.

Books Received.

South Winfield Manor. Illustrated by Plans, Elevations, Sections, and Details, with Perspective Views and a Descriptive Account. By EDMUND B. FERREY, Architect. Published by the Author. 1870.

FOLLOWING in the earlier footsteps of his father, Mr. Edmund Ferrey has industriously set himself to work, and measured, drawn, and lithographed all that remains of South Winfield, or Wingfield, Manor House,—which word "House," by the way, should have formed part of the title,—and has published the results in a folio volume of twenty-two plates. Wingfield, as the place is now called, is about three miles from Alfreton, and eight from picturesque Matlock Bath, all in Derbyshire. The manor existed before the time of William the Conqueror. Treasurer Cromwell, in the reign of Henry VI., commenced, it is believed, the present house on the site of a more ancient structure. The Earls of Shrewsbury had it after Lord Cromwell's

death, and it was made one of the prison-houses occupied by Mary Queen of Scots in 1569 and 1584. It was taken by the Royalists, and afterwards by the Parliamentarians during the civil wars. In 1666 it came into the hands of Mr. Immanuel Halton, and one of the family, the Rev. Immanuel Halton, is the present possessor.

Large portions of the building have been removed at different times for the sake of the materials.

We wish Mr. Ferrey had had even a better subject. Still, there are a great many useful details, and, in view of the possible restoration of the Manor House hereafter, Mr. Ferrey's monograph will be found valuable. The author himself will have derived no slight advantage from the work he took upon himself and has conscientiously carried through. As the worthy son of an old friend and valued member of the profession, we heartily wish him a successful career.

The Royal Guide to the London Charities, for 1870-71. By HERBERT FRY. London: Hardwicke.

THIS extraordinary list of public charities connected with the metropolis is continually on the increase. It includes no mere parochial charities, and does not even pretend to be a perfect and complete catalogue of the whole range of London benevolence, although it is now so much more complete than heretofore, that the book has had to be enlarged and increased in price from 1s. to 1s. 6d. On a rough calculation of an average of seventeen distinct charities on each of its 206 pages, we find that the total number of these public metropolitan charities must be about 3,500! Mr. Fry has done a good work.

VARIORUM.

"Moxon's Popular Poets" will, we have no doubt, be a popular book. It will be issued in volumes of from 432 to 640 pages, each illustrated with numerous steel and wood engravings, and tastefully bound in cloth, at a low price. Moreover, it will be edited, with explanatory notes and memoirs, by Mr. William Michael Rossetti. Two volumes are already published, "Byron" and "Longfellow," and seem to fulfil the promises—"The Grue-stand; or, Sauce Piquante to suit all Tastes" (W. Tegg), is the title of a little book of anecdotes and jokes taken from all sorts of places without saying where. The following "Grammatical Witicism" is suggestive:—"Bobby, what is steam?" "Boiling water." "That's right: compare it." "Positive, boil; comparative, boiler; superlative burst."

Miscellaneous.

Three Men Suffocated at Hastings.—No amount of experience is of any use in preventing such "accidents." Surely the circulation of the newspaper press is much smaller throughout the country than it is supposed to be. About ten o'clock on Friday night cries for help were heard proceeding from an A. B. C. tank at the drainage works, at the East Well, Hastings. Mr. Porter, chemist, and a man named Harris, employed on the works, immediately volunteered to descend to the help of two men, named Nash and Fry, who were in the tank. On the descent Harris saw Porter fall back, and he himself, feeling exhausted, came up at once to the fresh air. A coast-guardsmen then went down, but he had to be brought up in an exhausted state. Some fishermen volunteered help, and, after some search, they found the dead bodies of Fry and Nash. Mr. Porter's body was not found, and it is believed that it has been washed out to sea.

Chairmanship of the Board of Works.—A communication has been sent to the clerk of the Board from the Home Office, containing the following observations:—"Mr. Bruce desires me to mention to you for the information of the Metropolitan Board of Works, that having regard to the probability of legislation at a very early period on the subject of the Government of the Metropolis, he thinks it worthy of careful consideration by the Board whether any appointment that may be made of a successor to Sir John Thwaites should not be upon the understanding that such legislation as I have referred to cannot be long postponed, and that it may involve the abolition by Parliament of the office of chairman of the Metropolitan Board of Works."

Proposed New Poultry Market in Smithfield.—A project for the erection of a new poultry market on the vacant land on the west side of the Metropolitan Meat Market and on the northern and southern sides of the Western Approach-street to the Holborn Viaduct, has been under the consideration of the Markets Improvement Committee of the Corporation for more than twelve months, and it is said that they have resolved to recommend the scheme for the approval of the corporation. In a statement drawn up by Mr. Horace Jones, the City architect, at their request, Mr. Jones laid before the committee, in general terms, the cost and returns of utilising, for the purposes of a poultry market, that portion of land westward of the Meat Market, and on the south side of Charterhouse-street, now in their possession. He states that it might be assumed, in round numbers, that there are about 55,000 ft. superficial of land in that block, with a frontage opposite the Meat Market of 200 ft., and in Charterhouse-street of 270 ft. Of that, 17,000 ft. might be expected to be devoted to gangways and passages, leaving, on the ground floor, 38,000 ft. for shops, which, at the rate of 4s. 4d. per ft. per annum, would produce 8,233l. To this might be added 3,150l., being the amount at which the basement might be let, and 2,167l. for the occupation of the upper floor. The returns in all would amount to 13,550l. Against this would have to be placed 5,000l. for the annual value of the land, and 6,000l. for the interest on the cost of building (100,000l.), leaving 2,550l. for expenses and outgoings, to which would be added the sum received for tolls. The architect adds that about 4,000l. or 5,000l., the probable moiety of the cost of forming the road on the west side of the proposed market, might be deducted from the value of the land. The committee have approved of the architect's report, and recommended that they should be authorised to give directions for the preparation of a design, plan, and estimates for the proposed market. The Court of Common Council decide the matter.

Embanking the Thames.—Nature reminds us that whatever claims Sir Christopher Wren may possess to be considered the originator of the Thames Embankment, it is hardly fair to leave out of sight those which belong to Sir John Kivie. The latter gentleman was a refugee from Rotterdam, who came to England in 1666 and possessed some of the ingenuity of his brother-in-law, Admiral Van Tromp. It does not appear how soon after the Fire of London it occurred to Sir John to propose a river embankment, but as early as 2nd December, 1666, we find him examining the soil of the foreshore with a view to discovering whether it was suitable for making clinker-bricks. On the 6th of March following, Evelyn definitely proposed to the Lord Chancellor "Monsieur Kivie's" undertaking to warfe the whole river of Thames or Key, from the Temple to the Tower, as far as the fire destroyed, with brick, without piles, both lasting and ornamental." We may presume it was favourably received by Lord Clarendon, as upon the 22nd of the same month Evelyn had audience of the king with reference to building the Quay, and a few days later Sir John Kivie and the Diarist "went in search for brick-earth in order to a greate undertaking." No further mention is made of the scheme, and we may perhaps conclude that it was abandoned, either on account of the unpopularity of the inventor (whose Dutch extraction would at that time have been a natural bar to success), or of the fall of Clarendon at the ignominious close of the war with Holland.

Sir Isaac Newton's Observatory.—It is proposed to purchase this relic by subscription and present it to the nation, in the same way that Shakespeare's House was; with this difference, that the latter cost thousands, and can only be seen at Stratford, but Isaac Newton's Observatory can be obtained for 380 guineas, and can be seen in London. A view of its interior, in which Newton spent a great part of his time, and wrote his "Principia," is given in the *Illustrated London News*, of July 24th, 1858, with an account of the Prince Consort visiting it. It was his royal highness who originally suggested that it should be purchased for the nation, but on his decease the matter dropped. An earnest appeal is now made to the public for subscriptions; as, failing that, it will certainly be lost to the nation. Subscriptions received by the Union Bank at London at its four branches will be published.

Watford Parish Church.—At a meeting of the committee for carrying out the restoration of the parish church at Watford, held in the Corn Exchange, under the presidency of the Earl of Essex, the Hon. R. Capel read a report of the sub-committee in reference to the progress of the works. The report stated that on Friday, May the 20th, a portion of the south aisle gave way, mainly in consequence of the insecure state of the foundations, and of the rottenness of the roof timbers. It was the opinion of Mr. Christopher, the architect, that no particular blame attached to the contractors; and although, in a strict interpretation of the contract, they would be liable to make good all damage, he did not think in this case they were legally responsible. Mr. Gibson had engaged that the re-erection of that portion of the south aisle which had given way should not entail upon the fund a greater cost than 40%, he being willing to bear a portion of the expense. It being reported that the south transept was nearly 5 in. out of the perpendicular, it was resolved that it be pulled down and rebuilt, the extra expense being about 15%. The amount of the contract is 4,500*l.*, inclusive of 533*l.* for contingencies. This sum does not include the architect's fees, the salary of the clerk of the works, &c., estimated at 500*l.*, nor 234*l.* for lowering and levelling a portion of the churchyard. The total amount of subscriptions received or promised is 2,705*l.*

Berlin Waterworks Company.—The half-yearly general meeting of this company has been held at the London Tavern. The thirty-fourth report stated that the net revenue for the past half-year amounted to 31,960*l.* If the receipts for the current half-year were equally good, the earnings for the entire year would exceed 10 per cent. on the share capital. Under these circumstances the directors recommended the payment of an interim dividend for the past six months at the rate of 9½ per cent. per annum. The profits beyond 10 per cent. were to be divided with the Prussian Government for constructing sewers in Berlin. The works in Berlin were to a great extent underground, but the effects of war might interfere with them. The Government had kept faith, but the corporation of Berlin were not friendly to the company. The Berlin people were jealous of the company, and would get rid of it altogether if they could. The report was unanimously adopted, and the dividend as recommended was declared.

Mr. Mason's College.—Mr. Josiah Mason, who, twelve months ago, founded the Edington Orphanage, at a cost of nearly 250,000*l.*, has now in contemplation another public work of great importance, namely, a college and schools for scientific and technical instruction, open to all classes, and, if the hopes of the founder should be realised, capable of expansion into one of the noblest institutions in the kingdom. As yet the plan is only broadly formed; but as a beginning Mr. Mason has agreed to buy a large block of land in Edmond-street, exactly facing Ratcliffe-road between the Townhall and the Institute. The purchase money, we believe, is more than 0,000*l.*

Proposed Public Baths for Salisbury.—A public meeting has been held in Salisbury for the purpose of considering the desirability of establishing public baths. The mayor presided, at the attendance was not numerous. A resolution affirming the advisability of providing proper bathing accommodation was unanimously carried; and it was stated that Lord Radnor offered, if a suitable site could be found on its property, to give them a grant of it, with the use of the water at a nominal rent, and also to give an annual grant towards the expense of keeping up the place. A committee was appointed to report on the subject.

Strike of Joiners at Leigh.—The joiners of Leigh are out on strike; at a time, too, when there is much building going on in the town and neighbourhood. At an aggregate meeting of the carpenters and joiners, held on the 18th of June, it was resolved to ask for an advance of 1*s.* per week, which would make their wages 3*s.* The advance was to take place on the first Saturday in August; but as the masters have unanimously declined to accede to the request, the whole of the joiners have struck work.

A Sanatorium Wanted.—The managers of the Consumption Hospital, Brompton, have determined on having a plan prepared for the establishment of a sanatorium, on a site of not more than 10 acres of land, within a radius of 5 miles of the parent building.

Monumental.—It has been resolved to erect a memorial of the late Duke and Duchess of Sutherland in North Staffordshire. The proposed memorial will be a statue of the duke surmounting a fountain, to be erected in Trentham Park. A committee has been appointed. The statue, which has been erected on Brampton Moat, "by the people of Cumberland, to commemorate the public services and personal worth" of the late Earl of Carlisle, has been unveiled in the presence of a large number of spectators. Mr. T. H. Graham, of Edmond Castle, the chairman of the committee, delivered the inaugural speech. Shortly after the death of the great Virginian General, Stonewall Jackson, his English admirers formed a committee, of which Mr. Beresford-Hope, M.P., was treasurer. Their object was to erect a bronze statue of General Jackson in some public place in the state of Virginia. Subscriptions flowed in freely, and the work was entrusted to Mr. Foley, R.A. The ill health of the artist delayed the work, but the effigy will be shortly ready for casting. The subscriptions already received will, it is stated, be sufficient to cover all expenses.

Memorial of the late Earl of Carlisle.—The Cumberland memorial statue of the late Earl of Carlisle, erected on Brampton Moat, about nine miles from Carlisle, has been unveiled by the Hon. C. W. G. Howard, M.P., in the presence of a large company. The moat at Brampton is a wooded eminence, 150 ft. high, and stands within the barony of Gilsland, where a considerable portion of the possessions of the Howard family lies. The statue, which is on a pedestal of octagonal shape, 8 ft. 3 in. in height, made of fine white stone, is from designs by Mr. Foley, R.A., and is a bronze figure also 8 ft. 3 in. in height. It represents his lordship in a standing position, habited in the robes and insignia of the Order of the Garter, with one hand resting on a book, introduced as suggestive of his taste for literary pursuits. A general holiday was observed in Brampton.

An Anti-fouling Composition.—Two years ago, the engineers to the Commissioners of Northern Lighthouses received a block of wood from the British and Oriental Shipcoating Company, Crumend, near Edinburgh. It was coated entirely with the company's anti-fouling composition, and bolted to another block. Messrs. Stevenson then had these submerged at Wick Harbour Works, and have lately had them taken up and brought south. The log forwarded by the company gives evidence, we learn, of how the coating has defied the ravages of worm in a very remarkable manner; whereas its neighbour, bolted to it, has been almost entirely eaten away and riddled with worm in every direction, leaving only a fractional portion of its former dimensions. The British and Oriental Shipcoating Company have here a proof of the efficacy of their coating in prevention of fouling.

Guisborough.—Improvements have lately been going on in this little rural town. The old townhall has been enlarged and raised, an additional story being added to it. The building consists of a three-storied structure, containing offices on the ground floor, the justice-room and magistrates' clerk's office on the first story, and offices for the board of health, savings bank, highway board, &c., on the third story. The height of the building is now 70 ft. from the ground to the chimneys, and the front towards the street is faced by a gable, the top of which is surmounted by a stone ornament. There are now being erected 100 cottages in the town, for the accommodation of workpeople employed in the mines, the accommodation afforded by the town being insufficient.

Hole and Corner Tenders for a Town Council.—At the last quarterly meeting of the Portsmouth Town Council an altercation took place amongst the members in reference to a list of tenders for a building to be erected on the dock wharf for foreign cattle. The Camber and Dock Committee did not advertise for tenders, but applied to five or six of the townspeople and received the following:—Mr. Lawrence, 820*l.*; Mr. Roberts, 900*l.*; Messrs. Neave & Fry, 729*l.*; Mr. Light, 879*l.*; Messrs. Bramble, 742*l.* 16*s.*; Mr. Bevis, 891*l.*; Mr. Burbridge, 774*l.* 19*s.*; A. D. Smith, 700*l.* Two other tradesmen (respectable builders, according to the mayor), hearing of the affair in time, also sent in tenders, one of which was the lowest, but their tenders were rejected, and that of Messrs. Neave & Fry was accepted.

The Carpenters' Company.—Last week the master and wardens of the Worshipful Company of Carpenters were elected in the ancient hall of the company, in London-wall. They chose for master, Mr. W. H. Warton; for senior warden, Mr. W. Robertson; for middle warden, Mr. B. Jacob; and for junior warden, Mr. J. T. Preston. The custom of crowning the new master and wardens still exists in the company, and crowns or garlands used for the purpose have been in their possession nearly three centuries. The caps now in use are less ancient; they are of silver gilt, of handsome design and elaborate workmanship.

Workmen's Appeal for Peace.—The Workman's Peace Committee have issued an address to the working men of Great Britain and Ireland, inviting them to join "in protesting against the war between France and Prussia, as a great and horrible crime on the part of Christian nations at this period of the world's history, and a wanton infliction of misery and ruin, without any adequate cause, or the possibility of any beneficial result." It cannot be too largely circulated.

Gift of a Church.—The church of St. Mary built at a cost of over 8,000*l.*, which has been presented to Halifax by Mr. Michael Stocke, has recently been consecrated by the Bishop of Ripon. The sittings will be free. The building and its fittings are complete, except the organ, which is being built, at a cost of 500*l.*, by Hills, and the upper stages of the tower, which are in course of construction.

Postage of Tracings.—Arrangements have now been completed under which tracings on linen of an architectural or mechanical nature will be allowed to pass to Belgium at the book-rate of postage.

International Exhibition of 1871.—We are glad to hear that there is no foundation for the rumour that the International Exhibition appointed for 1871 is to be postponed by reason of the war.

Egyptian Antiquities.—We are informed that the Hay collection of Egyptian Antiquities will shortly be exhibited to the public in the beautiful Egyptian Court of the Crystal Palace, a very fitting locality.

Wine-Bin Tiles.—The application of tiles to a simple wine-bin, without laths, has been patented by a Mr. Pierce. The plan appears to be both cheap and otherwise advantageous.

Cardiff Exhibition.—The Cardiff Fine Art and Industrial Exhibition was opened on Tuesday last by the Marquis of Bute.

TENDERS.

For repairs, painting, and decoration, St. Mary's Church, Somers-town. Mr. James K. Colling, honorary architect:—

Nash	2396 0 0
Ryers	442 12 8
Nash (accepted)	389 0 0
Henderson (too late)	384 10 0

For erection of farm-house, near Tewkesbury. Mr. James Allsop, architect, Worcester:—

Collins & Collins	2735 0 0
Rapley	725 0 0
Mills	701 0 0
Mathews	645 0 0

For alterations and additions, Rose Lawn House, Worcester. Mr. James Allsop, architect, Worcester:—

Beard	2499 0 0
Heming & Son	496 0 0
Hughes	479 0 0
Beard	2511 0 0
Heming & Son	496 0 0
Hughes	494 0 0

For erection of seventy-two cottages and six shops, and for forming streets, for the Cardiff Workmen's Cottage Company, Limited. Mr. T. Waring, Cardiff, architect:—

Cottages.	Shops.	Street Works.
Dawson .. 49,331 7 0	22,033 15 0	2349 2 0
Day .. 8,22 0 0	1,854 0 0	319 0 0
Shepton .. 8,568 0 0	1,920 0 0	378 0 0
* Accepted.		

For the extension of the Oratory at the Crystal Palace. Mr. Charles H. Driver, architect. Quantities supplied by Mr. T. Nixon:—

Jackson & Shaw (accepted)	23,310 0 0
For Parsonage-house at St. Saviour's Church, Brixton. Mr. J. Bartlett, architect:—	
Wood	21,943 0 0
Asby & Sons	1,699 0 0
Conder	1,600 0 0
Pritchard	1,687 0 0
Downs	1,679 0 0
Colls & Sons (accepted)	1,667 0 0

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The Builder.

VOL. XXVIII.—No. 1438.

The Preservation and Purity of Iron.



UT few subjects connected with the craft of the builder, the work of the mechanical engineer, or the labour of any workman who is concerned in the manufacture or the preservation of iron-work, have more importance than the question, "What is rust?"

"Why, every one knows what rust is," many a reader may reply. "It is impossible to read any work touching on the subject, without becoming aware that rust and oxide of iron are used as equivalent terms."

Such, no doubt, is the general view; but the use of language, however general, is by no means a proof of the accuracy of the statement (the truth of which is taken for granted), that the destructive action which we call rusting is nothing else than the oxidation of iron by exposure to damp and to the atmospheric air; or, in other words, that rust is the oxide of iron. It is obvious at a glance that this is not a mere curious question of speculative chemistry. It is not a pedantic quarrel about words. Rust, whatever may be the etymological affinity of the word written in Latin, *rubigo*, is good, plain, vernacular English. We all know what the word means, to a certain extent; and we all of us have more or less suffered from the liability of ironwork to be deteriorated by its attack.

But the main importance of knowing what rust actually and chemically is, is not literary. It is eminently practical; for thus alone can we arrive at the answer to the yet more urgently practical question, "How shall we preserve iron from rust?" If we mistake the nature of the evil, we shall not be unlikely to mistake the nature of the remedy.

Before entering into the investigation of any chemical hypothesis on the subject, let us call attention to the result of an experiment made recently by an eminent chemist, with a view to determine the nature of the action which generates rust.

Two pieces of soft iron, of equal dimensions, were filed up smooth and bright. A solution of bicarbonate of soda was placed in a test-tube. A portion of the same bicarbonate was placed in a crucible, and subjected to a heat which rendered it caustic, and a solution of this caustic soda was placed in a second test-tube. One of the pieces of iron was placed in each tube. The first of these, that placed in the ordinary solution, instantly began to rust, and continued to convince the active progress of that destructive process. The latter remained quite bright.

It was left in the solution for about six months, towards the close of which period it began to show symptoms of chemical action, and finally rusted like the companion specimen.

The cause of the behaviour of the iron in each instance is made perfectly intelligible on the theory that the red, destructive rust is not, as ordinarily imagined, an oxide of iron, but a carbonate of the sesqui-oxide ($\text{Fe}_2\text{O}_3\text{CO}_2$). On this view the presence of carbonic acid is necessary for the production of rust. The bicarbonate solution ($\text{Na}_2\text{O} \cdot 2\text{CO}_2$), was readily decomposed, and set at liberty the carbonic acid and oxygen to attack the iron, which, accordingly, immediately began to rust. But when this equivalent was driven off by heat, the iron placed in the caustic solution was not in a position to attract carbonic acid, and therefore did not rust. Its freedom from destructive action continued until the solution, being left in an unstoppered tube, had attracted enough carbonic acid from the atmosphere to lose its causticity. The moment that enough carbonic acid had been absorbed by the solution for it to spare some for the iron, rusting commenced. The experiment is extremely elegant, and it is difficult to resist the inference which is drawn from its results.

The view that the corrosive rust of iron is, like that of copper, a carbonate, accounts very clearly for the destructive action which takes place when iron is set into stone work, or in any way wedged into buildings surrounded by mortar. The chemical change which takes place in the drying and hardening of mortar is, after the first short period of setting, extremely protracted. During the whole of this slow process carbonic acid is at liberty to attack the inclosed iron, and hence arises that thickening sort of rust which, almost as if with the growth of vegetation itself, slowly and irresistibly acts as a destructive wedge.

Iron may, however, be used in the interior of buildings with perfect safety, if it is protected from the access of carbonic acid. A remarkable instance of this occurred, as a piece of practical experience, on the demolition of the Wriothesley-street Bridge, on the London and Birmingham Extension Railway. This bridge was erected in 1835. Like the Hampstead-road and the Park-street bridges, it consisted of brick abutments, pilasters, and piers, supporting cast-iron girders, between which were brick segmental arches, *set in Roman cement*. On the pulling down of this bridge for the extension of the Euston Station, it was found extremely difficult to separate the brickwork from the girders. It was as easy, or more so, to break the bricks themselves. But when the separation was effected, it was found that this unusual adhesion was caused by the entire absence of rust. The blue scale remained uninjured on the face of the metal,—red incrustation there was none. This blue scale, no doubt, is the oxide of iron, which forms, as in the case of other oxides, a coating of a protective character. The confusion of this harmless oxide with the destructive carbonate is an error of no trivial importance; and its detection bids fair to lead to the reconsideration of the entire subject of the protection of ironwork from rust.

Closely connected with the question of the action of carbonic acid on iron is the investigation of the facts, which at present seem to be so anomalous, observed as to the intimate union of carbon and of iron in cast iron and in steel. Why the elimination of a small proportion of carbon from the metal (or alloy) should be accompanied by such an increase of power of resistance to tensile strain, and why the reintroduction of a yet smaller proportion should be attended by so much more considerable an increase, is a mystery of economic metallurgy which it is of extreme importance to solve. The entire question of the behaviour of steel is one requiring much elucidation.

That steel, under certain conditions, evinces a metallic tenacity, and power of resisting fracture, of the very highest degree, is evident from the effect of impact on steel shell, when fired at

armour plate. The action of that sudden and terrible blow, which shatters the case-hardened iron shot, is like that of the blacksmith's hammer on a bar of cold iron, dexterously manipulated on the anvil. We know that iron can thus be hammered till it is hot. The steel shell, in like manner, is heated until it actually explodes its contents. At the same time the head of the projectile is hammered out of shape; but no fracture takes place. The tremendous force of the blow seems to be converted into thermometric, or rather pyrometric, heat; and the steel, thus heated, forges as beneath the steam hammer. The property of steel shell was discovered by accident, a fuse having been picked up on the practice ground when there had been no blind shell fired; but, thus discovered, it has been made use of for the purpose of exactly timing the explosion of the projectile.

On the other hand, we have the fact that a steel armour plate, prepared with the utmost care for the purpose of experiment, tempered in oil and produced with the full expectation that it would evince a power of resistance never previously developed, was fractured, and speedily put *hors de combat*, by the comparatively trifling assault of a 68-pound shot. This difference in the behaviour of steel as hammer and as anvil, as projectile and as armour plate, is, as yet, entirely unexplained.

The interest of these inquiries is not merely philosophical. It is practical in the highest degree. So long as we are aware of the existence of facts, quite unexplained, but in which the most (apparently) inadequate causes produce the most extraordinary results, we are in the position of people who are on the brink of a discovery. How brilliant that discovery may be, we cannot tell. We are on the scent of a treasure trove, but we can only guess at the size of the creak of gold. Mankind has made use of iron for at least four thousand years, for fragments of iron tools have been found in the Great Pyramid, left by the original builders. How long was it before iron was turned into steel? And, even at the present day, while producing iron by millions of tons, and paving our railways with steel, we are discussing the chemical action which produces rust, and we are entirely ignorant of the intimate cause of the difference between iron and steel, so far as regards the effect of the dose of carbon.

It is stated by Sir W. Armstrong that both in the Elswick and the Woolwich guns, whenever failure takes place, it almost invariably originates in the part which is made of steel. The steel tube is the part that cracks first. Steel vent pieces, which were first employed, were fractured with alarming frequency; but since iron ones have been substituted, fractures have been rare. It is argued from these facts that the vibratory action attending concussion is more dangerous to steel than to iron.

The peculiarity of the case consists in the apparently contradictory behaviour of steel when used as a projectile, as a gun, and as a target. It is quite true that, in all manufactures of iron, the two opposite qualities of hardness and of toughness have to be considered. We are not so ignorant of the practical part of this branch of metallurgy as to be unaware of modes of tempering, and of annealing, and generally of producing a metal suitable to the purpose in view. But what we do not understand is the law which regulates the existence of these properties. Our knowledge on the subject is almost entirely empirical. The tensile strength of wrought iron is considered to be due in great measure to the removal of the 4 or 5 per cent. of carbon which is contained in cast iron. The formation of laminated fibre by hammering, no doubt, has much to do with the change; but the chemical difference is important. Yet when iron is made into steel, the tensile strength of the latter is increased by the addition of carbon up to the proportion of

some 1½ per cent. With this very increase of tensile strength, however, contrary to all analogy, we find an increase of brittleness to coincide. For resistance to impact it is considered that steel cannot contain too little carbon. That hardness and brittleness should increase or diminish together is not matter for surprise; but analogy would lead us to expect a different result to accompany the increase of tensile strength.

There is no doubt whatever that the great foe to the excellence of iron is impurity, especially the presence of sulphur. Our enormous production, and the commercial rivalry which has proved so strong a temptation to the manufacturer to study cheap modes of production, irrespective of their influence or quality, has deteriorated our iron to a lamentable extent. English axes are said to be useless in the forests of America, or against the iron-barked trees of Australia. The difficulty of producing, from the present wrought iron of commerce, anything approaching the excellence of the old English forged work, has been illustrated, within the past few months, by the high praise given, by very competent judges, to some specimens of smiths' work to which prizes were awarded by the Society of Arts the other day. If these prize specimens be compared, not only with the Hampton Court gates, forged in 1695 by Huntington Shaw, and preserved at South Kensington, but with such samples of neglected and unknown old English work as may now be seen in the course of rapid decay before an old house in the main street of Rochester, we cannot fail to deplore a sad decadence in the art; the fault, no doubt, as well of the iron-master as of the smith.

It would probably be impossible for any English smith now to produce such work as some of the later specimens of articulated armour in the Tower of London. On the other hand, where, for special purposes, special attention has been given to the manufacture of the iron, the result is satisfactory. We question whether either Toledo rapiers or Damascus sabres would stand un injured, taking them one with another, the rude tests to which Mr. Wilkinson, of Pall-mall, subjects his best swords. It is true, that of these carefully-made blades, we have seen three out of four damaged in the test. But the one which passes is a weapon to which a man may safely trust. If any corslet now worn in European warfare resists its thrust, it is the fault, not of the blade, but of the arm that wields it. In preparing iron for special purposes, the chemical character of the water used in the factory appears to be very important. It was an old by-word in the steel trade that a good sword could not be made at Sheffield, nor a good knife at Birmingham, the sword being the boast of the latter town, and the knife of the former.

The practical upshot of these considerations ought to be, the concentration on the subject of the chemical properties of iron and carbon in combination of the same kind of clear patient, purposed attention as that which has thrown so much light, within the past few months, on the question of the propagation of disease by germs floating in the air. An immense amount of empiric inquiry is going on upon the subject. Great practical results have been attained. We need not particularise any of those processes as to which no small amount of controversy has recently raged. We are not undervaluing the labours of such men as Whitworth, Brown, Siemens, or others. Still, while the action of carbon in its relation to iron is so apparently capricious and contradictory, and while the destructive effect of carbonic acid, and the actual nature of corrosive rust, have been hitherto, almost entirely, unsuspected, we cannot doubt that a great reward, in fame at least, if not in gold, will attend the success of that scientific investigator who shall unveil the true law of the relation which subsists between the material which forms the hardest and the most precious of gems, and the mineral which, all things considered, may be pronounced the most valuable of metals. The Victoria cross of science awaits the discoverer of the law of the combination of carbon with iron. The fact that the presence of phosphorus produces "shortness" or brittleness in iron when cold, while that of sulphur has the same effect at a red heat, is another of those anomalous and apparently capricious differences which chemistry has detected, but not explained.

Very closely connected with this part of the subject is the extremely important question of the influence of mineral or of vegetable fuel on

the reduction of iron ore. So far from this being a mere matter of chemical curiosity, it is one which is most intimately connected with our national prosperity. It is well known that iron was originally smelted in England by wood, and that, under these circumstances, beds of iron-ore, which are now entirely neglected, in consequence of their distance from the great coal basins, were advantageously worked. In the present state of the country, of course, no fuel can be obtained except coal. In 1866, it is estimated by the Mining Record Office, 9,665,000 tons of iron ore were raised, and 4,530,000 tons of iron were produced, in the United Kingdom. The quantity of coal consumed in the 613 blast furnaces which smelted this total quantity of pig-iron is not stated. The total quantity of coal raised in the year 1866 is set down at upwards of 101,500,000 tons. The iron made in England at present, — or, at least, in 1866, — was very nearly half the total make of the world, which is estimated for the preceding year, 1865, at nine millions and a half of tons. We shall probably be under the mark in setting down 15,000,000 of tons of coals as consumed in our smelting furnaces. The average value of English coal, at the pit's mouth, is taken by the Mining Record Office at 5s. per ton, which would give something like 15s. for fuel for smelting a ton of coal.

In Russia charcoal is still almost exclusively used for smelting; and as to the superior quality of the iron thus produced there is no question. Nor as to the mere element of the cost price of production is the difference so much in favour of the inferior quality of metal as to lead us to entertain any very great confidence as to the permanent position which our iron-masters will occupy in Europe. From recent and very carefully-collected information as to Russian iron works, we find that iron is now produced by the consumption of 110 tons of charcoal to 100 tons of iron made. The lowest price of birch charcoal in Russia is 6s. 6d. per ton. 8s. 2d. per ton is considered a cheap purchase; and 14s. 9d. per ton, and even more, is paid in some establishments. As this variation in price, however, is almost all due to the expense of land-carriage, there can be no doubt that the service of the great iron-works by light railways, which can be laid and relaid year after year to the portions of the forest from which the supply is taken (on the principle of allowing from sixty to eighty years for the regrowth of the timber), will keep down the cost of charcoal for smelting to something below 10s. per ton of iron.

We have not space to exhaust this important subject at present. One thing seems to us to be clear, and that is, that unless the attention of our practical and scientific chemists is turned to the purification of iron smelted by mineral fuel, to the elimination of sulphur and other impurities, and to the elucidation of the complete scientific theory of the relations existing between iron and carbon, the time cannot be far distant when our blast furnaces will be blown out one by one; and when the excellent charcoal iron which Russia can produce in any quantity, and at moderate prices, will replace Scottish, Welsh, and English metal in the market of the world.

THE ARCHITECTURAL EXCURSION IN LINCOLNSHIRE.

"A city that is set on a hill" cannot be hid," is a sentence that involuntarily suggests itself on first coming in sight, from the railway, of the three towers of Lincoln, which, from their lofty position, dominate the whole country round. The cathedral, in fact, occupies nearly the whole of the level ground on the eminence on which it stands, the ground sloping away from the building, more or less, in every direction, and the principal ascent to it from the south (the railway side of the town), appropriately labelled "Steep-hill," constituting such a climb as might have suggested to John Bunyan, had he ever visited it, the idea of the "Hill of Difficulty" on the road to the "Celestial City." In the projected town of the Architectural Association, among the Lincoln churches, under the guidance of Mr. E. Sharpe, the cathedral naturally presented itself as the starting-point, and accordingly the excursionists were invited to meet their accomplished guide, in the first instance, at the Lincoln Assembly Rooms, to hear an introductory lecture on the Cathedral, as well as on some of the general points to be noted in connexion with

the architectural style and development of the buildings to be visited during the tour. Accordingly, at two o'clock on Monday afternoon, there did duly meet there some thirty-five or so of architectural students and aspirants, after some "speering" on the part of stragglers as to the whereabouts of the meeting, the inhabitants of the good town appearing to be happily ignorant of their own valuable institutions, or else those of the "lower" town knew nothing of the meaning of the "upper." Besides the professional audience, there were present both at this and at the evening lecture, the Bishop of Lincoln, several of the neighbouring clergy, and a fair sprinkling of ladies. The main part of Mr. Sharpe's lecture on this occasion, as far as regarded the history of the cathedral, had been before delivered in Lincoln, and a full report of it appeared at the time in our columns. Thus it is unnecessary, therefore, to recapitulate; suffice it to say that it was listened to with much interest by those present, illustrated as it was by a large geometrical drawing of the building, coloured so as to distinguish at a glance the dates and chronological order of the various portions. It is worth repeating as a hint to those who are aware of the value of order and system in carrying on a study, that Mr. Sharpe has for many years past employed a regular scale of colour for marking, in illustrative drawings, the period to which each part of a building belongs; this is based on the prismatic spectrum, the colourless (or black) band exhibiting the starting-point before any style could be said to be matured, the colour progressing in brilliancy through green up to yellow, which marks the completely developed Early Decorated or (as Mr. Sharpe, like ourselves, prefers to call it) Geometrical period, and then declining through orange (the later more florid Gothic) to the final resumption of neutral tints. The large number of drawings exhibited on the occasion (including a very valuable and comprehensive chronological progression of the mouldings typical of various periods) were thus at a glance classified by the spectator, with more ease than perhaps any other method would have furnished. One or two special points touched on in the course of the lecture we may draw attention to for the benefit of students who were not present. In the Transitional period, from the round to the pointed arch, it was observed that (in the earlier period of transition, at least) the pointed arch was always employed constructively; the round arch decoratively. This view of the subject, very decisively insisted on by the lecturer as the result of observations of many buildings (Continental as well as English), is another contribution to the theory of the almost purely constructive origin of the pointed arch, already based by other able critics on an examination of the development of groined vaulting, and can alone explain the anomalous style of such a building as Kirkstall, which appears externally as a Norman, internally, in its main features, as a Gothic building. The quasi-classical but inverted volute at the angle of the capital was also alluded to as a unique feature of the Transitional period, existing almost simultaneously over the whole area where the style was practised, but for a very limited period only. In advertising to the fine and effective sections of the arch-moulds and vaulting ribs of the cathedral, Mr. Sharpe took occasion to repeat, even more urgently, his protest, recently printed in the *Builder*, against despoiling such mouldings of their natural effect of light and shade by the reckless application of colour; a caution which was received with applause by the professional portion of his audience. In the evening the same audience assembled to hear some remarks by Mr. J. H. Parker, chiefly directed to proving that the Early Pointed work in Lincoln Cathedral was the earliest example of that style in existence, and preceded the similar work at St. Denis, usually ascribed to the Abbé Suger, but which, he contended, had been rebuilt later than the time of that ecclesiastic. The main object was to affix the honour of having invented the pointed style to an English instead of a French builder, in connection with which some question was raised as to Bishop Hugh's architect at Lincoln and his French name (Geoffrey de Noyers), though it appears both possible and probable that the name might have been borne as an English name for two or three generations previously. It would not be to the purpose to recapitulate here the arguments *pro* and *con* as to this subject, more especially as it is evident that an architectural movement

so extensive, and yet so gradual as that which developed the pointed arch cannot, at this distance of time, ever be conclusively fathered on any individual architect. A few words from the Bishop of Lincoln concluded the meeting, the right reverend speaker dwelling appropriately on the sense of tranquillity inspired by the contemplation of such ancient and noble structures as our cathedrals, in contrast with the stir of nations and possible overthrow of dynasties now disturbing the Continent, and urging also the necessity of using the cathedrals, not only as objects of architectural study, but as structures available for public worship on a grander scale than has hitherto been realised. Whether these noble edifices can thence make, permanently, of practical value to modern England, time must show.

Tuesday morning found a numerous party, architectural and amateur, assembled at the west door of the cathedral, to accompany their guide through the building. The survey was arranged, as far as could be, chronologically. The centre portion of the west front, containing the work of Bishop Remigius, is, as most persons know, the oldest part, and it is noticeable that this portion of the work, which looks as firm and solid as when first erected, is built with the thick mortar-joints, the use of which has been so advocated in our pages, and of late by others. The details of the centre doorway are of later date, and those of the north and south doors in the west front later still, though even the latter preserve the Norman character in general style, the progress of transition being only marked by the altered treatment of some of the characteristic Norman ornament, especially the interrupted zig-zag, where two parallel lines of zig-zag ornament dovetail, so to speak, into each other. Much correspondence and lamentation arose, some years ago, concerning the "restoration" of these doorways. The richly-carved shafts are nearly all restored work,—in fact, new shafts inserted bodily, but carved from old fragments; and in the south door, while one jamb has been entirely re-worked, the other, which was the best preserved, has been retained in its original state, as a proof of the fidelity of the restoration. From the east end we go, following the chronological order of events, to the choir of Bishop Hugh, or (as we should rather say), of Noyers, his architect, whose work may broadly be said to be included between the eastern walls of the two transepts, including, that is to say, the whole of the east transept, and one wall of the west transept. Nowhere perhaps could the history of the development of Early Gothic be better traced than in this portion of Lincoln Cathedral. The eastern transept is of the boldest and finest Early Gothic work, not without some strong French touches here and there, as in the position and plan of the apsidal chapels projecting from the east wall of the transept, and the plan of some of the principal piers in this locality, with their boldly projecting disengaged shafts, connected, however, in this case with the main pier by a series of projecting curls or crockets partially filling up the gap between the centre column and shaft. Round great part of the east transept and the choir aisles adjoining, runs the splendid double arcade in the lower story of the wall, and in this and other specimens of wall-arcading in the immediate vicinity, can be traced all the stages of foliated carving, from the earliest rather stiff conventional foliage with its large round lobes (in the arcade aforesaid), to the perfection of free yet purely conventional Early English capital, and (in a screen wall between south aisle and choir) the near approach to *naturalism* in the richer but less entirely satisfactory decoration of the fourteenth century. Mr. Sharpe was consistent in his warnings to his younger architectural friends, more than once repeated, to avoid direct copying of natural foliage forms in stone, but always to conventionalise, as we have long taught. The search after architectural style is again exemplified in the almost wild irregularity of detail in the triforium, especially of this choir, where the tentative experimental attempts at what was afterwards to develop into geometrical tracery, are evident in the variously-shaped piercings in the spandrels of the arches, in many of which the sections of piers and arch-moulds, also, are much varied, as also the manner of introducing and grouping the Parbeck marble shafts, so profusely employed in this part of the building, as if the architect were determined to try all methods of obtaining a piquant effect. This irregularity in smaller

matters, shown also in the curious arrangement of the vaulting surfaces at the eastern crossing, where the centre of the vault is by no means in the centre of the plan, and in the fact that the axis of the choir and nave is not strictly in a line, is the more striking in a cathedral which conveys to superficial observation such a general impression of completeness and comparative uniformity. In the west transept the work of Bishop Hugh comes to an end in the east wall, about two-thirds of the distance from crossing to the south front of the transept: here, though the main design is continued, a marked alteration and attenuation of the arch-moulds in the wall-arcades shows where the work had ceased for a time (possibly from deficiency of funds), and been again resumed some twenty or twenty-five years later. In the upper portion of this transept is (on the south face) the well-known Late circular window, so often engraved; and on the west side of the transept the south porch, so perfect and rich a specimen of the late "lancet" style, offered more for admiration, though less for comment, than almost any other portion of the building. In the north transept the singular effect produced by the line of the northernmost vaulting-rib falling below the lines of the circular-plate tracery window drew from Mr. Parker the suggestion, almost amounting to assertion, that the vault had been re-erected after the fall of the central tower, and rebuilt at a lower level than before. But there is no trace in the triforium story of such a disturbance as must have been caused by altering the level of the springing of the vault (though there is plenty of evidence of the attempt to strengthen the triforium after the catastrophe by casing the shafts, &c.); and, moreover, we discern, if we mistake not, a distinct flattening or rather distension of the crown of the round arch over the wheel window, where the longitudinal vaulting rib cuts it, which must clearly have been made at the time of building, in order to allow for some slight miscalculation as to the height of the centre rib. A question from a member of the party as to the structure of the nave between the ribs (where it is plastered over) was deferred for further consideration till the adjournment to the presbytery, where the vaulting surface is exposed to view. Before this, however, we diverge a little from our chronological path to consider the organ-screen, a monument of what florid late Gothic could achieve at its best. Every portion of this remarkable screen is covered with carving of the most elaborate and delicate description, the whole surface of the panels between what, if it were wood, might be called the "stiling," being completely carved into a diaper. Less richness might possibly be more effective, but it is impossible to be hypercritical before so perfect a specimen of a remarkable period of the art. Hence we repair to the presbytery, the "angel-choir" as it has been termed, from the figures of angels in alto-relief in the spandrels of the main arcade. In what abnormal fashion the east end of Lincoln Cathedral may once have terminated can probably never be known now; that it was abnormal is probable from the fact that the building was confined at the east end originally by the city wall which crossed at this point, and which was removed in 1256 by a special permission from the sovereign, in order to allow room for carrying out the present design. Standing under the roof of the presbytery, at (any rate, as Mr. Sharpe observed, with an enthusiasm fully responded to by his audience, in the presence of "the perfection of Gothic architecture,"—in the face of this perfection, however, did doctors differ, and that materially,—and reverting to the question before raised, as to the treatment of interspaces of the vaulting, Mr. Sharpe, continuing his urgent and really almost solemn appeal to his young professional friends against the use of over-much colour, deprecated any decoration of the vaulting which would hide the masonic construction, and recommended leaving the vault surface untouched. To this responded Mr. Parker, that in his judgment all Gothic buildings not only had been entirely coloured internally, but had been designed by their architects with that view. Hence a tolerably animated discussion, majority resting apparently on the achromatic side; and opining that, granting undeniable evidences of colour, the said colour was not due to the original architect, but rather to ignorant hands defacing his work. Mr. Sharpe made a strong point in favour of this view by reminding his audience that in the Medieval wall-paintings, such as are known,

the architectural features (canopies, &c.) were almost always incorrectly drawn. Is it not, we may suggest, likely enough, that the same ecclesiastics who illuminated the Missals also illuminated the buildings in a similar style, either with their own hands or under their direction? *Au reste*, there is little need to dwell on beauties so well known as those of the Lincoln presbytery, with its exquisite triforium and east window, the perfection of geometrical tracery. In regard to the Parbeck shafts in the triforium, which have at some time been whitewashed over, a question arose how far the employment of those dark-coloured shafts was advisable in the centre of the opening against the dark shadow behind. A few of these shafts and capitals have been scraped and polished with a view to try the effect, but it must be admitted that the effect of those which are left white against the shadow is more satisfactory, if one could only forget that the effect was produced by whitewash. The monument and reliquary to the memory of the Burghersh family possesses both architectural and archaeological interest, and is a type of a class of monuments not uncommon in great churches, which may be termed "Founder's monuments," and which, being commonly immediately subsequent in date to the building in which they are found, often afford very valuable illustrations of the change of style. An interest of another kind attaches to the monument recently erected to the memory of that excellent and hardly sufficiently honoured painter, William Hilton, born at Lincoln 3rd June, 1786: the monument is illustrated by bas-reliefs of some of his principal pictorial compositions. A point in the choir of Bishop Hugh, which we should have alluded to, is that the shafts in each pier towards the centre aisle (which goes up to form the vaulting shaft) has been cut away below to make room for the wooden stalls subsequently added, and terminated above by a corbel inserted; the effect is peculiar, and at first sight somewhat puzzling, giving as it does a much "later" outline to the plan of the pier. From the presbytery we reach the well-known cloister and chapter-house, with its central clustered shaft; and from the Dean's garden (through the cloister), into which the party were kindly invited, a fine and rarely-seen view of the north flank of the cathedral is obtained. It is a pity that the authorities of this splendid cathedral cannot contrive to have a musical service worthy of the edifice in which it is held; the effect of a small handful of not over good voices going sleepily through the Psalms to a non-descript chant furnishes but an ill omen for the promised "new life" which is to be brought into the cathedral system.

On the afternoon of Tuesday, the party visited two churches close to the town, St. Peter, Gowt's, and St. Mary-le-Wigford, in order to shorten somewhat the programme for the next day; passing on the way the bit of Norman building known as "John o' Gault's stables," and showing some curious and unusual incised ornament. In the first of the two churches mentioned there is nothing of very special interest; but let none of our readers visit Lincoln without seeing that of St. Mary-le-Wigford (close to the railway station), where they will find some of the most beautiful Early English work, in the shape of piers and capitals, which could well be met with; St. Peter's also can show an early pier, of good and unusual section, and with a very elegant base. The evening meeting at the Assembly Room, again attended by a considerable number of amateurs, was taken up by a very clear and concise exposition by Mr. Sharpe, of the history and genesis of Gothic mouldings in the various styles, illustrated by a number of full-size sections, a portion only of a very large collection, much of which is still unpublished. It was impossible to study this fine collection of mouldings without feeling how much architectural effect is, after all, independent of carved decoration—how much of really solid and beautiful masonic art is attainable by contrast of surfaces and shadows alone. Besides the ecclesiastical structures, there is little of architectural interest in Lincoln, either ancient or modern, worth going out of the way to see. One drawback to a residence here, the readers of recent numbers of the *Builder* will not be surprised to hear of, we counted, if not quite Coleridge's "two-and-seventy," at all events, "several" stinks peculiar to different parts of the town. How we visited the neighbouring churches, and what we saw there, as Spenser says, "if ye list, another rede shall tell."

PLEASEING THE EYE.

Where art is concerned, the faculty of seeing becomes itself an art."—Mrs. Jamieson.

"The art of architecture does not consist in words; the demonstration ought to be sensible and ocular."—Freart.

The proverb, "If ignorance be bliss, 'tis folly to be wise," may occasionally be truthful; seldom, if ever so, in pleasing the popular eye by over-decorating buildings both public and private. There are two ways of pleasing the eye; one by crowding as much vulgar ornament upon the surface of a building as possible; and the other, by decorating an edifice with suitable cornices, mouldings, and superficial decorations, nicely distributed, so as to realise a well-balanced light and shade. When a building is covered with finery, in which our Continental neighbours indulge so largely, there is no contrast, no light and shade; a plain building is all light, and an over-decorated building is all shade.

A writer in 1736 observes "that folly in building is one of the most lasting reflections on a man's character, because it is not only universally known in his own time, but is often perpetuated through many generations." This proves the importance of entrusting works of architecture and sculpture to educated and careful hands; and he very properly continues that "true taste is not to be acquired without infinite toil and study; and we are generally too indolent to accept of an advantage on such terms. This is the real occasion why a false one is so apt to prevail, and, in a division of mankind, would number three to one in its own favour."

The powers of taste have been naturally uniform in all, but unfortunately these powers, in the bulk of mankind, have not been cultivated. The accomplished Claude Perrault, architect of the seventeenth century, asserted that what is agreeable to the eye is not so, on account of its proportion, when the eye knows it not, as it very often happens.

Gerard, in 1780, says that incorrectness of taste may arise, either from the dulness of our internal senses, or from the debility of judgment.

As far as architecture is concerned, the eye must be educated. "Taste," says Jackson, in 1795, "is not a gift of nature, but an acquirement of art—nor is it easily acquired." Knight also, in 1806, perceived this, when he wrote that in a Grecian building, in which the relative proportions of the different orders of columns were not observed, a person skilled in architecture would instantly discover a want of symmetry, which, to another of even more correct taste, as far as correct taste depends on just feeling, may be utterly imperceptible.

Burke endorses the necessity of educating the eye, by considering that the principal causes of the difference of opinion among those who criticise in architecture, are owing to their different degrees of knowledge of the principles of the art; for critical taste does not depend upon a superior knowledge: it is the offspring of learning and a just education, and is always more or less within our power.

The ear is naturally pleased with simple melodies, and the eye with natural scenery; and as musical compositions of the highest mental class require an educated ear, so likewise do architectural and art compositions demand a cultivated eye. In the latter cases, which claim an extensive and profound knowledge of all the laws dependent upon good music, architecture, &c., a natural taste will fail in pleasing either the ear or the eye. When the painter portrays natural scenery, he pleases by copying nature; so likewise the sculptor, when he copies living forms; but the moment art steps in, and design and compositions are attempted, then education must be enforced. This subject has created more conflicting opinions among men of letters than any other, and is seldom clearly explained.

The infant, urges an essayist, when it first opens its eyes to the light, looks upon a world of wonders, and can form no correct idea of any object which it sees, until it has also touched and handled, tasted, or smelled it. The moral of all this is, that sight, like every other faculty, requires careful education, and the pitch of perfection to which it can be educated is truly surprising. Very seldom is it sufficiently and properly exercised. Most men walk about this beautiful and wonderful world as if they had a veil before their eyes; vision is to them but a half faculty, a dull, almost inert sense. Sir Joshua Reynolds says, that if a man born blind were to recover his sight, and the most beautiful woman was brought before him, he could not determine whether she was handsome or not.

With all due deference to so able and distinguished a writer on art I differ in *tolerance*; no education being required here, the man would be as naturally charmed with the female form as he would be with a beautiful landscape. Nature acts in these cases, not art.

Cicero, speaking of the stateliness and magnificence of houses, urges that "there certainly ought to be some bounds fixed and prescribed to these things, and those to be according to the rules of moderation; but the measure whereby we are to judge of their being moderate is their subserviency to the ornaments of life."

In the ornamentation of a private mansion the owner can expend as much as he likes, although, morally speaking, he ought not to offend the eye even of the public. But it is a serious matter to expend the public funds in superfluity of decoration, and that for several reasons: the money might be more usefully expended in alleviating actual misery and want; the popular eye ought to be educated; and those selected to design public buildings ought to be capable of approaching the subject with a sound architectural knowledge, having respect for all that is good in precedent and antiquity: a mere decorator should never be employed.

In reference to educating the eye architecturally, the more the subject is inquired into the greater is the difficulty, and for this reason, that the buildings left us by the architects of Greece and Rome vary so much in their proportions, not in merely those appertaining to each edifice as a whole, as in the details. Architects have evidently been too timid with the classical remains of antiquity, hence the reason why architecture has been an exception to the law of progress.

It has been considered that the excessive respect architects have for the antique, takes its rise, as unreasonable as it is, from the respect which is due to holy things. To obtain a correct knowledge of the beautiful in art requires much study, as fashion, or custom, has sanctioned abuses which should be avoided. These have been pointed out by Perrault, Palladio, and others.

If the public eye were educated, architects possessing a correct knowledge of proportion would undoubtedly obtain more practice than those who, without that knowledge, please the uneducated eye, by employing artists to embellish their designs with natural scenery, landscapes, and all those charming accessories which are ever pleasing to the natural or uneducated eye. To the latter, an ill-proportioned building, say a church without a chancel, having a polygonal apse stuck against a cross church tower, or any other deformity, is rendered pleasing; but the educated eye is not misled because the critic, giving credit for the landscape, fails not to judge the design of the building upon its own merits. A good building with a bad landscape will receive censure, but an ugly edifice with a charming scenery will obtain a reward.

The young artist's mind must be educated through the eye; and, notwithstanding all that has been said by essayists against rules and systems, they are absolutely necessary in training the young mind. Rules and systems are little required by the advanced student. The architect and artist need not be modest in enforcing arbitrary rules to aid instruction, the more especially when we look around, and find the planets named after heathen deities, and the pretty simple flowers, so grateful and intelligent to the most childish eye, portrayed by the so-called scientific botanist with the most extraordinary complicated systems, of which Nature knows nothing. There is a fine opportunity for the astronomer and the botanist to simplify the whole, and render these beautiful studies more enticing and intelligent to the inhabitants of the world, instead of to a small class, at best but badly instructed in dead languages.

An educated man enjoys, through the eye, many pleasures that the vulgar are not capable of receiving; he can, as Addison says, converse with a picture, and find an agreeable companion in a statue.

I do not agree with Bacon, that houses are built to live in, and not to look on. An ugly building is offensive to an educated eye, and tends to demoralise civilisation. "If beauty," says Alberti, "is necessary in anything, it is so particularly in building, which can never be without it, without giving offence both to the intellect and the ignorant."

For pleasing the architectural eye there have been many suggestions and practical experiments. Knight ventured to build a house ornamented with Gothic towers and battlements

without, and with Grecian ceilings, columns, and entablatures within. Fortunately, the public had better taste than the essayist, and did not follow his eccentricity, although he congratulated himself upon the success of the experiment.

Sulzer, in 1806, recommended the cube for small dwelling-houses, the adoption of which has unfortunately been, until recently, but too general, and disfigured both town and country with monotonous boxes, more useful than ornamental. The dwarf shrubberies added like whiskers, on each side, instead of relieving their appearance, made them more ridiculous.

The writers on taste of the eighteenth and early part of the nineteenth century had a certain distemper, neither mentioned by Galen nor Hippocrates, termed by Juvenal *cacoethes scribendi*, and cited by Addison as a hard word for a disease called in plain English "the itch for writing." Had Freart been acquainted with these writers, he would have called them *cicaloni*, a term used by the Italians to designate "eternal talkers to no purpose." Of course there is a large amount of good common sense in their dissertations on moral beauties, but an ignorance of architecture is to be traced in all the essays. It would have been better if these amateur writers had not touched upon architecture, as it is a subject capable of exact demonstration, and ought not to be mixed up with sensations of the palate, dreams, sudden love, dancing, &c. I can understand an architect being versed in the manners, customs, and modes of life, but it surely is not necessary for him to be bored with the passions, however sublime and pathetic they may be. It would have been more edifying to the general reader, if these writers on taste had appended instructions in the art of cookery instead of their unmeaning comments on architecture, of which latter they knew nothing, having made unsavoury hash of the subject.

The architect will find it by no means a waste of time to ramble over the past, and to detect the errors of the architects and essayists on taste during the past century; a study which will tend to induce him to think, and will not be found altogether unprofitable or uninteresting; on the contrary, it will lead him to correct his own professional judgment. Sir Joshua Reynolds was of opinion that the habit of contemplating and brooding over the ideas of great geniuses, until you find yourself warmed by the contact, is the true method of forming an artist-like mind; it is impossible in the presence of those great men, to think or invent in a mean manner; a state of mind is acquired that receives those ideas only which relish of grandeur and simplicity.

In conclusion, the eye should be taught to criticise correctly the various styles of architecture; all maxims and theorems studied relating to architecture proper; painters or picturesque architecture must be shunned, such as spirals, columns, scooped pediments, Claude and Gaspar's mixtures of Grecian and Gothic in the same building; also French fopperies and decorations, with which Addison was so disgusted that he heartily wished there was an act of Parliament for prohibiting their importation. The observer must remove from his mind all felicitous of real genius, sensations, feelings, affections, emotions, and romantic dreams. Without a correct knowledge of all that is good, and what to avoid, the critic's "fire of criticism" is mere smoke.

W. PETTIT GRIFFITH, F.S.A.

MODERN ARCHITECTURE IN INDIA.

A LECTURE on Architecture delivered in India by Lord Napier includes passages which will interest many of our readers. After urging that in selecting materials the architect should consider two things chiefly—1. The sources of supply; and 2. The object of the structure, Lord Napier proceeds:—

If the rules concerning material which are here enunciated are correct, I need scarcely say that they are in every respect so violated in India on every hand as to rouse the regret and condemnation of all reasonable critics, and to make the virtuous weep. Madras is the epitome of every error that architecture can commit with reference to material. Look at the Railway Station, the High Court, the Custom House, the sea front of the Fort buildings, all discovering the same shameful condition of chronic disfigurement and decay, all blistered, discoloured, and crumbling, the victims of an unequal strife between the elements and stucco. Yet at no great distance there are inexhaustible supplies of the

finest stone, and the very soil beneath our feet with clay which only requires the skilful exercise of a familiar art to yield qualities of brick and terra cotta competent to resist the attacks of the blast and the spray for ever. The Presidency College and the Sailors' Home are the first attempts to build in an honest manner with undisguised materials, but the art of preparing them is not attained in a day, and I fear that we can scarcely regard these buildings otherwise than as the forerunners of a better era.

I turn my eyes, with satisfaction from our own misdeeds to the more attractive errors of our neighbours. Two considerable buildings have been recently erected under English impulse and superintendence in two Native States. I speak of the Public Offices at Bangalore and the Public Offices at Trivandrum. Both countries possess peculiar materials in the highest perfection, and both were in possession of ample financial means. Mysore is the region of granite, Travancore is the region of wood.

At Bangalore it is natural to suppose that in a great public building the plain external walls would be constructed for cheapness and variety of colour of substantial, well-prepared, well-baked brick, while the columns, corners, entablatures, and cornices would be composed of grey granite, which is procurable with the greatest facility and at comparatively little cost. A more natural, more beautiful and durable combination could scarcely be conceived. But not at all. Instead of this, you have an immense, well-distributed, and useful pile, constructed of materials too perishable to remain uncovered, so that the whole edifice is cloaked in cement of a very coarse texture and dull uniform hue.

In Malabar, there are still, on a small scale, examples of a very picturesque order of local architecture, which has been fashioned gradually, in past times, in obedience to the properties of the most accessible material and the requisitions of the sun and the monsoon. The solid portions of the structure are of laterite or brick, but the detached and salient parts, the columns, the deep eaves, the high-pitched gables, the shady and protected verandahs, the overhanging balconies, are constructed of the splendid woods of the country admirably wrought. The gateways of the Temple at Trichoor, the pagoda at Tellicherry, the older portions of the Palace at Trivandrum, the remarkable ancient residences of the Princes of Travancore at Padmanavapuram, offer attractive specimens of an indigenous art which is fast yielding to decay and the usurpations of European conventionalism. But in the construction of the public offices at Trivandrum there was a fortunate opportunity to build with local materials in the native style, and to unite both with the expansions and modifications necessary for the convenience of civilised administration. With brick or laterite for the main portions of the fabric, with teak and jack-wood for the porticoes and colonnades, the Public Offices of Trivandrum might in ingenious hands have been made to harmonise with the past and the present, to grace the landscape, to resist the weather, and to suit the habits and instinctive tastes of the native officials and population. The opportunity has been signally cast away. There was no want of liberality, no want of good intentions, but the despotism of foreign example was irresistible, and a costly edifice of the familiar plaster, classic type, which looks as if it had been designed in some European art academy in the second decade of the present century, affords an asylum to the outcherry and durbar of the Maharajah of the Nairs and Moplahs. I may remark that meanwhile the beach at Aleppy was strewed with magnificent timber which the Government of Travancore neither sell nor use.

It is only just to add that the railway companies have in India, as in England, done much to accredit the use of solid, honest, and appropriate materials in construction; that the Art School of Madras is solicitous and active in the same direction; and that the Government is building an improved brick and terra-cotta kiln under the direction of the Department of Public Instruction, which will emancipate our public architecture for ever from the tyranny of chunam.

Let us now proceed to consider the question of style. Speaking broadly, there are four styles of architecture disputing the soil of India at the present time: the Hindu or Brahminical, the Auzzulman, the European Classic, and the European Medieval. These several styles claim our attention with reference to cost, to convenience, to beauty, and in regard alike to public and to private buildings.

There is no order of architecture belonging to an ancient and civilised people absolutely deficient in the elements of grandeur, and those who neither accept the principles nor admire the decorations of the Brahminical style may yet approach its capital monuments with interest and respect. Long before the traveller reaches the sacred precincts, whilst he is yet winding slowly over the weary plain, his eyes are fixed on the lofty pyramidal towers which preside over the Indian landscape with harmonious solemnity. As he draws near, the porticoes for the accommodation of pilgrims and for the purposes of traffic form a secular and popular adjunct to the temple, full of picturesque life. On one hand, the stairs descend to beneficent waters; on the other, the Peepul throws its religious and salutary shade. The entrance to the abode of the gods is fashioned with stupendous solidity. Within the walls the multitude of cloisters, galleries and pools, the profusion of ponderous material and delicate sculpture, and the dimness of the inner shrine, all combine to affect the imagination with those impressions which belong to vastness, mystery, and the lapse of incalculable time, to the patient, devoted application of human labour, and the ceaseless tribute of human worship. The Brahminical architecture is imposing; it is even poetical, with its accessories: yet, regarded both from a scientific and an æsthetic point of view, it is manifestly defective. In the Brahminical style, the ruling feature is the horizontal line: the wall or the column supports a beam, the beam supports a flat roof. When the building is lofty, the fabric ascends by successive horizontal stages, one succeeding another in diminishing proportions to the apex. The inherent poverty of this method of construction is often ingeniously concealed by decoration on the contours, and the fabric rises with a certain measure of continuity and elegance; yet the fundamental features can still be discerned. The characteristics of the style, as practised in the temples of Southern India, are a multitude of supports crowded together, small intervening spaces, square apertures, horizontal superposition, a vast expenditure of solid material and radical defects of form disguised by minute ornamentation. I know that in the northern varieties of Hindu building there are elevations externally of a curvilinear and sometimes of a domi-form outline; I know that the ancient Jain and Buddhist builders were familiar with the construction of a dome on mechanical principles consistent with moderate proportions, and that some of their apertures have the configuration, if not the true constructive qualities, of the arch; but I seek not to explore the recesses of antiquity or to analyse all the diversities of style which at different epochs the different provinces of this vast peninsula may have disclosed. It is abundantly clear, from our everyday observation, that the arch and the dome are repugnant to the genius of the Hindu architecture, and have been for many ages practically unused by the Brahminical builders. But the introduction of the arch was the emancipation of architecture from the despotism of material. The arch and the dome are the most beautiful, the most scientific, and the most economical forms of construction; they are the proper methods by which large spaces can be covered, they are indispensable to the usages and recreations of modern public life. Considering the mechanical deficiencies of the Hindu style, and the predominance of sculptural ornamentation which it exhibits, it appears to me to be unavailable, under the present Government, for the purposes of the State, and ill adapted for the common and public use of the collective people. But is the Hindu style of building, for that reason, to be banished and degraded from all secular use, as is the case at present under the influence of unreflecting and ignorant innovation? Most certainly not. The methods of Hindu architecture may be practised in moderate dimensions with the greatest advantage, and they are perfectly adapted to the wants of the people. Domestic architecture should be the expression of social institutions and the necessities of climate. The principles of the old-fashioned Indian dwelling were exclusion and shade. For the women a tranquil, retired, and busy retreat; for the men privacy and repose after the labours of the day and protection from the scrutiny of grasping authority; for all, shelter from the sun. In its principal features it is the dwelling of the ancient Italians which we have exhumed, it is the dwelling that we admire at Damascus. To the street a plain exterior pierced by a few aper-

tures, but often furnished with a hospitable porch, supported by stone or wooden columns of quaint design. A narrow door, deeply sculptured, leads into a court supported by a pillared verandah on which the private apartments open; behind this the offices and the habitations of the domestics. The interior court is the charm of the whole, it is the feature which the Indian house-builder should never forsake, and it is just the feature which he is giving up. It forms the most becoming frame for the life by which it is animated. It is in perfect harmony with the figures, the costume, the ornaments, the primitive industry, and the simple furniture of the inhabitants. The columns, the beams, the cornices, the panels of the ceilings, the doors, the pavements, all display the mouldings and patterns in which native art is so rich, and over which the patient native workman delights to linger. The ugly conventional image sculpture of the pagoda scarcely invades the Indian home, but some pleasant tree natural to the soil will add its rustic and its fragrance. There are such interiors still in Madura and Tinnevely, of very modest pretensions, but which nevertheless reveal a true artistic character. Now, if this domestic architecture of other days discovers even in its humility a perfect appropriateness and a powerful attraction, what might not the same architecture become at the present time in the hands of a person of ample means, cultivated taste, and intelligent patriotism? If all the proportions were expanded, if all the materials were selected, if all the designs were chosen for the most exquisite and correct patterns,—and of such the whole country is a storehouse,—I do not hesitate to assert that nothing in the world could surpass it. Yet what do we see? The moment a native of this country becomes educated and rich he abandons the arts of his forefathers and imitates the arts of strangers whom, in this respect, he might be competent to teach. Nothing is more lamentable than the corruption and confusion of taste which is everywhere apparent, combined with unmistakable evidence of increasing opulence and an honourable desire for domestic comforts and decoration. The Hindu and European styles are in some thriving provinces a favourite improvement appears to be to build a Doric upper story, with plaster pillars of immense diameter, over the unpretending porch of the last age, with its slender Indian granite shafts. The same malady which infects the middle classes attacks the highest. I had the pleasure of visiting, not long since, in his country residence, a native nobleman, who, in addition to all the gifts of birth and fortune, possesses in his person and manners an unusual share of dignity and grace. I need not say that there is a numerous retinue and an overflowing bounty to Brahmins and native strangers. But the Jaghirdar recognises the duty of hospitality in every form, and he has built himself a little palace in a pleasant garden, where he delights to honour his European guests. It may seem ungrateful to me to criticise a dwelling in which I was treated with so much respect and kindness, but I could not repress a sentiment of regret when I found that every trace of native style had disappeared from the most recent example of native building, and that a handsome European villa, of spotless chunam, had risen among the grey pagodas and choultries and the whispering palm-trees.

It is possible that I may be speaking in the presence of some native gentleman who has made a fortune by the exportation of cotton, and who is about to build a new house. The case is not common in Madras, but it is not incredible. If there be such a one here, I beseech him to pause before he sanctions the modern "Muster" which I mentally see before me. I say to him, Discharge your Madras architect, and take a maistry from some remote part of the Mofussil where the traditions of the fathers are still preserved. Determine to have a national house, but such a house as an Indian gentleman should inhabit under an honest Government, in an age of peace, justice, and learning, a house in which the light of heaven and reason and freedom can penetrate. Adhere in general to the ancient plan, and especially to the court and colonnade; collect all the best models and patterns of native mouldings and sculpture; use brick of the finest quality, from the School of Arts, for the exposed surfaces; employ timber for the pillars within, Cuddapah stone for the pillars without, glazed tiles for the floors; make a liberal use of ornamental stucco and painting where the rain cannot penetrate;

fill the unglazed apertures with the beautiful tracery of which Indian art offers an unrivalled variety. For glazed windows, authentic models may be wanting; but they can be treated in the spirit of the style; and the Government architect can show you how. Get all your carpets from Vellore, and your stuffs from Madras and Tanjore. Where the Hindu patterns fail you, borrow from the Mussulmans. Make a sparing use of European furniture, and endeavour to harmonise it with the native forms. But in doing this, make everything lofty, light, bright, spacious and accessible. The task would not be easy, but it can be done; and every effort would be better than that which preceded it. Endeavour to realise this, that the Indian arts which you are at this moment casting away here are at this moment in London and Paris an object of inquiry and study to the most learned and cultivated minds. Do not imagine that you are required to do anything unprecedented. All I ask you is to do what has been done in Europe itself. In Europe the ancient national arts were for a couple of centuries as much forgotten and despised by us as the ancient national arts of India are now forgotten and despised by you. You have hitherto imitated our errors. I call upon you to imitate us in correcting them. I may add that an admirable opportunity now presents itself for an intelligent revival of the domestic architecture of the Hindus in the construction of a small palace at Bangalore for the residence of the young sovereign of Mysore. The building will be placed, I believe, in juxtaposition with the dilapidated but beautiful Durbar Hall, constructed in a mixed Indo-Saracenic style by Hyder Ali. There is no want of time, there is no want of money, and the authorities mainly concerned are an accomplished civilian and an accomplished soldier, Mr. Bowring and Colonel Malleson, both trained in the North of India, where secular and palatial architecture attained under native government the most exquisite perfection. I expect the result with curiosity.

I now come to consider the forms of architecture introduced by the English in this country, which reflect the condition of art in England itself.

In an artistic point of view, the contemporary use of conflicting styles of building, or the abrupt addition and juxtaposition of modern styles of one type with older styles of another, is undesirable. The most conspicuous proofs of this may be seen in English cities at the present time, when one style is generally used for domestic and another for public and sacred structures, and where occasionally private houses of an unusual character are thrust into long rows of habitations of the familiar sort. We have private houses, which, for convenience, I may designate as Classical and Gothic churches, and here and there we see a Mediaeval house interposed among its Classical neighbours. The horizontal and ascending lines are thus mixed up in our streets and squares, in a fashion which offends and perplexes the eye; decorations and details are not diversified, but discordant; buildings acquire the appearance of specimens or imitations selected capriciously from the examples of the past; art ceases to be the expression of any necessity or taste common to the age; and its harmonious development, in conformity with new social requisitions, is materially retarded. This state of affairs is the more deplorable, because it is unquestionable that our ancient national style of building, as it existed before the substitution of the Classical for the Gothic forms, was equally available for secular and religious purposes, that it was susceptible of developments suited to modern life, and that it comprehended varieties of outline and ornament which would have defended it against the reproach of a tedious uniformity. The northern nations of Europe do not require more than one style of architecture, comprising, of course, the local and subordinate diversities, which the use of stone, brick, or wood, opulence or poverty, exposure or protection, and similar secondary influences would naturally produce. Those nations have all virtually the same religion, the same institutions, the same climate, the same habits of life. It is more easy, however, to lament the existing confusion than to correct it. No one can predict to what issue we are drifting; no one can tell whether the prevailing chaos of taste will settle down into some new order, or whether the architectural anarchy is to last forever.

The harmony of architecture which might

have been preserved in England, and indeed throughout all the nations of Germanic origin, could not be expected in India, where for centuries two peoples, sharply opposed in religion and distinct in many other respects, have occupied the soil, and where a third race and a third religion have recently been planted in artistic antagonism with the others. Under these circumstances, contrasts were unavoidable, and my countrymen have certainly done nothing to mitigate them. The English have simply transported to India the fashions and revolutions in architectural taste which have occurred at home, but following them leisurely and being always behindhand. We, too, live and work in one sort of building and worship in another. The ruling opinion at present appears to be, that the Classical style is good for habitation, and the Gothic indispensable for prayer. I venture to dispute the first position, and I most earnestly deprecate the second.

It would be unjust and ungrateful to deprecate, in all respects, the buildings which we inhabit, and which for the most part we owe to the liberality of a former generation. Many of the houses of Madras are constructed with due regard to the nature of the climate, and in proportions which far excel anything with which we are familiar in England. Some even indicate a higher cultivation and feeling in art, among the official architects, in an earlier period than is usually found among those of the present time. It must be admitted, however, that there is a mournful uniformity of design externally, a total absence of colour, and a disgraceful poverty of material; while the authoritative practice of this kind of building is not only at variance with all that India itself formerly produced, but, by the force of example, tends to pervert the taste of the natives of this country. If the Classic houses are bad, the Gothic churches are worse. The Gothic style of architecture, which was developed in a temperate climate, cannot be rendered appropriate to a tropical one, without modifications of structure, which only an accomplished and inventive artist could design. Of all the styles which possess a perfect mechanical development it is the most expensive. It demands the finest materials and the most delicate treatment; painting and sculpture in their highest forms are alike indispensable to its perfection; and though it may not absolutely exclude the use of brick, it is decidedly uncongenial to that material, the extensive use of which is so indispensable here. The ordinary style of a Gothic church in India may be seen in Blacktown or in Veprey,—meagre, cheap, plaster counterfeits of the glorious originals to which we affectionately turn in memory and in hope. I know that there are happier attempts. At Megnasaiporum, in the sand wastes of Southern Tanjavelly, the energy of an enterprising missionary has raised a fabric in the Early English style, which would grace the plains of Suffolk or Lincoln, and in which I have heard 2,000 Tamil voices mingled in Christian psalmody. At Edeyengoody, the most learned pastor of the Shanars, but who counts his learning for nothing compared with the service of the Lord, trains the Indian mason in the arts of the northern craftsmen, and watches over the growth of a Decorated structure, which will be the creation of his life and the monument of his ministry. Even the Roman Catholics at Dindigul and elsewhere are following the same track. I admire the piety of their founders, but I question the wisdom of their selection. I question the propriety of adopting the Gothic as the architectural type of Indian Christianity. It cannot be necessary, for Christianity flourished for a thousand years before the Gothic was invented, and for three hundred while the Gothic was in abeyance. It can scarcely be desirable, for the Gothic is remote from the forms of Oriental art and from the traditions of the Oriental Church. It may be objected that the notion of bringing Christian architecture into harmony with the native architecture of India is impossible, and that if it were possible it would be of no importance. I grant that it is not of any serious or vital importance. It is a mere matter of fancy, of taste, not one of policy or morals. But I do not admit that it is impossible, and I affirm that if it is not done, the blame, if such there be, must rest with the artists and not with art.

I have already submitted that the Mussulman style of architecture offers, for secular public buildings, all the conditions of beauty and utility that can be desired. As a matter of personal taste, I see no objection to the adoption of the

same style for the private habitations of Europeans. There is nothing in that style incompatible with our habits and beliefs. It allows no images, it uses no symbolical ornaments, it possesses nothing that essentially fixes it to any particular nationality or particular faith. The florid calligraphic inscriptions in the Persian and the Arabic characters, which occupy in this order of art the place of pictorial representations, can be dispensed with, or supplanted by the superficial linear combinations which are equally sanctioned. The rest is mere form and colour. Mussulman art is essentially spiritual and universal. Englishmen might, however, in general demur to live in habitations constructed in a style which is historically and conventionally, if not by any positive principle, associated with races of a different religion and different manners from their own; and it is certain that Christians cannot assemble for worship in a mosque. Where, then, is the method of reconciliation between native and Christian art? To what point of approximation can the European advance? The history of art supplies an expedient. It contains a style of building which is at once Oriental and Christian.

While the architecture of ancient Rome assumed, in the hands of the Mussulman builders, that beautiful transformation which we designate Saracenic, the Christians of the East worked out the same original forms in another but a cognate manner, which prevailed for a time over Northern Italy and Asia Minor, which assumed in Georgia a type peculiarly ornate and picturesque, and which became the basis of the national architecture of the Russians. It has been revived in various parts of Europe in our own day, under the general title of Byzantine. The Byzantine style, like the Saracenic, embodies, as its distinctive features, the arch and the dome, while the slender separate companions in the first answers to the minaret in the second. The arch has rarely, if ever assumed, as far as I remember, in the hands of the Oriental Christians, when used constructively, the pointed or the horse-shoe shape; but when used decoratively it offers, in its superficial combinations and intersections, many resemblances to the Saracenic forms, resemblances which are still more apparent in the minor details of mural ornamentation. The two styles have ever retained a certain family likeness, and the common possession of the dome constitutes a capital point of union. While the Byzantine style of building is perfectly adapted for every domestic purpose, need scarcely say that in the hierarchy of Christian styles it occupies the most venerable place. It was the first Christian style, nor has Christianity formed a finer since. To the Anglican it presents the image of those primitive centuries in which our Church loves to trace the patterns of her faith and ritual; to the Roman Catholic the architecture of St. Mark's can never be repugnant; to the Protestant bodies generally it furnishes forms more simple than the Gothic, more suited to great congregations and to oral teaching. The question is a speculative one, and many might deprecate, in our present position, another innovation. But to me the Byzantine style seems to offer the best architectural type for Christianity in India, a type sufficiently distinct, yet most in harmony with one capital section of the ancient monuments of the country.

TECHNICAL EDUCATION OF THE ARTIZAN.

A VISIT to the Workmen's Exhibition, in Islington, and a glance at some articles of constructive carpentry and joinery in the Netherlands Section, bring forcibly again to our mind a subject which has often been advocated in this paper. To the building trades particularly, our remarks refer. Until all our workshop become, in theory and practice, normal schools of art, the proper education of the artisan will not be effected. Skilled workmen, workmen who can plan out their work, as well as execute it with an artistic finish, are greatly in the minority, in all our workshops. Experience can produce an ordinary good workman, but a length of experience or following will compensate for the want of technical knowledge. To the carpenter, joiner, mason, stone-cutter and carver, and the plasterer, technical education is all-important. Parents who intend their sons to follow any of these trades ought, as a requisite to see that their youths at school learn arithmetic and geometry. No tradesmen are more often

called upon to work out in practice the theories they have learnt in school than building mechanics. Euclid should be their text-book in youth; for a knowledge of its elements will, in after years, save them considerable pains and loss of time, and in many instances loss of employment. We consider that a journeyman carpenter, joiner, or mason, who requires his work "laid out," or "struck out," for him, is little more than a machine. It may be, and is, necessary, in large workshops, that the foreman should give directions, and furnish a working drawing, pencilled out on a piece of board. But though this may be necessary on the part of the foreman, so that the proper organization of labour in the workshop may proceed regularly, the workman should, if necessity required it, be capable of doing all that his foreman can do. The workman should thoroughly know the principles of his trade, as well as its practice; for occasions may and will arise when he will be called upon to trust to his own mental resources, away from his companions by the bench. The making of a sash, the framing of a door, the preparation of boxes and shutters for windows, and their fixing, comprise but a small amount of a joiner's work; in fact, this is merely what any apprentice of short standing can do. Give any workman a template or mould, and he must be very stupid indeed if he cannot properly prepare its counterpart. We wish to see our building artisans educated to the standard, that when the plan and detailed drawings of a house are put into their hands, they will feel no difficulty in undertaking them. Every mason and carpenter deserving of the name, if required, should know how to work to or from scale, and should find no difficulty in making working drawings from the architect's plans and instructions. The construction of a staircase has always been considered a pet job, among carpenters and joiners; and until late years there were but comparatively few hands in our builders' workshops who thoroughly understood the branch. Many even now of our professed staircase-hands hardly deserve the name. It is pitiable at times to witness, in some of our mansions or public warehouses, the things called staircases. Of course, we do not intend, when talking of staircases, to bring into the category those break-neck step ladders to be seen in modern houses of the "Jerry" class. We have often witnessed some first-rate houses completely spoiled, in an artistic point of view, by an abominably ugly staircase, the hand-railing often, if not invariably, being the most disgraceful part of the affair. We have known, in our experience, tons weight of valuable mahogany to be simply butchered by the most egregious blockheads and butchers of wood that ever handled a plane or gouge;—butchered, we repeat, from causes which are not creditable to mention. Perhaps it arose from the miserable saving of a few shillings, in the first instance, on the employer's side, who preferred it cheaply done; or, on the other hand, shall we say, the workman undertook to do a piece of work he knew next to nothing about. What is proved by this? want of technical education, both on the side of the employer and the employed; for if the employer had his eye educated he would be ashamed, for his own credit's sake, to allow bad workmanship to pass; and, if the workman understood the principles of his trade, he could not be a "botch."

It is indispensable that every building artisan should have a knowledge of "lines." The carpenter, mason, bricklayer, or stone-cutter who is ignorant of them is certain to be an inferior hand. If the workman can draw or properly "lay down" on a piece of planed board the work he is about to execute, he will feel no difficulty in his way, and will lose no time. If he cannot do so, and has no one near who can do it for him, he is certain to lose his time by a system of "groping," working by "rule of thumb," and undeciding again and again what he has spent several hours over, doing wrongly.

No workman can put up an intricate roof or staircase who does not understand the setting out of the templates or moulds for its working, or for the "outs;" and how many times have we not been a witness to the wasteful cutting up of perches of scantling to arrive at the proper "out" for a rafter or purlin against the hip rafter. With a little technical acquaintance with "lines," the workman could set the proper bevel, and apply it to the end of his piece of scantling, and the work would be accomplished at first cutting. A knowledge of the development of curvilinear surfaces is requisite for

both mason and joiner, and we think no better novice than could be for the young carpenter-apprentice than to keep him, for the first year, in the workshop, in learning the principles of construction by the aid of drawing, and then making him, according as he understood the theory, work out the practice in the framing or putting together of articles entailing but a small waste of material. His time would be more profitably spent in this way than in spending his first twelvemonth in boiling the glue pots, heating the workmen's breakfast cans, and running on endless errands for the workmen. Under the eye and guardianship of intelligent foremen, the young apprentice could be moulded into the making of a good and skilled workman; and, in the absence of a special school of art for the technical education of the artisan, much and lasting good might be thus effected.

Of late years the exigencies of life have destroyed many observances and requisites, and have forced into activity an unhealthy state of society. These changes are more observable among our working classes than in other quarters. The mechanic's son now, whether he be mason, joiner, plasterer, or palster's lad, has scarcely left off his long clothes when the father calculates on having him on the building with him as a help. Thus, hundreds of little boys, under their twelfth year, are learning the trade of their fathers—earning a few shillings a week, with hardly any education, and fated, in after life, to be, of necessity, indifferent and ignorant workmen.

Ordinary schools are plentiful enough now, and no boy should be put to learn his future trade without a tolerable primary education. But what is a tolerable education for the young artisan? Sufficient acquaintance with arithmetic and geometry as to give the youth the facility of ready calculation and measurement, and enough plain English to make him spell, read, and write correctly. This much, at least, is expected by society at the hands of the humblest artisan on behalf of his child. This can be had free, or at a nominal cost. The parent that would refuse to afford his children this much should be compelled to do it. State or municipal power should step in when the parent fails to see it done, and then if it is found the parent is able to pay, it should have power to recover the expenditure. Compulsory education, by all means, where the parents are able, but unwilling, to school their children.

We began our remarks in the Netherlands Section, in the Workmen's Exhibition, and we find ourselves nearly back in the nursery. There are a few things shown in constructive carpentry and joinery, on the part of the Netherlands, and illustrated by drawings, which are useful for the young apprentice to study and imitate. The simplicity of construction is made apparent on looking upon these things on view, but in their absence the youth would find it a little more difficult to understand from a mere drawing the technical lesson he can learn by their examination. The young carpenter can here see how cylindrical surfaces develop themselves, how joints and mitres are affected and change when they break on curved bodies or angles. Ribbed vaultings, curved panellings, elliptical hyperboloids and parabolic development may also be seen and traced, in inception and execution, and a good lesson in technical education may be learnt by the young aspirant if he wills it.

Good and excellent work is done in London in carpentry and joinery by English mechanics; none better need be wished for; but we cannot conceal the fact that execrable workmanship is also performed, and a large amount of it. Much of the work performed in houses that are built to "sell," hardly deserves the name of carpentry or joinery.

The establishment of schools of art, on a more enlarged scale than hitherto,—workshops not confined alone to artists in marble and colour, but workshops and studios, where the building craftsmen may learn, not only the theory of their different trades, but the principles on which they are based,—this is what is wanted. The same necessity exists to show the carpenter, mason, and joiner models of the different articles he may be afterwards called upon to construct, as exists for teaching the sculptor and painter. If the latter are allowed to study from good models, they become better artists; and if the youth of the building trades, during their early apprenticeship, can be ushered into museums or studios, where they can see models of roofs, staircases, domes, columns, and their entablatures, worked to scale, their understandings

will be enlarged, and their power of imitation will be more rapidly and easily developed, consequently they will become more enlightened and skilful workmen. But they themselves must work: merely looking about is of no use.

Whatever tends to give the workman a more intimate knowledge of his business, tends to make him a more independent and valuable member of society. Thus we see in the present Workmen's Exhibition a valuable auxiliary in imparting practical instruction, and forwarding the technical education of our artisans.

WASTE OF PUBLIC MONEY.

SOME ONE in authority ought yet to be hung for robbing the nation in the course of the Abyssinian expedition. The story told by the Commons' Committee, and more especially by the chairman of that Committee, in a rejected report, is a foul and degrading one. It causes us as much shame as anger. The wonder is, considering the amount of fraud and incompetence which prevailed, that a successful result was obtained. We should care nothing about the amount spent, if it had been needed to effect what was desired. Our indignation is caused by the fact that half the amount was wasted by stupidity, or abstracted by cupidity. Mules were bought at recklessly high prices, and sacrificed for want of care; some 29,000, at a cost of at least 40*l.* a piece, being either destroyed or abandoned. A contract for camels was made after the fall of Magdala was known to the purchasing officers. Enormous quantities of forge were sent over sea that not merely were not used, but, under the circumstances, never could have been. Thousands and thousands of pounds were paid to get rid of contracts that had been made unnecessarily. Three hospital ships were despatched from England, though the Bombay Government only asked for one; their hire exceeded 136,000*l.* The chairman of the Committee says it would not appear to be a violent inference that at least one million of money was expended on tonnage more than the necessities of the expedition justified. For a few months' hire vessels obtained payment to the extent, in some cases, of four times their market value. The *Continental*, an old sailing ship of 1,464 tons, without any character, and whose value was therefore not more than 4*l.* per ton, or say 6,000*l.*, was chartered at 1*l.* 14*s.* per ton per month, and received for 9½ months' hire 24,000*l.*, or four times her value. It may also be mentioned that the three hospital ships, which cost for freight 135,123*l.*, were sold on their return for 50,000*l.* Thousands were paid for vessels that were chartered and never used, and hundreds of thousands to vessels left lying at anchor doing nothing, while other ships were being engaged.

The account of the manner in which the railway was bungled, as condensed by the *Times*, is almost past belief. Surely the matter will not be allowed to rest here. What would become of the nation under this system if we were dragged into war with any great power? As a matter of course, no risk should be run in providing for a campaign, precautions of every kind should be taken, the supplies should be on the most ample scale; but to allow again such an amount of jobbery and robbery as the reports make evident with reference to the Abyssinian campaign, would be a disgrace to the Government under which it was permitted.

A NEW FORT OFF PLYMOUTH.

THE fortifications which enclose the Three Towns are nearly finished. Seaward, a fort which is in course of construction upon an artificial island of stone immediately within, but detached from, the centre of the Breakwater has been delayed. A plan, however, has been definitely settled, and the works are proceeding.

The Breakwater Fort, according to the *Western Morning News*, will be the strongest and most important structure of the kind in existence. It will be the key to the defences in the Sound. Lying low itself, it will command the whole of the waters on all sides, and will co-operate, as regards the entrances to the roadstead, with the battery at Picklecombe on the one hand, and that at Bovisand on the other. "The whole of the outer face of the masonry of the substructure is of finely-wrought granite blocks. In its upper portion, which is of brick, are placed the magazines, shot and shell stores, &c., above the water level, but protected from an enemy's fire

by upwards of 18 ft. of solid masonry. To a casual visitor these magazines and stores, which are approached by two staircases, one at each end of the fort, present a bewildering maze of chambers and passages. In reality, however, their plan is as simple as it is effective. There is first a central group of chambers; then a passage running round them; then a ring of chambers; and, finally, another passage exterior to them. The gun-floor will contain eighteen guns of heavy calibre, will be protected by 3 ft. of armour, and will be covered by a shell-proof concrete roof, 4 ft. in thickness, resting upon iron girders. The armouring is now being fixed in its place. It consists, first, of a series of vertical iron bars filled in with teak; then a layer of horizontal bars; then 2 in. of iron concrete—iron filings and asphalt; then of another layer of vertical bars; and, lastly, of the outer plates, which are of extremely massive character. At each end, immediately above the two staircases, there will be a couple of turrets, armed with the heaviest guns in existence—600-pounders, or even larger should they be invented.

All this sounds very well. Let us hope the work is being done well. Some of the forts forming part of the fortifications here, which we examined a year or two ago, were faulty in both design and execution, and would be worse than useless under certain circumstances. One or two of them, indeed, if we remember rightly, shortly afterwards collapsed. We trust a better system of things is now in operation. Who are the responsible supervisors?

THE WOUNDED IN WAR.

THE admissions of the *Builder* as to "open-air treatment" of wounded and sick at the seat of war, widely repeated both at home and abroad, have not been without their uses, as this paragraph will show:—

"Seven hundred soldiers, wounded in the combat of Borny, arrived on Sunday night at the Eastern Station, in Paris. Instead of occupying closed compartments, the men were distributed on beds of straw made up in the goods wagons, exposed to the open air. This mode of transport is recommended by the medical men in favourable weather."

The Germans are also said to be treating their wounded and sick men in temporary shed hospitals.

Some of the war correspondents complain of the surface-filth in the French camps, as also of neglect in the French in not removing their wounded from the field. Cleanliness and humanity in war are not more necessary than they are profitable. That army which has its sanitary and hospital arrangements best ordered and carried out will fight best and endure longest. Neglect of the wounded is a remnant of the worst sample of barbarism. War, under any aspect is horrible; care for the wounded alone redeems it from mere savage brutality.

BENEFIT BUILDING SOCIETIES.

A "SLAUGHTER of the innocents" occurs towards the close of every session of Parliament, and the session recently concluded has not been an exception to the rule as regards the performance of this unsatisfactory act in the legislative drama. Many of the victims will have, doubtless, their respective circles of mourners. There was one unfortunate that departed, it may be believed, "universally regretted" by all who were acquainted with the promising little hopeful; we refer to the Benefit Building Societies Bill, which was introduced early in the session under the sponsorship of Mr. Alderman Gourlay, one of the members for Sunderland, Sir Roundell Palmer, Mr. Stevenson, member for South Shields, and Mr. McCullagh Torrens, one of the members for Finabury. It was just such a measure as such a Government as that now in office might have been expected to regard with favour, and the conversion of which into an Act they would have been ready to facilitate. Party questions may now be said to be disposed of, and Government has occupied itself worthily in somewhat of the character of an Imperial Social Science and Law Reform Association, armed with plenary powers. The Bill had not an iota of the party element in it; the defects alleged, rightly or wrongly, to attach to friendly societies, or some of them, and the difficulties that encompass the question of trade unions, and the legal protection of their funds,

were entirely absent in this case. The passing of the Bill would have conferred a great boon upon many thousands of the prudent, well-doing classes of the community, who have the strongest possible claim to legislative facilities, when these can be given without cost to other portions of the community, for the safe and efficient administration of their affairs; and to enable them to carry into effect, without legal encumbrances and hindrances, their highly laudable objects. The Bill was drawn at the instance of representatives of a large number of building societies in all parts of the country, and its real was strictly in accord with its professed purpose, "to consolidate and amend the laws relating to Benefit Building Societies." The promoters of the Bill deferred, not from lukewarmness or indifference, from pressing it forward to the inconvenience of the Government. When the time came for them to demand attention, the reward they received for their accommodating spirit was to be told that they were too late. There was only one petition, signed by one person, against the Bill, but on the motion of Sir M. H. Beach, it was shelved after it had passed through the committee in the Commons, and been amended.

The Bill provided for registration of rules, and of all alterations in them; the enrolment of societies; the publication of accounts; security to be given by officers; security for, and recovery of debts and property; directed actions by or against trustees should be conducted; that disputes should be determined by arbitration; how the Court might order compliance with the decision of arbitrators, the order of the Court to be final; with numerous other useful and reasonable provisions, for the safe, speedy, simple, just, and efficacious transaction of business. Mr. Gourlay has given notice of motion to re-introduce this Bill in next session, when it is to be hoped the promoters will not be so diffident in pressing it forward to a consummation.

Mr. Dodds has given notice of motion for next session for a select committee to inquire into the Benefit Building Societies' Acts, and to consider any, and what, amendments are required therein.

BRISTOL: ITS SEWERS, SANITARY REGULATIONS, AND ITS DEATH-RATE.

SOME twelve months since Dr. Budd wrote up the excellence of the sanitary arrangements carried out in Bristol, and the *Times*, by publishing the articles, gave notoriety to them. Bristol was said to be the best regulated town in Great Britain. Disease was detected at its commencement, and was then stamped out. Since this statement the Registrar-General's Returns have almost invariably shown Bristol to be one of the most unhealthy towns in the kingdom. Bristol stands on steep gradients, the main sewers have rapid fall, and discharge the sewage into the river, and houses are connected directly with the sewers. At low water the sewer-mouths are open, so that any wind there may be can drive in. And the main sewers are without adequate ventilation. All this summer the river through the city has been foul with sewage, and the state of sewers and drains is so bad, that the *Bristol Times*, as quoted in the *Builder* (20th inst.), designates the beautiful city "a whited sepulchre." Will the local surveyor see to the closing the mouths of all open sewers, and provide abundant and free ventilation, especially at the upper ends of all sewers? remembering that otherwise sewers and drains are fuses for foul gases to enter the houses. Intercept the sewage, take it to land, and let it be used in irrigation, and Bristol will then be both improved and benefited.

TORQUAY NEW HARBOUR.

SIR LAWRENCE PALK, M.P., has been supplementing good work done at Torquay by his father, by constructing an outer harbour; and this is now so near completion that an entertainment was given to Sir Lawrence last week, in recognition of his liberality and public spirit. The provisional order for the construction of the harbour was obtained about three years ago. Plans were prepared by Mr. Margary, engineer; the contract was taken by Mr. Mountstephen; and the works have now been nearly completed, at a cost of 30,000*l.* The old basin, still in use, is six acres in extent; the new one is ten acres. It is enclosed by a pier of massive masonry,

which runs out 650 ft. from under what was once the Beacon Hill, and has a cant at the outer end. The pier is built of limestone and concrete, some of the blocks of the latter exceeding 20 tons in weight; and is sheltered seaward by a stout parapet. There is a minimum depth of water in the harbour of 18 ft. at the lowest spring tide. Adjoining the quay is an extensive range of stores, designed by Mr. Rowell, architect, and so constructed as not in any way to block the view from the road behind; whilst the roof of the upper range is made to form a promenade. This is in partial substitution for the open public space which formerly existed on the Beacon Hill, and which has been removed to make room for large assembly rooms, erected by Sir Lawrence, in connection with the baths, also from the designs of Mr. Rowell. The principal room will be a handsome apartment, when finished.

THE CHELTENHAM SEWAGE FARM.

In our last we briefly mentioned the approach to completion of these works by the town of Cheltenham. Indeed, as far as the extension of all the outfall sewers, they are now finished, so that all the fluid, after the solid sewage has been arrested in the tanks, is carried on and applied to land which the commissioners have purchased, and to other suitable land in the vicinity, thereby removing a great nuisance which has long existed in regard to the pollution of the two streams which form the natural outfall for the drainage, as the water now flows into them after passing over and through the land in a comparatively pure and very satisfactory state.

There is still a good deal to be done in regard to the land, but the effect has hitherto been extremely good, and those concerned feel reason to believe that the ultimate result will be most successful.

The whole of the works were arranged by the borough surveyor, Mr. Humphries, and Mr. W. Smith has acted as clerk of the works from the commencement.

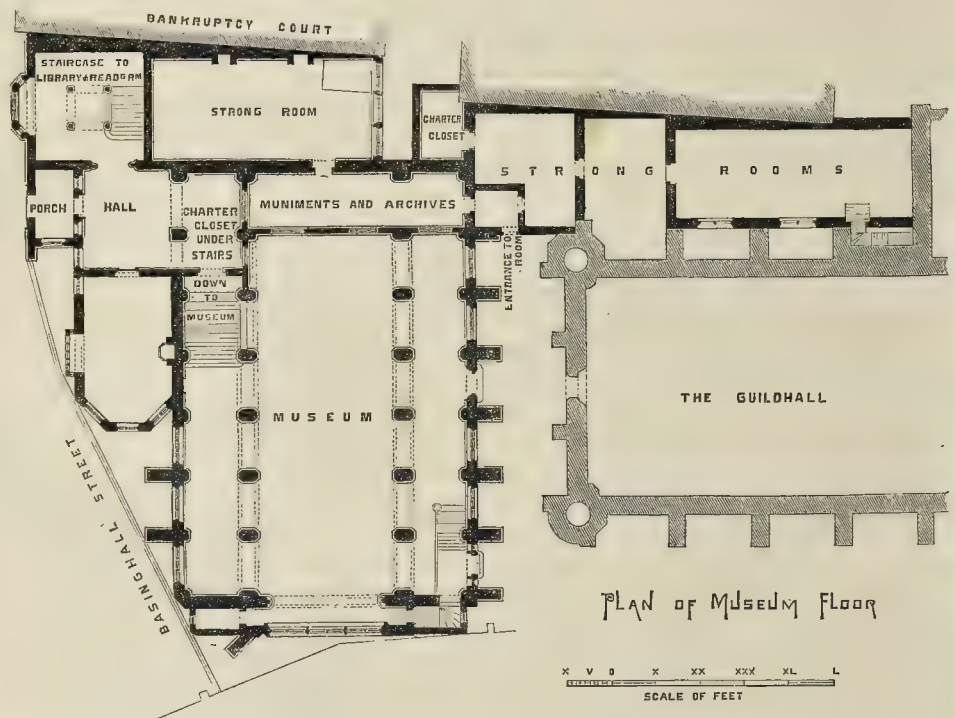
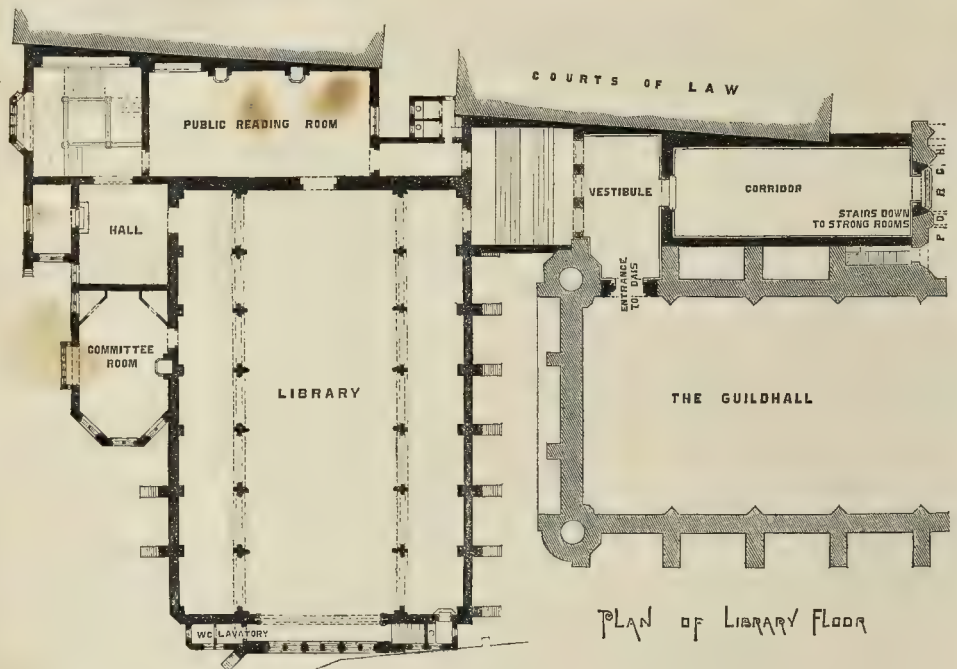
We shall look anxiously for the results of the system adopted.

LIBRARY AND MUSEUM OF THE CORPORATION OF LONDON.

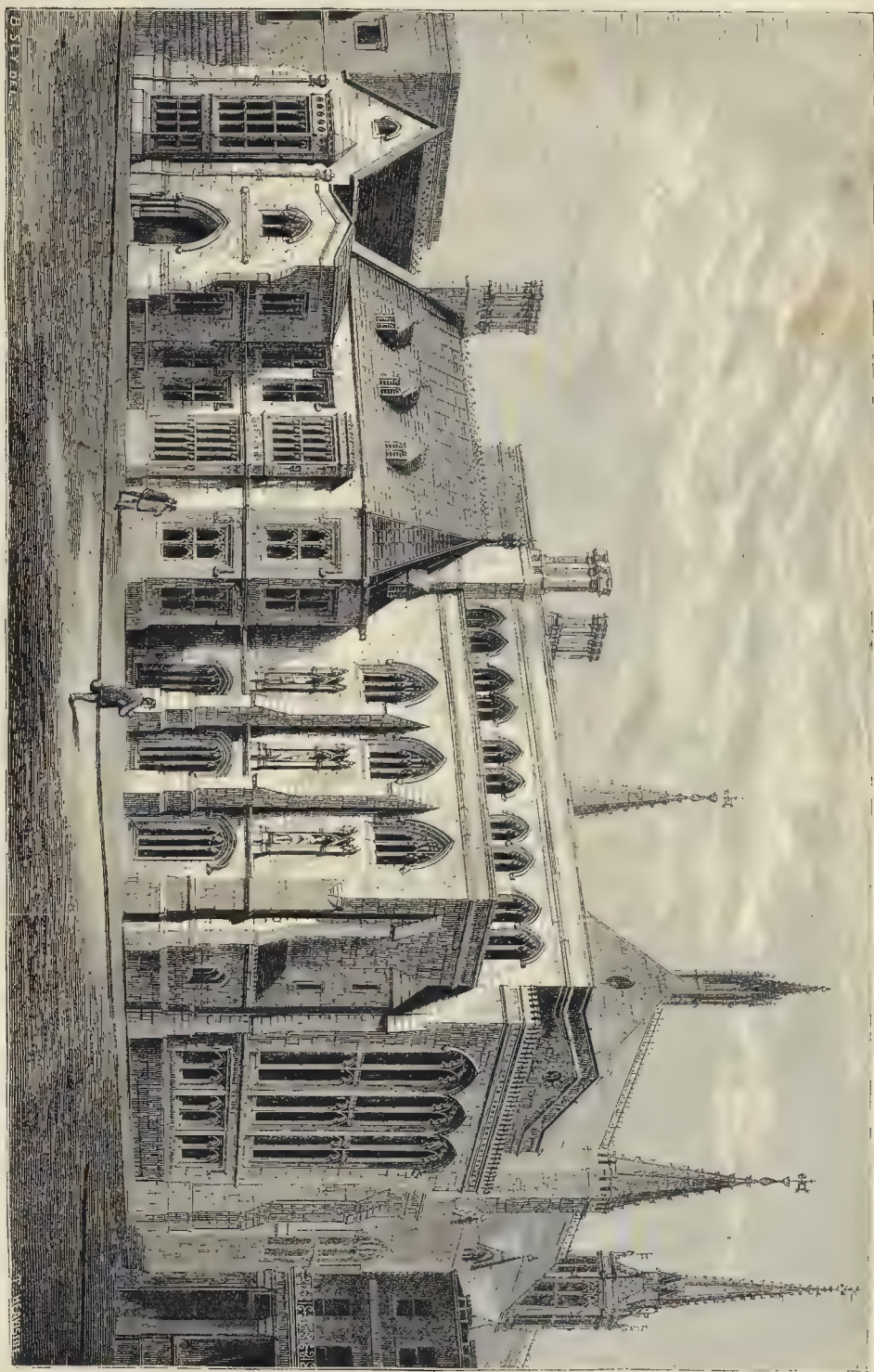
THE foundations of the new Museum and Library adjoining Guildhall, and with the entrance front in Basinghall-street, next the Bankruptcy Court, are completed to the damp-proof course throughout, and the work above is commenced. The Corporation has long been urged to provide a proper and accessible building for their very valuable library and museum, but it was not till quite recently that circumstances served for the fulfilment of this wish. An appropriate and convenient site adjoining the Guildhall being obtained, the city architect, Mr. Horace Jones, was instructed to prepare a design, and a contract to complete the building in accordance with it, for 21,360*l.*, was entered into by the Messrs. Trollope. The public are much indebted for this result to the energy and persistence with which the chairman of the Library and Museum Committee, Dr. W. Sedgwick Saunders, has followed up the subject.

We give a view of the building as it will appear in Basinghall-street, together with plans of the two floors. The style is Gothic, to accord with the Guildhall, and the external facing stones. The museum, on the lower floor, ranging with the Guildhall crypt, will be 83 ft. 2 in. long and 64 ft. 4 in. wide; the library above it will be 98 ft. long, and about the same width as the museum; the height will be 45 ft., the roof of oak. Adjoining the library are a public reading-room, 50 ft. long, and a commodious committee-room. A flight of stairs leads from the library to a vestibule opening on the stairs in Guildhall, and which is approached also by a corridor 64 ft. 6 in. by 20 ft. 6 in., opening into the existing porch of the hall in Guildhall-yard. These arrangements, it is evident, will materially increase the accommodation and facilities for great entertainments or receptions. We should have mentioned that below the corridor, and extending to the library staircase in Basinghall-street, is a range of strong rooms and apartments for monuments and archives. There is every reason to expect that the new library and museum will reflect great credit on the Corporation and all concerned in the erection of them.





THE CITY LIBRARY AND MUSEUM, GUILDHALL, LONDON.



THE CITY LIBRARY AND MUSEUM, GUILDHALL, LONDON.—MR. HORACE JONES, ARCHITECT.

THE CHURCH OF ST. OVEN, JERSEY, AND ITS RESTORATION.

I VENTURE to think that a few notes on the restoration of the Church of St. Owen, Jersey, and of its re-consecration by the Bishop of Winchester, on Friday, the 5th of August, may prove interesting to some of your readers, as an evidence of the rapid growth of church feeling in the island within the last few years.

The church of St. Owen is an interesting example of a type of church peculiar, I believe, to the Channel Islands, and consists of a nave and chancel, both having aisles, with central tower, and low square spire, forming together, before the prolongation of the chancel eastwards, in the restoration, a parallelogram of about 95 ft. by 13 ft., roughly speaking. The date of its original consecration is 1153, and it probably then consisted only of nave, chancel, and transepts, the aisles being added at a subsequent period.

The church is vaulted in a manner peculiar, I believe, to these churches. The vaults are perfectly plain, in the form of an acutely pointed arch of rubble masonry, springing from the walls, without the intervention of a cornice, and strengthened internally by flat bands of masonry. The vaults are generally of the roughest and rudest description, and are invariably plastered. Externally, the masonry is formed to a regular slope, and the tiling laid directly upon it, without any timber work whatever. The lateral thrust of such a vault would naturally be great; accordingly the walls are built of great thickness, and are very heavily buttressed. When the aisles came to be added subsequently, the piers and arches necessarily had to be built of a corresponding thickness to sustain the weight of the wall above: the result is, that the piers and arches, at first sight, on account of their being so thick and squat, have all the appearance of being Norman or Transitional work, but on examination of their mouldings prove them to be the work of the Flamboyant period. The masonry of these churches is of granite, with little exception.

This church of St. Owen is remarkable, internally, for a very curious staircase of masonry, leading to the central tower, to which it is the only access. I believe there is only one similar example known.

The windows consist principally of single most openings, nearly 3 ft. in width, but there are remains, on the south side of the chancel, of two-light windows, with Flamboyant tracery, since destroyed.

About five years ago the building had fallen to a very miserable plight, both externally and internally. The tracery of the windows, as first mentioned, had been cut away. The west end of the south aisle was blocked out from the rest of the church, and used as the receptacle for the parish gun, and the interior was crowded with pews, of the most miserable description, jumbled together without the least regard to ecclesiastical arrangement or decency, the altar being placed in the centre of the chancel, and the pews eastward being arranged facing west, and one pew placed against the east wall itself.

The rector, the Rev. George Clement, had long wished to see this state of things at an end, and to appeal to the parish resulted in a meeting being called on the subject; and matters gradually progressed so far, that the professional services of Mr. John Hayward, of Exeter, who has tried out several works of more or less importance in the island, were called in. He made a careful survey of the building, and his plans for the restoration of the church have been carried out, little by little, until the work has been brought at last to a satisfactory conclusion.

Briefly, what has been done is as follows:—The wretched modern porch at the west end of the nave has been removed, and the two ancient doorways at the west end of the north and south aisles are restored to their original uses; the part of the south aisle formerly occupied by the parish gun, is thrown into the church; the two hideous galleries have disappeared; new windows of an early character have taken the place of modern disfigurement at the west end of the nave; and the Flamboyant tracery is restored to the windows at the south side of the chancel; the chancel has been new vaulted throughout, and extended eastward 8 ft.; a modern excrecence, called the south porch, has given place to one in harmony with the building; the tower, piers, and arches restored, and partially rebuilt; new granite piers and crosses placed on all the gables, the roofs re-tiled throughout, and the vaults and

walls re-plastered; the curious internal staircase has also been carefully restored. The seating is entirely new, that of the nave and aisles being of red deal, stained and varnished, and that of the chancel of oak, of somewhat elaborate design; a new pavement of tiles, supplied by Mr. Godwin of Lugwardine, Herefordshire, has been laid down throughout the church, that of the chancel being of rich and varied design; and steps of Devonshire marble have been placed in the sacristy. The windows, with few exceptions, are filled with stained glass, principally the work of Messrs. Hardman & Co., and are exceedingly good, both in design and colour; two windows, by Messrs. Lavers & Barraud, are equally good; but the same, unfortunately, cannot be said for the east window, the work of a French firm, at Le Mans, which contrasts very unfavourably with the others. These windows are all gifts to the church. The pulpit, the gift of two unknown ladies, is executed in Caen stone, by Mr. Boulton, of Cheltenham, from the architect's drawings. The upper portion is circular on plan, springing from the octagon, and is divided into a series of panels by moulded arches, supported on marble columns, with carved capitals. The panels, which have dispersed backgrounds, are filled with statues of the four Evangelists, and St. Paul, St. Peter, St. James, and St. Jude, comprising the several writers of the New Testament. The cornice is carved, and is surmounted with a capping of alabaster, the same material being employed for the capping of the open balustrade on each side of the stone steps, which is supported by marble columns. The pulpit rests on an octagonal base of polished red granite, worked in the island. The font, also a gift, is of grey granite, of bold design.

The church will be warmed in winter by the apparatus of Messrs. Haden, of Trowbridge, and lighted at night by paraffine lamps of ornamental design. The organ, placed in the north chancel aisle, is built by Mr. Robson, of London, and is an instrument of considerable power. The case was designed by the architect. The lectern is in the form of an eagle, carved in oak by a native artist.

The general contractor for the work was Mr. Le Sueur, of St. Helier's, but the chancel fittings have been executed by Mr. Blamfield, also of St. Helier's; and the altar-rail, parclose screens, &c., are the work of Messrs. Hart & Co., of London. The execution of the work generally reflects credit on all concerned. The total cost of the restoration will be between 4,300l. and 4,500l.

Friday, the 5th of August, was the day fixed by the bishop for the re-consecration of the church, this ceremony being rendered necessary in his opinion by the extension of the chancel eastwards. The weather was all that could be wished, and the church was filled long before the appointed hour.

At the conclusion of the service, the bishop, and a large number of the clergy and laity were entertained at luncheon in the school-room by the rector, the Rev. George Clement, to whose unwearied exertions the accomplishment of this great work has been mainly owing. The day will long be remembered by those present with peculiar satisfaction, as commemorating the first instance in the island of the restoration of an ancient church carried out fully and completely.

There can be little doubt that what has been accomplished here will, under God's blessing, do much to improve the state of Church feeling in the island generally, and to pave the way for a similar work in other churches, many of which, fully as interesting as St. Owen's, have fallen into a sad state of neglect and decay; and the presence of their bishop in the islands, who seems to have won all hearts, during this, his first visit among them, cannot fail of bearing good fruit.

H. B. P.

THE WELLINGTON MONUMENT.

SIR,—In order fully to understand the merits of a case it is generally necessary to begin at the beginning. So far as I know, this has not yet been done in the matter of the Wellington Monument.

The original cause of the delay in the completion of the monument, and of the present money difficulty, is to be found in the award of prizes at the competition of sculptors. This will appear if the history of the work be followed out.

Of all the models sent in, that of Mr. Stevens was the only one which showed such a know-

ledge of architecture and ornament, united with what is looked upon as purely sculptor's work, as to make it fit for the site chosen in St. Paul's Cathedral. This, I believe, is generally admitted; and, at any rate, the judges knew that a "perverse" monument was alone fitted for the site, and that Mr. Stevens's design was the only one answering to that character. Upon what principle the prizes were awarded I do not know. It ought obviously to have been upon that of giving the first prize to the work best suited to the place for which it was designed; and, as every competitor knew where his work was intended to stand, this would have been perfectly fair to all. This principle, however, was not adopted. The bad effects of the first mistake were soon apparent. The first and second prize-holders were commissioned to execute bas-reliefs, simply because they were first and second prize-holders, and they were paid out of the 20,000l. intended for the monument itself, and to which sum all the designs were originally made.

Thus Mr. Stephens was placed in a false position at the very commencement of his labours; and, as if it were not enough to cut down the price to be paid him, he was also required to erect a full-sized model of the monument, a proceeding both unusual and unnecessary, and which added greatly to his expenses, compelling him to prepare and study expressly for it. That, under these circumstances, Mr. Stevens should have had to take other commissions, is not wonderful. He certainly might have refused the work altogether, but whether he would have been justified in doing so let artists judge. It now remains to be seen whether the country will allow Mr. Stevens to complete the national work at his own cost. If it does, I can only say that it deserves neither the work nor the artist.

G. C. E.

ROADMAKING IN THE METROPOLIS.

A REPORT has been made to the vestry of St. Giles's, Camberwell, by their General Purposes Committee, in which are embodied the results of numerous inquiries on the subject of paving and road-making throughout the leading towns in England and Scotland. With few exceptions it appears that the footways are paved with York or other flag paving. In some cases special kinds of pavement are adopted from the circumstance that the material is to be obtained near at hand. Attention has in many districts been directed to several kinds of composite paving or asphalt, for roads as well as footpaths. Bricks also are specially made for the purpose, and wood has been extensively used for pavements and roadways.

The committee thought it would be advisable to take the material in the parish. Their further recommendations were:—That experiments be made with paving bricks for pathways; that where the leading pathways are wider than 6 ft. (and such as in their opinion from the traffic should be paved with York flags), in such cases the remaining portion of the pathways should be made up with one of the description of asphalt or tar paving; that paving works be done to the extent of 25,000l. or 30,000l.; that they be at once empowered to contract for paving works to the extent of 2,000l. in York flagging, and 1,000l. in tar paving or asphalt; and that North-terrace, Camberwell High-road, be paved at once with a 6 ft. course of 2½-inch York flagging, and the remaining portion of the pathway with tar paving. The surveyor, whose opinion is attached, thinks there are many local streets in which the several kinds of asphalt and tar paving could be used with advantage.

On the subject of the use of steam-rollers in repairing roads, the surveyor reported to the committee that he was of opinion that the heavy rollers used crushed and wasted the material, and until further experiments had been made he would not recommend the adoption of the steam-roller. A five-ton horse-roller, at a cost of 90l., he thought would be useful. The committee resolved to recommend the purchase of this, asking, however, for power to purchase a steam-roller divided into three five-ton portions, thus reducing the crushing power to which the surveyor had directed their attention, should they deem it advisable. It must be remembered that a heavy one has been in use for some time in Islington, and has at last been purchased by the vestry, and that its results are remarkably satisfactory. The vestry of St. Marylebone has also deserted the horse-roller, and is experimenting with the steam-power.

A Steam Road Rolling Company is announced, with a capital of 5,000*l.*, in shares of 1*l.* each. In a prospectus we are informed that for road maintenance the average of seven estimates shows a reduction over the present system of fully 40 per cent., whilst the saving to the public chased from the Duke of Devonshire, and contains 500 yards. The cellars, four in number, with the bakehouse, contain an area of about 1,540 ft. The oven is fitted up with Tomlinson's patent apparatus, and bakes twenty stones at one time. On the ground-floor is a shop, 28 ft. square inside, bounded on one side by a house for the shopman; and on the other by a covered archway, and the staircase to the storerooms and office on the first-floor, and to the large room and ante-room on the second-floor. The large room is 46 ft. long by 29 ft. wide, 17 ft. high, and will seat 400 persons. In the ante-room is a fifty-gallon boiler, with water oven. In addition to the contract the fittings have cost 160*l.* Since the removal to the new premises the society's trade has increased upwards of 50 per cent., with every prospect of soon being double. The members also keep increasing, the number now being 205, holding a share capital of upwards of 1,070*l.*, with a reserve fund of 39*l.*, and 15*l.* of an additional fund, towards establishing a reading-room and library. Up to the present time the society has sold goods to the amount of 9,700*l.*, and realised a net profit of more than 600*l.*, after paying all expenses, thus reproducing about two-thirds of the members' capital.

Those who take an interest in the subject may advantageously study the report by Mr. Paget, C.E., recently alluded to by us as having been published by order of the Metropolitan Board of Works, on "Steam Road-rolling, with special reference to the Metropolis."

RECLAMATION OF WASTE LAND.

The Gardener's Magazine gives a help to this our pet project:—

From the known we argue to the unknown. This generation has seen enough of the reclamation of land to be well assured that a surface alone is wanted to form the foundation of an agrarian enterprise, that needs only prudent management to make ample returns on the capital necessarily invested in it. We repeat that it is not in the first instance a question of good soil or bad soil, or no soil at all. The better the soil, the better the prospect of success certainly; but, to begin with, a surface is enough, and, that there may be no mistake about our meaning, we will point to Dartmoor as offering surface only, and yet being well adapted to become cultivable land, and in due time make fair returns upon the outlay its conversion would involve. Whittlesea Mere affords one of the finest examples of reclamation in our time. Where the melancholy marshes spread far and wide, feeding only the wild duck and the bittern, magnificent crops of grass, corn, and roots are now annually raised upon the jet-black vegetable soil. This was a good case, and a question of engineering rather than of experiment in agriculture. But take a bad case, that of Salisbury Plain, which has been pronounced again and again by "competent authorities" utterly unfit for any purpose except the pasturage of sheep. Traverse the plain any time between midsummer and October, and see how the "competent authorities" were slightly wanting in prophetic insight. See a piece here and a piece there under the plough, and on these pieces turnips as good as ever were raised on what may be called a second-class soil. Barley, oats, and rye have been grown upon the plain, and on some of the older fields that have had the frequent aid of artificial manures we shall yet see wheat, and the homely scenes that accompany wheat on the land, as homely comforts accompany bread in the household. "The wilderness and the solitary place shall be glad; it shall blossom abundantly, and rejoice even with joy and singing."

OPENING OF A CO-OPERATIVE HALL AT BUXTON.

The new stores of the Buxton Co-operative Society have been opened. According to a report which was read at the opening, the society was formed in January, 1866, by about twenty-two persons. Every obstacle was at first put in their way, and they frequently had to meet in the open air. None of the property owners would let them have a shop for love or money, and at last they gladly accepted a cellar offered to them by one of the members. They now commenced to deal in flour, their capital at this time being about 23*l.*, and more than two tons at a time could not be bought to advantage. Cash had to be paid before the goods were delivered. At the end of 1866, the members only numbered twenty-five, with a capital of 43*l.* In 1867, the old stores in Concert-place were taken by two members, as sufficient confidence was not felt in the general body to let them the premises in the society's name. At the end of that year the members had increased to ninety-three, with a capital of about 300*l.*, doing a business

of 40*l.* a week. From this time rapid progress was made, and in the spring of last year it was decided to erect the present building, from plans prepared by Mr. Wm. Newby, of Manchester. The contract was taken by Mr. John Barker, of Burbridge, for 1,314*l.* The site is freehold, purchased from the Duke of Devonshire, and contains 500 yards. The cellars, four in number, with the bakehouse, contain an area of about 1,540 ft. The oven is fitted up with Tomlinson's patent apparatus, and bakes twenty stones at one time. On the ground-floor is a shop, 28 ft. square inside, bounded on one side by a house for the shopman; and on the other by a covered archway, and the staircase to the storerooms and office on the first-floor, and to the large room and ante-room on the second-floor. The large room is 46 ft. long by 29 ft. wide, 17 ft. high, and will seat 400 persons. In the ante-room is a fifty-gallon boiler, with water oven. In addition to the contract the fittings have cost 160*l.* Since the removal to the new premises the society's trade has increased upwards of 50 per cent., with every prospect of soon being double. The members also keep increasing, the number now being 205, holding a share capital of upwards of 1,070*l.*, with a reserve fund of 39*l.*, and 15*l.* of an additional fund, towards establishing a reading-room and library. Up to the present time the society has sold goods to the amount of 9,700*l.*, and realised a net profit of more than 600*l.*, after paying all expenses, thus reproducing about two-thirds of the members' capital.

SOUTH-EASTERN RAILWAY: WORKMEN'S TRAINS.

Some time since the South-Eastern Company, of their own motion, put on workmen's trains by which return tickets were issued between Woolwich and any of the London stations, London Bridge, Cannon-street, or Charing-cross, at fares of 4*d.* for the twenty-two miles. It has been found that about 25 per cent. of those using the trains belong to classes for which they are not intended; and, irrespective of the class of passengers using them, it has been found that these trains do not pay. In relation to compensation in cases of accident to passengers by these trains, in the Acts of the Metropolitan, North London, Great Eastern, London, Chatham, and Dover, and Metropolitan District Companies, the compensation to passengers by workmen's trains is limited to 100*l.* The South-Eastern Company reasonably requested Parliament in their Bill, which passed the late session, to grant them a like limitation, but their request was, for what reason we know not, not complied with. The subject was discussed at the half-yearly meeting of the company held on Thursday, at noon, in the Cannon-street Hotel. Sir Edward W. Watkin, chairman of the company, expressed himself strongly in favour of the continuance of the workmen's trains; but the feeling of the proprietors appeared unanimous against the conveyance of large numbers of passengers at such a very low fare, and with unlimited liability. The matter was left in the hands of the Board, and it may be hoped that the many persons interested may approach the Board of Trade with such a representation as may induce them to grant the South-Eastern Company the comparative indemnity granted to other companies, in the matter of compensation, and thus prevent the trains from being taken off, as they may and probably will be, their continuance being optional on the part of the company.

Sir Edward stated that they had been accused of sending large quantities of contraband of war to the Continent since war had been declared. He did not know that they had done so. They had sent medical stores freely over their line, and had had one offer, before the war was declared, to convey a large quantity of arms. They had intentionally quoted so high a rate that the consignment was not sent over their line. Recently the authorities of Scotland-yard had been instructed by the Home-Office to communicate with them (the South-Eastern Company), respecting a number of very heavy wooden cases labelled "books," which had been sent down the line en route for the Continent. The packages were suspected to contain arms, not books. These packages were detained and examined, and found to contain Bibles, not breach-loaders, on their way for distribution in the belligerent armies.

The receipts of the South-Eastern have been less for the last half-year, as compared with the

last corresponding half-year, by 2,717*l.*; but the working expenses, without starving the line, have been less by 13,263*l.*, which leaves an increased net profit of 10,546*l.*

A dividend of 3*d.* per cent. upon ordinary stock has been earned, but it was deemed prudent to declare a dividend at the rate of 2*d.* per cent. per annum, after providing for loan and preferred stock, and to carry over a balance of 22,996*l.* to the current half-year.

The meeting, which was of a most harmonious character, was concluded by a vote of thanks to Sir Edward Watkin.

COLOUR AND ARCHITECTURE.

Sir,—I have only just seen Mr. Sharpe's letter on "Colour and Architecture" in *The Builder* of the 6th inst. Since my name is mentioned in it, I feel sure that you will allow me to say a few words in reply.

There is much in Mr. Sharpe's letter which will receive a very general assent. No doubt some of the attempts to apply coloured decoration to our churches deserve the epithets "crude and gaudy" which he applies to them: no doubt colour ought not to interfere with architectural form:—and so forth. But when he argues from the abuse against the use of colour in architecture, very few, I apprehend, will follow him. Mr. Sharpe, I feel sure, will readily admit that traces of coeval colour are so very often found in our church restorations that we may safely say that colour was commonly—if not universally—used by the Gothic architects in their churches. I think he will also admit that the men who had sufficient knowledge of the principles of art to produce the "glorious architectural effects," which he so justly eulogises, were little likely to injure those effects by an injudicious application of colour to them. If our modern attempts to colour Gothic churches are not very successful, is it not more likely that it is because we have not yet learnt how to do it, than because it cannot be done?

The use of stained glass windows was part of the ancient system of coloured decoration; we have learnt (after some initiatory failures) how to make and use stained glass as the old architects did, and we now apply it with excellent effect. We are going on to the use of wall-painting, and at present, perhaps, we are in the stage of initiatory failures; but I for one do not doubt that we shall before long achieve equally successful results in this mode of decoration also.

That this success is to be attained by copying old examples I do not say. Some of the fragmentary examples of Medieval colouring which remain are very perplexing—to me at least, and seem equally to deserve the epithets which Mr. Sharpe bestows on their modern reproductions. It is difficult—to me at least—to imagine how the coloured decoration of a building in which some of these fragments formed a portion could ever have produced a satisfactory effect. But knowing how skilful the old artists were—as their stained glass is enough to prove—in the use of colour, I humbly attribute my difficulty in appreciating these ancient examples of wall-painting entirely to the fragmentary nature of the examples, and to my ignorance of the principles on which the artist worked, and of the design of which this is a portion. I have never advocated the imitation of these ancient fragments; I have, on the contrary, frequently deprecated their restoration or reproduction; but I think that to understand the principles on which the Gothic artists coloured their buildings, is our first step towards a satisfactory revival of the practice.

What I have maintained, and still maintain, is, that every great school of architecture,—Egyptian, Assyrian, Greek, Roman, Byzantine, Gothic,—used decorative colour (and historical painting and sculpture besides) to heighten the effect of its great buildings; and that our modern public buildings are crude, incomplete, and unsatisfactory to the eye and mind, without these aids from the sister arts. What I have advocated, and still advocate, is, that our architects and painters should turn their attention to the subject, and rediscover and establish the principles on which the architect, the sculptor, and the painter ought to combine their work into a grand and harmonious whole.

I rejoice greatly that in St. Paul's Cathedral, at length, the sculptor and painter are to be called in to complete the noble work of which our great architect did his part so long ago. The little which has been already done is enough to

show what a wonderful transformation may be effected in that cold and dingy interior. I rejoice in the anticipation that the decoration of St. Paul's will spread, almost universally, the "fashion" of completing our public buildings, and at the same time create a school of artists capable of doing it worthily.

EDWARD L. CUTTS.

RESTORATION: BURY ST. EDMUNDS.

SIR,—Your correspondent "B. B." claims that St. James's Church, Bury St. Edmunds, is "a fair example of the style" to which it belongs; exactly what I inferred,—a fair example of a style in which detail (of mouldings, &c.) is in general flat, tame, and comparatively ineffective. He is right in preferring the arcade to that of St. Mary's Church adjoining, the plan of the piers in which is exceptionally bad, so much so that, in the absence of documentary evidence, I should question it being earlier than St. James's. As to the new roof over the latter, in the first place, a double hammer-beam roof is about the "heaviest" roof in appearance that could well be devised; secondly, the roof is certainly, archaeologically, earlier in style than the substructure, having the usual characteristics of a roof of about the first quarter of the fifteenth century, whereas the substructure is what we usually refer to the last quarter of the same epoch; and, thirdly, every one with an eye for architectural design (as apart from archaeology) must perceive that with such a comparatively attenuated arcade, and such a narrow and lofty nave, the eye does not demand the further exaggeration of these proportions by a steep-pitched roof. This is so obvious that I cannot but give credence to a report that the eminent architect who was called in to restore this church fully intended to give it a roof in keeping with the rest of the building, but was overruled, in spite of his urgent representations, by some of those amateur ecclesiologists who manage these matters in country places, and who are as thorns in the side of the luckless architect who has to come in contact with them.

"B. B." must have oddly overlooked the drift of my letter, if he thought it necessary to point out that "a bad style may be tolerated in an old building, but can never be a fitting subject of reproduction in a new work." The whole tenor of my remarks was adverse to the restoration of even bad parts of a building, and therefore, *à fortiori*, of a building altogether bad. If such a building falls into decay, sweep it away, and build a better one. A LOOKER-ON.

BRAEMAR CHURCH.

SIR,—Seeing in a recent issue of the *Builder*, under the head of "Notes from Scotland," a statement relative to Braemar Church, which gives the name of Mr. Robert Lamb, of Darlington, as the architect, I beg to inform you that Mr. Lamb is one of my assistants, and has acted in this, as in other matters, under my instructions. JOHN ROSS.

ARCHÆOLOGICAL MEETINGS.

Cumberland and Westmorland Antiquarian and Archaeological Society.

A MEETING of the members of this society has been held in the Concert-hall at Kirby Lonsdale. Although 150 members had been invited by circular to attend the meeting, only fourteen made their appearance. A few ladies were also present. The Rev. J. Simpson read a paper, written by the Rev. Mr. Moore, of Bewcastle, upon the Roman stations in Cumberland, and the paper was ordered to be printed among the transactions of the society. After some conversation respecting the antiquities of Kirby Lonsdale, the Rev. H. Ware read some notes upon the parish church. Subsequently the members lunched at the Royal Hotel, where preparations had been made for about forty persons, but only about twenty partook of the repast.

Sheffield Architectural and Archaeological Society.

The members of this society have made an excursion to South Wingfield Manor House, Derbyshire, to which we recently referred. They were admitted by the courtesy of the Rev. Emanuel Halton, the owner of the estate. The

Rev. J. Stacey, the president of the society, read a short paper on the history of South Wingfield or Winfield, sketching the descent of the property from the days of the Domesday survey. Mary Queen of Scots resided at Wingfield for about six months in 1569, and again for a short time in 1584. Tradition says that her apartments were in a range of buildings, now wholly destroyed, standing on the west side of the inner court. It appears from Sir Ralph Sadler's papers, that there were in all 210 gentlemen, yeomen, officers, and soldiers employed in the custody of the Queen at Wingfield, in the month of November, 1584. Her domestic establishment then consisted of five gentlemen, fourteen servants, three cooks, four boys, three gentlemen's men, six gentlewomen, two wives, ten wenches and children. "The diet of the Queen of Scots on both fish and feshes days is said to have been about 16 dishes at both courses, dressed after their awne manner, sometimes more or less as the provision serveth." The Queen and her train are said to have consumed about ten tons of wine a year. Mr. Stacey described the different portions of the ruins, and the party then inspected them. The afternoon was spent in rambling about the ruins, under the guidance of Mr. Cupit, tenant of the manor farm; and before returning to Sheffield, the party partook of tea at the Peacock Inn, near the railway station.

DOLGELLY MARKET-HALL AND PUBLIC ROOMS.

This building, which was opened on Thursday, the 11th inst., has been erected under the superintendence of Mr. W. H. Spaul, architect, of Oswestry, on a very commodious site in the centre of the town, and covers 4,960 super. feet; it contains a general market, 60 ft. by 39 ft., with four shops, kitchen, two bed-rooms, four retiring-rooms, an assembly-room, affording accommodation for 600 persons, with raised orchestra, and a spacious reading-room. The walls are of grey granite, relieved by light limestone dressings and arches.

The contract was taken by Messrs. Humphrey Jones, Rees Owen, and Evan Morris, of Dolgelly.

The total outlay for building, stalls, chairs, gas-fittings, &c., was 2,200l.

VERMIN IN NEW HOUSES.

I THINK I can inform your correspondent, "R. W.," of a remedy for the disagreeable visitors of which he complains.

Some years ago a friend of mine came to a country vicarage, an old house, and found the upper rooms swarming with these insects; dozens, I might, perhaps, say hundreds of them might be scraped out from between the floor-boards. He made use of the receipt I give below, which most effectually destroyed them, and he has never been troubled with a single one in the house since. I also was troubled with several in my lodgings at the commencement of the year, but the same mixture has been entirely effectual in removing them all.

The mixture I must tell you is a deadly poison.

Spirits of wine, 4 oz.; spirits of turpentine, 4 oz.; white mercury, $\frac{1}{2}$ oz.; camphor, $\frac{1}{2}$ oz. Mix, and apply with brush to infested part.

G. I. C. C.

ST. AUGUSTINE'S CHURCH, HIGHBURY NEW PARK.

MR. HENRY RYDON, of Highbury New Park, deserves more than a word of praise for the liberality which has led him, not merely to present the site for a church, but to build it at his own sole cost, probably nine or ten thousand pounds. Moreover, as a preliminary, Mr. Rydon, some six years ago, put up a temporary iron church and hall, at an expense of nearly 3,000l. Some of the parties interested think it too much to expect Mr. Rydon to erect two churches at his sole expense within six years, and they are subscribing with the idea of at least defraying the cost of the temporary church, but that has not yet been accomplished. It is hoped that this will be done, and that the spire on the new edifice will be raised also by voluntary contributions.

St. Augustine's was consecrated, a few days ago, by the Bishop of London. It is a spacious

and handsome structure of brick, with stone dressings, in the style of the fourteenth century, with the nave divided from the aisles by stone columns and arches; and it has a clearstory. The architects are Messrs. Habershon & Brock, and the contractors, Messrs. Perry & Son, of Stratford.

The organ is divided, one part being on the right, the other on the left, of the chancel; and the movements have the aid of electricity.

The Rev. Gordon Calthrop is the minister.

Mr. Rydon is the owner of most of the land round about, green fields a very few years ago, and now nearly all covered with large houses. The clay which was under the turf is now above it, in the shape of walls.

CHESTER CATHEDRAL.

In a letter to the *Times* Dean Howson says:—The architect's estimate for the complete restoration is 55,500l. To this some additions must be made, in consequence of our having discovered that foundations were wanting, and that parts of the walls were in a bad and perplexing condition, so that it would probably be safe to say that the whole will cost 60,000l. During the present year very rapid progress has been made in the work of restoration. The exterior of the tower has been entirely renewed. The masonry structure of comparatively recent construction which used to disfigure the south side of the Lady Chapel is gone. The exterior is restored to its original form and beauty. Windows also of great beauty have been inserted here, and others of a decorated character in the clearstory of the choir. An entirely new roof, covered with lead, is being constructed for the nave; the groining of that part of the church is steadily advancing, as well as its exterior reparation at the west end and throughout the south side. The completion of the whole work may be expected to occupy three years; but, in order that we may make sure of this result, it is necessary that our subscription list should be continuously reinforced. We shall be peculiarly grateful if individual contributors, or separate families, will make themselves responsible each for some distinctive portion of the work, as, for instance, a window, a buttress, or a section of the cloister.

THE ARTIZANS' AND LABOURERS' DWELLINGS ACT.

THE Act empowering vestries and district boards to take down or improve dwellings occupied by working men and their families, which are unfit for human occupation, and for the building and maintenance of better dwellings, has been extensively carried out in the parish of St. Luke. Upwards of fifty houses have been brought under its operation, and the object of the Act successfully accomplished. There has only been one case reported in the parish wherein the owner of premises refused to comply with the orders of the vestry, and intimated his intention of appealing to the Quarter Sessions; but, on further reflection, he deemed it prudent to carry out the order, and has since converted the dwelling-houses into stables. A great deal still remains to be done in this and other eastern parishes, in many of which no action has yet been taken by the vestries or other local authorities, nor have the inhabitants resolved to put the machinery of the Act in motion, so that in these cases the Act is, in reality, inoperative.

CONDITION OF DUBLIN.

THE *Irish Builder* says:—

"The writer in the *Builder* has not yet ceased to pour out his store of censure on the powers that be' in our city. In his paper, in Saturday's issue, he fearlessly asserts that 'Dublin is not half cleansed.' He names several districts in which 'corporate vigilance can never be detected.' Certain it is that the

'Chief's among us, takin' notes,'

and however shrewdly we had previously conceived such to be the case, we are confirmed in our opinion, when the writer tells us,—'We have walked through these quarters, and examined the house property, questioned the dwellers as to their wants, and during our visit, seen sufficient with our own eyes to justify every word we have written or may write.'

"With respect to his queries as to the railings in front of Old Trinity, and the 'dead wall' in

College-street, we are happy to inform the writer that, within the past fortnight, the works have been in progress. The blocks of Ballynocken granite for the base are on the ground; the foundations are laid about 10 ft. in. We regret that they have not been laid still nearer the frontage line of the College, and with a lesser curve towards the street."

BUILDINGS FOR EDUCATIONAL PURPOSES AND THE INTERNATIONAL EXHIBITION.

LIEUT.-COL. SCOTT, as secretary, writes thus: I am directed by her Majesty's Commissioners for the Exhibition of 1881, to transmit the enclosed copy of a letter which has been addressed by them to the honorary secretaries of The Royal Institute of British Architects, The Architectural Association, The Architectural Exhibition, and The Architectural Museum, and to state that her Majesty's Commissioners will feel obliged if you will be good enough to cause it to be published in the next impression of the *Builder*.

"Sir, I am directed by her Majesty's Commissioners for the Exhibition of 1881 to inform you that in their opinion the great interest at present felt in the question of national education, and the fact that educational works and appliances are intended to form a prominent feature of the approaching International Exhibition of 1881, seem to present a suitable occasion for the formation, at the Exhibition, of a large and important collection of models, plans, and elevations of colleges, school buildings, and other edifices designed for educational purposes.

It is therefore the intention of her Majesty's Commissioners to request the Committee of Selection for Architecture to assist them in forming such a collection, by devoting their particular attention to the designs, drawings, and models relating to school buildings which may be submitted to them, and her Majesty's Commissioners have determined to place at their disposal on this occasion, in addition to the amount of space which will be regularly set apart for architectural works at these annual exhibitions, a supplementary allotment, to be specially devoted to plans, drawings, and models of school buildings.

Nothing, then, remains but to secure the co-operation of the architectural profession in this work, and I am therefore directed to ask you to have the kindness to make known to the members of your society the views and intentions of her Majesty's Commissioners on this subject."

THE CHEESEWRING.

SIR.—The propping to which your correspondent, "H. B. W.," alludes, was done last year, by order of the Duchy authorities. It was adopted as a precaution against the danger to which the Cheesewring was exposed, through the foolish practice of rocking the upper beds attempted by many of the visitors. For any other purpose it would have been simply ridiculous.

Time will not allow us to do more at present than repeat our assertion, that the Cheesewring is not endangered by our operations; its security, as far as we are concerned, has been amply provided for.

JOHN FREEMAN & SONS.

THE GREAT-HORTON FINE ART AND INDUSTRIAL EXHIBITION, BRADFORD.

The Exhibition, which has for some time been in preparation at the New Congregational School, Great Horton, has been formally opened. A large and fashionable company assembled in the large room on the first floor of the building, converted during the exhibition into a picture gallery, the Mayor of Bradford in the chair. A great many ladies of Bradford and the district were present. A choir composed of vocalists and instrumentalists, members of the Bradford Festival Choral Society and others, occupied a large portion of the platform, and opened the proceedings by singing, the solo and chorus, "The Marvellous Work."

The exhibition is one of considerable extent. The building in which it is held is well adapted, in the size of its principal apartment, the number of its smaller ones, and in the possession of a long corridor, for the purposes to which it is applied. The principal departments may be described as art collections (including many subdivisions), objects of natural history, objects of vertu, and machinery. Of these departments that of art is the most important.

Vacant Land in the City.—The *City Press* points out that the corporation have at the present time upwards of 40 acres of land in the City, which is vacant and entirely unproductive. The greater part of this land is situate in the neighbourhood of the Holborn Viaduct and the New Meat Market at Smithfield; but there are several plots in much more central positions.

CHURCH-BUILDING NEWS.

Hackney.—The foundation-stone has been laid of a new church for South Hackney. It is to be called Christ Church. The edifice will occupy a space of ground between Victoria Park-road and the angle of Victoria Park. The style will be the Middle Pointed, and the church will consist of nave, side aisles, and chancel. A large window will occupy the western gable, with three-light windows in the chancel, which will be apsidal. No side windows are intended. The walls will be of brick, with stone ashlar work, and the roof open-timbered. In the chancel will be a sedilia. The entrance at the western extremity will show a lofty tower. Three descriptions of stone seem to be employed, —Portland and Bisham stone for the outside, and Bath for the internal ribbed and moulded work, &c. The tower, it is said, will be of Bisham stone; but we think, from an examination of it, it appears altogether too soft and weak for its intended purpose. With tower and spire, the contract price is put down at 4,875*l.*, and the church is to afford accommodation to about 800 people. South Hackney is at present well provided with churches. It has no less than fifteen, although thirty years ago it had but two. Of the architectural character of the churches, however, we cannot speak very highly. The present structure will be erected from the plans of Mr. Wigginton, architect. —The district church of St. Mark, which is situate in the Sandringham-road, has been consecrated by the Bishop of London. There are a vast number of empty houses in the vicinity. The structure is very large, affording accommodation for no less than 1,713 persons, exclusive of the gallery. The ten pillars supporting the edifice are painted a dull chocolate colour picked out with gold, and the bricks are painted blue, red, white, and black. All the windows are stained. The roof is of oak, varnished, and the pews are constructed of the same material. The edifice already has cost 11,000*l.*, exclusive of the site, which was given by Mr. Amburst. When the incumbency was first offered to Mr. Pilkington, 3,800*l.* were required to pay off the builders, &c., and to render the church fit for consecration; but of that sum 2,952*l.* have been subsequently raised, and there remains at the present time a pressing want of 848*l.* to wipe off the debt. Those figures, however, did not take into account 1,500*l.* for the completion of the tower and spire, and 350*l.* for the purchase of an organ and font, and the cost of schools and parsonage, which sooner or later will have to be built, and subscriptions are earnestly solicited.

Bristol.—An adjourned vestry meeting has been held at St. George's, Easton-in-Gordano, to consider a proposition to take down and rebuild the church for that part of the parish. Since a district church has been built at Pill, it has been found much too large for the population, which numbers about 500 in the whole. It is a very plain-looking building, built on to an old tower, and has sittings for about 800. Most of the vestry people appear to have a great dislike to the pulling down of St. George's Church, as it has only been built between forty and fifty years; and they thought it would do very well for them. Still, no opposition was offered to a resolution to the effect that the church shall be rebuilt in accordance with the plans produced, if the necessary funds can be raised, and the necessary faculty is to be applied for. There is every probability, the local *Times* believes, that the church will be rebuilt in the course of the ensuing year. Plans and specifications were submitted to the meeting. The total cost is about 2,000*l.* It is proposed that the new church shall take the form of a memorial of the late vicar, the Rev. Henry Mirehouse. Altogether, about 1,000*l.* have been promised towards the sum required to rebuild the church.

Dodleston.—It is now more than a year ago since the work of restoring, or almost re-building the parish church of Dodleston was commenced. The sum required for the work was 3,000*l.*, as it was proposed to rebuild the church, with the exception of the tower. Mr. Douglas, of Abbey-square, Chester, was selected as the architect, and he has not departed widely from the features of the old church, which was in the Perpendicular Gothic style. Both the nave and the aisle have been considerably widened, and what was formerly the chapel has been utilised as an organ chamber and vestry. The whole of the tower has been restored, the upper part reconstructed and a polygonal capping or spire added. This part of the work, including the re-

casting of a bell, and the addition of a new one, together with a new clock, has been carried out as a memorial of the late Dean Anson. The entrance to the edifice is by means of a rather quaint half-timbered porch, on the north side, near the tower. With this exception the material used in the construction is the red sandstone from Handbridge. The roof is open over the nave and aisle, but panelled over the choir and chancel; chocolate and white in the former, and green and gold in the latter, being the predominating colours. The decorative artists who executed this work, and also the *Agnus Dei* and lettering on the east wall surrounding a stained-glass window, were Messrs. Heaton, Butler, & Bayne, of London. An inscription in the lower part of the window shows that it is in memory of Frederick Anson, D.D., Dean of Chester, and Rector of Dodleston, who died May 8th, 1867, aged 88 years. The Christian ministry furnished the ideal subjects for the artist, Mr. Wailes, of Newcastle. A coloured window at the opposite end, now that the tower is thrown open, would be a desirable addition. The woodwork is of varnished pitch pine, if we except the lectern, which is of oak, and the stalls and pulpits are carved. All the seats, which will accommodate 300 persons, are open, and, we presume, will be free. The passages between them are paved with red and black tiles, and the chancel with encaustic tiles. The churchyard has been extended by slips of ground on the north and the east, and on the south by a much larger piece, which have been given by the Marquis of Westminster; and the same nobleman has defrayed the cost of the wall enclosing the same, as well as the lych-gate through which the churchyard is entered from the village. The cost, exclusive of this, and the tower, was 3,000*l.* Mr. Henry Wigginton, of Chester, was the builder; and Mr. John Harrison, of Chester, contracted for the joiner's work. The edifice has been opened for divine service.

Calverley.—St. Wilfrid's (parish) Church, Calverley, has been restored and re-opened. During the last sixteen months extensive alterations, amounting to a complete restoration, have been in progress at this ancient church. The present restoration was prefaced by the removal of pews, galleries, &c., since which the whole of the roofs have been taken down. That to the nave, which was originally covered with lead, and the only one formed of ancient timbers, has been raised to its original pitch, boarded, felted, and covered with grey slate. The other roofs are entirely new, constructed of Memel timber, and boarded, felted, and slated. Owing to the defective construction of the former chancel roof, the walls had been thrown considerably out of the perpendicular, thus rendering the rebuilding of the chancel imperative. All the old masonry, however, that proved sound has been retained, and the new chancel is an almost exact reproduction of the old one, with the exception that it is lined internally with ashlar instead of rough walling. The aisles of the nave and chancel, which were of recent construction, have been pulled down and extended laterally in order to provide additional accommodation, the east portion of the north aisle being now used as a vestry, and the adjoining bay forming the organ-chamber, screened off from the chancel, &c., by an oak screen. The present porch is new, all traces of the old work having been destroyed; but the doorway into the church is the original one, repaired and rebuilt. In the course of the work it was discovered that the foundations of the nave arcade had been rendered insecure by interments within the church. This has necessitated the taking out of the pillars, the construction of deeper and stronger foundations, and the substitution of new stonework in place of the defective masonry. The walls of the clearstory have been cleaned from plaster, and the stonework pointed. The walling above the nave arches is new, to match the tower walling. The old chancel arch being insecure, a new one of loftier proportions has been substituted. The whole of the seats, stalls, doors, &c., are of oak; and the level of the original floor, sloping from west to east, has been retained. The church is warmed by means of Haden's hot-air apparatus, and the lighting is effected by metal standards, the production of Messrs. Hart, Son, & Peard, of London. The organ has been built by Mr. F. W. Nicholson, Bradford. The east window, with its tracery, has been restored at the cost of Mr. Horsfall and family, of Hornby Grange. The west window is the gift of Mr. and Mrs. Thomas H. Gray, of Calverley, who likewise present the communion-tablets and the oak communion-rails.

The other stained-glass windows, which are in the chancel, are the gifts of the family of the late vicar, the Rev. S. Redhead, of the Rev. A. and Mrs. Brown, the family of Mrs. Sykes, late of Leeds; and a lady, in grateful remembrance of the late Dr. Ramsbottom, of Leeds. The oak for nave roof was given by Mr. Margerison, parish clerk. The church-yard has been levelled throughout. The cost of the works, exclusive of stained glass, has been about 3,600*l*. The contractor was Mr. John Tomlinson, of Leeds. The works have been carried on under the direction of Messrs. Healey, architects, Bradford, by whom the plans of the restoration were prepared.

Books Received.

Sussex Archaeological Collections. Published by the Sussex Archaeological Society. Vol. xxii. Sussex: G. P. Bacon, High-street, Lewes. 1870.

The volume just now issued by the Sussex Archaeological Society, if not one of the best of the very valuable series to which it belongs, a value acknowledged on many occasions in these pages, contains a considerable amount of interesting matter and a number of illustrations of more or less merit, including a portrait of the late Mr. W. H. Blauw, to whom the society mainly owes its origin. "Notes on Pre-historic Burial in Sussex," by the Rev. Henry Smith, M.A., and an account of a curious mural painting lately discovered in Wisborough Green Church, are valuable. Many, too, will read with interest a memoir by the Rev. Edward Turner, M.A., of Henry Smith, commonly known as "Dog Smith," written with special reference to his Sussex charities. Henry Smith, who died in 1627, gave large sums of money, partly before his death, to various parishes in Sussex, Surrey, and elsewhere, for charitable uses, and mainly "for the settling of the poor on works." As he wisely directed that the sum (generally 1,000*l*.) should be expended in the purchase of land, the gross income at the present time must be enormous. For instance, he left 1,000*l*. "to buy lands for perpetuity to redeem poor captives and prisoners from the Turkish tyranny." The land purchased with this in Brompton, known as Smith's Charity Estate, and long since covered with houses, already brings in a very large income, which in the course of a few years, as the leases fall in, will become immense. A history of the way in which the various sums left by Smith have increased, and of the manner in which the proceeds are now applied, would be valuable.

To meet the views of members of the Sussex Society who did not join at the commencement, it is proposed, if a sufficient number of names be sent in at once, to reprint vols. ii., iii., and v., at present not attainable.

Mr. Mark Antony Lower announces a new "History of Sussex," certainly long wanted, in two octavo volumes uniform with those of the Archaeological Society. We shall be sorry, however, if it be thus restricted. Within such limits it cannot be complete, and it will have the effect of preventing for some time longer the publication of a thoroughly satisfactory history of the county.

Land and Houses: the Investor's Guide to the Purchase of Ground Rents, Houses, &c. By JOHN PARNELL, Estate Agent. London: Effingham Wilson. 1870.

The main object of this brochure is rather to make personal clients than to instruct fully would-be investors. Still, it does something, and would lead an intending buyer to think for himself, and inquire further. We will not endorse the writer's recommendation of short leaseholds as "a very good investment," though the hint is given that the amount likely to be required for dilapidations at the end of the lease should be properly estimated; nor can we agree with him in advising that a mortgagee who has lent 2,000*l*. upon freehold houses, producing 180*l*. per annum when let, may safely lend another 500*l*. on the same security, and still have plenty of margin.

Stables and Stable Fittings. London: St. Pancras Ironwork Company. 1870.

As we have recently drawn attention to the stables and loose boxes fitted up as models by this company, at their works, in Old St. Pancras-

road, we need only say of the little work before us, that it is a trade book supplementary to those models, and includes a considerable amount of useful information on the subjects of which it treats,—"stables and stable fittings,"—irrespective of the company's special manufactures.

The Practical Solution of the Great Sewage Question, by a Combination of the Irrigation and Precipitating Processes. By WILLIAM JUSTINE. John Day. London, 1870.

READING the first portion of this book, the chief object of it would seem to be to discredit the utilisation of sewage by irrigation, the system being pronounced unprofitable and detrimental to the public health, although there is not at present, at any rate, the least evidence to that effect. Reading further, however, it is found that this is but secondary, the main purpose being to advocate the A B C process, the managers of which are certainly the most indefatigable trumpeters that we have heard for some time. We have no wish to prevent Mr. Justine, or any other writer, from advocating to the utmost a system of which he may think well, but we do most seriously object to the endeavour, as made in this book, to raise a cry against sewage irrigation on the ground of its spreading cholera and all sorts of dreadful diseases to slay "new hosts of human victims at every variation of the wind," without a tittle of reliable evidence to support the assertions. The hollowness of the cry is shown by the advice, with which the book concludes, that the sewage of towns should be used to irrigate land, but that it should be done through the A B C Company, who would see that the sewage was applied at the right times and in moderate quantities.

Miscellaneous.

The New Law on Public Education.—The Act to provide for public elementary education in England and Wales has been issued. There are two sections and five schedules in the statute. The Act is divided into two parts—"Local provision for schools," and "Parliamentary grant,"—and then apportioned under several heads. The new law does not extend to Scotland or Ireland. On the "religious question" there are several regulations not requiring children to attend religious instruction. The Education Department is to make school districts, and provide school accommodation for the children resident in each district. A weekly fee is to be paid by each child attending school, which may be remitted on account of poverty. Free schools may be established. Any sum required to meet a deficiency in the expenses is to be paid out of the local rate. With regard to "attendance at schools," the Education Department may make bye-laws, and require the attendance of children not less than five years nor more than thirteen years of age. No penalty with costs is to exceed 5*s*. After the 31st of March next, no Parliamentary grant is to be made except to a public elementary school. In the schedules annexed to the Act there are rules as to school Boards in the metropolis and elsewhere, with a description of the school districts, and the rating authorities are mentioned in the statute.

The Drainage Question at Ashford.—A fully-attended meeting of the Local Board has been held to decide as to the appointment of an engineer to advise as to the drainage of the town, and the removal of the sewage from the river into which the outfalls at present flow. Letters were read from Mr. Bateman and Mr. Baldwin Latham, stating their charges for plans and reports. The chairman and others were averse to going to the outlay, believing it to be unnecessary, and that a local engineer or surveyor could prepare a satisfactory plan. It was contended by others that, looking at the fever which had lately prevailed in the town, and the communication from the Sanitary Commissioners, the Government would certainly interfere, and at a very heavy cost to the town, if the sewage were not taken out of the river; and it was further contended that an engineer from a distance, and of large experience, was required to grapple with this matter, as local parties would be more open to personal influences. On a division, it was resolved, by a large majority, to employ Mr. Baldwin Latham; and a committee was appointed to meet that gentleman.

New Hospital at Tamworth Workhouse. The local guardians having determined to erect an entirely new building instructed their surveyor, Mr. N. Joyce, of Stafford, to confer with the Poor-law Board and prepare plans for a suitable building, at a cost not to exceed 1,000*l*. A design prepared by Mr. Joyce, and approved by the Poor-law Board was adopted by the guardians. The building was arranged for twenty-eight beds. On the ground floor, in the centre of the building, are a kitchen and sleeping-room for the nurse, and on the right and left hand sides are day-rooms for male and female patients respectively. Communicating with the day-rooms are sleeping-rooms for those patients who are too infirm to ascend the staircases. On the upper floor are three wards—one for males, one for females, and a third for special cases. To secure perfect ventilation the wards and day-rooms have been placed so that there are windows in opposite sides of each room. The windows have been so arranged that they occupy spaces between the beds, and not in any case over them. All the windows are hung to open both at the top and bottom, but if at any time it should be found impracticable to admit a direct current of air through the windows, fresh air can be admitted by means of iron louver ventilators fixed near the ceilings. The water-closets are placed in wings projecting from the main building, approached by passages from the landings. These passages, as well as the closets, have windows on each side, so that no effluvia can possibly escape into the wards or day-rooms. Hot and cold water are laid on to supply the lavatories and baths. The work has been completed by Mr. Joseph H. Clarson, at a cost of 998*l*. 14*s*.

Norfolk-street, Strand.—It is only fair on Norfolk-street, Strand, through which an opening is being made to the Embankment, to state that it was not always quite so uninteresting a street as of late years it has appeared. In the *Past-mag* for January 13, 1698, it is stated—"On Monday night the Czar of Muscovy arrived from Holland and went directly to the house prepared for him in Norfolk-street, near the waterside." William Penn, the founder of Pennsylvania, lived in Norfolk-street. His circumstances, at a certain period of his life, were so involved that it was not safe for him to go abroad. He chose the house as one from whence he might upon occasion slip out by water. In the entrance to it he had a peeping-hole, through which he could see any person who came to him. One of these, having been made to wait more than a reasonable time, knocked for the servant, when he asked, "Will not thy master see me?" "Friend," answered the servant, "he has seen thee, but he does not like thee." Last, but not least, we learn from the *Spectator* that Sir Roger de Coverley, when in town, put up occasionally in lodgings in Norfolk-street, although he had a house in Soho-square.—*Fall Mall Gazette*.

The New Workhouse at Hertford.—A letter from Messrs. W. Wilds & Sons, architects, was read at the last meeting of the local Guardians, in which they say:—"We have examined every door in the new workhouse, and find very many of the frames and hinges in a very faulty condition, attributable to the wood bricks and lintels, which, although sufficient in number and size, must have been put in wet, or, perhaps, in a wet season (for every inch of rough fir in sight has shrunk). Consequently, the frames and hinges are not firmly held, and in some cases there is a lack of sufficient weight in the wood bricks to resist the leverage of the doors; and the current of air in the corridor and passages, at times very strong, has caused slamming of the doors, thereby aggravating, if not in a great measure producing, these defects. . . . The most inexpensive and effectual remedy to be obtained is a wedging up of the lintels and wood bricks, securing the fittings to the floor, and, above all, fixing a check-spring to prevent the violent jar from the sudden closing of those most exposed to the effect of the wind and most used." The suggestions are to be carried out.

New Markets for Aberystwith.—Two market-halls are in rapid progress of construction in Aberystwith. They have been got up by rival limited liability companies. The memorial stone of the one in Market-street has been recently laid by Colonel Powell, of Nanteos, who has granted a long lease of the site on which the old market stood, which market is to be entirely taken down. The Terrace-road Market is already opened.

Cheap Railway Travelling for Working Men.—At a recent meeting of the Metropolitan Association for Procuring Cheap and Regular Railway Transit for the Working Classes, the chairman, Mr. Dawson, read a number of letters from gentlemen and members of Parliament, expressing cordial approval of the objects of the society. Earl Fortescue said: "One penny per ton per mile is found to be a remunerative charge for the conveyance of coal by railway. A ton weight of men and women—from twelve to eighteen persons, without luggage—load and unload themselves from the train, besides bringing and taking themselves away. Even at the low fares you propose, this ton of intelligence would, on an average of the distance travelled, and their own individual weight, pay at least twice as much as one ton of coal pays at 1d. per mile. In case of accidents the railway companies should only have very moderate claims for compensation to pay—in fact, only enough to keep up a penalty upon carelessness; for each passenger, before he starts, has, by a slight extra payment, the power of insuring, from a well-known company, a good sum for himself or his family in case of accidental injury or death on the journey." There was some conversation as to the future action of the association, especially in reference to the Great Eastern Railway.

Damages from Fall of a Grand Stand.—At the Leeds Assizes, in the Crown Court, before Justice Brett, damages have been given for injuries to a woman by the fall of the grand stand at Rotherham, in March, 1869. The defendants were members of a committee, and their defence was that the stand was properly made, but that certain stays and supports had been removed. They also urged that the profits were to be devoted to charitable purposes. The judge referred two questions to the jury, first, did certain persons, without the knowledge of the defendants, remove and carry away some of the struts or supports? secondly, did the stand fall in consequence of the removal of such supports? If they found the first question in the affirmative, then the plaintiff could not recover. If reasonable care and skill were exercised on the part of the defendants, then the plaintiff could not recover. The case seemed to come to this, were there diagonals or were there not? If there were diagonals put the whole length, then the stand was properly constructed; otherwise it was certainly defective. The jury found a verdict for plaintiff, damages 85*l*. Plaintiff had previously offered to accept 70*l*. in full discharge.

A Mechanics' Institute for Hazel Grove, Stockport.—The foundation stone of a Mechanics' Institute has been laid in this village. Mr. J. W. Legh, M.P., of Lyme Park, gave an eligible plot of land for a site in the centre of the village, with the buildings standing thereon. It is situated at the end of Hathersole lane, and has a frontage to the Buxton turnpike road of 54 ft. and of 47 ft. in the lane just mentioned. The institution will be of brick, with stone base in a line with the corner-stone, and fire-brick cornice, the windows being arched, and locked in with key-stones. It will be two stories in height, independent of the basement story. On the first floor will be a reading-room, 21 ft. by 30 ft.; a library, 14 ft. square; and two classrooms, each 21 ft. by 15 ft. Above these is a large lecture-hall, 54 ft. by 30 ft., with convenient ante-rooms. There is a porter's house attached. The building will cost over 1,000*l*, towards which nearly 400*l*. have yet to be raised. The architect is Mr. Samuel Howard, jun., and the builder Mr. Samuel Howard, sen., both of Disley.

Postponement of the International Working Men's Congress.—In consequence of the war, the General Council of the International Working Men's Association has appealed to the Continental sections to sanction the suspension of the rule which makes it imperative that the annual Congress should meet on the first Monday in September. In their replies the sections are unanimous in stating that, under existing circumstances, the Congress could not be held anywhere at the appointed time, and they authorise the Council to appoint the time and place of meeting according to its judgment. Some are of opinion that the Congress may be held in Paris at no distant date. The meeting of the Fifth Annual Congress is accordingly postponed till earliest opportunity.

Paris.—Messrs. Bacon have published a cheap map of Paris, showing clearly the fortifications, walls, and forts.

Monumental.—A memorial has been erected at Wexford to the memory of the late Mr. John E. Redmont, who expended a fortune in the improvement of that town. He introduced steamship and railway conveyance, reclaimed some thousands of acres from the sea, built the approaches at both ends of the town, and to assist in obtaining a free bridge across the Slaney he contributed 5,000*l*.—A monument, in the form of a Medieval altar tomb, to the memory of the late Colonel Fergusson, has just been erected on the Castle Hill, in the Raith grounds, near Kirkcaldy, in Scotland. It is sculptured in Carrara marble, and was designed and executed by Mr. John Hutchinson, R.S.A. The sides and ends of the monument are enriched with quatrefoil panels. Extending over the top, and in relief, is an Early English cross, with the sacred monogram I.H.S. The whole marble rests on a massive plinth in one block of polished red granite.

Fire on Herne Bay Pier.—On Sunday night a fire broke out at the extreme end of the wooden pier, Herne Bay, owing to some cause at present unexplained. A great number of spectators quickly assembled, but, owing to the absence of any person in authority, there was considerable delay before proper measures were adopted for preventing the flames spreading. As soon, however, as some of the officials of the place arrived, a number of men were set to work, and the progress of the fire was effectually stopped. If this accident should have the effect of obtaining attention to the pier generally, it will be a good thing for Herne Bay.

Watering Roads.—Dr. Whitmore, in his Report on the Health of the Parish of St. Mary-lebone, during July last, says:—"During the summer most of our crowded streets have been watered on alternate days with a weak solution of carbolic acid, as has been the custom for the last four years, and there is no doubt that this excellent antiseptic and disinfectant has been very beneficial in a sanitary point of view. The inhabitants of those streets have often expressed satisfaction at the freshness and removal of disagreeable smells which this acid produces, and they regard it as an addition to their comfort."

Statue for Bradford.—At the last meeting of the Bradford Town Council, a letter from Mr. J. B. Philip, the sculptor of the Oastler Monument, was read, announcing that in accordance with a promise which he had made on the occasion of the inauguration of that work, he was now prepared to present to the Corporation, for the purpose of being placed in Peel Park, the model of the statue of King Alfred the Great, recently executed by him for the Houses of Parliament. A resolution was passed, on the motion of Alderman West, seconded by Mr. Broadbent, accepting Mr. Philip's offer with thanks.

A Belfast Sculptor.—Three statues in Carrara marble, by Mr. Shakspeare Wood, have been sent to Belfast for exhibition. One is a full size and full length figure of Enid waiting on "the three" in Tennyson's "Idylls of the King." Another is a similar figure of the Elaine of the Idylls. The third is a nearly full-sized nude figure of a young girl, who "cometh forth as a flower." There are also several busts of Belfast people by the same artist, and one of an Italian girl. The Belfast Newsletter complains of the treatment of native artists in the province of Ulster.

India.—The Indian newspapers say:—"The Lahore Museum has secured a very fine series of seventeen sculptured heads executed in plaster, all found at Shahka-Dera, supposed to be the ancient Taxila; also a portion of stone entablature, containing a seated figure of Sakya Muni, and another figure standing; and the plans of the projected flying bridge over the Hooghly at Calcutta are nearly completed, and a contractor selected. The rates, fixed by referees, are at present before the Government at Simla for final approval."

Accident at Paddington.—Dr. Hardwicke has held an inquest at Paddington, on the body of John Climpit, a labourer, aged thirty-six years. Deceased, who was in the employ of Messrs. Brown, builders and contractors, was assisting at some works in Chapel-street, Paddington, and while on the scaffold, shifting some boards, incautiously stepped back, where he had just taken a plank, and fell through, a distance of 42 ft. He was immediately taken to the hospital, but expired on the way. Verdict, "Accidental death."

Leyland.—The trustees of the Osbaldeston Charity, Leyland, near Preston, have for some years contemplated the rebuilding of a number of almshouses. On Monday morning last, the senior trustee, Mr. John Keesles, J.F., laid the first brick. The almshouses, six in number, have a good, commanding position, and will be built of brick, with stone dressings, interspersed with blue and white bricks. The architects are Messrs. Myres, Veevors, & Myres; and the builder is Mr. Wm. Alston, all of Preston.

To House Buyers.—Some benevolent individual is advertising at his own cost as follows:—

"BUILT TO SELL.—Inspect new Buildings in carcass unplastered. Beware of heavy ground-rents, repairs, short leases, and old materials!"

The advice is good, and should be taken.

Okum for Lint.—A specimen of fine picked okum, used in London hospitals for lint, has been submitted by Mr. W. H. Pownall, late chairman of the Middlesex Sessions to Lord Lindsay's Committee. It is proposed to employ paupers and criminals in producing it.

TENDERS.

For erection of new Wesleyan Methodist school chapel, Fern street, Bolton-le-Moors. Mr. Thomas Ormrod, architect. Quantities supplied:—

		Allowed for Old Building.
Thompson	£1,230 0 0	£28 0 0
Dickinson	1,220 0 0	45 0 0
Marsden	1,220 0 0	50 0 0
Donaldson	1,190 0 0	60 0 0
	* Accepted.	

For boundary-wall to garden of Dr. Vincent, East Derby. Mr. Henry Thomas, architect:—

Neeson	£145 0 0
Mayes	140 0 0
Hubbard	133 0 0
Lerner	129 15 0
Slipper (accepted)	118 15 0

For the erection of a detached cottage at Rainham, Kent, Mr. J. H. Andrews, architect:—

Miller	£483 0 0
Sampson	460 0 0
Sagot	449 0 0

For the erection of house and stables, High-street, New Brompton, Kent, Mr. J. H. Andrews, architect:—

Tozer	£1,410 0 0
Watkins & Son	1,383 0 0
Gates	1,271 0 0
Hasrick	1,165 0 0
Baxter (accepted)	995 10 0
Reetes	775 0 0

For completion of Nos. 13 and 14, Alma-road, Fender's-end, Mr. W. A. Murphy, architect:—

Couper	£239 0 0
Snaggle & Webster	320 0 0
George	279 0 0
Wison	278 0 0
Whitaker	275 0 0
Pieroe	273 0 0
Parsons & Tilling	269 0 0
Shorball	256 0 0
Hance	241 0 0
Warr	219 0 0
Prasbie	215 0 0
Dease	207 0 0
Norman	192 0 0

For alterations to six houses in Argyle-place, Tonbridge-street, London-road, for Mr. Loraat, Mr. James Roberts, F.R.A.S., architect:—

Matthews	£210 0 0
Ball	339 0 0
Jarman	205 0 0
Taylor, Bros. (accepted)	255 0 0

For pulling down and rebuilding a stable in the rear of No. 16, Lougham-road, Kenilworth, for Mr. H. O. Nodes. Mr. James Robert Furris, architect:—

Fawcett	£355 0 0
Ball	350 0 0
Haley	354 0 0
Dickies	292 0 0
Taylor, Bros. (accepted)	248 0 0

For three houses in the Abbey-road, St. John's-wood, Mr. W. Todd, architect:—

Ebbs & Sons	£3,479 0 0
Simpson & Son	3,365 0 0
Bainworth & Son	3,360 0 0
Phillips & Son	3,334 0 0
Longmire & Burge	3,277 0 0
Higgs	3,243 0 0

For new building, corner of the Poultry and Queen Victoria-street, London, for Mr. James Wheeler. Messrs. John & John Belcher, architects. Quantities by Messrs. Frankland & Andrews:—

Lawrence & Sons	£27,130 0 0
Little	19,863 0 0
Higgs	19,625 0 0
Perry, Bros.	19,094 0 0
Brass	16,223 0 0
J. & F. Coleman	15,629 0 0
Mansfield, Price, & Co.	15,528 0 0
Cannan & Sons	15,480 0 0
Couder	15,480 0 0
Irwin & Sons	15,33 0 0
Henshaw	17,65 0 0
Myers & Sons	17,449 0 0
Jackson & Shaw	16,652 0 0

The Builder.

VOL. XXVIII.—No. 1439.

*The Works of Non-Historic Man in Various
Parts of the Globe.**



VALUABLE work has just been compiled by Mr. Waring, the first sight of which will warm the heart of every antiquary and archaeologist who looks upon it. It is entitled, somewhat vaguely, "Stone Monuments, Tumuli, and Ornament of Remote Ages, with Remarks on the Early Architecture of Ireland and Scotland;" and consists, chiefly, of reproductions in lithographs of most of the leading illustrations that have been given by different people, in different parts of the world, in various works in various languages, of the structural and artistic remains of non-, if not pre-historic man.

We say chiefly, because Mr. Waring has furnished a short reference to the objects on each plate, and sometimes a slight description of them, and points out, when there are corresponding features to be seen in several examples; but his letterpress is not of a length to take from the fact that the drawings are the great interest of the work. These drawings have appeared before in the most scattered places, in ponderous glossy nut-brown tomes a century ago, in the light paper-covered proceedings of antiquarian societies in various countries in England, and in Wales, Ireland, Scotland, in France, Denmark, Switzerland, and Sardinia; in fine, in numerous valuable works delineating the antiquities of Europe, Asia, Africa, and America. Nearly three hundred titles of books are given, in a list, as having been consulted by the author in the compilation of his work. He gives the result of all this search in a hundred and eight large plates, few of which contain less than a dozen representations of objects relating to the early history of man. Thus viewed in one wide array, it cannot be otherwise than a matter of surprise that it has been reserved, for the most part, for our own days to take any appreciating account of the number, correspondence, curiosity, and consequence of these remains.

It is true there were antiquaries in the reigns of Queen Elizabeth and Queen Anne, as well as in that of Queen Victoria. But they were topographers, travellers, genealogists, heralds, or lovers, principally, of Roman antiquities. They did not know a Saxon arch from a Norman one, and most of the older remains they met with were set down either as Druidical or Danish. They ascribed our most masterly and noble Norman cathedrals and priory churches to the Saxons; and every trace of fortification, habitation, monument, or ornament earlier than those, was, in

their limited count, either the work of the Danes who harassed the Saxon Christians, or of the Druids who preceded them. One of the early antiquaries who went farthest out of the track beaten by Leland, Stowe, Camden, and Dugdale, was a Welsh vicar in the reign of Queen Anne, H. Rowlands, the author of "Mona Antiqua;" but he had only one idea upon the subject of the large quantity of pre-historic remains in the Isle of Anglesea. They were, to him, monuments, not of an ancient people, but of their priests. Camps, hut-circles, cumuli, as tumuli were then called, cromlechs and carnedd, as well as circles of overthrown or standing monoliths, were all the belongings of the Druids. "Let no one," he pleaded, "despise, and think the accounting for the affairs and transactions of these men to be vain and frivolous, who have in their time deserved so well of the world, and whose characters and actions were esteemed worthy to be recorded and transmitted to our hands even by the greatest of ancient authors." Strabo, Cæsar, Tacitus, Diogenes, Laertius, Clemens Alexandrinus, Diodorus Siculus, Pliny, Ammianus, Marcellinus, and Cicero, were all quoted in support of his theories on this subject. The Druids were Kelts, and the Kelts were the sons of Japhet, who, gradually crossing Europe, arrived at last at the present French coast; and in the course of a few generations their descendants, longing for new pastures and decrying the white cliffs of England, eventually crossed the Channel, and finally wandered westwards until they came to the uttermost land, the shady island, yness Dowyll, Ultima Thule of the Romans, the actual island of groves that suggested to the ancients their fables of Elysian fields and Fortunate islands, Mona, or Anglesea, as we now know it. This was the creed of an advanced antiquary in the reign of Queen Anne. He knew nothing of the small people of Lap-stature, who wandered and hunted in the primeval forests of Europe, and fished in its blue lakes, and who were eventually driven northwards with their reindeer and other belongings, by a race they called giants, and who called them dwarfs. The caves that sheltered them, and hoarded their castaway implements and other refuse, yielded up their secret, fully, only to the nineteenth century.

Their times are scarcely explored in the volume we now introduce to our readers. But they are not ignored. It is not Europe only that is searched for its testimony concerning them and succeeding remote ages. The antiquities of India, to which attention was turned by Mr. Maurice when George III. was king, have more recently been found to comprise graves, tumuli, cromlechs, and grave-mounds with stone circles around them, of similar character to those in Wales, Northumberland, Algeria, and Scandinavia. Representations of all these are given; while the cave-pagodas and the temples, overlaid with plates of gold and encrusted with rubies, emeralds, and other precious stones, that astonished Mandelocoe in 1638; and Tavernier, Thouvenot, and Bernier, subsequently, are passed over. The French antiquaries who first counted the steep steps up to the temples, paced their marble courts, noted the sculptured porticoes, the agate and mosaic-work walls, viewed the pillars of plated gold, and penetrated into the sanctuaries lighted with pendant lamps and reflections from innumerable jewels, and occupied by idols of stone and thousands of images of gold and silver, would marvel at the present taste and inquiry that sets a value upon poor mounds of earth, marked out by a few unbewn stones, which they passed by without heed. These mounds and these untooled stones, however, tell us a wondrous tale.

Mr. Waring sets his face against the association of unbewn stone monuments with the so-called stone age in the arbitrary division of remote ages into the three—stone, bronze, and iron—

periods lately accepted in what we may, perhaps, call pre-historic circles. He does not believe, either, that all that Cæsar said about the ancient Britons should be taken for granted. The perusal of three hundred volumes on cognate subjects, doubtless, is sufficient to give rise to many misgivings. At all events, the present author sees good ground for dissent to much that has been said. The influence of the Phœnicians in these islands, for instance, is altogether scouted. These early traders, the author says, were the ocean carriers of their day, and that is all. Their settlements could have been no more than trading-stations, or than our "factories" in foreign countries in modern times; and to attribute the least influence to them, either in religion or art, is a mistake.

Mr. Waring follows Professor Worsæe in his division of pre-historic time: two stone periods of thousands of years of duration; the bronze age, beginning in some places some centuries before our era, and in others a full thousand years, and lasting down to about the year 200 of our era; and two iron ages, the earlier lasting from 200 to 450 A.D., and the later from about 450 to 1000 A.D. This gives him a definite period of from 1,500 to 2,000 years to deal with; but it is to the second half of it that he assigns the great bulk of Celtic remains. His sympathies are with the more refined and cultivated people who had bards, riches, chariots, and horses, and whose bards said of them, as Taliesin said of Owain ab Urien, their spears, sharp-pointed, were winged with pain, and they hoarded not, but were ever free of bestowing war-horses to those that craved them;—a grand people surely: not with the small people, whom the Danish antiquary, Sven Nilsson, tells us, they hunted down as sorcerers, and too cunning men. The "drift" is not touched. And the examples of stone tools are not numerous. The author says, "Although a theory which was mooted some short time since, connecting the rough stone monuments with the makers and users of stone implements, and which would have assigned to them a date prior to the use of copper, bronze, or iron, is certainly quite untenable; yet as stone implements are so frequently found, as well as metal, in conjunction with the early graves and monuments, we give some few examples of what they were." These examples commence with some flint arrow-heads from M. Boucher de Perthes's "Antiquités Celtiques." Doubtless, like the bronze spear-heads of the later Kelts, these must have been "winged with pain," for their edges are jagged, and they would make an ugly wound. A flint dagger, a granite hammer, a chalcodony hammer, are given. On this sheet, too, are a stone horse-collar from Glenroy, Scotland, and a stone lamp used at the present day in the Faroe Islands. This modern use of stone utensils points to the necessity of extreme care in the examination of claims to antiquity. "The stone implements of the early rough period, and those of the succeeding polished period," Mr. Waring continues, "are, however, pretty well defined, though the use of both kinds doubtless extended down into the bronze, and even into the iron period, so that their presence on graves as a means of affixing a date to such, must always demand the greatest care and caution." Following these stone pieces is a sheet of urns. Here we are reminded to observe that the ornamentation of a sepulchral urn found in Penzance has a great resemblance to L'Ancrese pottery; that the form of another, found in Derbyshire, is like that of an Indian urn elsewhere figured; that another found in Ireland is similar to one found in Scotland; a fourth, found under a dolmen in Ireland, resembles the form of another met with in or near Anglo-Saxon graves at Brighton, and has also a likeness to the shape of a Danish bowl; a fifth, from a chambered tumulus at Kerlesant, Brittany, has ornament-

* "Stone Monuments, Tumuli, and Ornament of Remote Ages; with Remarks on the Early Architecture of Ireland and Scotland." By J. B. Waring, F.R.I.B.A. London: printed and published by John B. Day, Savoy-street, Strand, 1870.

ation that is akin to that of old Irish goldsmith's work, French metal work, and Danish glass; finally, that a cross within a circle found on the bottom of an earthenware vessel from a cairn, Llandissilio, Pembrokeshire, is also to be seen on the bottom of an archaic Greek vase in the British Museum. Is not this correspondence curious?

Again, the concentric circles, and other marks, first observed sculptured on rocks in this country and Scotland within the last few years are given, and their wide diffusion, or exact correspondence with similar marks in other parts of the world, shown. Mr. Waring takes them to be symbolic designs connected with the worship of the heavenly bodies, and adds, "but what knowledge the makers had of their special meaning we have no means of ascertaining." One example is from a rock at Ballybaun, county Cork; another is from a chambered tumulus, Hill of Dowth: they are contrasted with the supposed inscription from the chambered tumulus, New Grange, Ireland. One of the oldest or most primitive-looking marks is also seen on an earthenware vase found under the lava in the Isle of Theraisie, Greek Archipelago. Similar rude devices appear on a fragment of pottery found in the Cueva Lobrega, Old Castille; on pipe bowls found in North American mounds; on archaic Greek vases in the British Museum; on a rock with cave sepulchre, Lake Superior; in a Sardinian *nuragh*; and, at last, on Buddha's foot, Amaravati tops, India, are to be seen three concentric circles and a central cup.

Curiously, many of the earliest relics of remote ages have this general affinity. Nationalities seem to have bred their own divergences in the course of time. Turning to cromlechs, or cromlechs, as the Welsh vicar whom we have mentioned wrote them in the reign of Queen Anne, or dolmen as they are called in France, we may see there are already examples found in England, Wales, Ireland, Denmark, Guernsey, France, Savoy, Corsica, Algiers, Acheny, Siam, Circassia, Rajnikoloor, Malabar, Hugaritzi, and elsewhere in India, and the attention that is now awakened to the subject will, doubtless, lead to the recognition of a great many more. We may see, too, for some purpose, there was frequently a round hole worked in one or more of the stones forming them; and these instances are also to be found in most of the places named. Circles of upright monoliths, again, are found in India, Ireland, Orkney, Scotland, Brittany, Norway, Sweden, and Denmark, as well as at Abury, Cumberland, Stonehenge, and elsewhere in England. There are the huge poised stones we call rocking-stones, too, in Norway; Tunbridge Wells, Kent; Monmouth; Mende, in France; in the Crimea, near Kertch; and in Northern India; and single stones, or monoliths, generally of a splinter form, but sometimes faintly shaped into the suggestion of the human figure, by the rudest means, are found, in this country, in Sardinia, Tartary, Brittany, Ireland. There are round grave-mounds in Australia, Ethiopia, and China, as much alike as one Kalmouk Tartar's tent is to another; and in the Crimea, near Kertch, there is a tract of tumuli, conical, and in general appearance exactly like the great group on the bank of the river Don. These Mr. Waring associates with the Pyramids at Faioum and Gizeh. Circular tombs, formed with a basement of masonry, from which the earth tapers to a point, are found in Italy, North Africa, and Asia Minor. On the sheet that shows them is a view of the tumulus on the plain of Marathon. The heathen races of Germany appear to have differed from the various Celtic tribes in the number and value of the articles deposited in their tombs with their dead. Lindenschmidt's "Germanische todenlagen bei Selzen" gives some good examples of these graves, and Mr. Waring reproduces them for us. In the stone kist of one was found a woman's skeleton, a gold and red enamelled brooch, a bone sheath, a golden vase, a glass cup, a bronze bowl full of grey ashes, a bronze gilt fibula, an iron knife, shears, a bronze armlet, a wooden comb, an iron buckle, an enamelled brooch, a bronze fibula, blue and red glass beads, and a bronze finger-ring. The largest articles lay at her side, but the small ones were in positions that prove they were placed upon the body. Were they the last gifts of the mourners, or the whole possessions of the departed? Another grave examined in the same work, and shown on this sheet, contained the skeleton of a man, an iron sword, an iron dagger, iron knives crossed, a bronze buckle, three iron lance and javelin heads, an earthenware urn, a glass beaker, and

some fragments of bronze articles. Another example, taken from Bähr's "Gräber der Lieven," shows a skeleton with a torque and a necklace on its neck, with brooches or fibulae on its shoulders, and half a dozen pendant chains on its breast. Two sword-handles and an urn lie by the side of the figure. This Mr. Waring considers late, as Livonia retained the Scandinavian and Teutonic influences down to the twelfth century, owing to its tardy conversion, the first missionary, Meinhard, a German monk, not labouring there till 1185.

Although Mr. Waring dismisses the Phœnicians from any share in the cultivation of the early inhabitants of these lands, he does not do them from all connexion with architectural remains in more southern climes. He commences his work, indeed, with one of the temples, imputed to them, at Crendi, in Malta, though it is only to show that, if this is their work, it has no resemblance to our own stone circles. The plan indicates that this building, formed of large stones, set indiscriminately one over another, as in more ordinary masonry, is of a form best described, briefly, as half a dozen ovals, roughly drawn towards a common central entrance, extending right across the group, four ovals being on one side of this line, and two on the other. This plan has been supposed to represent the mundane egg, believed to be at the base of all ancient religion. The ruin of this temple is known as "Hagiar Kim," which being translated from the Maltese, means "the stones of worship." It has one feature in common with the cromlechs of Ireland, Scotland, Cornwall, and India, viz., the holes mentioned as pierced through the stones. These are of sufficient size to admit of a man being passed through them, which may have been done either as a rite or cure. In the neighbouring island of Gozo there are similar remains, also depicted by Mr. Waring, where these holes again occur, accompanied by spiral and serpent ornamentation, with an altar in situ. But, though attributed by La Marmora, Gerhard, Vassallo, Vance, and Gallabard to the Phœnicians, the author's own impression is, they belong to the people these traders found in possession.

The watch-towers of the Balario Islands are next illustrated. These "talayots" are circular towers, found associated with large upright stones, much in the same way as the Irish round towers are sometimes associated with smaller and later gravestones. They have a resemblance, too, to the duns, or forts of the Shetland Isles, and of the Hebrides. Two, at St. Augustine, Minorca, illustrated, stand about sixty paces apart, surrounded by unheven stone circles, and with stones so placed that they are believed to be altars and tombs. One, at Son Noghera, Minorca, resembles a Sardinian *nuragh*. The general impression appears to be that they were intended for defence. The Sardinian *nuragh*, of which there are some 3,000 remains, according to La Marmora, were depositories for treasure, it is believed as bracelets, collars, armlets, and a great number of little bronze figures have been found in them. They have the appearance of low watch-towers also. Mr. Waring says of them, "That they were places of defence, refuge, and safety would appear probable; and even in our own day, allowing for different requirements, we meet with buildings of a corresponding type in the Martello towers along our coast. Nor is the custom yet given up, in the Caucasus, of erecting similar places of refuge." That they were Phœnician or Carthaginian structures he cannot allow, as there are no remains of similar buildings in Syria, Malta, the Levant, or in that part of Africa which belonged to Carthage. Again, he attributes these buildings to the Celtiberian people, who settled there before any trading commenced. "The most analogous structures we are acquainted with," he continues, "being found only in the islands forming part of our own group, which may also have been raised by the same archaic race, which Mr. Hyde Clark considers to have penetrated into Europe, and then into our own islands, from Asia." One writer, Mr. Tyndale, considers them to be, "temples of sacrifice and worship, built by the early Canaanites." The shielings of the Shetland Islands are given to show their resemblance, as also are the bee-hive structures on the high Alpine valleys, and those of the Hebrides.

Sometimes these huts open out of one another, or are associated in groups so closely together that the plan of them is one ramification. They then approximate very noticeably to the ancient towns or camps found in Northumberland, Corn-

wall, Wales, and Ireland. The Cahernamactierech fort, county Kerry, Ireland, appears to be a connecting link between the two. Here there is an embankment of masonry surrounding a roughly circular space, in which are six huts, of various sizes, destined for different purposes. The entrance is through a narrow way left in the embankment, which is made still narrower, about half way through, by projecting stones. This passage opens into a courtyard, where there is a second narrow way, with a guard-but on either side of it, which, after passing by both doors of these huts, opens into the central space, immediately in front of a third hut, from the doorway of which fresh resistance could be made to hostile comers. In the inner court are three good residential huts. Within the wide embankment, which varies from 11 ft. to 18 ft. in thickness, are three lengths of long covered passages, to be approached only from within the fort; and on it is a small watch-tower. Both walls and huts are built of blocks of grit and sandstone, without cement; and the huts have domes formed of overlapping stones. Very much like it is the fort of Ballyheabought, Fahan, Ireland, also illustrated. And there is a general resemblance, also, to remains of a fort in North Wales, at Aber, and to the tower at Greaves Ash, on one of the Cheviot hills. Specimens given of the masonry of ancient dwellings in Cornwall, Edin's Hall, Berwickshire, and the Temple of Gozo, near Malta, above mentioned, show a marvellous correspondence.

Another sheet of Early masonry shows the attempts man has made in various parts of the world to arrive at the results of the arch, before the principle of it was discovered. An ancient cistern on the Cheroneusus, a section of a tomb chamber, at Tantalais, Asia Minor, and a section of the treasury at Athens, Greece, all show the required curves wrought in the stones; but a tomb at Hagar, on the banks of the Euphrates, another at Kertch, in the Crimea, and a doorway at Uxmal, Mexico, get high-pitched roofs by means of overlapping, square-edged stones. A third plan, adopted in the wall of Tyrris, Greece, and in a cistern at Agrigentum, Sicily, was the slanting forwards of the square-faced stones, which were of a size that permitted of the third course touching and supporting each other. The author says, "It is interesting to remark that the same overlapping method of masonry is to be found also in most of our early chambered tumuli, which may arise from traditional practice, or may serve to show how nature leads men to adopt similar methods for obtaining similar ends, without any necessary intercommunication. In cases where the surface is flat, it is merely because trouble has been taken to cut off the projecting angles, and no inference as to priority of date can be drawn for certainty from the difference of surface." One of the "duns" in the Isle of Mona, Shetland Isles, has curved walls, whereby the summit is much smaller than the base, without aiming at their meeting; and another example of this rare treatment has been seen in the Kilmakadder Oratory, county Kerry, Ireland. Both in tombs and dwellings then man in the remote ages under investigation contrived to get stone roofs in various ways. As a rule, it is to be observed that tombs embody all contrivances used in dwellings. Even the long passages to a central chamber of tombs, as at New Grange, are to be found in dwellings. Mr. Waring gives an Esquimaux hut as one instance of this; and an underground domed dwelling with a long, low, narrow passage to it, at South Uist, in the Hebrides, from a paper by Captain Thomas, R.N., as another. Here the length of the building is 45 ft., and the height of the domed chamber 7 ft. In the matter of entrances there are several very curious resemblances to be noted in this wide survey. A doorway of the Acropolis of Sipylus, in Asia Minor, has the same two jambs in one length, gently tapering, with the same low, wide lintel over them, as that of an ancient building in Eubœa, Greece. Again, a gateway at Norba, Italy, whereof the sides are composed of three large stones, one above another, with a lintel of which the under surface only has been worked smooth, has the same characteristics as a doorway in Templepatrick Church, and the doorway of Cill-sleibhe, Armagh. And the round-headed slant doorway of Ardmore tower is of precisely the same form as that of a similar round tower at Abernethy, Scotland. An early instance of vaulting is shown in the oratory on Inchcolm Island, ascribed to a disciple of St. Columba, in the seventh century.

The round towers of Ireland are confronted

with round towers in Orkney, the Isle of Man, Scotland, Norfolk, Suffolk, Wales, Bavenna, Georgia, and America. Farms are shown, too, in the Caucasus, with round towers of refuge. A section of one shows they contained no staircases. The first access from without, by means of a ladder, landed those who entered in an upper chamber, from which a ladder, again, gave access to the flat, parapeted roof, or through a hole in the floor, to a basement chamber. But all have some points of difference from the Irish towers, except those in Scotland, which were probably erected under the influences of the same traditions. Mr. Waring says he sought diligently for examples of similar structures in the East, as the advocates of the fire-worship theory have referred confidently to them; but he could find nothing nearer than the specimen from Georgia he has given, which is a minaret. This is built of brick, 180 ft. high, and has a double set of winding stairs. From the capital, which is of stone, the Mæzian called the faithful to prayer. The author notes that the word "minaret" is taken from the Arabic of "menarah," a lantern, which association may be the result of their use as night beacons. The Irish towers, he thinks, may have served for this purpose, too, as well as for bell-towers, landmarks, depositories for relics and church valuables, and places of refuge for the priests. But he cannot accept Mr. Westropp's suggestion that they were *fanatics* merely. As our readers are probably aware, there are about 120 of these towers still standing, of heights varying from 40 ft. to more than 100 ft. There are about fifty round towers in Suffolk and Norfolk. These, the author thinks, must be a continuation, with adaptations, of the Irish idea in England. The Welsh round towers are, he considers, purely military. We have culled his own opinions, but must add that he gives those of some received writers, though only cursorily, on the subject, so that the reader is in possession of various views upon which he can form his own judgment. Refinement in curves appears to have been a distinctive feature in every branch of early Irish art. Irish urns are pre-eminently beautiful in this respect. Irish leaf-shaped spear-heads are, for the most part, of excellent forms. The curvilinear ornament in the Book of Kells is a marvel; and the plant curves and interlacings upon Irish crosses, also speak for the familiarity of the artistic mind with curves. We can scarcely be surprised that the builders of these towers should have followed, or partaken, the national taste.

Mr. Waring has ventured to habitate a figure in pre-historic garb, by the light of the vestiges of garments found in Danish mounds. This is compared with an Irishman in the woollen cloths ascribed, by Sir W. Wilde, to the fifteenth century. They have a great resemblance to each other. Both have trousers coming down to the ankle; both have leathern shoes; both have skirts fastened round the waist by a belt, like the modern blouse; and both have loose capes, or cloaks, without sleeves, over all. The cap of the Scandinavian fits closely to his head, and has a flat crown; that of the Irish Kelt finishes with a point. Both have long hair. Mr. Waring considers the dress comfortable and complete, and a corroboration of his view, that the Kelts were much more polished, and enjoyed many more of the comforts and elegances of life, than is generally allowed. His authority for the Danish dress consists of an interment described by Sir J. Lubbock, in which not only the garments mentioned were found, but an extra cap in a box, with a comb, and a bronze dagger with a wooden sheath to it. A second skirt and pair of trousers, with a well-ornamented leathern shoe, have been found in an interment described in Engelhardt's "Denmark in the Early Iron Age." These have a general resemblance to those just described.

The collection of gold and silver work is very satisfactory. Here we have the Tara brooch, with full-sized details, to contrast with the brooch of Lorn. A silver bodkin found in Largo, Fifeshire, is worthy of a second glance, from the fact that the back of the head of it is marked with a symbol found on the Scottish sculptured stones, while the front of it displays a small cross. Was this wrought for some early convert, who engrafted the new faith upon his old convictions, instead of discarding them? A stone figure is given, found in Scotland, which shows that two brooches were worn at the same time, one on each shoulder. The figure or skeleton found on the Livonian grave before mentioned, it will be remembered, was also decked with two

brooches, besides other jewelry. Some of the Highland brooches given are very rich. The curious sceptre and circle ornament found on the Scottish stones occurs in a silver ornament reproduced. And, curiously, on the same sheet there is a horn, richly carved with interlacing work, with the modern date of 1685 upon it. A great many examples are taken from the Copenhagen Museum; and we may see that the Danish goldsmith and bronzesmith had in his mind thoughts identical with those that were wrought out by smiths whose work has been found on Bologna graves, on lamps in Sardinia, and on charms in North Germany. In fine, there is no end to the long thread of observations that can be made by means of this accessible collection.

It is not an original work. It could not possibly be so. But it is a book that will set theories germinating, speculations drifting about, and let wonder loose. Every one who has taken to heart the history of the human race will rejoice in the acquisition of it. But it would have been better, nevertheless, for a more systematic classification of the objects delineated, and fuller descriptions of some of them. The remarks upon the early architecture of Ireland and Scotland, mentioned upon the title-page, are disappointingly brief.

AMONG THE LINCOLNSHIRE CHURCHES.*

A BEAUTIFUL fresh morning, on Wednesday, the 24th, saw our party en route by an early train from Lincoln to Caythorpe, thence to return by carriage to Lincoln, making a raid by the way on the churches bordering the line of operation. Caythorpe Church, about fifteen miles (by road) from Lincoln, reminds the student how desirable it is to look with his own eyes at a building before judging of it. The spire has been sinfully labelled in Wicket's well-known work, where it assumes somewhat the shape of a cucumber. It does, in fact, "tumble home" at the top, to a certain extent, as do some of the other spires of the district,—a peculiarity probably resulting from the ambitious intention, at starting, to build an immensely high spire, the lines of which it was afterwards found could not be safely carried up to their natural point of meeting. The church is nearly all of the Geometrical type, the principal point of interest being the central arcade in the nave, of very wide arches on very slender piers, which carries the ridge of the roof, and abuts with a half-arch against the eastern wall of the nave above the chancel arch. This curious and unusual feature may possibly have been intended to strengthen the tower, or counteract a tendency of the latter to settle towards the west. Externally, a centre buttress in the west front receives the thrust of this arcade, and thus adds a peculiar feature to the exterior design. The external masonry of the nave, it may be noticed, is in alternating courses of grey and greenish-brown stone, producing an excellent effect, probably derived from the layers of brown marl which exist in the lias formation of the district. It is thus that natural variations of material should be utilised by the architect who would render his building picturesque in surface and texture as well as in design. From Caythorpe, a pretty drive of about a mile through undulating lanes brings us to Fulbeck, with its red-tiled roofs, which give such colour to the landscape, and its grey limestone church, which, retired at some distance from the road, on a green lawn, under the shade of masses of heavy foliage, seems like Tennyson's "English Home;—"

"The haunt of ancient Peace,"

Externally the church is mostly of late date, the west tower the latest, and finished by a parapet and rich crocketed pinnacles, of the style so frequently added by the architects of the "rectilinear" period, whose mission it seems to have been in many cases to complete and decorate the towers of their predecessors. Internally the piers and capitals of the nave are of transitional date, perfectly plain. There is a late Norman font (restored); and it may here be observed, that fonts of this early date are very commonly found even in churches which scarcely anything else of Norman work has been left: they seem to have been religiously preserved,—the rather as their preservation entailed no injury to the building. Fulbeck, however, did not possess sufficient architectural

interest to detain the party long, with so much before them, and accordingly the signal was given to proceed. The said signal (as agreed beforehand) was a call-whistle, to be sounded by the leader of the party when "time" was up; and we venture to say that some of the party will not soon forget the sound thereof, and that Othello's "Silence that dreadful bell!" would but faintly represent the feelings of those who were called off from a half-finished sketch of some cunning bit of detail by Mr. Sharpe's inexorable whistle. Dire, too, at such moments was the hasty gathering up of sketching materials, the search for a lost hat (how those hats did get astray!) amid the dark recesses of a sheep-pen pew (for such, alas! exist still), or the frantic exclamations of a young gentleman who wished to know "if any one had seen a two-foot rule?"—a thing which most of us, certainly, had seen. As we had to wait upon railway time, an hour and a quarter was about the most that could be given to each of the more interesting churches; but, nevertheless, there was some good and solid work done, not only in the way of sketching, but in profiling mouldings, capitals, &c., by the aid of the *cymograph*, invented for this purpose by Professor Willis, and since brought into more perfect working form by Mr. Sharpe. Several of these instruments were in the hands of the professional members of the party, and in active employment, and possibly the results of the work may become available, in one way or another, for others than those who were present. Among the ladies, too, who accompanied the Wednesday excursion from Lincoln, and whose society seemed to be highly appreciated by some, at least, of the party, were a few practical amateurs, and one young lady in particular might be seen sketching away at details in every church with a rapidity and precision which argued a practised hand and eye, and which might reasonably have excited the envy of some of the professional draughtsmen present. But we must get on to Leadenham. This very fine church is mainly of late Decorated date, the spire and upper stage of the tower being additions in the subsequent still later style. The spire is one of those lofty erections, with large crockets up the angles, so common in Lincolnshire, but wants the slight flying buttress at the base, which is a usual feature. The large and rich crocketing of these spires, though on a near view appearing to overload the lines of the architecture rather, has a charming effect at a distance, standing out like a row of beads against the sky. Other noticeable features at Leadenham are the blank arches below the bell stage of the tower, with remarkably bold and effective casing; and the fine section, simple, but effective, of the nave-piers and tower-arch, and still more the base-course of the exterior, a model of effective moulding for such a position, and which is to be found in nearly similar proportions in other churches of the neighbourhood. The south side of this church is richer in design and decoration than the north, another not uncommon characteristic. It is suggested that this difference was probably owing to the difference of sunlight on the two sides. The spire, with its grey stone partially covered with very delicately tinted green moss and lichen, exhibits an exquisite bit of natural polychromy. A mile or two further brings us to Welbourne, a church of great interest, mainly of "curvilinear" date, the tower up to the parapet being lancet, and remarkable for its bold and massive treatment of stair turret and buttresses, and the clearest being of rectilinear date. The spire (curvilinear) shows the same curious falling in towards the top which we noticed at Caythorpe. The north porch, with rich canopied buttresses and niche over the door, is a beautiful specimen of the Decorated style in its perfection, though unfortunately rather dilapidated. Outside the east wall of the nave is not only a good gable cross, but one of the few specimens left of the little canopy or bell-cot projected from the gable, to hold the "sanctus" bell,* which was always hung as near the altar as possible, so that the priest could conveniently ring it to announce the sanctus. The present specimen is a very pretty feature in good preservation, and in the church is preserved what is stated to be the original bell. A peculiar and not pleasing

* Called also the "sacring bell," as in the taunt of the courtier in "Henry VIII.," to Wolsey:—

"I'll startle you
Worse than the sacring bell, Lord Cardinal,
When——"

But under what circumstances the Lord Cardinal was supposed to have been startled we will leave to the recollection of our Shakspearian readers.

* See p. 678, ante.

external feature in the church is the stopping of the member of the base-course on each side of the aisle windows, to allow greater length to the latter; and another peculiarity, internally, is the existence in the clearstory, between the windows, of wide and rather shallow niches, six on each side, with four-centred cusped heads; these were suggested to have been receptacles for statues of the apostles. The internal masonry here, as in many of these churches, is left uncovered, and is beautifully regular and closely set, with joints where no mortar is visible, but where the blade of a penknife could hardly be inserted; contrasting strangely with the "restoration" walls of the chancel, where the stonework is also left bare, but where the trick known as "tuck-pointing" has been indulged in, depriving the masonry of all character and expression. The little church at Wellington, standing on one of the few bits of high land in the district, need not detain us long, the thing best looking at in it being the "poppyheads" of the oak seats, of late date, and showing a very effective appearance produced by a very simple treatment. Navenby, a mile further, is a church of great interest, though irregular and somewhat tame in external design, with the exception of the beautiful flowing tracery windows of the north aisle (very similar to some of the Heckington windows). But, internally, the fine chancel, of curvilinear date, contains treasures in the shape of sedilia of exceptional beauty on the south side, and an Easter sepulchre and monumental arch on the north; the latter (very probably the founder's tomb) is an exquisite piece of work, consisting of a deeply recessed segmental arch, finely moulded, with a low straight-lined, richly-crooketed canopy over, forming a tangent to the arch, and meeting at right angles over the apex, where it finishes in a finial of great beauty; the spandrels also being filled with carving, and the recess overhung by a foliated drop-arch below. It is worth a visit to the church merely to study this one feature. From Navenby to Coleby, a drive of a mile and a half brings us to another little church, but of considerable interest, both on account of its Norman tower, without buttresses and with the thin, flat masonry characteristic of very early work, and internally on account of its Transitional and Early English capitals, and also its Norman font, a capital well-preserved (and un-restored) specimen in the form of solid centre bowl, with interlacing arches carved on the outside, and detached shafts with capitals giving a square form to the whole. Harleston is interesting only for a bit of Norman work in good preservation; but Waddington, the next church visited, mainly an early "Lancet" structure, is remarkable for the beauty of its carved capitals: indeed, it may be said that the beauty and variety of these capitals of the Transitional and Early Lancet date cannot be fully appreciated except by a circular visit to the churches containing them, passing in review the various forms which they take, and noticing the evident experiments in new effects traceable in various situations. A little detour from the intended line of route rewarded the party with the sight of a little church (Canwick), which would scarcely hold their numbers, almost entirely of Early Norman, in remarkably perfect preservation. Some painters were diligently engaged here, under whose direction we know not, in covering the walls with alternate parallelograms of white and grey paint, in imitation of a parti-coloured masonry! The schoolmaster had not got out here, apparently. "And so home" (as Popsy phrases it) by a charming drive to Lincoln; for there is much to be said after all for the beauty of these nearly flat districts. From Wellbourne back to Lincoln we are on the ridge where the lias and greensand meet, with the white limestone road before us, the land falling slightly on the left to the plain—

"That sweeps with all its autumn bowers
And crowded farms, and lessening towers;"

to the point where land and sky blend, with shower and sunlight passing over it (for it was quite a "painter's day"), and occasionally a white spire appearing actually to sparkle in the middle of the blue distance. Some of the party, too, will not soon forget the grand aspect of the cathedral as we slowly approach it from the south-west, still less when we wind round to the top of the hill to find the scenery of the western façade all glorified with the glow of the level sunlight, which works cunning magic of light and shadow in the arcades and in the recesses of the south-west porch, and brings the whole into such a rich and solemn harmony as will fill the memory

for long after. Peace be with the builders who left us such a legacy!

Farewell, however, to Lincoln; for, after an unmentionably early breakfast next morning, we have said good-bye to our civil host of the White Hart (whom we recommend to all those who prefer the obliging courtesy of the old-fashioned "house" to the manners of the modern "grand hotel," where you are served as a matter of condescension); farewell, too, to "Steep-hill" (after the manner of Byron's "Farewell to Malta"—

"Adieu, ye cursed streets of stairs—
How surely he who mounts ye swears!"),—

and at 6.35 we are off to Sleaford *via* Boston, to see what that neighbourhood has to show us. At Sleaford Church the interior masonry has been a good deal restored; and, though a large, fine building, it does not present much of special interest. Externally, the heavy massive west tower and spire give great dignity and effect to the front, but with rather a want of refinement; there are some remains of Norman work in this front. There is a fine Decorated window in the north transept, and the west chapel of one of the north aisles (for it is a four-aisled church) shows an inverted arch of construction between chapel and aisle exactly like the well-known feature at Wells Cathedral. We feel more interested, however, with the smaller, but earlier and more artistic church of Silk Willoughby (there must surely be histories attached to some of these quaint names of the Lincolnshire villages), the tower and spire of which are simply exquisite in their unpretentious beauty of line and detail, the latter just giving sufficient richness without interfering with the composition: the wave-line parapet of the tower resembles some of the better known work at Heckington. A remarkably good south porch, and a Norman font, rather peculiar in design, are among the attractions of this charming little church. A fine drive, partly round the outskirts of a park and past a noble avenue of trees, brings us to Osournby, the chief interest of which is centred in the fine sedilia of the chancel, with the rich, heavy crocketing and foliation characteristic of the Decorated period. Another Norman font, and some oak seats of late date, are to be seen here; and the tower (the lower portion of which is lancet), though low and square in proportion, is worth attention for the simple and effective play of line obtained by means of the shallow buttresses and set-offs on its face. And here let us hint to the architectural student, when on his sketching tour, not to confine himself to sketching what is called "ornamental" detail only, but to take account also of all happy incidents of design obtained by the mere contrast and opposition of wall-surface, and of the lines and working of the masonry; one of the most purely architectural sources of effect, and certainly one of the most durable. We come next to Threckingham, concerning which there is the less to say, since it has been pretty fully illustrated by Messrs. Bowman & Crowther ("Churches of the Middle Ages"), whose drawings, however, admirable as they are, scarcely give an idea of the peculiarly fine aspect of the geometrical tower and spire, with its high broaches with curved entasis line, the whole of a sturdy simplicity of proportion and detail, which would be laughed to scorn by the "committee" in a modern competition, but which may possibly be standing when some of the "competition" spires have tumbled down. The early transitional (round-arched) windows of the chancel possess remarkable beauty and interest, and also the west respond pier of the nave and the capital of another pier now built up in the north wall of chancel, and of later transitional date, with very beautiful and effective carving. There is a lancet font here; and the nave arcade (except the respond alluded to), is of the most admirably early Geometrical work. There could not possibly be a greater architectural contrast than between the tower and spire at Threckingham and that at Billingborough, which may be taken as almost typical, both of the faults and the merits of the late curvilinear spires so common in the county. The proportions of the spire are somewhat scanty (though less so than in some other better known examples), and the thin flying buttresses peculiar to these spires here reach the climax of starvation, having almost the proportions of cast-iron, and having, naturally, sagged visibly at the joint. But, on the other hand, the "aspiring" expression here reaches a climax undisturbed by anything

in the design that can conflict with it; the lofty tower rises to a great height in an almost unbroken course of grey masonry, in splendid preservation, finding expression only in the tapering lines of the buttresses, and the one simple two-light window with which each face of the belfry-stage is pierced, and culminating in the lofty spire which almost seems to continue the line given to the eye by the buttresses of the tower below, so sharp is its angle. The junction of tower and spire, indeed, was a problem which the late curvilinear architects rather ignored than solved; the parapet is placed to conceal the junction, and the spire commences a second stage of the design, almost independently of the substructure; but, despite this inherent defect, Billingborough Tower is a noble work of architecture, and well deserving of study. Ten minutes will bring us to Horbling, a cross church, with a central tower, which has played cruel work with the substructure, and aptly illustrates the masonic proverb as to the un-sleeping qualities of the arch. This chancel arch, of Transitional date, has settled to such an extent that the arch,—not a very large one,—is at least a foot wider at the impost than at the base, and nearly all the piers of the nave arcade have been thrust over more or less towards the west. Insufficient foundation has of course been the main cause of this state of things, which the rector of the church informed us, with an enviable philosophical calmness, was "still going on," the masonry having lately shown indications of settling further. Prayers should certainly be offered up in the neighbouring churches for "a congregation in peril." A tomb in the wall of the north transept, with armorial bearings carved below, and a dilapidated and almost grotesque bas-relief of the Resurrection above, probably of the fifteenth century, is of interest; and also the capitals of the chancel arch, Early Transitional, in which the Norman scollop capital is decorated on the face with a pattern of semicircles worked in little beads below the abacus, and one member of the abacus decorated with a kind of fluting: the effect is very pretty, and gives quite an elegant expression to what is in its foundation only an ordinary Norman capital. The late Norman sedilia in the chancel are worth notice, and also a curious form of the zig-zag ornament under the south window of the chancel. The Geometrical piers in the nave contain some beautiful designs in the caps. Swanton Church, a mile or two farther on, has a remarkably interesting chancel of lancet date, the wide internal splay of the windows marking it as rather late in the style, and the exterior showing some of the most beautiful and picturesque masonry, in rather thin courses, that could well be seen. The picturesque of masonry was certainly better understood in the earlier than in the later periods of Gothic art; it is, perhaps, the first source of effect to which an early building age naturally turns; or is it that the unsophisticated employment of stone simply in the manner in which it is most stable results of its own accord in rendering such masonry pleasing and satisfactory to the eye? The piers here, of the Decorated period, are remarkably fine, and the crossing piers also (of earlier date); and the belfry of the tower is roofed by a good groining of late curvilinear date (probably). The tower at Helpringham, where we arrive next, is very similar in general design and proportion to that at Billingborough, the spire, however, being a little heavier and crocketed at the angles, and the thin flying buttresses also carrying large crockets on the upper side, with somewhat singular effect. Here again we find beautiful and picturesque masonry, this time internally, in the nave walls, where the irregular courses of small stones, bound together here and there by a straight course of squared stone driven through them, form quite a picture of expressive masonry. The chancel contains beautiful early geometrical sedilia, with foliated drop arches springing from a cap which is quite an epitome of Gothic art of the period in this feature; there is no carving, but within a depth of 4 in. (excluding the bell of the capital) is a cluster of little mouldings, of nine or ten different members, executed with marvellous care and precision, and forming quite a study of the art of moulding an abacus. The west doorway, a remarkably fine one, has been illustrated by Messrs. Bowman & Crowther, who have also so fully and minutely illustrated the splendid church at Heckington as to render it almost superfluous to give any description of it here, further than to remark that the large window of the north transept, a comparatively

recent restoration in the Geometrical style, is absurdly out of keeping with the building, being, in fact, earlier in style than any feature of the original structure, which is entirely of the Decorated period. It is to be hoped that steps will shortly be taken to remove the wretched roof over the chancel, the tie-beam of which cuts off the head of the east window, and shows below the chancel arch. One remark is suggested by the tower of Heckington, viz., the importance of considering the design of a tower and spire, with regard to the outline it will show at a distance, when all detail is lost, as well as with reference to near observation. Fine as the tower and spire of Heckington are, the effect at a distance of a mile or so is anything but satisfactory, as the large angle pinnacles and flying buttresses, rising high above the corbel table, give to the composition at that distance a high-shouldered appearance, depriving the spire, to the eye, of half its length. The thick pointing of black mortar laid on the joints of the internal masonry during recent restoration has a very bad effect, quite destroying the tone of the interior of the building. It is a thing that should not be repeated. From Heckington we adjourn to Boston as headquarters, but our remarks on the south-eastern churches of Lincolnshire (the most interesting of the series visited on this occasion) we must defer until another week.

MARGATE AND RAMSGATE.

THE Isle of Thanet watering-places, the long-tried trio, Margate, Ramsgate, and Broadstairs, not merely retain their old, but show an increasing popularity. The people of to-day seem quite willing to say, with the ancient illuminator who wrote in his church at Monkton, on the island,—

*"Favula rotunda Tanatus quam cunctis unda,
Fertilis et manda nullis est in orbe secunda;"*

which has been recently translated,—

*"Isle Thanet is round, wave and water abound;
'Tis fertile and fair, the like is nowhere."*

And certainly Isle Thanet has many charms, if only in the shape of an open sea, fine air, charming landscapes, and historical associations of the deepest interest, too seldom thought of and followed out by its pleasure-seeking frequenters. A great start is to be made at Margate westward, as we briefly mentioned some time ago, the Hartdown estate having come into the market. Two hundred new houses will shortly be added to the town in this direction, close to the two railway stations; and a large hotel, communicating with the London, Chatham, and Dover Station by a covered way, somewhat after the style of the Lord Warden Hotel at Dover, is about to be erected. The rapid increase of the town during the last five years and the great success of the large Cliftonville Hotel, on the Fort, show that the new enterprise, the land being so much more easily reached, is a promising one. We may find an opportunity presently to speak more fully of it. Margate jetty is to be enlarged and improved; and the directors have offered three premiums to a limited number of engineers for the best plans for effecting this at the cost of about 11,000*l*. The jetty has become such a favourite place of resort,—a remarkable feature of the town, in fact,—that money well spent upon it will bring a good return, and benefit the place.

Broadstairs still remains the quietest of the sisters three; although very full, there is less of the excursioning element about it,—less flashing in and dashing out. Excellent "Murray," by the way, says, "The breadth of the sea-gate gave name to Broadstairs." When, however, we find that in ancient days, there was a chapel here, (indeed, portions of it still remain), to "Our Lady of Bradestow," which can scarcely be so translated, this asserted derivation seems another example of the substitution of the probable for the true.

In the case of Ramsgate, the apparent derivation of the name gives the place a sort of precedence in Thanet, which the Ramsgate people should not forget. It was the Thanet gate (or opening between the cliffs) *par excellence*, *Ruim* being the name the Britons knew the island by: it was the Saxons who afterwards called it Tanet, with some reference to its display of fire-beacons, and the old geographers made it Thanatos. That *Ruims-gate*, with its noble pier and other advantages, is now doing its best to maintain its precedence, we will not say. Very little care seems taken to make the most of its natural advantages, and increase the beauty of the place. We

may point to the miserable surroundings of the Sands so much frequented, to which there is no proper entrance; an untidy stone yard, and the utter absence of anything like art, or even care, characterise the spot. The appearance of the locality seems to have an effect on the visitors to it, for never have we seen there such ill-dressed and ill-mannered crowds as have been assembled during the present season. From a sanitary point of view, by the way, while on the sands, we would point out to fond mothers that to tie up children's dresses, and to set them half naked paddling about in the pool of sea-water left on the sands as the tide recedes, is by no means a safe practice, especially in the case of delicate little girls, with a sharp wind blowing. Incalculable mischief must often be the result.

The briskest street business in Ramsgate is that of boot-cleaning,—not merely blacking, but whitening. If half the energy and activity to secure customers exhibited by the poor boys engaged in this occupation were uniformly shown by men, either in the pursuit of knowledge or business, probably fewer complaints of "bad luck" would be heard.

A number of small neat houses have been built lately in the suburbs of Ramsgate, and some of the more recently-erected shops in the town look bright and tasteful. The most important building operation, however, is the pile of brick and stone edifices in Gothic style on the East Cliff, forming the Granville Hotel. The hotel proper, at one corner, includes, with other good rooms, a fine ball-room, quietly and tastefully decorated, with a stage for concerts or plays. The chimney-piece is handsomely carved, and has inscriptions, which is also the case with the entrance doorway, where visitors may read,—
"Through this wide gate, none can come too early, none depart too late." The external elevations are effective and sensible. In connexion with the hotel are gardens, lighted up at night, and an excavated passage-way leads to an esplanade below, and the beach.

The clever, if somewhat erratic, architect of the pile was committed for trial on a charge of libel, on the day we were in Ramsgate, but will, doubtless, put the matter straight in due time, and act up to his motto, "*En Tant*." This new part of Ramsgate is to be called St. Lawrence-on-Sea.

The real St. Lawrence is half a mile inland, and has a Norman church modified in later Medieval times. The main columns within are Norman, bearing pointed arches; and the Norman tower, now covered with rough-cast, has a semicircular arcade around it, above the roof of the church. The building was restored four or five years ago. A good brass to Nicholas Mauston, 1444, formerly in the floor, is now affixed to the north wall. If the visitor travel about a mile farther, he will find what was the residence of these Maustons, Manston Court, now a farm-house. One of the ancient buildings, unroofed, still remains. The walls are of flints and boulder-stones, and the mortar is as hard as the flints. In this same direction is Osengall Hill, the site of the Saxon graveyard that was opened and investigated some twenty years ago, with most interesting results; close by being Pegwell Bay, where St. Augustine landed, at the end of the sixth century. The burials were of an earlier period than this, and included some of the Romans who had remained to enjoy Thanet. The views at this point were charming then, and are charming now. On the occasion of our visit, the sea was sparkling with a million of diamonds, the earth was an emerald, and the sky a sapphire.

LEWES, IN SUSSEX.

READERS of the *Builder* know what an interesting old town Lewes is, with its priory ruins in Southover and ancient castle. That Lewes was well-known to the Romans no better proof can exist than the collection of coins, medals and other vestiges of Roman art discovered in or near Lewes, or through the extent of Sussex. The town of Lewes, we need hardly remind the English reader, was the scene of a memorable battle between Henry III. and the barons and their retainers, led on by Simon de Montfort, Earl of Leicester.

A splendid view can be obtained on a clear day of the town and its environs from the castle's height. Outlying and stretched underneath, every object of picturesque or romantic interest in and about the place can be seen, the priory ruins and all the parish churches in the town

and vicinity are brought forth in full relief to view. Around its six or eight parish churches hang incidents and memorials of more than local value,—memories running back to Saxon and Norman days, of Danish princes and Danish doings; of charitable bequests; of good and great men, who did good works, and impressed their names upon the mind of their age.

In our more modern days Lewes can muster a respectable roll of more than local celebrities.

Towns or cities, any more than individuals, cannot exist on recollections, no matter how glorious or refugent they might once have been. Towns and cities must be possessed with a recuperative power,—an energy, an industry, *adscriptus gleba*, or they cannot progress. When we speak of a town in this manner we mean its people. The people of Lewes have a town worth preserving; but, to preserve it, its public boards must repair and improve it. Antique structures will not always last; stone will decay, brick will crumble, and the old memorial oaken beams with their carved imagery and fantastical datings will collapse in time into moths and dust.

As Lewes is looking up in sanitary matters, and ambitious to present a fair face in company with Brighton in many things, the authorities cannot feel offended with us for throwing out a reminder or two.

The situation of the town of Lewes is favourable to its development. There are probably but few of our readers who have not heard of the "Southdowns" as a name applied to "flocks." The title is derived from a series of hills of that name in Sussex, and Lewes lies partly under the western crest of these rather bold and steep prominences. Though affording pasturage to cattle, these hills about Lewes are not rich in under-soil, being of chalk formation. The Ouse winds round their base, and the town may be said to be situated on the river.

To be sanitary wise is to be wise otherwise. To ventilate the cellars and attics of the poor by free air and free drainage is to keep plague and sickness down. To utilise waste material is to create capital; and this Lewes can do with advantage to itself and the surrounding district. The streets of Lewes might be kept in better order; the side channels could be made more distinct, and the main footways raised a little higher over the level of the roadway. The County Hall is a very good building. The county gaol is sufficiently commodious for its purpose. The main thoroughfare is lighted tolerably well; but the side streets might be rendered more passable. Waterworks in Southover supply the town, but the water has rather a chalky taste for London palates; but, then, use is a second nature.

We have not heard yet that Lewes has turned the sewage to any profitable account, though in the bed of the Ouse, in the town of Lewes, as well as at Newhaven, eight miles distant, there is ample raw material for agricultural purposes. The town is admirably situated for a thorough drainage.

To and from Lewes to Newhaven there is a trade by boats in coals, timber, malt, and corn. Some years ago there were respectable ironworks in Lewes by the Ouse, and in the last half-century cannon were manufactured here. A gazetteer in the middle of the last century, in speaking of Lewes and its trade, added that "the roads from hence to Tunbridge are so deep and dirty that the ladies are sometimes drawn to church on Sundays in coaches by oxen." There was no need of a "drag" in those days for the carriage wheels, the pull was always on the one side; but a drag would be very necessary to-day in Lewes in descending many of its very break-neck streets and cross lanes.

With public courts and assembly halls, mechanics' institute, memorial library, and baths, shall we say we think that the town ought not to stop short of putting up two or three public fountains; and, as it takes a pride in a long muster-roll of local celebrities, it is strange that it does not erect a public statue to even one of the number. How is this? Is there no room in the High-street, north or south, no niche or indent anywhere, where the public spirit of prosperous Lewes can perpetuate an honoured name, set up an example, and thereby honour itself? Could there not be also a public park laid out for the inhabitants, where trees and shrubs, soft velvet grass, fountains, and flowers might grow, to woo the weary from their cares, and to cheer the tired worker after his toil. Let Lewes look to this, and earn the position desired. The South-down declivities may be climbed over by the four-footed, but they are rather steep and

undulatory walks for sober-minded or invalided townsfolk to scale in search of recreation and air.

In railway accommodation, the town is pretty fairly served by the London, Brighton, and South Coast Railway.

It will be remembered that the western keep of the castle contains the museum of the Sussex Archaeological Society. The collection, though small, is interesting. Lying outside the wall of the western keep two mythological marble effigies, one of each gender, are done penance, or, in the words of Father Prout,—

"Standing naked in the open air,"

and near are to be seen the remains of an old Saxon or British canoe and a small cannon, turned up during some excavations in the district.

Morally and intellectually the town of Lewes is well represented at present. She has churches, schools, asylums, workhouses, and prisons; and three local newspapers to supply the literary pabulum.

THE LATE DANIEL MACLISE, R.A.

The Council of the Royal Academy appointed Mr. Edward Davis, sculptor, to execute a marble bust of the late Daniel MacLise, to be set up in their gallery to his memory, and the model is now in the sculptor's studio. MacLise sat to Mr. Davis some years ago, so that the bust represents him in early life. It is a beautiful head, full of life and animation; the hair is, perhaps, a little over massive, but none who knew MacLise even in late years can fail to recognise the likeness. The Council have been fortunate in their selection.

In the notices following the lamented death of this great artist, many inaccuracies were committed as to his early days and later opinions. One may well ask who is to write history, when we find as to a man born in our own time, and living amongst us, neither age, name, country, nor parentage, is correctly given. The fact is, there was a desire in after-life to forget the early days, and it seems pretty clear that at one time, at any rate, MacLise strove to show that he was not an Irishman, but a Scotoman; but this was only a passing weakness. From the minister of the Presbyterian Church, Prince's-street, Cork, we learn the true circumstances of his birth as recorded by a predecessor in the ministry, the Rev. T. D. Hincks. It seems that in the month of March, 1797, the "Elgin Fencibles" came to Cork to do duty, and attended regularly at public worship in Prince's-street. On December 24th of the same year, "Alexander McLish, soldier, Elgin Fencibles" Regiment, was married to Rebecca Buchanan, daughter of Mrs. Buchanan, of the Almshouse, with the consent of his officers and in presence of his serjeant. The offspring of this marriage consisted of five sons and two daughters, the eldest son, Daniel, afterwards R.A., being baptized on February 4th, 1806,—that is, five years previously to his reputed birth! Alexander, before this time, had given up "soldiering" and taken to the craft of shoemaking. He lived in Castle-street, and afterwards removed to South Main-street, where he kept a lather-shop. His wife, Rebecca, familiarly called "Becky" McLish, was for many years employed as a pew-opener at the Prince's-street Church. Young McLish (or, as afterwards spelt, MacLise) was sent to an English day-school in Cork, and was early known as a clever sketcher and painter of soldiers, horses, and artillery, executed on pieces of cardboard, which he sold to his schoolfellows.

The late Richard Sainthill, F.S.A., early aided him in his education, and Sir Thomas Deane, the architect, always a friend to rising talent, was afterwards amongst his friends, and bought many of his sketches. When MacLise first came to London he lodged with a Mrs. Pearce, in Arundel-street, Strand (not Norfolk-street, as stated). He was at that time in somewhat straitened circumstances, and had to work hard, but soon made his mark, and when he died his will was proved under 40,000*l.* personality.

MacLise painted one of his two sisters, Isabella, in several of his pictures; she is the most prominent figure in "Snap Apple Night." MacLise was a well-educated man, of a refined and gentle nature, an excellent writer, and a good poet.

Green Slates from America.—It is stated that green slates are being brought from Vermont, U.S., for the English market. Surely they can be produced more cheaply at home.

THE TRUE SYSTEM OF ART ACTION.

IN the endeavour to help to bring about a better and more truthful state of things as regards the executive artists of the time, whether workmen or acknowledged "artists," it is not a little difficult to determine where and how best to begin the work, even if in idea only. In all great contemplated changes there are always two ways open: the one is to try and reform and improve some one old and accepted institution already at the work; and the other is to initiate, at least in idea, an entirely new institution that shall, as perfectly as possible, represent and realize the improved or organically new method. It can hardly be doubted that the art action of the Royal Academy, with all its shortcomings and injustices to the so-called inferior ranks of artists, is the best and most valuable now in active existence, in this country at least; but what chance, we may ask, is there, even in the improved position of the Academy, of any change in its system of art action, what probability is there that the Academy will alter its mode of artistic action, or make any sort of change in that system which satisfied Sir Joshua Reynolds and Sir C. Eastlake? There is in reality none; nor do we find elsewhere any institution at work with the proper conviction as to the very foundation and primitive cause of true artistic action—*viz.*, the *distinct personality and individuality of the executive artist*. We have, therefore, to begin again, and can only regret that there is no more direct help. If ever there was in the world a "clear stage," it is here. There are two things which must be kept in mind by the student who would understand this now almost unthought-of subject of a true and living art action; the one is that nearly everything remaining of the past has been more or less "restored," or is now in a rapid process of restoration; or, in other words, the whole or a part of the real and true impress of the mind and hand of the original executive artist has been obliterated, or is now being obliterated, and in some instances, as in the British Museum, actually washed away by powerful chemical agents, to clean them, as it is termed. So that, melancholy as the fact is, the old art is fast disappearing, and all evidence of its truth and strength going with it, indeed reducing it to the condition of modern manufactured art. This is the first art fact to be kept in mind, and the second is the fact that the Royal Academy yearly exhibition of cabinet pictures is the only living and active evidence of the capacity and skill, and at times genius, of the artist as an individual being gifted with artistic power. There are, of course, now and then, exceptions to this almost universal rule, but generally and broadly and, as a principle of art action in these modern days, and as a fact, no one can or will dispute it. This is a deplorable state of things enough, but it is at the same time not a little encouraging; for it assures us that the great principle involved in it is a true one, and of the very first moment, otherwise we should have a regular *manufacture* of small oil-pictures, worked out and published like plates and dishes and architectural perspectives; but this being, strange to say, impossible, the great and primitive fact is established that *personal artistic power is a thing ordained by nature, and a necessity of true artistic action. It includes the really creative power in art.* Thus shortly may we see two distinct forces at active work in these modern and scientifically-enlightened days of art: the systematic destruction of the old art *handwriting*, and the solitary fact of the old system or method of producing it, still in living action, it is true, but confined to a very small section of living artists, and almost to a single institution; and yet is this art action in the life of to-day, and in the preservation of what remains of it from the past, the most important subject which can possibly occupy the attention of those who are in any wise interested in the well-being and progress of art and the future of artists. And let it be observed that this is not mere theory and ingenious speculation, curious to think about, but practically useless and inoperative! It is, on the contrary, the great principle which will and must rule the future of practical art and the action of working artists.

But, lest any one should think this subject one of mere theoretical or speculative interest only, we may remind him that at no time in the history of art or architecture was there the occasion there is now for a full and fair inquiry into this most vital of art subjects. The high

artistic value, and even educational importance, of such buildings as Westminster Abbey, St. Paul's Cathedral, the Temple Church, and so many others, is beginning to be felt; and one of the natural consequences of it is, that their incomplete state as regards decoration, as it is termed, is become matter of notoriety and public interest. But the great question then arises, What is art and decorative art, and how may it best be brought into actual existence, and by whose instrumentality? This is the art question of the time. Now, there are two answers to this momentous question: the one is that art is the result of the combined action of the *hand* as well as the mind of the executive artist, and can be produced only by the combined action of the hand and mind in and through one individual; in short, and to make our meaning perfectly clear, art is the artistic *handwriting* of the artist. This was the old system of art production, and from it came all such work as the Parthenon and its sculptures, the Sistine ceiling frescoes, the Raffaele cartoons, fortunately not yet destroyed, and St. Paul's Cathedral and Westminster Abbey. The other and modern and fashionable system now in vogue and in practical action everywhere is the direct reverse or opposite of this; its principle is that art can be produced by the combined action of a number of minds and hands working together, or one after another on the same art object, these minds and hands being directed and overlooked by another single artist mind, with its hands in its pockets! This is now the universal idea in operation everywhere; and the whole range of objects which we see everywhere about us are the results of this system. Most of the architecture, public statues, and sculpture coinage, and the whole of decorative painting in churches and music-halls, theatres, and club-houses, and everywhere else, is produced in this way. There is little art *handwriting* anywhere to be met with, no results of the personal power of hand of the executive artist, and cannot be while the present idea of art-production lasts and continues to be endorsed by the public. Such a system as this is, in reality, fatal to real art; because whatever the personal power of the executive artist may be, it can never, as things now are, show itself; for one man fairly blots out the work of another, and the final result, no matter how costly the work, is not art, but *art-manufacture*. We have said that this important and vital subject is, at this present moment, rendered the more especially interesting and pressing from the fact of the proposed decoration, as it is termed, of St. Paul's and Westminster Abbey, the two great churches of London. St. Paul's Cathedral is asking for a quarter of a million of money to cover it with either art, fine art, and art-hand writing, or mere art-manufacture; and the great problem is which of these two systems we have spoken of is to prevail. Is St. Paul's to be "decorated" like a common music-hall or theatre or smart drawing-room, with decorators' work, artistically no higher than paperhanging and graining, or is it to be covered, partially at least, with great painting by *bona fide* artists, as is the Sistine ceiling, or the chapel of St. Paul, Parma, or our Whitehall Chapel, by Rubens? Is it to be the work, in short, of tradesmen and common workmen, or artists and Academicians, or, at least, Academy students? Is it to be the result of the old system of art action, or the new? Let us put this quite plainly, and within the comprehension, as a matter worth a little thought, of all. There is a quarter of a million of money to be spent in impressing on the interior of St. Paul's Cathedral, the pride of London, some pictured thought or other worthy of the building and the city it is in, and the wealth and intellectual progress of the people who call it theirs. A few years back, the whole of this interior was of plain and bare, but at least honest, stonework. Modern art painted it over with four coats of common oil colour, in imitation of stone as fresh from the quarry; and over this, in the choir or east end of the church, "decorative ornament," as it is termed, has been added, by way of showing what is intended all over the church. Exeter Hall shows a building completely decorated in this way; and the question then comes, is there, or can there be any sort of interest, good or bad, artistic or otherwise, found in such a mode of covering over the bare natural material of which the inside of a building is composed? Which is best, plain stonework or random painting of panels and mouldings to imitate real mouldings, and details of ornament to imitate the real ornament, which it would

be cheaper to use if cast in plaster and stuck on to the plain flat surface of the walling or roof? But the nave of St. Paul's is as yet free of decorative art of any sort except the four coats of common oil colour: let us suppose, therefore, that instead of the whole of this end of the church being covered with manufactured ornaments and colours laid on by mere workmen in accordance with the modern system of art production, and with a consequent result totally devoid of artistic, or mental, or manual interest, the first or antique system of art production be insisted on, and that painters be employed to do the work whatever it may be. Let us go a step further, and suppose only sufficient funds be raised for the decoration of one single bay: which is best or worst of the place and people who own it, or most likely to induce a second visit to St. Paul's to look at the work? It will, we think, hardly be doubted that the old and primitive system is the best; and that it is infinitely better to have in St. Paul's but one panel painted by a painter, one picture worthy the name of picture, than to see the whole building covered with colours and ornaments all the mere results of business arrangements and impersonal labour! It is not possible to imagine for a moment any progress in art until the old system of art production is again in active operation; and where so good a place to begin it as in the happily unoccupied and empty nave of St. Paul's Cathedral?

CHATHAM DOCK WORKS.

THE Government having decided on opening two of the large basins, with the adjoining new docks, which are now being constructed at Chatham Dockyard, early in the ensuing year, a large number of additional workmen have been placed on the works, in order that two out of the three large basins may be completed by the time determined upon. The two basins, on which between 2,000 and 3,000 workmen and convicts are now employed, are the repairing, and the factory basins, together having a water area of between 40 and 50 acres. Each basin has a depth of water of 30 ft. at high-water neap tides, and will therefore be able to receive the largest ironclad vessels in the Royal Navy. The most forward of the two basins now under construction is the repairing basin, which is entered from the harbour at a point nearly opposite Upnor Castle. This basin has an area of 22 acres, with a wharfage frontage of 3,600 ft., with the necessary docks and workshops. Connected with this basin are four large docks, two of which are nearly complete. Each dock is 468 ft. in length at the coping line, and 430 ft. on the floor, with a width of entrance, at the coping, of 80 ft., and 108 ft. amidships; on the floor each dock is 42 ft. 6 in. in width. Over the sill at high-water ordinary neap-tides, there will be a depth of water of 31 ft. 6 in., and at ordinary neap-tides of 28 ft. 6 in. The factory basin, which adjoins the repairing basin, has an area of upwards of 20 acres, and a quay frontage of 3,750 ft. The works connected with the docks are scarcely in so forward a state as those of the repairing docks. The third basin, which is intended for a fitting-out basin, from which vessels may be finally despatched to sea with the whole of their equipment, stores, guns, &c., on board, has a water area of nearly 40 acres, with a depth of 80 ft., and a wharfage frontage of close upon 6,000 ft. This basin is the least forward of the three, but still sufficient progress has been made to lead to the belief, that it will be completed and ready for opening by an early period. The opening from the fitting-out basin is at Sovereign-reach, where there is at all times sufficient water to float the largest vessels. The extension works which are now being executed at this dockyard, have been in progress since 1856.

VALUE OF PROPERTY.

In Romney Marsh and Ashford.—Mr. H. Cooper, instructed by Messrs. Wightwick & Kingsford, of Canterbury, has sold by order of the Court of Chancery, at the Saracen's Head, Ashford, about 560 acres of land, principally in Romney Marsh and some near Ashford, known as the Wall Estates. The following prices were realised:—Lot 1, 12a. 3r. 35p., at Kennardington, 1,520l.; lot 2, 25a. Or. 15p., in the same parish, 2,550l.; lot 4, 18a. 2r., New Romney, 1,280l.; lot 7, 41a. Or. 16p., Hope All Saints, 4,000l.; lot 8, 31a. Or. 24p., in the same parish, 3,850l.; lot 9,

31a. Or. 35p., in New Romney, 3,500l.; lot 16, 14a. 1r. 10p., in Eastbridge, 1,620l.; lot 19, 2a. 3r. 2p., at Newchurch, 330l.; lot 21, 9a. 2r. 16p., near Ashford, 1,460l.; lot 22, 26a., adjoining, 2,950l.; lot 23, Kennington Farm, 80a. 2r. 4,000l.; lot 24, 26a. 2r. 18p., adjoining, 1,600l. The several smaller lots fetched equally good prices.

In Dronfield Parish.—These sales took place at Mr. Nicholson's auction-room. Lots 1, 2, and 3, three small allotments of land, were first offered, but the bidding did not reach the reserve bids, and they were withdrawn. Lot 4, a small farm at Cowley, with house and farm buildings, and 25a. 1r. 37p. of land, let for 40l. a year, was sold to Mr. John Ward for 1,380l., exclusive of timber. Lot 5, five closes of land, situate between Coal Aston and Dronfield, and comprising 15a. 1r. 2p., was offered, but withdrawn. Lot 6, the Birchett farm, comprising house and homestead, and 91a. Or. 19p. of land, in the occupation of Mr. Creswick, was sold after a very keen competition between Mr. W. Wake and Mr. A. Wightman, to Mr. H. May, for 4,700l., exclusive of timber. Lots 7 and 8 together, the Stubble farm, in the occupation of Mr. Newton, comprising homestead and buildings, and about 89a. of land, was sold to Mr. W. Wake, for 5,300l., exclusive of timber.

At Doverdale and Ombersley.—Messrs. Bentley & Hill offered for sale at the George Hotel, Droitch, the freehold estate known as Southall Farm, in the parishes of Doverdale and Ombersley, and comprising a substantially-built farmhouse and homestead, and 167a. 1r. 29p. of productive land. The biddings commenced at 4,000l., and reached 6,050l. The property was bought in at 6,750l., which was the reserve price. We understand that the property has since been sold privately for 7,000l.

EDUCATIONAL STATE OF BATTERSEA.

An interesting report on the state of Battersea, as regards education and means, has been made to the Society of Arts, at the request of the council, by Mr. T. Paynter Allen.

Battersea is a very poor district, and its educational means are very defective. The reporter says:—

"The conclusion, from all the facts observed in relation to labour and the condition of the home, is that many distresses, if not actual destitution, exist,—it especially prevailed during the last winter,—and that there is a wide-spread inability to pay even the minimum school fee for every child; but much of the distress is due to an exceptional state of the labour market, and is aggravated by the excessive improvidence of the people themselves. Yet it is open to grave doubt whether free or ragged schools would be the most economical or satisfactory solution of the difficulty which this distress raises in regard to education. This is not the same question as that of making education entirely free. The fee school and free school, standing side by side, would each be alternately rendered inefficient by plethora or depletion. It is beginning to be felt, too, that the epithet 'ragged,' as applied to schools, though very useful at first in attracting sympathy, is exceedingly unfortunate. Even the poor object to it, as being injurious and degrading."

Mr. Allen is of opinion that a competent Metropolitan School Board (with possible evils guarded against) might be made the means of largely improving and shortening the time of primary education, and of thus providing for that art and science instruction which the Society of Arts have so greatly at heart. The task of taking steps for the guidance and information of the electors of such a Board, he thinks, might well be undertaken by the Society of Arts, or similar societies.

As regards Battersea, and the means of its inhabitants, the income of each family averages about twenty shillings. This, however, is the average for fairly regular but not permanent employment; and as 61 families out of the 200 were earning nothing for about a third of the winter, the real average for the 200 families, during six months, was sixteen shillings. Those whose incomes were especially precarious were almost all engaged in building operations,—carpenters, sawyers, bricklayers, and servers. Shoemakers were everywhere suffering, being unable to compete with the machine. In the building trade, a sudden collapse, through rash speculation, reduced many hundreds to short-time work, and threw out others altogether. The two thousand or more labourers who crossed over the bridge to Chelsea daily have fallen away to 200. Thirteen hundred houses had still to be completed in Battersea, and five hundred others were projected; but rather than submit to a reduction of wages, required by the altered conditions of labour, men abandoned work entirely, and went to the rates for support. "On the testimony of

a medical officer," says the reporter, "I can state that men in the union have been overheard remarking that 'they could get from twenty to thirty shillings at any time if they liked; but they would be d—d if they would work for less than six shillings a day.' Is it for the convenience of these superb gentlemen that the guardians have consented to an outlay of 60,000l. (perhaps more) on annexes to the union, to be decorated with ornamental marble?"

BLECHINGLEY CASTLE, SURREY.

A FINE mansion is being built for Mr. J. Norris, from the plans of the late Mr. J. Wylson, architect, Mr. George Jackson being the clerk of the works. The external walls are of a very hard and durable stone, quarried on the estate, and with Bath stone dressings, the whole producing a pleasing effect. The contractors for the carcass of the building were Messrs. Jackson & Shaw, and the internal finishings are being carried out under the management of the clerk of works. The joinery is left in its natural state, and varnished. The decorations are being executed by Mr. L. W. Collmann, of Portmansquare; the hall and corridor floors are laid with encaustic tiles by Messrs. Minton & Co. The new mansion is on the site of one of the ancient buildings, of which marks of interest still remain; the views from the mansion are beautiful and extensive. On Saturday last the workmen employed were entertained at dinner, when they presented to Mr. Jackson a silver cup as a testimonial of their respect and esteem, speaking of the just and impartial manner in which he had acted towards them.

GLOUCESTER CATHEDRAL RESTORATIONS.

The progress made in the restoration of this cathedral has been described in a circular by the Rev. E. Douglas, sub-dean. The restoration, according to the circular, has been carried out (under the supervision of Mr. Gilbert Scott) on as large a scale as the funds will permit, and with as much rapidity as is compatible with an accurate study of the traces of original design and the cautious and delicate work, and also with the desire to render each portion of the work undertaken worthy of the cathedral church of the diocese. The south porch, says the local *Chronicle*, has been nearly completed. The front of tabernacle work, which had been sadly mutilated, has been reproduced. The modern dial, bearing the motto, taken from Martial, *Perseus et imputantur* ["The hours pass away, and are set down to our account"], has been removed, and niches for statues, with carved canopies, have taken its place. Mr. Redfern, of London, is carving fourteen statues for the porch. When these, and the central spire, which Mr. Scott has designed, are erected, the exterior of the porch will have been completed. The aisles of the choir have been cleaned and repaired, St. Andrew's Chapel has been finished for some time, St. Paul's Chapel is being completed, and the renovation of some of the other side chapels is in a forward state. The roof of the choir has been coloured by Messrs. Clayton & Bell, who have also received orders to provide stained glass for the five windows in the north side of the cleareatory. Canon Tinsling states that the carving of the woodwork for the choir has been undertaken by Messrs. Farmer & Brindley, of London, and that Mr. Scott has been instructed to proceed with the restoration of the sedilia, and to prepare plans and an estimate for the reredos,—to provide which the Freemasons of the province have subscribed 650l. The south transept is now nearly ready for the stained glass in its great south window, which has been presented by Mr. T. Marling, and which Messrs. Clayton & Bell will furnish; and the cleansing and repair of the north transept have begun. This, in brief, describes the work accomplished and in progress. Canon Tinsling says that "the amount already contributed is not by any means commensurate with the wealth and extent of the diocese"; it certainly, as he adds, "is utterly inadequate to meet the expense of the contemplated restoration." The estimated cost is 45,000l., whereas the total amount paid and promised up to the present time, even including 5,000l. given by the Dean and Chapter, is only 14,157l.—considerably under one-third of the sum required. We learn further that already some 6,000l. have been expended, while estimates

accepted in reference to the choir and south porch exceed 4,000l. more. This sum, however, does not provide for the reredos, the sedilia, the repair and re-leading of the roof, the floor, or for the organ and side-screens, nor does it include the weekly payments for the general work of restoration in other parts of the church. Canon Taiting adds,—"Additional subscriptions are urgently needed if the choir is to be made ready for divine worship at an early date, and if the restoration is to proceed without interruption."

In addition to the collective gift of the Chapter of 5,000l., the Dean gives 1,000l.; the Lord Bishop, the Lord Lieutenant, Lord Redesdale, Earl Eldon, Mr. Marling, M.P., Mr. Price, M.P., and Mr. Charles Walker, each contribute 500l.; Mr. Gambier Parry gives 300l.; the Gloucestershire Banking Company, 250l.; Mr. Monk, M.P., Mr. Holford, M.P., and Lord Dynevor, each 200l.; Canon Sir J. Seymour, Canon Harvey, and Mr. T. Fulljames, 150l. each; Sir Lionel Darell, a hundred guineas; Canon Evans, Earl Harrowby, Lord Sudeley, Rev. T. Peters, Mr. J. Walker, M.A., Mr. J. J. Powell, Q.C., Mrs. Monk, Mr. T. Holt, Mrs. Claxson, Mr. J. H. Elwes, Sir F. Goldsmid, bart., M.P., Mr. Graham-Clarke, and Mr. B. St. John Ackers, each 100l.; and there are about eighty other subscribers of amounts ranging from 75l. to 11l.; but only about a hundred persons have yet responded to the many appeals that have been made.

COTTAGE HOSPITALS.

A new cottage-hospital is to be built at Saver-nake, on the same hill as the present hospital, but as much nearer Marlborough as the road will permit. Mr. Gilbert Scott is to be the architect of the building, which will be furnished with sixteen beds, to be easily augmented to twenty should the income of the hospital justify the committee in making such an addition at any future time.—A cottage hospital, which has been erected at Stanley, near Wakefield, at a cost of 550l., has been formally opened for the reception of patients. The building is in the Elizabethan style, and stands in an airy and healthy situation, on the brow of a high eminence behind Stanley Church. The working people of the thickly-populated district have taken the liveliest interest in the work, and out of the 460 subscribers to the fund, 430 are from that class. The building was not only opened free from debt, but with a guaranteed income of 60l. towards the 120l. required.—It is to be hoped the simple original idea of cottage hospitals for country towns and villages, will not be lost sight of in the erection of elaborate and comparatively costly edifices, with architectural pretensions.

THE TRADES MOVEMENT.

London.—An aggregate meeting of the carpenters and joiners of London, in support of the new Code of Working Rules, embracing the nine hours per day, has been held at the Hall of Science, Old-street, Finsbury; Mr. Siuclair, of Messrs. Myers's firm, in the chair. There was a very large attendance from the large firms, shops, and jobs represented. The chairman, Messrs. Harry, Meerden, Davis, Makin, Lewis, Layrie, Sadler, and others addressed the meeting in support of its object, and resolutions were adopted to the following effect:—

"That this meeting approves and accepts the code of working rules as prepared by the committee, and accepted at the district meetings; that the working hours be reduced from fifty-six hours to thirty hours per week, being nine hours per day for the first five days of the week, and five hours for Saturday; the rate of wages to remain as at present, 8d. per hour. That such a reduction would be conducive to the physical, moral, social, and pecuniary advantage of the trade."

Arrangements were then made for laying the new rules before the master-builders.

The Paris Workmen and the War.—A correspondent writes:—Round the *Mairies* the scene is pitiful. That of the third *arrondissement* is charged with the wives and children of the workmen of the quarter who have been carried off by the war—the bronze workers and those who fashion out the articles in ornulm for which Paris is so celebrated. They are not a thrifty set, and their wives stand helpless now before M. le Maire, wondering what is next to happen. In the eleventh all work has ceased. About 100,000 families are here left without resource. The wages are less than in the third, consequently the want is felt at once. All labour has ended suddenly, as if by the snapping of a spring. Orders

half executed have to be given up for want of means of payment. This quarter provides the furniture for the whole of France; and now this furniture, but half made up, remains upon the workman's hands of less value than the raw wood upon which he has expended his time and labour in its fashioning. The forced currency has furnished an excuse for non-payment of the last week's wages, and the family is already beginning to morn with hunger and privation. The subscriptions to the war fund afford another answer to the supplications of distress. But these subscriptions are themselves bestowed with a niggard hand, and only reach the thirtieth part of those already raised for the same purpose in Prussia! But the bright side of human nature was beheld last week when a knot of manufacturers assembled on the Place de la Bastille, and, having summoned the workmen in their employ, frankly confessed their impossibility to continue their trade:—

"Friends and Fellow-sufferers.—How long this crisis may last none can tell, for this war has told its secret of death to none. We have divided our fortunes into two equal shares. We keep one and abandon the rest to you. Let us suffer and be saved, or perish together!"

Many of those engaged in this noble act of fraternity have since departed for the frontier, and the wives and children of those they have saved from actual starvation followed them to the railway, telling aloud this story to the astonished crowd.

ACCIDENTS.

Fire in Victoria Docks.—A fire, inflicting a loss roughly estimated at 15,000l., has occurred in the Victoria Docks, in one of the timber warehouses used for storing bales of jute. This building was 150 ft. long, and of about the same depth, and contained 3,000 bales of jute, each bale being valued at 5l. Within a very short time the roof gave way, and it then became apparent that the building and its contents were doomed to destruction. The Salvage Corps succeeded in pulling out several burning bales of jute, but they were no sooner placed upon the quay than the bandages were burnt away, and the compressed jute blew about into flames. As to the origin of the disaster no information could be obtained. The officials state that when the building was locked up on the previous afternoon there was no smell of fire, and no appearance of the jute having become overheated. Jute is evidently a most dangerous material in stores. Overheating was, no doubt, the cause.

At the Fulham Gasworks.—Mr. Langham has held an inquest at St. George's Hospital, concerning the death of William Yelley, engineer, from injuries received while at work in the Fulham Gas Works. William Evans, engineer, Garden-road, Fulham, was engaged with some other workmen at the gasworks raising an iron girder intended to be placed on the top of one of the purifiers. When they had got it up nearly to its position, a horse and cart happened to pass at the moment, and there being a good deal of hammering at the time, the horse started off and came in contact with the guiding rope, which gave way, and the girder fell on to the purifier, and was broken into several pieces. The deceased, who was in the purifier at work when the accident occurred, was knocked down by one of the pieces of the girder, which fell on his right thigh. When he was removed from the purifier he complained of his injuries, and vomited a large quantity of blood. He said he would never again be fit for work. The jury returned a verdict of "Accidental death."

NEW MARKET, ABERYSTWTH.

The new market at Aberystwith, recently alluded to as having been opened, on Monday, the 22nd ult., is situated in Terrace-road, near the sea, and covers an area of 8,750 square feet. It has been erected in the short space of three months, at a cost of little more than 1,100l., and comprises a general market, having separate stalls for butchers and others; also a large corn-market, together with the usual appurtenances.

The central avenue is 32 ft. wide and 35 ft. high, the roof having semi-circular ribs, supported on columns of pitch pine, the whole finished with a large ventilating skylight, the entire length of the building. The front has been treated in Portland cement, as a protection against the severe weather prevalent at the seaside.

Messrs. Szlumper & Aldwinckle, of London and Aberystwith, are the architects; and Mr.

James Evans, of Aberystwith, the builder. The market was inaugurated, a short time since, by one of those choral gatherings peculiar to Wales, at which between 3,000 and 4,000 persons were present.

VOTIVE MONUMENT IN HOLY CROSS CHURCH, SCHWABISCH GÜND.

We have previously given an account of the interesting little town of Schwabisch Gmünd, in Württemberg, and of the beautiful church there of the Holy Cross. The little monument, or, rather, "votive pillar," of which we now give a sketch, is situated in the south aisle of the nave of the before-named church, and, as will be seen by the illustration, stands in a shallow arched recess in the wall. At first sight this little monument appears like a churchyard cross or a "Calvary;" but it is quite evident that it can never have served for either of such purposes,—firstly, on account of its diminutive size (it is only 8 ft. high to the top of the highest pinnacle, so that it is on too small a scale for an external cross); and secondly, the very perfect and sharp state of the sculpture and carving at once shows that it has always been inside a building. It bears neither inscription nor date, but is adorned with figures representing St. Peter, St. Andrew, and the Crucifixion. The choice of saints, St. Peter and St. Andrew, both of whom were crucified, seems to bear some allusion to the dedication of the church,—Holy Cross; and it is possible that this pillar was a *votive offering*, or was placed here to commemorate the completion of some portion of the edifice. Whatever may be its purpose or history, it is a capital example of fifteenth-century sculpture, and is particularly interesting on account of its very perfect condition.

FREIBURG MINSTER: FLYING BUTTRESSES.

In the account we gave recently, with a view of the spire of Freiburg Minster, Germany,* allusion was made to the beauty of the flying buttresses supporting the clearstory walls of the Minster, and we promised an illustration of them. That promise we now redeem.

ST. LUKE'S, KENTISH TOWN, LONDON.

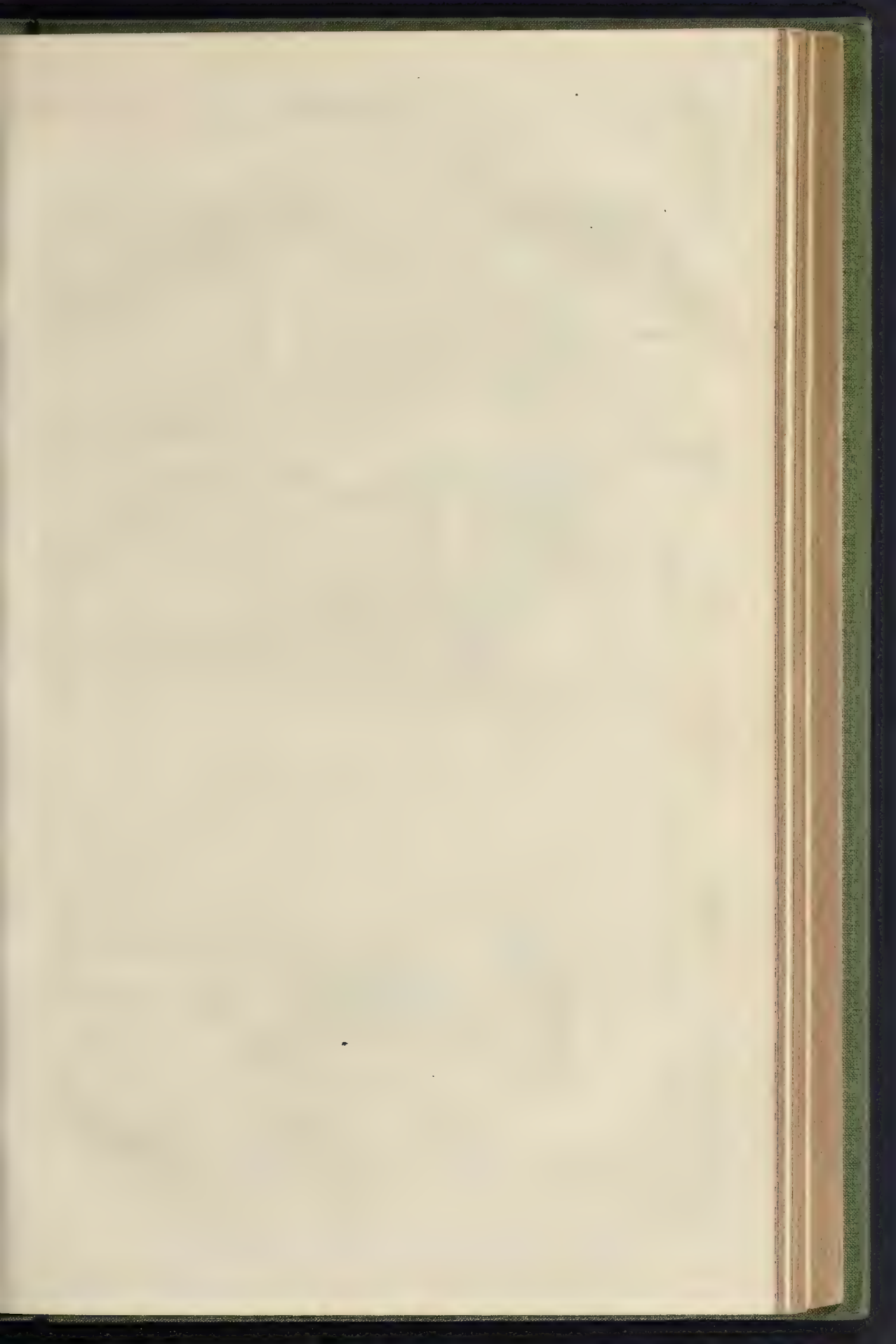
SOME years ago, a church, called St. Luke's, King's Cross, was built upon the present site of the St. Pancras station of the Midland Railway. When it was resolved to build this terminus, the Midland Railway Company paid 12,500l. for the existing fabric and site; and, by a special Act of Parliament, leave was given to build a church with this fund upon another site, and form a new parish, the original parish, as well as the church, having been almost swept away to make room for the buildings of the Midland Terminus.

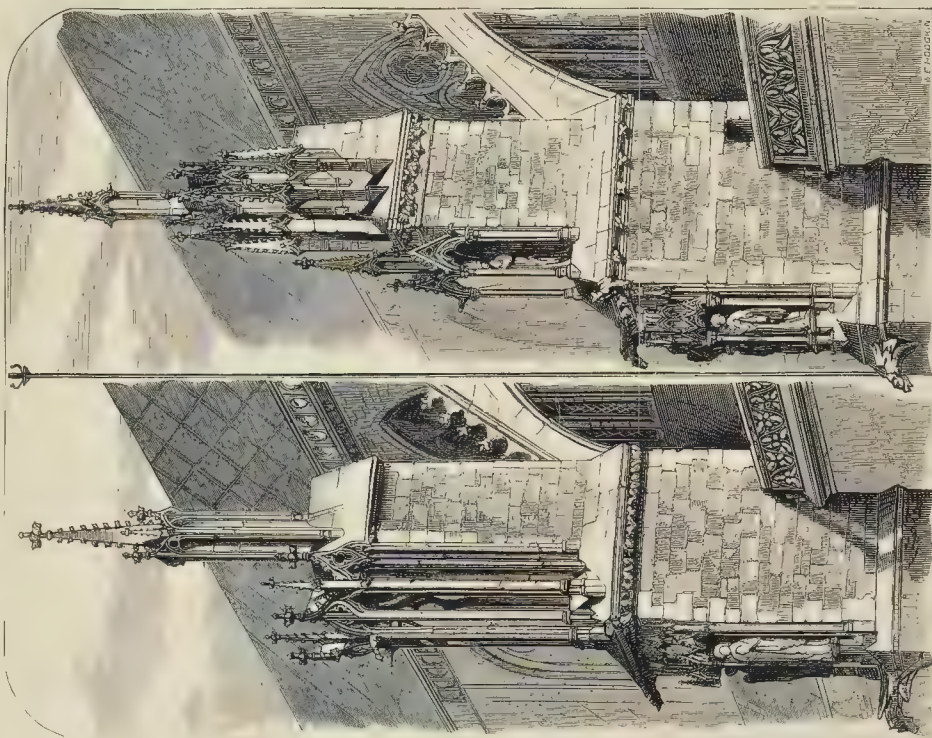
We gave some particulars a few weeks ago of the church that was built in lieu of the former; but as we publish a view of the new building in our present number, it may be as well to repeat them.

The site of the present church and parsonage was given by Christ Church, Oxford, and a parish formed out of the surrounding districts, and out of the fund obtained from the Midland Railway, greatly diminished by the expenses of obtaining the Act of Parliament, the present church and parsonage were built. The contract for the church was 9,391l., and for the parsonage, 2,615l. The entire cost of the church, including railings and facing round church, stained glass, warming apparatus, and so on, will have amounted to about 10,500l.; that of the parsonage to about 2,750l. The contractor was Mr. Thomas Williams, of Cardiff and London; and the architect, Mr. Basil Champneys. The stained glass was executed by Messrs. Heaton, Butler, & Bayne, from designs by Mr. Henry Holiday. The material of the church and parsonage is red brick, of a dark tint. The stone used is from the Tisbury and Hollington Quarries.

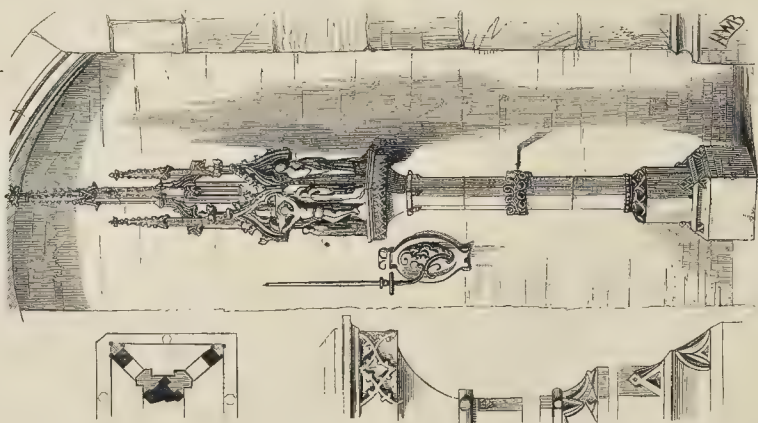
The illustration we publish has been produced by a process which seems only to need proper handling and a certain amount of improvement to become of value. It is from a view made by Mr. Thomas C. Nisbet, whose mode of drawing is well adapted to meet the requirements of the system.

* See pp. 616, 617, ante.

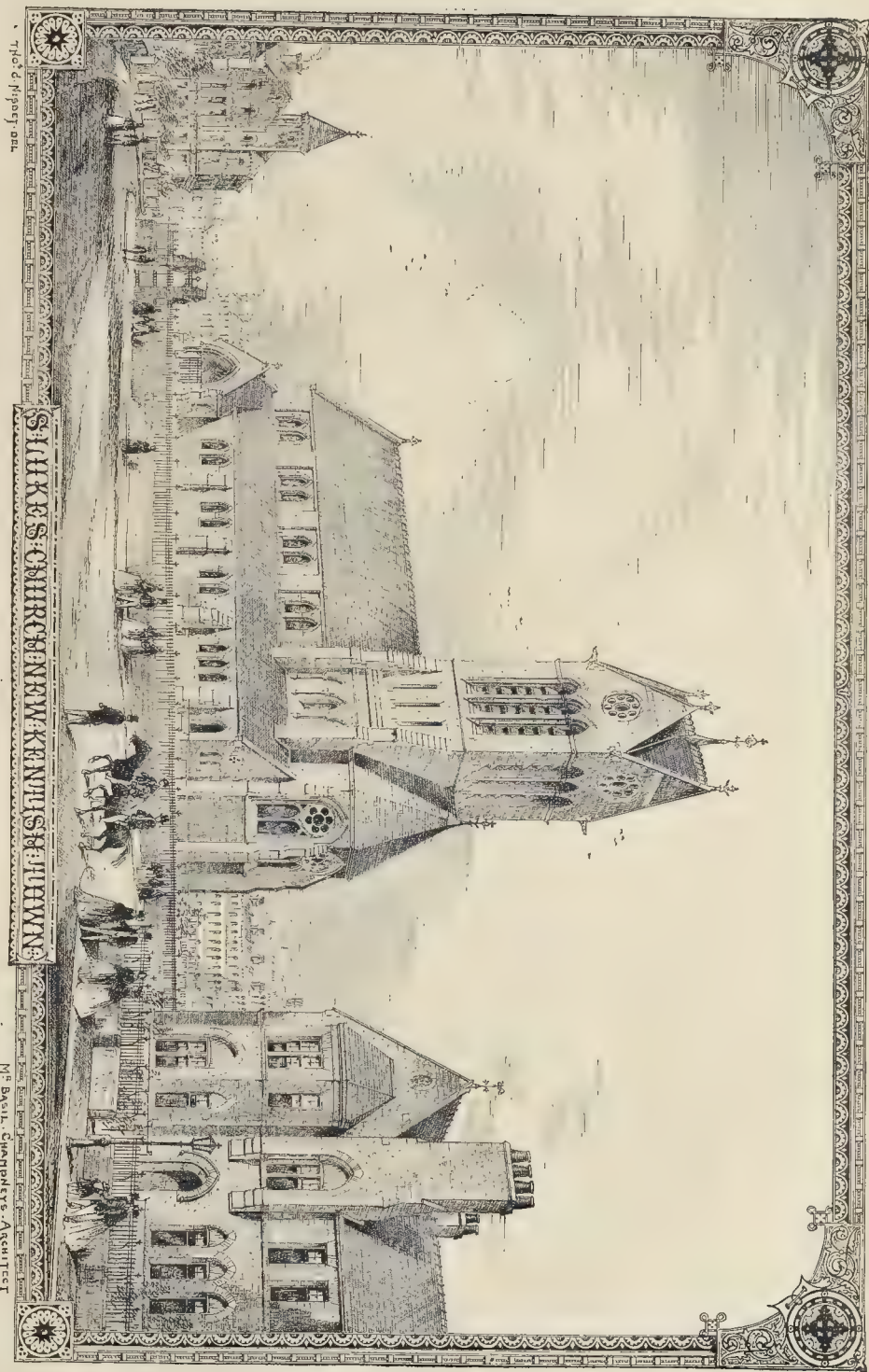




FLYING BUTTRESSES, FREIBURG MINSTER.



VOTIVE MONUMENT, WÜRTEMBERG.



"WASTE OF PUBLIC MONEY."

SIR,—I was much pleased to read in your last week's publication, your remarks on "Waste of Public Money." I can fully bear you out in all of them touching the Abyssinian expedition. I was there from the middle of February until the end of the war, being in the last vessel but three to leave Annesley Bay. We were chartered in Bombay, about the middle of January, 1868; were employed until the middle of September following (it was quite this date before we discharged the last of the Government cargo), at the enormous sum of 27 rupees per ton, per month. This on 500 tons, her registered tonnage, for the eight months, amounts to 10,800*l.*, as much as the vessel was worth, and the Government finding costs. We burned on an average 12 tons per day (twenty-four hours): say four months under steam during the war, or 122 days; this at 12 tons per day, at 25*s.* per ton (coals were dear in Aden), is 1,830*l.* Add this to the former amount, making 12,630*l.* the use of our little steamer of 500 tons cost the British nation. This is at the rate of 18,948*l.* per annum.

In May, 1868, there were no less than 250 vessels lying at anchor in Annesley Bay, besides vessels at sea, plying to Bombay, Suez, Aden, Suakin, &c., and I dare say all, or nearly all, chartered in the same reckless manner. Well may the English people wonder how the Abyssinian expedition cost the country, in round numbers, eight millions of money!

Hundreds of donkeys were bought in Suez, for 30*l.* each, taken to Abyssinia, and, when the war was over, sold for 5*s.* per head, on the spot, not being worth the cost of shipping away.

I could mention a vessel of 1,000 tons register which arrived in Annesley Bay in the middle of November, 1867, moored there with two anchors, and never lifted them until she set sail for Bombay in June following, having lain there seven months, and never unbattered her hatches. She took back the same cargo she brought. A host of vessels arrived there during the early part of the war, lay there until it was over, having during the nine months discharged about 20 tons of their cargo out of about, say 1,000 to 2,500 tons (I mean vessels ranging from 1,000 to 2,500 tons each). I should very much like to know which Government is to blame for all this. Most of the vessels were taken up in Bombay. I enclose my name and address, and remain,
BURRA MALEM SAHIB.

SANITARY SCIENCE AND THE MEDICAL PROFESSION.

SIR,—I am prompted to say a few words on some comments made by the *Lancet* last week on one of your recent articles, and to which, probably, you will not think it necessary to reply. The *Lancet* appears astounded at the temerity of any non-medical writer venturing to attack the medical profession, and more especially complains of the "evident unfamiliarity" of the writer of the *Builder* with "medical history." A list of names is given, supposed to be culled from "the long roll of names illustrious in science," from Galen and Hippocrates down to the present time, of those who, as the *Lancet* says, the progenitors of all that is known about the preservation of health. Considering, however, that sanitary science, as at present understood, is quite of modern origin, the knowledge of "medical history" displayed by the mention of the two antiquarian physicians appears rather unnecessarily aired. As to the names given, no one will deny that most of them have, directly or indirectly, contributed largely and valuably to the progress of sanitation; but it is a singular fact that nearly all were, or are still, in the employ of Government, and have thus had their attention forcibly and profitably directed to this branch of medical science. The very success of their labours is a proof of what benefit might be expected from the more extended interest in this subject among the profession at large, such as you call for. Unfortunately for the public, most of the really best men in the profession are too much immersed in extensive practice to devote their talents to the study of prevention of disease, so that this more or less theoretical branch of their science falls, for the most part, into the hands of those who are not especially engaged in attempting to cure disease.

In the interests of sanitary progress, we want to know more of the cause of disease. We find

waves of scarlatina, or measles, or fever, or whooping-cough, ebbing and flowing as they did in the days of our grandfathers; and, beyond the spread of ordinary intelligence, which tells us to live more cleanly, to see that we drink pure water, and ventilate our rooms, we are really but little forwarder than our grandfathers were. Can the profession explain to us any better than they could a hundred years ago how scarlatina is generated? Without a registration of disease we cannot even ascertain whether a larger or smaller percentage of cases now prove fatal than formerly. Bristol is a notable example of the comparative dead-lock to which sanitary matters are coming, and the medical profession ought to come to the rescue. This city has had the services for many years of an excellent health officer (a member of the profession), under whose care the health of the city improved so remarkably that it was continually being held up as a model of success in sanitary supervision. During the past few months, however, under the same régime, a severe epidemic of scarlatina has continually raged. Neither the medical officer nor any other members of the profession can offer any reasonable explanation (though you have proposed one) of this fact, which is one of a host that tend to retard the progress of, and the confidence of the public in, sanitary reform.

Till within the last few years, sanitary matters were but very scantily, and often most inefficiently, touched upon in the *Lancet*; and even now, aspiring, as it does, to be the leading organ of a most disinterested and admirable profession, it would do well to spare a little more of the space now devoted to purely medical and surgical practice, to that branch of the science dealing with the prevention of disease, which is still comparatively in its infancy. Some of the observations made by the *Lancet* sound oddly enough to such of us as remember the long years during which the *Builder*, at one time almost alone, has striven for sanitary reform, and assisted in building up an improved public opinion.

ONE WHO REMEMBERS.

A HISTORY OF SUSSEX.

SIR,—In your brief notice of the "Sussex Archaeological Collections" in the *Builder* for August 27th, you announce the fact that I am about to produce a new "History of Sussex"; but you express regret that my work should be limited to two volumes to range with our well-known "Collections," as you consider that my work may prevent the production of what is an acknowledged desideratum,—a "thoroughly satisfactory" history of our grand old county. Such a work will not appear in our time; but, as a contribution to the resources of the future historian, whoever he may be, I am vain enough to believe that the thousands of facts which I have embodied in my book, and which have not hitherto been put upon record, will considerably assist the "coming man." I may be allowed to state that my two volumes, though ranging with the twenty-two volumes of our "Collections," as to the book-shelf, will contain as much matter as four volumes of that series. Such a "History of Sussex" as you and I desire to see would involve the expenditure of many thousands of pounds, and I see no prospect of such a work. I may add that, forty years since, when I was a boy, I published a very small book on Sussex, and that book is now marketably worth more than the published price; which shows that a "compendious" history of the county is called for by the public. MARK ANTONY LOWER.

RAILWAY MATTERS.

Fall of a Railway Bridge in Lanark.—For some time past a number of workmen have been engaged at Orbeiston Bridge, on the Belshill and Roman Bridge road, crossing the Clydesdale branch of the Caledonian Railway, near the Orbeiston Collieries, in making preparations for removing the bridge, which was considered in an unsafe condition. Between forty and fifty men had been working during the Saturday night in order to have it pulled down and the line cleared for traffic. A large number of holes were bored in the bridge, and powder was inserted for the purpose of blowing it up. The bridge is fully 100 ft. long and 30 ft. high, with three 36 ft. arches of free redstone. The shots were fired, and the bridge was shaking from top to bottom, when it was intended to finish the work

of demolition with a battering-ram; but scarcely had the men commenced operations before the whole mass unexpectedly fell down with a fearful crash, carrying with it a number of the unfortunate men who were on the top of the bridge at the time. Those who escaped were at once set to work to remove the debris, and in a short time they succeeded in extricating their comrades, one of whom was dead; three were in a most precarious state; and Mr. A. Macdonald, the foreman of the work, was slightly injured on the leg and ankles. It is supposed that a keystone had been removed through the effects of the blast.

Sale of Railway Plant, &c.—A telegram from Chudleigh, Devon, says:—"On Saturday last there was a sale here of plant and machinery belonging to the Teign Valley Railway, under a bill of sale for 400*l.*, given (it is stated) by the contractor for the line to the West of England and South Wales Bank. The property realised upwards of 300*l.* To-day the purchasers went to remove their goods, but found the yard barricaded and defended by about 150 'navvies' and 200 workmen, who declared their intention not to allow the goods to be removed until their wages (amounting, as they alleged, to 200*l.*) were paid. The police were communicated with, but refused to interfere, and so violent was the demeanour of the men that all attempts to induce them to give up possession entirely failed. Arrangements have been made for 100 other men to relieve those now on guard to-morrow."

DUST-YARD CINDERELLAS.

A VISIT to a London dust-yard is not thought a fit subject for a Royal Academy picture: let us endeavour to limn for the mind's eye what these places are. A splashy gateway leading to a dirty yard; heaps of rubbish all over the place; mounds of garbage undergoing fiery ordeal. It is a busy scene: carts coming in loaded, depositing ashes to ashes, and carts departing with the breeze. It is privileged ground, for pigs may live and revel here, and fight for an official meal. Oft are they overwhelmed by avalanches, but they wriggle out again, grunting. Philanthropists, humane M.P.s, and rigid militarians might exercise their fine senses, and employ all their virtues, for women are here debased by an occupation unfit for females: they are, literally, *industrious*, for they work till the siftings accumulate high around them. If women working in coal-mines deserved legislative interference and care, surely the like benignant sympathy should be extended to their poor sisters in the dust. Ladies of England, to the rescue! It is a cause for you to take up, and blessings will attend the endeavour.

STORM PROGNOSTICATOR.

SIR,—Leeches are most sensitive of approaching storms. Hours previously to one, they all leave the water, as all know, and cling to the upper part of the perforated jar. Now, if this perforated bulb were bent forward by a long neck, the weight of the leeches crowding into it would cause it to turn the balance, and drop on an electric machine, to convey unerring information to nations. R. T.

NEW ST. THOMAS'S HOSPITAL.

SIR,—A few words from a working man on the above new building I hope will not give any offence. I look upon the *Builder* to be as much the working man's paper as it is the employer's, and it is with a view of eliciting from working men during the forthcoming long winter evenings their ideas on the improvements adopted, and the superiority of modern arrangements in large newly-erected buildings over the old systems, and to show that working men are not slow to appreciate the efforts of architects and others who have made it their study; and as my friend Mr. Hall has not been able to continue his visits this summer to large buildings and public works with members of working men's clubs, my idea is that a few letters from working men may be very useful, not only for mutual, but for practical, technical instruction, which I hope will be reciprocated, and be an inducement to many to take more interest in the *Builder*.

For the information of those who may not have had an opportunity of seeing the new hospital, I will state that it is situated on the Southern Thames Embankment, called the Albert Embankment, between Lambeth Palace and Westminster Bridge, opposite the Houses of Parliament.

It is divided into nine blocks, and to a stranger walking up the Victoria Embankment and over Westminster Bridge, it has the appearance of seven noble mansions; especially now it has got its clean face; and a person at first sight must be struck with amazement at the magnitude of the building. The idea to some people who have not seen it seems incomprehensible and incredible that a hospital should be erected in blocks six stories high, and extending a quarter of a mile long, with wards and rooms 16 feet from floor to ceiling. The amount of study required in designing, planning, taking out the quantities, and working out the details and estimating, must have been enormous. But the outside observer can have no conception of the interior arrangements. Many might take an excellent lesson from these works,—in the accuracy of the planning, setting out, and construction; the admirable arrangements for ventilation, and for the prevention of fire, and the system of warming; the convenience of the hydraulic lifts to take visitors, patients, and attendants up to the level of any floor to the height of about 60 ft., so as to avoid the necessity of travelling up and down stairs; also the hydraulic food-lifts; and very probably there will be telegraphic communication with the various wards. Every arrangement to the present seems perfect.

But one thing to be regretted is, that no improvement is adopted on the system of hanging sashes with weights. When sashes were first introduced, they were a great improvement on the old quarry-glazed windows; and to hang a single sash with weights, to ventilate a room, was very good; and I believe it was usual to hang the bottom sash (which in some cases was the largest), and to fix the top one; but some wise man thought it would be better to hang both top and bottom sashes, for additional ventilation, to let out the foul air as well as to admit the fresh. They used to be hung with lead weights; so that, if they were too heavy, the carpenter could cut a piece off with his saw. I have taken old, unequal-sized sashes hung with lead weights, out of an old mansion; but equal-sized sashes, or sashes hung with four equal weights, have been in use now for many years; and it is a matter of astonishment that people should have put up with the inconvenience of broken lines, the sashes sticking, and the weights hanging against the linings, when the boxes have been too small, or the parting slips too thin, when a system of hanging them *without* weights is so simple, and at about the same cost, only requiring great care and accuracy in fitting and hanging. A WORKING MAN.

IRON SCAFFOLDING.

MR. R. CONCI, Paris, has obtained a patent for iron scaffolding. This improved scaffolding is constructed with an iron platform mounted on four wheels running on axes which are adjustable, so that the platform may rest on those wheels or may be lowered upon the ground. When mounted on the wheels it may be transported with great facility from place to place, and when arrived at its destination it is lowered and secured upon the ground, and forms a firm bed or foundation-plate for the scaffolding. The two axes revolve on four bearings upon the platform, and have motion imparted to them by toothed wheels, one of which is fixed upon each axle, and geared in connexion with an endless screw. Two supports upon the framing of the apparatus are furnished with a bearing for the shaft of the endless screw, and the wheel for imparting the circular motion of the axle for raising and lowering the carrying wheels.

RESTORATION: BURY ST. EDMUNDS.

SIR,—Allow me to say a few words in reply to "A Looker-on." In the first place, the roof of St. James's Church, Bury St. Edmunds, is not, as he supposes, a double, but a single hammer-beam roof. I hope, therefore, it may, at least on that score, be removed from the category of "heaviest" roofs in which he would place it. Then, as to the date of the design. It is believed to accord with that of the middle of the fifteenth century, 1450, or thereabouts. The history of the church requires a roof of that period. Documentary evidence makes it probable that the work of rebuilding the nave was undertaken after the year 1439, while the date of the rebuilding of St. Mary's Church, to which your correspondent would assign even a later date than to St. James's, is known to have been going on between 1430 and 1433. On the whole I think 1450 may be assumed as a fair date for the original design, with which, and not with the late period at which the work was concluded, the roof properly accords. I observe that your correspondent now abandons, or at least pretermits, the supposed incongruity between the roof and the four-centered west window, and seeks to find one in the exaggeration of what he considers the attenuated proportions of the arcades by a high-pitched roof.

As a matter of taste, the question presents itself to me, as it doubtless will to others, in the opposite form. The lofty arcades require, to satisfy the eye, a lofty roof. So, at least, thought the builders of St. Mary's, when they finished their nave with a high-pitched roof above arcades merely as lofty as those of St. James's. The designers of that noble piece of carpentry, so wonderfully superior to the masonry of the sub-

structure, were as well or better able than we are to judge of that matter. I for one applaud and adopt their decision, and I venture to think that had the builders of St. James's Church not been hindered by constructional difficulties resulting from the failure of their work at the east end, in consequence of their having rashly removed the end walls of the aisles, and also possibly by want of funds, they would have adopted a similar treatment.

With regard to the general subject of your correspondent's letter, I understood him to maintain that the rebuilding of portions of a church should be done in the style of the bulk of the building whether early or late. To that principle, taken as applying to any large extent of rebuilding, I demur. In such a case, I think we should avail ourselves of the best work of the best time, and take that as our example, improving it if we can. B. B.

SIR,—Your correspondent who writes on the subject of St. James's Church, Bury St. Edmunds, is correct in his surmise that the high-pitched roof of the nave was adopted in direct opposition to Mr. Scott's advice. I have a copy of a letter from Mr. Scott, dated August 11th, 1863, to the then incumbent, in which is the following passage:—"I have no doubt myself that the course I have given way to is erroneous, and contrary to the true principles of restoration, and inconsistent with the doctrine I am preaching and have for years preached to others." G. J. H.

IMPROVEMENT WANTED.

SIR,—As you have contributed so much towards the improvement of London by the excellent articles which have appeared in your columns on its neglected lanes and alleys, I would wish, through the medium of the *Builder*, to direct the attention of the Sanitary Commissioners and of the building trade to a block of small tenements, covering a large area, bounded by the Broadway and Tothill-street, Westminster, on the one hand, and the Birdcage-walk on the other.

The object I have in view is the moral improvement and health of this locality. The economical results I leave to the calculations of those who are better acquainted with those details than I am.

It is inconceivable that within view of the Houses of Parliament, in one of the most improving quarters of London, such nests of fever and contagion should be tolerated. The scenes of immorality and riot emanating from these dens, especially on a Sunday, are a reproach to the police. Will you not, sir, assist us with your powerful pen to abate these nuisances?

Considering the great improvements which have been effected and are in progress in this neighbourhood, it is extraordinary that so valuable a site as the one referred to should be allowed to remain unproductive.

I would add that the shop accommodation generally of Westminster is below the requirements of the upper class of the residents.

The Governors of Christ's Hospital, being extensive owners of house property in Westminster, ought, with the large resources at their command, to do something towards the improvement of the neighbourhood.

A WESTMINSTER HOUSEHOLDER.

ANECDOTIC.

SIR,—Amidst just eulogies of the venerable deceased Baron Pollock, the best of all, which I read in a newspaper many years ago, has been overlooked. He was early termed, in his judicial dealings with criminals, the *merciful* Pollock. The following, which I had the pleasure of hearing from him at Westminster, a year or two only after his accession to the Bench, has been privately considered a good specimen of extralegal liberality of sentiment. During a case before him, it was stated that a party had "kept within the letter of the law." "Letter of the law," said the Judge, with honest and contemptuous emphasis to the jury, "why a person might keep within the 'letter' of the law, and be one of the greatest pests to society;—which I can but think a high-minded and Christian view of 'duty to our neighbour.'"

I will take the opportunity of seeking to give an "original" anecdote of Dr. Johnson, which my kind friend, Mr. Tate, of St. Paul's, obtained my leave to offer to Mr. Murray for a new edition of "Boswell," but which I believe was not used. I had it in 1819, then a youth, in Guernsey, from the late Mr. Richard Sannazere, who may be remembered by old stagers there as a "fine specimen of the old English gentleman," of known kindness of heart. He

had been of Johnson's college, though several years after him, he being then about seventy, and doubtless heard it from high local authority. It is known that Johnson, on first coming to Pembroke College, Oxford, was poor and hardly able to keep up a decent appearance. An acquaintance, meeting him one day, observed (certainly with little feeling), "Why, Johnson, your shoes are 'capped'?" "Capped," answered Johnson, promptly; "well, and why shouldn't they—ain't they fellows?" Those who know the mark of respect required from undergraduates to college dignitaries will fully understand this. The pun was, perhaps, unworthy of his genius, but is curious from the prejudice he afterwards had, or professed to have, to that rather harmless—peculiarly "Johnian"—accomplishment at Cambridge. J. D. PARRY.

THE POSITION OF THE ARCHITECT.

SIR,—Your notice of "The Setting Sun," a poem, was brief. I think the following paragraph from it would interest some of your readers, if you will find a corner for it. J. H.

"I should not like to be an architect. A man of genius and of cultured mind, Long patient study, and expert invention, Designs an admirable public building— Convenient, light, proportionable, and stately— Foreseeing with the eye of practical taste Effects and merits inappreciable To those who only look with common eyes, Yet have abundant notions of their own; And having absolute control of fund, Possess the power to thwart him every way, And use their power to alter all his plans. What can be master slavery of soul Than to be driven to submit to this? If I were a horse, I'd be a brewer's horse; If I were a pig, I'd be a miller's pig; If I were a slave, I'd be a woman's slave, But not the slave of half a dozen fools."

CHAIRMANSHIP OF THE METROPOLITAN BOARD OF WORKS.

THE names of a number of gentlemen supposed to be candidates have been mentioned, and we have received half a dozen letters, urging the superior fitness for the office of this or that member. Without knowing positively who are the candidates, we cannot pretend to offer an opinion as to who is the best man, nor would any advantage result from our doing so. The Board are quite competent to make a right selection, and are not at all likely to be influenced by the observations of outsiders.

AN AQUARIUM.

SIR,—In common with many other working men I have visited the International Working Men's Exhibition, now open at Islington. On entering at the Liverpool-road entrance, I have not proceeded far on the north-west side when I observed a novel constructed aquarium containing a perfect menagerie of fish, consisting of roach, dace, tench, bleak, gudgeon, minnows, four kinds of carp, cray-fish, two sorts of mussels, winkles, snails, beetles, &c. On interrogating the exhibitor, I was informed that the aquarium was 2 ft. 6 in. long, 1 ft. 6 in. deep, and 1 ft. 6 in. wide.

The novelty consists in its being fitted with a reservoir and self-acting syphon, which keeps the water pure and the fish perfectly healthy. A single jet of water playing in the corner causes a continually running stream, the water passing away by means of the syphon; there is therefore no necessity for the aquarium to be emptied at any time, and the fish are maintained in a healthy condition. The aquarium is an object of attraction to most of the visitors. The inventor, patentee, and manufacturer is Mr. W. Small, 13a, William-street, Camden-road, Holloway.

COMPETITIONS.

Epsom.—The Burial Board have, in a limited competition, selected the designs by Messrs. R. M. Shaw & W. Young, of Exeter Hall, Strand, and Crooked-lane, City, for the chapels, lodges, gates, &c., to be erected at their new cemetery. The selected designs are in the Early Gothic style, of English character. The works are to be commenced immediately, under the superintendence of the above-named architects.

Bramley.—The guardians of the Union of Bramley, near Leeds, having determined to erect a new workhouse, lately advertised for

designs, offering premiums of 50l. and 25l. respectively. The buildings are to contain 250 inmates, at a cost of 9,000l., not including the land, boundary-walls, &c. Fifteen architects from different parts of the country responded by submitting plans. The designs of Messrs. O. S. & A. J. Nelson, of Leeds, have been selected for the first premium; the second being awarded to Messrs. Waide & Turner, of Barnsley. The works are to be commenced immediately, under the superintendence of Messrs. Nelson.

SIR ISAAC NEWTON'S OBSERVATORY.

Sir,—In response to your notice of the fund for purchasing the above, and presenting it to the nation, I beg to say I have received the following subscriptions: Sir R. L. Murchison, bart., 10l.; Miss Burdett Coutts, 5l.; W. Gladstone, Esq., 5l.; E. Hope, Esq., 5l.; R. D. Bell, Esq., 5l.; A. Findlay, Esq., 5l.; A. Martin, Esq., 5l.; J. Bloxland, Esq., 5l.; 4, Basing-road, Notting-hill, W.

WHICH IS THE GROUND STORY OF A HOUSE?

Sir,—Will you kindly allow me to thank the gentlemen who wrote me on the above, all of whom concurred in my view. The case came on before Mr. Dayman, on Friday in last week, who, before the hearing commenced, intimated that the decision would be against me. During the hearing I drew his worship's attention to the 23rd section of the Building Act (which refers to underground rooms), and read him the written opinions of various London and provincial architects. Subsequently, the magistrate contended that I was in error in using the term "floor," and applying to it the same distance as "story," used in the Building Act. Mr. Marriable attended to give evidence in support of my view, but was overruled. The case was adjourned to the 7th of October, when his worship having consented to consult the 23rd section, and read the letters. And y allow me to inform those gentlemen who wrote me, that it is my intention to send them written acknowledgments to each, on the letters being returned. Thanking you for your courtesy I am, &c., J. E. KIMBLEY.

CHURCH-BUILDING NEWS.

Monkwearmouth.—The ceremony of consecrating a new church has been performed at Monkwearmouth by the Bishop of Durham. The parish is an extensive one, and accordingly a new church, or chapel of ease, for St. Peter's has been erected on a large piece of ground, containing about 1,550 square yards. The building has been completed, and is in length 104 ft. and in breadth nearly 48 ft. It has been dedicated to St. Bede.

Liverpool.—The new church dedicated to St. Stephen, and erected in Byrom-street, has been consecrated by the Bishop of Chester. The old church and its site were appropriated for the widening of Byrom-street. The new church contains 637 seats, of which 529 are in the body of the edifice, and 108 in a gallery which crosses the western end. The church is Gothic in style, of the Early Decorated character. At the south-western angle there is a tower with spire. The entrance arch is in the western gable. The church consists of a chancel and nave, without transepts. On the right of the chancel there is an organ chamber, occupied by an instrument from the Liverpool branch establishment of Messrs. Gray & Davison. On the opposite side is a vestry. There is an open roof, with panelled ceiling. The open seats are free. The pulpit is of stone, carved by Mr. Norbury, of Liverpool, who also executed the stone font and other carving about the church. The font, like the pulpit, has a border of flowers of architectural type. The reredos is of pitch pine, with Gothic tiles introduced, by Mr. Ellis. The east and west windows are filled with stained glass. The west window is a rose one. The fourteen low-light windows of the nave are filled with ecclesiastical tinted glass, with stained glass in the headings. The windows were supplied by Mr. C. W. Camm, of Smetwick. The organ was provided by Messrs. Gray & Davison. The architects of the church were Messrs. Culshaw & Sammers, of Liverpool; and the design has been carried out by Messrs. Grindrod & Harcourt. The cost of the church and school—the latter situated in the basement beneath the church, has been 8,300l., towards which upwards of 500l. are still wanted.

Hythe.—The parish church of St. Nicholas Newington-next-Hythe, has been re-opened, after extensive alterations. Three years ago, the late Rev. Tatton Brookman, of Beasbrough, at his own cost, restored the chancel and north chapel, and, at his decease, left a sum of money to further restore the nave and north aisle. This has lately been accomplished. The church presents a very altered appearance; the old square pews have been removed, and open

benches substituted. The walls have all been replastered, and the old stone groins cleared of whitewash. The roofs, formerly plastered, are now of wood, formed in panels. The old tie-beams and ring-posts are still visible from the church, and are cleaned and stained. The chancel ceiling is panelled in like manner, but takes the form of an arch. A carved oak pulpit, of the Perpendicular period, has been restored, and set upon a new base. The chancel is fitted with oak stalls, and the altar table, also of oak, is vested with a crimson velvet cloth, having frontal and super-frontal, worked chiefly by Mrs. Charles Shaw, from the architect's design. The works have all been designed by Mr. Robert Wheeler, of Tanbridge Wells, architect, and the church restoration executed by Mr. W. Vaughan, of Maidstone.

Wormingford.—The church of St. Andrew, Wormingford, has just undergone a restoration, at a cost of nearly 2,000l. The work has been carried out by Mr. Joseph Grimes, of Colchester. The three stained-glass windows in the chancel are all of them new. The principal one is the gift of the High Sheriff of the county. The subject of it is "The Last Supper." The north and south windows are also in *memoriam*. The church is paved throughout with Maw's encaustic tiles; and Messrs. Catchpool and Thompson, of Colchester, have supplied and fixed a new hot-water apparatus. A vestry has been added on the north side, and a new porch on the south side, the quaint old south arch having been repaired and fixed at the entrance to the latter. There are other minor alterations and improvements. There has been no formal re-opening of the church. The architect was Mr. Fred. Chancellor, of Chelmsford. We understand that new schools are shortly to be erected near the church, at the entire cost of Mr. J. J. Tufnell.

Luton.—In the gradual restoration of St. Mary's old parish church, Mr. E. O. Williams has, under instructions from Mr. John Shaw Leigh, of Luton Hoo, lord of the manor, adapted the remains of the carved oak and painted screen of the fifteenth century, formerly separating the chancel from the nave, which, though much mutilated, had been preserved. Rumour says that it was used at one time as a coal and coke bin. It now forms the base of a carved Gothic screen, between the south transept and the Hoo Chapel. The new roof over the chapel is a plain composition of oak main timbers, with deal soffit boarding and lead covering. The black flint and freestone chequer work of the outside repairs corresponds with the tower, and is thought to be more in accordance with the walling of the church generally than the plain ashlar of the east end. The town should show its appreciation of Mr. Leigh's liberality by putting up a stained glass window in commemoration of *Valforth*.

Valforth.—A new church has been consecrated at this small village, situate a mile and a half from Northallerton. A plan for restoring the old church was proposed; but owing to the bad state of a part of the walls, and the inconvenient narrowness of the building, it was abandoned in favour of erecting an entirely new church, for which designs were furnished by Mr. Pritchett, of Darlington, architect. Funds for the undertaking were raised, amounting to about 1,800l. The new church is in the Early English style, and consists of tower, nave, and chancel, with porch and vestry. The interior affords ample accommodation for the inhabitants. An east window of stained glass, by Messrs. Clayton & Bell, has been given by Mr. and Misses Masterman (who have also lately built and endowed a school in the place), and a side window by Mrs. Dobson.

Books Received.

"Art Pictorial and Industrial: an Illustrated Magazine" (Sampson Low & Co.) is the title under which the publication foolishly called "The Photographic Art Journal" is continued under improved arrangements. The distinguishing feature is the use of photographs as illustrations. In No. 3, just now published, there are six, including reproductions of an unfinished painting by John Phillip, a mild "Sampson and Lion" by Mr. Milnes, two very thoughtful little drawings by Mr. E. Vedder, and examples of Dorrers by Mr. A. E. Brown. The latter would have been better made from the originals rather than from sketches. Mr. Blanchard Jerrold, Mr. Cordy Jeaffreson, and others, contribute papers.

Miscellaneous.

South Staffordshire Hospital.—For some time past, says the *Wolverhampton Chronicle*, the board of directors of this institution, impelled by the necessity of increasing its accommodation, have had under consideration the best means of enlarging and improving the hospital; and a few months since they adopted a plan, and a builder's estimate for the execution of the work has since been accepted. A long-felt want which the hospital will supply when enlarged as proposed will be accommodation for fever cases, and for this purpose a new wing will be erected at the south-east end of the present building. Another important and essential part of the enlargement plan consists of a new out-patient department, which it is proposed to erect at the east end of the hospital, but entirely separate from the main building. Besides the new buildings, the plan comprehends several important alterations in the existing structure. The sum intended to be spent is about 12,500l. Some of the materials and the character of the work are required to be of a special character, so as to prevent such diseases as pyæmia. In the construction of the accident ward Parian cement is to be used, which will involve an expense of several hundreds of pounds over and above what the ordinary material would cost. The floors are to be of oak. The buildings will combine all the improvements adopted in the most successful hospitals in this country and of France. Members of the committee, with the architect, have visited several of the best constructed hospitals in England. Funds are wanting to enable the committee to complete the good work. The architect is Mr. Bidlake; Mr. Horsman, who is now building the town-hall, is the contractor.

Roman Pavements.—Mr. H. S. Harland, of Sawdon Park, near Scarborough, has just made known the discovery of Roman remains at the village of Oldcoates, near Blyth, Notts, about four miles from Ranskill Station on the Great Northern Railway. Mr. Harland says the discoveries deserve more attraction from antiquaries than they are receiving. The pavements were discovered by accident by a workman, in digging a mortar-pit adjoining a new house erecting for the Catholic priest. The workman turned up part of the principal floor of a Roman villa, which has since been bared, and is found to consist of about 25 square yards of tessellated pavement, the tesserae being about 1-in. cube, of a brown and bluish colour on a white ground, the whole worked into an elaborate geometrical pattern, and having a rude representation of a (supposed) Roman warrior in the centre. This floor is about 14 ft. below the natural surface. A second floor, supposed to be that of a bath-room, or hot-room, is still lower, and on the west, and is formed of tesserae about 1-in. cube, and all of white stone. The floor forms two sides of a square, and appears to have flues below it. At one part is a flagstone, or hearth, and near it was charred wood.

Street Tramways.—The invention of Mr. J. Livesey, Victoria-chambers, consists, first, in the formation of a permanent way for street tramways, the sleepers of which are constructed of standards of wrought or cast iron secured to iron plates, arranged so that the various parts shall come between the divisions in the pavement without offering any obstruction, and for the fixing of two standards on one base-plate; second, in the use of a section of rail having a projecting piece to form the groove for the flange of the wheel to run, and with pieces projecting downwards, in order to give greater vertical strength, and form a dovetail section, which admits of being secured without external fastenings, and also for a flat-bottom rail, having one side broader than the other for the purpose of forming a groove.

A Model Temperance Town.—In Bessbrook, a manufacturing town near Newry, in Ireland, there is no public-house. The town was founded by a Mr. Richardson, a member of the Society of Friends. He set up a spinning-mill, which now employs 3,000 hands; yet there is no public-house in the place; the working people are all sober and orderly; and there is not a policeman in the town.

Another London Theatre.—A new theatre is about to be erected on the vacant plot of ground formerly occupied by part of St. Thomas's Hospital, London Bridge. Mr. Strange, of the Alhambra, it is said, will bring his large experience to the new undertaking.

London General Omnibus Company.—The directors state in their report that the gross traffic receipts of the company during the last half-year were 298,216l., and in the corresponding period of 1869 they were 270,926l., showing a decrease of 2,710l. The number of passengers carried was 21,417,553, and for the same half of 1869, 20,157,926, showing an increase of 1,259,627. The number of omnibuses working on week days was 587 against 590, and on Sundays 469 against 480 in the same half of 1869. The average receipts per omnibus per week were 17l. 7s. 10d., against 17l. 9s. 7d., and the average fare received per passenger was 296d., against 317d. The directors found it necessary to introduce low fares for short distances in several new places during the half-year. The number of passengers had thereby been largely increased, but scarcely sufficient to make up the deficiency in amount of receipts; the loss, however, was more than made up by the new system of taxation on locomotion which had prevailed since the 1st of January last. A dividend at the rate of 10 per cent. per annum, free of income-tax, would absorb 29,886l., and leave a balance of 6,014l. for the next half-year. The directors deemed it advisable to make arrangements for hiring the cars of the North Metropolitan Tramway Company from Bow to Whitechapel, and they had therefore entered into a contract for that service.

Free Library for Bilston.—At a recent meeting of the Town Commissioners, the chairman read a report from the Free Library Committee, stating that they recommended "that advertisements be inserted in the *Builder* and local newspapers, inviting architects to submit plans for a suitable building, the cost not to exceed 1,000l." The chairman mentioned 20l. as a suitable amount to offer as a premium for the best plan, and said he thought it would be to the advantage of the town to have the works carried out under the direction of their own surveyor. The committee were empowered to advertise for plans, the successful competitor to be remunerated with a premium of 20l., and the chairman was requested to convene a public meeting to consider the propriety of asking Mr. Mason to exchange the site in High-street for the one in Shale-street.

A New Graving Dock on the Thames.—A large graving dock has been lately completed at Blackwall Point, East Greenwich, and the first ship, the *Patriarch*, a large iron clipper, was placed on the blocks on Wednesday. The dimensions of the dock are:—Length, 400 ft.; width (extreme), 68 ft.; width at entrance, 60 ft.; depth of water at average spring tides, 21 ft. The dock is well situated for access from the river, and is convenient for vessels lying in the East and West India, Millwall, or Victoria Docks.

Manchester New Town-hall.—At a meeting of the new Town-hall sub-committee, held on Thursday, the 25th ult., at which tenders were submitted for the erection of the superstructure of the Manchester new Town-hall, the lowest tender, being that of Messrs. George Smith & Co., builders, of Great George-street, Westminster, amounting to a sum of 192,574l., was accepted. There were eight tenders. Messrs. Smith & Co., as our readers know, were the builders of the Colonial-office and the India-house.

Fall of a Grand Stand at Leicester.—Several hundred persons assembled to witness a series of athletic sports and pony-races lately, at Leicester. Just before the pony-races were started, a stand, upon which were about 100 persons, fell with a crash to the ground. Its occupants were huddled in a mass, and several of them were seriously injured. In spite of the accident the sports were continued until the programme was completed.

Harrogate.—The foundation stone of a new manse for the pastor of the Congregational Church at Harrogate, has been laid. The manse is to be erected in the West-end Park, adjoining the Leeds-road. The land on which the house is to stand is freehold, the cost of which is about 300l. The manse will cost about 1,300l.

The Langham Hotel Company.—A dividend of 10 per cent. per annum has been declared. It is intended to build, on the western side of the hotel, billiard-rooms, a smoking-room, and from twenty-five to thirty bedrooms, at the cost of 40,000l.

Roman Rochester.—During the time the workmen have been engaged in making the excavations for the new corn exchange which is about to be erected in this city, many remains of ancient Rochester have been discovered. The most interesting of the discoveries hitherto made is that of a portion of what appears to be an old Roman wall, which was reached at a depth of about 8 ft. below the ground. Near the wall were likewise discovered several Roman coins, some of which are in a very good state of preservation.

The Charing-Cross Pier.—The Thames Conservators in their recently-published report state that the Pier at Hungerford, now called the Charing-cross Pier, has been completed by the Metropolitan Board of Works, but it has not been passed to the Conservators in accordance with the provisions of the Act of 1862, and this Eastern Railway Company; but the Conservators are taking proceedings, under legal advice, to obtain possession of it for the benefit of the public.

Sir Edward Smirke, on whom her Majesty has just conferred the honour of knighthood, is the fourth son of the late Mr. Robert Smirke, A.R.A., and brother of Sir Robert Smirke and Mr. Sydney Smirke. He was born in the year 1796, and was educated at St. John's College, Cambridge. He was called to the Bar at the Middle Temple in 1824, and was successively Solicitor-General and Attorney-General to his Royal Highness the Prince of Wales as Duke of Cornwall.

Statue of Mr. Gladstone.—The statue of the Prime Minister, in St. George's Hall, Liverpool, will be unveiled on the 14th of September. Invitations to be present on the occasion have been issued by the mayor (Alderman Hubback) to a number of distinguished men of science and others, who are expected to be in the town attending the meeting of the British Association, as well as to the subscribers to the statue fund.

Steam-Power Culture.—Mr. W. Smith, of Woolton, Bucks, reports that his fifteenth crop under steam culture compares well against horse culture, especially so the corn crop; and when, he adds, "we take into consideration the fact that I have no fallows whatever on my heavy clay land, the evidence is conclusive on the side of steam culture."

TENDERS.

For new Wesleyan Chapel, &c., Colman-street, Hull. Mr. W. Botterill, architect. Quantities supplied by Mr. G. W. Russell.	
Morrell	27,615 0 0
Marshall	7,358 18 5
Tomlinson	7,270 0 0
Hockey & Ligges	7,221 12 0
Jackson	7,162 0 0
Sergeant	7,090 0 0
Rutblin	7,079 0 0
Wallet	7,058 0 0
Usher & Stamp	6,892 10 0
Musgrave	6,665 0 0
Scholefield & Taylor	6,893 6 0
W. & J. Hall (accepted)	6,528 0 0

Accepted for Congregational Church, school, parsonage, &c., at Ripon. Mr. J. P. Pritchett, architect.—

Mason's Work.

Wright & Sons £1,993 17 7 |

Slating.

Kenet 153 16 0 |

Plastering.

Wright & Sons 132 10 0 |

Joiner's Work.

Macadam & Sons 1,105 15 0 |

Plumbing and Glazing.

Wilson 259 9 8 |

Painting.

Briggs 78 5 0 |

Ironwork.

Macadam & Sons 146 8 0 |

For church at Middleton One Row. Mr. J. P. Pritchett, architect.—

Mason's Work (including Tower).

Dodgson £1,102 6 10 |

Slating.

Pattison 58 17 0 |

Plastering.

Ormerod 54 0 0 |

Joiner's Work.

Garget & Son 256 7 6 |

Plumbing and Glazing.

Johnson 90 0 0 |

Painting.

Dryden 55 0 0 |

Accepted for roads and drains required in laying out building land at Ripon. Mr. J. P. Pritchett, architect.—

Brumby £409 0 0 |

For stable at Minister, in Thanet, for Mr. F. Cobb, Mr. W. Lane Sear, architect.—

South-Eastern Building Company £128 0 0 |

Rogers & Son 183 10 0 |

Nash & Taylor (accepted) 180 0 0 |

Accepted for Romford Cemetery. Mr. E. C. Allan, architect. Quantities supplied:—

Contract No. 1.—Drainage.

Hayward £457 0 0 |

Contract No. 2.—Oak Fencing.

Marshall 174 19 8 |

Hayward 137 0 0 |

Contract No. 4.—Building.

Potter 1,694 0 0 |

For factory, Curtain-road, Finsbury. Mr. H. F. Bacon, architect.—

Turner & Son £1,479 0 0 |

Corder 1,463 0 0 |

Woodward 1,426 0 0 |

Coile & Son 1,433 0 0 |

Higgs 1,433 0 0 |

Sharpton & Cole 1,363 0 0 |

Aitchison & Walker 1,325 0 0 |

For St. Mary's Church, Primrose-hill, Hampstead. Mr. M. P. Mason, architect.—

Mann £9,863 0 0 |

Hull, Keddell, & Waldram 8,966 0 0 |

Vasson 8,630 0 0 |

Brown & Robinson 8,457 0 0 |

Longmire & Burge 8,443 0 0 |

Patman & Fotheringham 8,442 0 0 |

Swell 8,356 0 0 |

Manley & Rogers 8,290 0 0 |

Henshaw 8,210 0 0 |

Patrick & Son 7,045 0 0 |

Sharpton & Cole 7,760 0 0 |

Dove, Bros. 7,655 0 0 |

For alterations and additions to the Rectory House, Shadwell. Mr. Edwin Christian, architect.—

Ross £1,297 0 0 |

Jackson & Shaw 1,256 0 0 |

Sharpton & Cole 1,234 0 0 |

Kenor 1,185 0 0 |

For the erection and completion of two cottages at Codshead, of six rooms each, with cellars and outbuildings, for Mr. Joseph Ashley. Mr. Sherwin, architect. Quantities supplied:—

Webster £474 0 0 |

Cain 439 0 0 |

Davies 428 0 0 |

Lock 405 0 0 |

Garwell (accepted) 395 0 0 |

For the erection and completion of a nine-roomed villa residence, with bath, w.c., and outbuildings, at Heaton Chapel, for Mr. Thomas Leigh. Mr. Sherwin, architect. Quantities supplied:—

Webster £838 10 0 |

Wade, Bros. 590 0 0 |

Atkins 586 0 0 |

Burns 567 0 0 |

Herd & Edie 553 0 0 |

Davies (accepted) 550 10 0 |

For alterations and additions to residence, Kettering. Mr. R. W. Johnson, architect.—

Wilson & Belamy £356 13 0 |

Briggs 500 0 0 |

Barlow & Butlin 498 0 0 |

Henson & Son 475 0 0 |

Sharman 462 0 0 |

For additions to Harborough Hotel, Melton Mowbray. Mr. R. W. Johnson, architect.—

Weaver & Barnes £714 0 0 |

East 651 0 0 |

For additions to Barkby Hall, Leicestershire. Mr. R. W. Johnson, architect.—

Herbert £2,211 16 0 |

East 2,199 0 0 |

Noble & Son 2,139 0 0 |

For new stables, Craven Lodge, Melton Mowbray. Mr. R. W. Johnson, architect.—

Brown £1,167 0 0 |

Hilliday & Cave 1,047 0 0 |

East 1,030 0 0 |

For new Wesleyan Chapel and Schools, Melton Mowbray. Mr. R. W. Johnson, architect.—

Herbert £3,015 0 0 |

Johnson 2,975 0 0 |

Willman 2,760 0 0 |

Barnes 2,609 0 0 |

Hilliday & Cave 2,607 0 0 |

East 2,377 0 0 |

Perkins, Bros. 2,556 0 0 |

Stevenson & Weston 2,610 0 0 |

Weaver 2,490 0 0 |

Winkles & Kelleys 2,390 0 0 |

For new Congregational Chapel, Tillington Park, Horncastle-road. Messrs. Chas. G. Searle & Son, architects.—

Greenwood & Sons £10,341 0 0 |

Jackson & Shaw 10,259 0 0 |

Stumpson 9,808 0 0 |

Revel & Son 9,863 0 0 |

Vicks, Bangs, & Co. 9,736 0 0 |

Higgs 9,712 0 0 |

Brass 9,694 0 0 |

Myers & Sons 9,463 0 0 |

Nacey 9,329 0 0 |

Patman & Fotheringham 9,316 0 0 |

Dove, Bros. 9,190 0 0 |

For addition to warehouses, Calvert's-buildings, for Messrs. Wiggins & Co. Mr. R. P. Pope, architect:—
 Brown & Robinson £1,796 0 0
 Patrick & Son 1,789 0 0
 Rider 1,683 0 0
 Sharpington & Co. 1,535 0 0

For completion of six houses, Old Grayhound-lane, for Mr. G. Baker. Mr. W. S. Sargeant, architect:—
 Shoals £204 0 0
 Sergeant 872 0 0
 Thorpe 839 0 0
 Kerley 789 0 0
 Brickell & Light (accepted) 775 0 0

For the erection of detached villa and boat-house, on the Grove Park Estate, Chiswick, near Row Gardens, for Mr. Maynard, of Barnes, Surrey. Mr. W. S. Sargeant, architect. Quantities supplied:—
 Braithwaite £2,000 0 0
 Chamberlain, Bros. 1,931 0 0
 Clark 1,819 0 0
 Adamson & Sons 1,688 0 0
 Gibbs 1,500 0 0
 Thorpe 1,370 0 0
 Sargeant 1,282 0 0
 Brickell & Light (accepted) 1,125 0 0
 Prewer 1,072 0 0

For new wing to Burlington Lodge, Brighton, for Mr. S. Smiles. Mr. W. S. Sargeant, architect. Quantities supplied:—
 Matthews £1,362 0 0
 Richards 1,370 0 0
 Brickle & Light 1,220 0 0
 Sargeant (accepted) 1,180 0 0

For Grammar School, Maidstone. Mr. E. W. Stephens, architect. Quantities supplied:—
 Ansonab (accepted) £3,621 0 0

Accepted for the completion of the Queen's Hotel, in Arbury, for Mr. James Fox. Messrs. Wade & Turner, architects. Quantities supplied:—
 Masonry and Excavating.
 Walton & Lawton £2,050 0 0
 Carpenter and Joiner's Work.
 Goodyear 510 0 0
 Plumbing and Glazing.
 Brown 368 0 0
 Slating.
 Brown 73 0 0
 Plastering.
 T. & J. Shaw 290 0 0
 Painting.
 Stephenson & Charlesworth 41 0 0
 For the whole.—
 Nicholson & Son £4,370 0 0
 Robinson & Son 4,020 0 0

For boilers, pumping machinery, and hot-water supply, the St. Marylebone Schools, Southall. Mr. H. Saxon, architect:—
 Hillyer £781 9 3
 Gimson & Co. 766 0 0
 Mackenzie, Bros. 704 0 0
 Lambert & Sons 695 0 0
 Frost 687 0 0
 Turner & Co. 682 10 0
 Benham & Sons 666 0 0
 Jennings 589 0 0
 Pitter & Son (accepted) 578 16 0

For the erection of boiler-house and chimney-shaft at St. Marylebone Parochial Schools, Southall. Mr. H. Saxon, architect:—
 Barber & Grove £362 0 0
 Nias 335 0 0
 Nightingale 302 0 0
 Weston & Chapman 280 0 0
 Rowell 240 0 0
 Howard 275 0 0
 Gilling & Frost (accepted) 260 0 0
 Woodcock 220 0 0
 Parsons & Telling 237 0 0

For alterations and alterations to Eastlands, Basingstoke, for Mr. Alderman Wallis. Mr. G. B. Musselwhite, architect. Quantities supplied:—
 Budden £238 0 0
 Musselwhite & Son 755 10 0
 Pistell 743 18 0
 Jennings (accepted) 741 16 5

For alterations and additions at No. 13, Baker-street, for Mr. J. Taylor. Mr. W. S. Witherington, architect:—
 Mark £280 0 0
 Elington 260 0 0
 Robertson 255 0 0
 Bamford (accepted) 227 10 0

For alterations and additions at No. 72, Edgware-road, for Mr. F. Bullock. Mr. Witherington, architect:—
 Melville £283 0 0
 Scott 108 10 0
 Mark 142 0 0

For new infirmary wards at Staines Union. Messrs. H. H. Platt, architects:—
 Bushell £697 0 0
 Surgeson 678 0 0
 Oades 647 0 0
 Harrison 630 0 0
 Pether 628 0 0
 Cook & Green 625 0 0
 Nias 600 0 0
 Perry 580 0 0
 Mole 560 0 0
 Rowell 548 0 0
 Nias 538 0 0
 Furley 530 0 0
 King 527 0 0
 Hiscock & Son 527 0 0
 Woodcock 420 0 0
 Werr 475 0 0
 Parson & Telling 417 0 0

For the erection of a factory, Long-lane, Bermondsey. Mr. Joseph Gale, architect:—
 Colls & Son £4,530 0 0
 Downs 4,389 0 0
 Rider & Sons 4,368 0 0
 Tarrant 4,227 0 0
 Dove, Bros. 4,165 0 0
 Ashby & Sons 4,067 0 0
 Hill & Keddell 4,025 0 0
 Brown & Robinson 3,917 0 0
 King & Son 3,870 0 0
 Henshaw 3,858 0 0

For the erection of a warehouse in Holborn-bars, for Messrs. Richard Lloyd & Sons. Mr. W. P. Griffith, architect. Quantities not supplied:—
 Perry £2,010 0 0
 Lidstone 1,998 0 0
 Farnham & Fotheringham 1,857 0 0
 Webb 1,885 0 0
 Clemence 1,975 0 0
 Mansfield 1,960 0 0
 Hart 1,915 0 0
 Lawrence & Sons 1,832 0 0
 Newman & Mann 1,768 0 0

TO CORRESPONDENTS.

A Town Surveyor (in numbering the houses of streets in the metropolis, the numbers begin at the end nearest St. Paul's Cathedral)—Clerk of Works (see column)—The architect or engineer (if a clerk of works does not clearly understand a drawing, he should obtain explanation from the architect. The duty of a clerk of works is to see that the architect's instructions are carried out; not to throw discredit on his drawings, or endeavor to prove him wrong)—J. W. Q. N. (not clear enough for publication. No information)—R. F. C. (photographs have arrived: a view shall be engraved)—A. B. W. J. L. M. H. T. W. B. D. P. W. C. R. T. O. C. E. B. D. W. R. & C. N. H. W. B. D. P. W. A. W. A. W. S. N. H. M. S. J. E. W. J. K. G. J. H. W. S. W. W. T. C. A. N. H. M. S. G. R. M.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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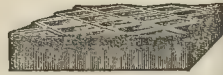
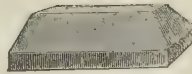
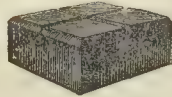
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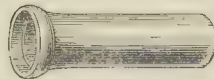
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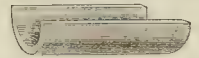
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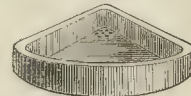
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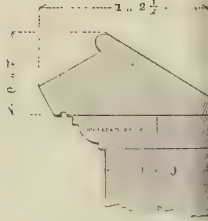
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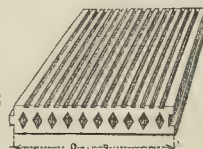
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The Builder.

VOL. XXVIII.—No. 1440.

What do we pay for Education?



HE advantages which man has over beast, in safety, in material comfort, in the means of protecting, prolonging, and enjoying life, are hardly greater than those which the cultured and instructed

man has over the ignorant savage.

Nor does this apply to individuals alone; nor need the contrast be limited to that between the philosopher and the barbarian. It is true in the case of nations. The harvest-moon of 1870 has witnessed the inscription, in letters of fire more terrific than those which startled the feast of the Chaldean king, of a warning that we can ill afford to neglect. Whatever be the outcome of the sanguinary campaign of the present summer, one lesson is plain. The primacy of Europe is not to be retained by the mere possession of the noblest or most brilliant qualities, in the absence of patient and conscientious culture. The steady application of the German race to the great business of education, for the life-time of two generations, has enabled it to give a new illustration of the ancient fable of the hare and the tortoise. But the once sluggish animal, in this instance, emulating the wonderful metamorphose of its relative, the frog, has developed the wings of the dragon.

Not less ominous, to those of us who have known how to read contemporary history, than any phenomenon of the day, has been the persistent manner in which, for the last eighteen years, the mind of France has been studiously misdirected to the cultivation and the increase of luxury. A display that no honest earnings could afford, has been kept up by systematic corruption, and, at the hour of extreme need, the noble army of France has collapsed for want of the due application of that supply which, freely voted by the nation, has been diverted to the service of the *demi monde* of Paris. When a nation thus purposely demoralised comes in contact with a patient, self-cultivating, honestly working community of equal magnitude, the result cannot long remain doubtful. No gifts, however divine, profit those who neglect to cultivate them.

What, then, every Englishman ought to ask, are we doing to maintain our own national dignity? What is our organisation, compared with that of our German cousins on the Continent? What is our education, compared with that of educated Prussia?

A report from that fraction of our complex administration which replaces, clumsily and inefficiently enough, the Ministry of Public Instruction which is common to most civilised countries, has just issued from the press. The Lords of the Committee of her Majesty's Privy Council on Education have humbly presented to her Majesty their "Report of the Science and Art Department for the year 1869." From this document, and from the "estimates for the Civil Services for the year ending March, 1871, Education, Science, and Art," we must strive to draw a reply to so momentous a question.

The first point, however, that strikes an inquirer, who notes that somewhat less than a

fortieth part of our public expenditure is devoted to educational purposes, is, that the administrative action only scratches the outside of the subject, instead of piercing to the centre. We are not speaking of the direct action of the State in training those who are to form its citizens; but of the yet more primary and elementary duty of collecting information on the subject. Where are we to turn for knowledge as to what is actually being done in the United Kingdom by way of education? What do the Lords of the Committee of her Majesty's Privy Council observe on the subject? What does any one know?

Thus much, indeed, we have been told and told again, in and out of Parliament, in reports, by inspectors, in blue books, and, ugly fact, in certain trade returns and commercial bargains. We are not doing what we ought to do. We are doing far less than our neighbours. So admitted is this fact, that we are now voting hard upon two millions sterling to supplement the grievous deficiencies of our general method of education. But we are yet left almost totally in the dark as to the extent, the resources, or the upshot, of that national system, if system it may be called, which has so notoriously broken down.

The wisdom and the piety of our ancestors have consecrated, from time to time, no inconsiderable part of the national wealth to the purposes of education, regarded in its broadest sense. The church, to be in any way fitted for the wants of the day, should be a great educational institution. To inculcate dogma, which men seem to take as the essence, is but a very minute portion of the duties, of a religious organisation. There are many who hold that, the more there is of true religion in a community, the less there will be of dogma. At all events, few of those who are familiar with history, past or contemporary, will deny that the converse proposition holds true. The teaching and training of the entire nation, boys and girls, men and women, the true "mathematics," the general course of all that is to be learned—in morals, in science, in the natural history of nations—that great primer of political science,—all this is the function for the performance of which churches were endowed, at a time when the sum of human knowledge was comparatively trifling, even by the side of its present very imperfect state.

We do not insist upon that care to relieve the poor, to visit the sick, and generally to supplement the words of truth by the acts of mercy, which formed charges on the resources of the mediæval and of the primitive churches. The point we wish to bring into relief is this: we have a very large annual sum,—in land, in charges, in rates, in Parliamentary votes, in private subscriptions,—professedly applied to the education of the people. We cannot but be aware, from the results, that the application has not been as successful as could be desired. We know that the very gravest questions press for solution as to the primary principles on which such application should be made. And yet we are content to remain without that statistical information which is the very first requisite to enable us to understand our position; to say nothing whatever about improving it. We now offer some two millions a year to eke out a very deplorably deficient self-acting, or rather non-acting, system of education. But whether two,—or twice two,—or ten, or what number of millions are spent on the duty which we thus largely supplement,—who is there to tell us? We only know the educational state of England by its fruit, or rather by its marked absence of fruit. But we know that there was an old idea that some tenth part of the national income should be devoted to what are now called educational purposes; and we have a very shrewd guess that an enormous annual outlay must be, at this moment, perilously ill-directed.

Could we sum in one full line the annual income of universities, churches of all denominations, hospitals and charities, colleges, and schools, we should have no occasion to blush for the figure. That for which we should blush is, that we spend so much, and have so little to show for it. To know what we actually do spend in the teaching and training of the nation is a primary and imperative need.

Reverting to that partial information which is furnished by the Report of the Science and Art Department of the Committee of Council on Education—that is to say, of Lord de Grey and Ripon and Mr. Forster, with Mr. Cole as secretary,—we are happy to find that a suggestion, which was, we believe, first published in our columns, has been carried out in the present volume. Maps of England and Wales, of Scotland, and of Ireland, are contained in the Appendix to the Report, which show, by red and black dots (complemented by ill-devised lettering), the localities in which schools are now existing in connexion with the Department.

The expenditure reported for the financial year 1869-1870 (exclusive of the vote for the Geological Society) was 201,552*l.*, being 2,551*l.* more than that for the previous year, which amounted to 198,701*l.*

The approximate total number of persons who have availed themselves of any of the different means of obtaining instruction afforded by the Department in 1869, is 2,372,000. This is an increase of 596,000, or 33½ per cent., over the corresponding total for 1868, which was 1,776,400. But as a mere stroll through the South Kensington Museum counts for one of these instances of information obtained by the public, we must not attach too much importance to the educational profit derived by this million and three-quarters of people from the labours of the Department.

The total number of visitors registered as attending the South Kensington Museum during the year 1869 is 1,043,654, against 881,076 in 1868. The total monthly average has risen from 73,423 in 1868, to 86,971 in 1869, and this notwithstanding the regrettable circumstance that the attendance on student days has declined from the monthly average of 9,542, to that of 9,154. In 1867 the students' monthly average was 10,843. The attendances in the holiday weeks of 1869 have been far larger than in any previous year, amounting to 54,354 for Easter week, 40,868 for Whitsun week, and 51,259 for Christmas week, against the respectively corresponding numbers of 35,241, of 27,591, and of 48,037 in 1868; and of 26,594, of 22,557, and of 21,790 in 1867.

The number of persons receiving instruction in science applicable to industry, under the auspices of the Department, has increased from 15,010 in 1868 to 21,500 in 1869. The number of individuals instructed in art has increased from 123,562 in 1868 to 157,198 in 1869, or at the rate of 27 per cent.—the increase in the science schools being upwards of 43 per cent. The Royal School of Mines numbers only seventeen regular and ninety-three occasional students; the Royal College of Chemistry, 136 students; the Royal School of Naval Architecture, forty; and the Metallurgical Laboratory, thirty-five. The evening lectures have been attended by 1,617 artisans and school teachers; and 253 science teachers attended the special course of lectures provided for their instruction. There have been thirty-two students at the Royal College of Science, in Ireland, and 5,773 persons have attended the various courses of lectures delivered in connexion with the Department in Dublin. The attendance at the evening popular lectures delivered in the Edinburgh Museum of Science and Art during the Session 1868-1869 was 1,386.

Thus the total number of persons who have received instruction as students, or as attendants

upon lectures, in connexion with the Science and Art Department in 1869, is upwards of 187,000; a total exceeding that of the preceding year by 41,300, or 28 per cent. The increase in 1868 over 1867 was about 18 per cent.; so that the rate of progressive increase, as compared with the former year, shows an acceleration of more than 30 per cent. The general march of the public scientific and artistic education of the country may be readily appreciated from the above statistical summary.

To the above-stated sum of 201,552l., increased, in the Parliamentary estimates, by the addition of the geological survey, to 218,336l., have to be added some other items of educational cost for Great Britain, and four items for Ireland, in order to make up the annual sum paid by the nation for education other than elementary. These items are as follow:—British Museum, 90,765l.; National Gallery, 16,181l.; National Portrait Gallery, 1,800l.; Learned Societies, 12,370l.; University of London, 9,577l.; Endowed schools commission (which is an administrative rather than an educational charge), 12,220l.; Universities, &c., in Scotland, 18,644l.; Board of Manufactures, Scotland, 2,100l.; Irish National Gallery, 1,990l.; Royal Irish Academy, 1,684l.; Queen's University, 3,240l.; and Queen's Colleges, 4,265l. Oxford and Cambridge, as endowed universities, do not figure in this list. The total annual outlay thus incurred amounts to 393,072l.

With regard to elementary education, the sums voted for the year 1870-71, amount to 914,721l. for Great Britain, and to 381,897l. for Ireland. A comparison of these sums with the population of the United Kingdom gives some noteworthy facts.

The number of children in Great Britain between the years of 3 and 15 may be taken, in round numbers, at 7,000,000. (The census of 1861 gave 6,323,596.) Of these, 1,300,000 are between 3 and 5; 3,000,000 between 5 and 10; and 2,700,000 between 10 and 15 years of age. Of the 4,900,000 below 10 years old, 493,852 were presented for examination under the standards in 1869. Of the 2,700,000 children from 10 to 15, 310,213 were so presented. The total number of children over six years of age that were qualified for presentation in this period was 991,449. The total number of children on the school-books for the year was 1,797,358, and the average number actually attending school was 1,245,097. Thus our public primary education may be said to contemplate the training of one-fourth, to attempt the training of one-sixth, and to effect (more or less satisfactorily) the training of one-seventh, of the children below 15 years of age. The cost of this education amounted, for the year 1869-70, to 840,711l., being at the rate of about 17s. 3d. per head for the children actually taught, or of 12s. 8d. per head for the average attendance on the schools. This, of course, is only that portion of the expense which is directly borne by the State.

The vote for the year 1870-71 for public education is 914,721l. An annual increase may be reckoned on; so that we may speak of our current State provision for primary education as involving an annual expenditure of a million, in imparting the simplest rudiments of instruction to one million and a half out of our seven millions of children. Of those so instructed, moreover, three-eighths are of an age fitted to receive not primary, but secondary, instruction.

Our national influence over the training of the 2,700,000 children between ten and fifteen is at present confined to the operations of the Science and Art Department of the Committee of Council on Education. The expenditure of this Department in administration, grants in aid to schools, and expenses of circulation, was 109,775l. for 1869-70, and will rise to 123,902l. in the current year. The number of persons receiving direct instruction in the Science and Art schools (exclusive of the other educational establishments before cited) for 1869 was 178,698l. The national cost, therefore, of this portion of secondary education, of which between a fourteenth and a fifteenth part of the youth adequate to receive it have availed themselves, has been at the rate of about 12s. 1d. per head. As an economical application of funds, there is nothing to be said against these figures. The question of efficiency is distinct. That of numbers may be called appalling.

With reference to superior education, the institutions supported by the votes contemplate rather the prolonged pursuit of some special branch of study, than the general culture of the student,—a point which is not, so far as we are

aware, attempted in any of our civil establishments.

The Royal College of Science, Dublin, received, in the year 1869, thirty-two students. Its cost was 6,800l., being at the rate of 212l. per student.

The cost of the Royal School of Mines, the Royal College of Chemistry, and the Metallurgical Laboratory, in Jermyn-street, for the same year, has been 10,692l. The total number of students, regular and occasional, in these institutions, has been 281, at the rate of 38l. per head.

The cost of the Royal School of Naval Architecture for the past year was 2,175l. The number of students, forty; the rate, 54l. per head. The partial education, therefore, of 353 students, at a cost of 19,667l., is the amount of our public education of a high-technical order, offered to such of our 2,700,000 youth as it may accommodate. The youth of Ireland, indeed, are not included in the returns.

Thus the United Kingdom, out of an annual public income of some seventy millions sterling, contributes less than a million towards the primary instruction of the seven millions of British children. It contributes 120,000l. towards certain branches of secondary education, which, in more highly-cultured countries, are made obligatory on all young persons, but of which, with us, (exclusive of private tuition) 180,000 out of 2,700,000 avail themselves; and it contributes 20,000l. towards a fractional superior education, which is shared by 353 students. To the support of learned bodies, London, Scotch, and Irish universities and colleges, it contributes 50,000l. per annum. Museums and galleries receive the subsidy, not excessive *per se*, but disproportionately large in comparison with the more directly educational expenditure, of some 180,000l.; and this, together with 380,000l. for the primary education of Ireland, makes up the annual outlay, provided by the State, for educational purposes. For the rest, we have to trust to the operation of the law of supply and demand, to the much vaunted efficiency of the voluntary system, and to the working of those varied institutions, originating in the piety of the past or the speculative energy of the present, as to most of which, it is so foreign to our national habits to require or to possess any definite or synoptic information.

AMONG THE LINCOLNSHIRE CHURCHES.*

NEARLY every one is familiar with the general outline and design of the noble tower and octagon lantern of Boston Church, to which an interest of another kind has been added, also, by its connection with Jean Ingelow's best poem, "High Tide on the Coast of Lincolnshire," where we are told how the Boston bells rang out the tune of "The Brides of Enderby" to warn the country folk of the advance of the "stolen tide;" but the statement that—

"The old mayor climbed the belfry tower" (340 steps, to wit) must surely be taken with limitation, unless he were an exceptionally active old gentleman. Of the grand, almost cathedral-sized church, one need only observe that it is well preserved and rich in detail, of a late date externally, and that the effect of the interior is somewhat marred by a wooden vault to the nave. The western tower, separated from the nave by a remarkably lofty arch, and open nearly to the top, with its ties of lofty windows, is as fine internally as externally. A remarkably elegant specimen of metal-work in the shape of a communion-rail of Classic design, should not be overlooked by the visitor to this church. Proceeding by rail to Sutton *via* Spalding, we must pass rapidly over the salient points of the fine range of churches between the two last-named places. Sutton has a fine simple timber broach spire, which has been imitated more than once, if we mistake not, by modern church-builders, the nave piers and triforium, of late Norman, or rather transitional work, are of interest, and afford one among other instances of the round arch being retained, for constructional purposes, in smaller churches some time after its disuse in the larger arcades of the cathedrals. Gedney is remarkable mainly for its grand tower, chiefly of lancet date (the upper stage only being rectilinear), and affording another instance of the fine and expressive effect produced in the early Gothic towers by the mere

play of surface and outline obtained by buttresses, stair turrets, &c.; all the rich decoration of some of the later towers will scarcely enable them to compete with these truly masonic designs. The nave is very late, and shows the thin walls (in this case not projecting beyond the line of the piers) characteristic of late work; the roof is a fine one, and a good instance of the variety of effect often produced in roofs of this date by the alteration of roof-principals of two different designs; and there is some very good flowing tracery (curvilinear) rather exceptional design in the north aisle windows. Fleet, again, is chiefly remarkable for its tower and spire, standing apart from the church, and known to many from the engraving in Brandon's "Parish Churches;" in the church are eight carved heads, corbels at the springing of the roof timbers, of remarkable spirit and variety of design, and (so far as we know), hitherto unpublished. The well-known church at Holbeach, some of the windows especially of which have been so often figured as fine specimens of curvilinear tracery, is now undergoing an internal restoration, as far as the nave is concerned, under the direction of Mr. Christian; the much-worn masonry of the fine nave arcade piers having been cleaned and renewed where necessary, and a new timber roof of corresponding style placed over it. The chancel and the south porch are among the best portions of this church; and the unusual form of west doorway, with groined soffit, and gable cutting into the window above (the window also being of exceptional design), is worth notice, though very late work. A warning to church restorers is stereotyped in the north doorway, where the arch mouldings, originally very good, have been gone over and smoothed down by some careless hand in such a manner as to remove the fillets from the face of rolls, leaving as a residuum a sort of nondescript moulding. This achievement, we believe, is long previous to the present restoration.

From Holbeach to Whaplode: we can concentrate all our attention on the churches this journey, for truly the country itself is uninteresting enough; but Whaplode is a reward for a dull drive. What could be done with the Norman style in a small church is shown here by the eastern part of the nave, with its chancel-arch decorated with zig-zag and pellet and horseshoe ornaments, and its piers and caps each differing in section and in design, some of the caps showing the hollow cone ornament, which is believed to have had its origin in Wales, though met with occasionally elsewhere. Some of the piers here are actually thicker than the wall above them (which is of the same date), the caps projecting far beyond the archivolts springing. The western part of the nave is of transitional date, the caps of the piers just blossoming into stiff, but highly effective, foliated ornaments. Taken altogether, this nave is an epitome of the progress from the complete Norman towards the realisation of Gothic feeling, even the older portions being in such sharp preservation of line and surface as would almost seem at first sight to discredit their undoubted antiquity. A fine tower of transitional date adds a further interest to one of the most complete and interesting relics of the period when our peculiarly national architecture was beginning to struggle into form and life. Moulton Church, mostly transitional in style, takes us a step further in this respect, especially as regards pier sections and carved capitals; and in the late transitional church of Weston, further on, we find the same progress continued, the three churches having very probably been built successively in the spirit of rivalry so prevalent among the Mediaeval builders, and affording a remarkable opportunity for the study of the development of that beautiful feature in architecture, the Gothic capital. The chancel arch and capital at Weston are among the most beautiful, in moulding and design, that could well be met with on so small a scale; and amid work of later date, the rectilinear tower and spire at Moulton should not be overlooked. We conclude our survey with the large and only church in the apparently active and wide awake town of Spalding. This church is remarkable in plan, having four aisles, or rather four and a half in the nave, and a side aisle to each of the transepts; remarkable also for the almost total absence of carved ornament of any kind in an edifice so large and of such "good" date (latter half of thirteenth century). The mouldings, too, are of the simplest, and rather tame in character, though, owing to the solidity of the masonry,

* See pp. 678, 699, ante.

and the remarkable perspective effects given by the plan, the general internal aspect of the building is very fine. The centre aisle of the nave was formerly the same height as the transepts; but, at a subsequent period, the nave piers were raised 6 ft., the arches being taken down and rebuilt at the new level. The roof is a fine piece of late timber-work, with carved angels with outspread wings on the hammer-beams, and a deep moulded and carved cornice. For the benefit of our musical readers (of whom we hope there are many), it may be mentioned that Spalding Church contains a very fine organ, of three "manuale," recently added to and retouched by Hill; and at Whapload there is a little organ of some interest, not only on account of intrinsic good quality, but as being, in great measure, the work of the amateur hands of (if we understood rightly) a former incumbent. Most of the other churches mentioned contain only what our Scottish neighbours might rightly term "kists of whistles."

Of course, such a near vicinity suggests a flying visit to Peterborough, only nominally beyond our Lincolnshire limits. Has the celebrated west front been possibly a little overpraised by those critics who have called it "the finest in Europe"? The conception is a remarkable one, no doubt; it may be owing partly to the blackened state of the stone that the great arcade scarcely shows its real size (losing its light and shadow tints), and seems less grand in reality than it appears in some illustrations; and the section of the jamb mouldings, a series of circular shafts of nearly equal size, placed at an angle of 45° with the wall plane, is not the most effective either for shadow or for giving scale to the design. We are not questioning the title of the façade to high admiration, but only by some critics. This front again illustrates the influence of rivalry in stimulating architectural achievement, the present design having been clearly added as an afterthought in front of the originally proposed termination, in order to "cut out" the transitional west front of Ely, then just completed; just as the present Lady Chapel, with its late and completely developed fan-groining, was substituted for the earlier one adjoining the north transept, in order to outdo the Ely Lady Chapel built just before, and in which the fan-groining has not quite reached its final development. The general design of the grand Norman arcades of the interior is familiar to every one; as at Lincoln, the vaulting-shafts (or rather roof-shafts) in the choir have been cut away and stopped to make room for the stall-canopies, perhaps in the fifteenth century; the "stopping" being effected by cutting away the heavy Norman shaft nearly to a point against the wall, and finishing each with a small delicately carved head; the effect of these little faces, scarcely more than 2 in. across, thus introduced into the midst of the massive comparatively uncouth Norman work, is most curious and piquant. The present stalls, by Blore (some thirty or forty years since), are admirable specimens of "restoration" work of that period; and the recent colouring on the ceiling and on portions of the walls of the choir, executed (we believe) under the direction of Mr. Gilbert Scott, is very harmonious and pleasing in effect, except the figures of Christ and the Apostles on the ceiling over the altar, which are in that archaic style against the revival of which we have again and again protested, and which has not the slightest necessary connexion either with modern church art or modern Christian worship. The colouring on the walls, be it said, is confined to flat surfaces; mouldings are not touched by it, and it is to be hoped will not be. The ruined hospital and chapel to the south-east of the cathedral should be inspected, as the remains of fine Geometrical work, and instancing the application of three-aisled buildings to other than strictly ecclesiastical purposes. We cannot however, on this occasion, linger longer over Peterborough, and will quit it with a word of appreciation for the careful and satisfactory singing of the choir: much better, certainly, than that at Lincoln.

What lesson is suggested to the architect by such a rapid review as we have been making of a number of churches of different periods of Gothic art? A good many, probably; but this one in particular—the only one on which we will here insist,—that of designing in strict relation to the properties of your material. We should be inclined to call this one of the most remarkable characteristics of early Gothic art. Taking one feature, the capital; we find, in the Norman period, and up to the climax of the

style, in the Geometrical period, ornament which precisely demands stone for its effect, and which could have been so easily and so effectively worked in no other material. So with larger features; the early lancet towers, for instance, which are emphatically masonic designs. It is only in later Gothic that we find panelling in stone, buttresses cut in wood, features used in contradiction to the material in which they are executed. Is not this relation between design and material the secret of the remarkable preservation in which older work is often found, in comparison with later? In our modern Gothic churches we often find most beautiful and delicate naturalistic carving, in comparatively soft stone, but of a type which would be better suited to wood-carving, and which has certainly little chance of lasting, in Bath or Caen stone, to be studied by the architects of five or six centuries hence. The early Gothic architects considered that in stone they had a granulated material, most effectively and most durably worked in large rounded projections and hollows, leaving plenty of breadth of surface. Their design almost grew out of the nature of their material. To the modern designer, whether he work in stone, wood, or iron, we say, "Go thou and do likewise."

Those who accompanied the excursion we have been making notes of, will feel that such notes would be incomplete without a word in recognition of the time and trouble so liberally given by the distinguished archaeologist and architect who suggested and organised it. Those who have gained a life-long experience in any branch of study, can hardly be more worthily employed than in giving to the younger generation some of the results of their acquired knowledge; and the valuable assistance and information given on this occasion to a number of the junior members of the architectural profession, calls for more than the merely private tribute of respect and regard which, we believe, Mr. Sharpe has already received from those who enjoyed the pleasure and profit of visiting the Lincolnshire churches in his company.

NEW PUBLIC BUILDINGS IN BARNSELEY.

ALTHOUGH the building trade in Barnsley cannot be said to be so active as it was a few years ago, there is, nevertheless, a fair quantity of work for the builder. Several large public buildings are either being erected or renovated. The introduction of the Midland system into Barnsley has not only given to the public a far superior station and a new county court, but the promise of a commodious and healthy station, in place of the present filthy structure which is owned by the prosperous Lancashire and Yorkshire Railway Company. The present county court, which has only been erected for a few years, being required for the purposes of the railway company, a new erection is going on at the top of Regent-street. The building is of a very substantial appearance, and when fitted up will combine all the requisites usually looked for in an erection of its kind. Mr. Sorby is the architect; the contractors being Messrs. Nicholson & Son, of Leeds.

The Beckett Dispensary, which was erected a few years ago through the munificence of the late Mr. J. S. Beckett, of Torquay, is being considerably improved. Another building of about the same area as the first erection is being built by Messrs. Nicholson & Son, at a cost of something like 4,000l. The structure, which is of brick with stone facings, will supply a long-felt want to the town and district in the provision of infirmary accommodation, which, to a mining and manufacturing community, is one of the most essential boons which can be placed at their disposal in case of accidents, which are of daily occurrence. The architect is Mr. Woodhouse, of Bolton, and the work, which is progressing satisfactorily, is being carried out under the superintendence of Mr. Amos Taylor, of the firm of Messrs. Taylor & Son, architects and surveyors, Barnsley.

The renovation of St. Mary's Church, which is fast progressing towards completion, has occupied the attention of the contractors and architect for some time. The structure (with the exception of the tower) owes its construction to the years 1820 and 1821. The interior, which is being renovated, measures 102 ft. by 61 ft., and was built at a cost of 12,000l. The whole of the galleries have been removed, together with the old square pews, and in their stead open stalls are to be constructed. The

interior generally has been renovated, and a vestry or recess, which was approached from an outer door, thrown into the church. A stained-glass window is to be placed in memory of the late Mr. J. S. Beckett, whose munificence has been before noticed. A stained-glass window is also being placed in the tower, which was built in the early part of the fifteenth century. The work has been placed in the hands of Mr. Bodley, of London. Messrs. Robinson & Son, builders, are the contractors for the mason work. Mention may also be made of several buildings, which, although not in the course of erection, must shortly follow in the train of public improvements. A commodious town-hall is greatly needed by the corporation, which has recently claimed and become enrolled amongst the boroughs of Yorkshire. The whole of the town-ship of the borough is transacted in the court-house, which was constructed in the year 1833, by subscription and out of the rates.

Public baths and washhouses are about to be erected by the town, a site having been promised by a gentleman largely interested in the welfare of the borough. As before intimated, a new railway station is also arranged to be built by the Lancashire and Yorkshire Railway Company. The erection of cottage property, although not so large as it was a short time ago, is still progressing, and a good many buildings have been put up during the present summer.

Several pieces of land have been laid out as building plots, and it is believed that the Shaw Lands, which were left for certain charitable purposes, about forty-two acres in extent, will be laid out, so that, should trade flourish and commerce deal out her customary blessings, the building trade of Barnsley will be at least moderately active for some time to come.

AMERICAN SHIPPING: NEMESIS.

FROM the time of and since the war, the Americans have gone in strongly for "protection," particularly in so far as the iron producers and manufacturers of iron are concerned. They have imposed duties almost prohibitory upon all kinds of iron and iron manufactures, from pig-iron to penknives, from scrap to steel springs, and the range has, of course, included the kinds of iron bolts and parts of machinery required in the construction of ships. The pressure brought to bear upon Congress recently has induced a relaxation of the tariff. The import duty upon wrought scrap iron has been reduced from 8 dollars to 5 dollars per ton; on cast scrap iron from 8 dollars to 6 dollars; and on pig-iron from 9 dollars to 5 dollars. To effect these reductions the free traders had to undergo a severe encounter with the protectionists, who insisted upon higher rates. The figures we have named do not materially affect the materials required in ship-building, and a renewed and continued fight may be expected between the shipping interest with others doubtless, and Congress, with a view to a relaxation of the tariff, and much need there is for such a change. Before the duties just referred to were reduced the dues stood thus:—Pig iron, 11. 17s. 2d. per ton; refuse scrap, 11. 13s. 2d.; Russia admitting pig, bars, and scrap, at 10s., and half a dozen other European countries admitting pig iron free. For parts of machinery, the United States impose an import duty of 9l. 15s. per ton, or four times the rate of some European countries. On some of the finer manufactures of iron and steel the import duties are almost fabulously high. Needles for sewing-machines, for instance, are charged 4s. 2d. per thousand, and, in addition, 35 per cent. *ad valorem*. Penknives and other knives, 60 per cent. *ad valorem*. Steel pens, 5d. per gross, the full value at the works, and 25 per cent. *ad valorem*. Files, rasps, and floats are charged with an import duty of 45l. 16s. 8d. and 27l. 13s. 4d. per ton, as they may be under or over 10 in. in length, and, in addition, 30 per cent. *ad valorem*. Screws are charged 50l. 13s. 4d. and 37l. per ton, and, in addition, 55 per cent. *ad valorem*. There is no tariff in existence, that we know of, as severe as that of the United States with regard to the metals and metal manufactures produced by the United Kingdom. It may be mentioned here that we take twenty millions sterling more of their productions than they do of ours, the figures being, as near as may be, imports from the United States 45,000,000l., exports to the United States 25,000,000l.

The protection shoe pinches; the effect of the screw put upon the shipping interest during the war, and of the severe tariff, has been to extinguish, as nearly as possible, the American mercantile marine and the American ship-building interests. The laws of the Union forbid would-be ship-owners from buying foreign-built ships, and registering them under the United States' authority; and the tariff prevents them from building new vessels. The days of timber-built vessels, they probably think, are over; and the customs charges upon the materials used in building iron ships render it utterly impossible for them to compete with European builders: hence it is that the stars and stripes, once so common on ships in the Thames and the Mersey are now rarely to be seen. The American would-be ship-owners are exasperated by the circumstance that their laws shut them out completely from participation at the present time in the ocean-carrying trade of the world, the greater part of which will fall to the ship-owners of the United Kingdom, who have amongst them a larger mercantile navy than all the rest of the world put together.

The ship-building yards of Boston (where there are about thirty), New York, New Jersey, and Newbury Port, are all silent and deserted. The yards on the Thames are not as busy as is desirable; but they are not all quite silent. On the Wear, the Tyne, the Clyde, and even on the Tay, there is the healthy clangour of ship-building industry. The remedy for the depression demanded by the Americans is that Congress should pass an Act to admit all articles required in the construction or repair of ships, and ships' stores, duty free. The shipbuilding art seems to have been destroyed, not by the protection given to it, but to the Pennsylvania ironmasters. A shipbuilder writes in the *New York Times*:—"For seven years there is not a ship-carpen-ter that has had work enough to teach a young man the business; and it is now a fact that it is almost an impossibility to get any first-class ship-carpen-ter to build ships. Those that are in the navy yards are so slow that they are of but little use to outside builders. I am confident that we cannot build up our mercantile marine with any aid we can get from Congress." The editor of the *New York Times* laments that for the first time in a generation an opportunity is offered to the American people of recovering an immense business once enjoyed by them—the carrying trade with Europe. He deplors the fact that the American mercantile marine is disappearing from the ocean, and that instead of their adding 500,000 tons a year to their shipping, as they did from 1827 to 1857, they are not building 50,000 tons a year. The Americans consider that the European complications have laid the carrying trade of the world at their feet, but they cannot take it up,—have given them a splendid chance that they cannot grasp.

They have no misgiving as to their ability to compete with English ship-builders, provided they had free imports. They would beat the English builders, they believe, in "the more ingenious use of labour-saving machinery" and otherwise; but confessedly, as matters stand now, they have no chance of existence in ship-building. An attempt was made recently at Chicago to build an iron vessel for the grain trade of the upper lakes. The import duties on the materials were found to range from 85 to 66 per cent., and the project was abandoned. There is not now a single American ocean steamer on the seas, among the 130, or more, that ply to and from United States ports. It may be hoped that those interested in the American ship-building and shipping trades may cherish a fellow feeling which may make them wondrous kind to others who are oppressed by the heavy burdens imposed upon the American people, and those who are willing to serve them, by their Old World and unwise tariff, and that the result may be its modification in the direction of a free exchange of productions.

The Manchester Surveyor's Salary.—At a recent meeting of the General Purposes Committee of the Manchester City Council, the town clerk read a report from the sub-audit committee, in which the question of the proposed increase of the salary of the city surveyor (Mr. Lynde) was referred to. The committee unanimously recommended that the salary of the city surveyor should be increased to £2500 per annum. The recommendation of the audit sub-committee was adopted, subject to the approval of the council.

ARCHÆOLOGY IN HEREFORD.

THE British Archæological Association are holding their Congress in the ancient city of Hereford. It was opened on Monday, under the presidency of Mr. Chandos Wren-Hoskyns, M.P. The Mayor and Corporation attended in state, and the Town Clerk having read a very complimentary address—

The Mayor of Hereford, in the name of the citizens, gave a very cordial greeting to the members of the Association.

The President then delivered his inaugural address, which was so interesting that we are led to print a considerable portion of it. After expressing a hope that every hour of their presence would be productive of gratification, as fully as it was appreciated by those honoured by it, he said that had he been led to think that in the part assigned to him there was involved any emprise beyond the homely and hearty expression of a Herefordshire welcome, nothing could have induced him to enter upon the duty of the hour. But the mission of the illustrious society, whose twenty-seventh anniversary was held there, was to teach, not to listen,—to point out to them with all the aids and advantages of widely-gathered antiquarian skill and experience the precious and too often overlooked or forgotten history of many local monuments of the past, such as their own district so richly furnished. He had, however, now to learn that true knowledge is ever gentle and forbearing,—that it knows well how to sympathise with the most imperfect efforts—nay, to condone even with ignorance itself which desires to learn. Such was the feeling under which he ventured to weave into the offering of their welcome, a few thoughts and questionings that occurred to him and to others in reference to the archæological features of the district, which formed the scene of their session of 1870. Having spoken of the term "our ancient city" as indicative rather of affection than actual chronology, he said, we are all archæologists at heart, and like to feel that we belong to the past, that our roots lie deep like those of the native oaks of our country, that there are old weather-beaten links that connect us with the almost forgotten days of an ancestral world, whose dead, but not memory, had passed away. It would seem like a waste of time were he to attempt a panegyric upon a branch of knowledge now so popular and so justly valued as that of archæology. Long before archæology had begun to be studied as a science it was the remark of one who professed himself a disciple (Sir Thomas Browne) that "Time conferreth a dignity upon the most trifling thing that resisteth his power." Such were the words of one who, in the seventeenth century, spoke only with the feelings of an antiquary. What would have been the expression of his feelings now? We had only to look at the language of every historian who had written within the last twenty years to witness the relation into which archæology had now entered as the acknowledged handmaid of history. So remarkable had been this progress, that it could hardly fail to have awakened in many minds a reflection that had taken something of the form of paradox—that the older the world grew the more it should seem to care, the more curious it became, and in truth the more it learned about its origin, ethnological, linguistic, and historical. In the ordinary course of experience, and even of thought, it might seem quite natural that a science which essentially bears reference to the past should belong to the class of subjects to which time brings diminishing interest, and should suffer from the presence of the busy world around us. So far is this from the fact, that every work that issues from the press in history, or language, or philology,—on race, on geographical discovery, and the physical history of the globe, even on general literature,—contradicts emphatically such a conclusion. It almost seems, on the contrary, as if it had been reserved for this latter age to open out a new and extended horizon, derived as from a new world of old matter. What was less than a generation ago looked upon as a topic of rare, almost eccentric curiosity to a small knot of inquirers, has, by gradual but well-marked steps, dilated into a broad front of eager and extending research, and that, too, not in one, but in many directions, the joint effect of which is in some respects to throw a fresh significance upon every branch of history, and claim for archæology a position amongst the most valued studies of the world's advanced age. Some there are, it is true, and still pos-

sibly no inconsiderable class amongst us who regard the pursuit of it as "unpractical." But he ventured to think that a little comparison would show that this was not only erroneous, but opposed to some of the best practical evidences that can possibly exist of the relative value and position of human studies. In politics, in ethics, in metaphysics, in poetry, viewed abstractedly as studies,—in painting and sculpture, in geometry, architecture, and in decorative skill, viewed as arts, the vertebral principles, so to speak, have been before the world unaugmented by any established addition or discovery, for the last two or three thousand years. For the four first that he had mentioned, the names of Appelles, Phidias, Archimedes, and the artists of Nineveh, Thebes, Athens, and Pompeii, stand to this day unrivalled, almost unapproached. These subjects have been, in a certain sense, argued out; nothing really new (with one great exception) has been said about them for ages past, nor seems likely for ages to come. He was not aware that a single new principle of government had been evolved out of the human mind since Aristotle wrote the *Politica*, or Plato his *Republic*, and each of the others stands in the same category. Upon these great subjects, though on many of them men remain as divided as ever into opposite views, it is not so much that we shut our eyes to new truths as that there are no new truths to tell.

Not so is it with archæology; the study which but the other day was regarded as the harmless pursuit of the curious and eccentric—groping among the dry bones of the past,—has now awakened into such life and meaning, as to startle even the most incredulous with facts that present an organised shape no more possible to pass by or overlook than would be one of those extinct giant creatures of our globe, were it suddenly to arise before us at the recreating touch of a Cuvier or an Owen from one or two fossil bones of its stupendous form. Indeed, it is in exact analogy with such a recreative power as this that archæology develops its most useful results. It restores to the mere skeleton of history or tradition the flesh and lineaments—the very bearing and expression—which each age wore as it passed by. We see the illustrious figures of the past moving over the stage of life, as Macbeth saw in spectral procession the future of Scotland's monarchy, even down to that one who showed a double crown, by which with transcendent art our great poet brought down the story of his immortal drama to the time and into the very hearts of his audience. The history of our race, which even up to our own day was content, indeed compelled, to walk alone by the light of tradition, or of documentary evidence not always more reliable or authentic, is now compared by an active colleague who takes nothing for granted, owes little to theory or hypothesis, but points to earthly vestiges, substantive records, visible and tangible existences, that have awakened a new century of thought, and seem to enlarge not only the scope but the very scale of our contemplation. As an illustration of his words: less than a generation back, if an antiquary had been questioned where the most ancient monuments or vestiges of our race were to be found, he would at once have pointed to Egypt or to the East. Very different would be his answer now. Without going out of Europe, without even crossing that narrow channel which so graciously divides us from its complications,—on banks, once the extended beds of familiar English rivers; beneath the soil of many a modern village,—indubitable traces are to be found of human life and habitation, reaching up to a period so remote that in comparison with those primeval denizens of our island the shepherd kings of Egypt, or the almost fabulous dynasties of India and China, would seem but men of yesterday.

"Antiquity appears to have begun
Long after their primeval race was run."

It might almost raise a smile to see the antiquary of the last generation paying reverence to a coin or fragment of pottery, for its extreme antiquity, reaching to some three or four thousand years, while beneath his very feet reposed the long-forgotten implements and weapons of men who saw the hippopotamus floundering and basking in the mud of the Severn or the Thames, or tracked the stately mammoth to his lair in the neighbouring Forest of Dean, or transfixed the giant reindeer, with bone-headed arrows, and scooped out its marrow with flint knives. Such

are the thoughts which unavoidably suggest themselves to the contemplation of archæology and the sciences in close alliance with it.

Proceeding in the spirit of inquiry to ask the solution of some of the difficulties the archæologist would meet with in Herefordshire, he ventured to assume the existence in other minds of a sense as enthusiastic as that which had dwelt from childhood in his own, in looking upon this county as the very heart and centre of the border land that has separated in turn some of the most varying and remarkable races by which our island has been from time to time occupied. From the earliest dawn of traditional history, this has been the disputed territory, the battleground of opposing tribes and races,—may we not almost look upon it as a sort of epitome in itself of the changeful dynasties and fortunes of the whole soil of England? By the Roman and the Silurian, by the Mercian and the Briton, by the Dane, the Saxon, the early Norman settler before the Conquest, and the Welshman, our fields have been fought over acre by acre, and inch by inch. War has been here in all those forms of grandeur and of misery of which we have lately heard, and are still impressed by such painful and such solemn evidence. Century after century it has swept like an ebbing and flowing tide, backwards and forwards on the Severn on one side, to the frowning barrier of the Hatterel hills on the other, sometimes perhaps ennobled by deeds of high daring and chivalrous generosity—more often marked by the dark and fierce passions that made the very name of border warfare and the inroads of the marauding a synonym and excuse for every form of rapine and cruelty; its combatants on either side realising in the worst degree the Roman general's contemptuous phrase "*Cauponantes bellum non belligrantes*."

Certainly the most interesting and intelligible, as well as the most early recorded of these conflicts is that long twenty years' struggle of the Silurian ancestors single-handed against the power of Imperial Rome, which found on the red plains of Herefordshire an opponent not unworthy of its arms. I need not recall to you who listen to me here that in the neighbourhood of the very spot on which we are now assembled there once existed one of the bravest and fiercest races that ever defied the practised arms of the world's conquerors. Far and near around this spot the very ground we daily tread on witnessed their dauntless and never-dying resistance to the Roman invader. Even at this distance of eighteen centuries it is difficult not to feel a glow of pride at the description given by a hostile historian of a race dwelling here whom no strength or strategy could divert from their patriotic courage, who kept the veteran troops of Rome's best legions in a state of constant vigilance and alarm, even within their entrenched camps. For such we know were throughout the Claudian war strategically arranged by Ostorius along the course of the Severn and the Avon. Yet for nine years we find this brave people under their great leader and king, Caradoc, defying the Roman arms and struggling to break through the chain of military camps established to repress them. It is doubly interesting to gather from the eloquent facts themselves that had no historian on the British side,—from the gallant and long-protracted struggle,—from the extensive operations to which the Romans were driven,—our assurance of the genius and courage of that noble British chief

"Descended from a sceptred race,
Who ruled Britannia's independent Isle,
Beyond all annals of recording fame."

The interest of this struggle deepens after his final defeat and capture, and the well-known scene in Rome; when we find them unsubdued by their loss, revenging themselves by bloody onslaughts upon their invaders, and Ostorius himself, in spite of his victories, dying of vexation more than fatigue; and his death followed by a defeat so ignominious that the province still threatened to be torn away from Roman power. And when was noble tribute ever wrung from the pen of an enemy that conveyed in the words of Tacitus, in describing the close of that twenty years' warfare, where he tells us that Julius Frontinus had the glory of subduing this powerful and warlike Silurian nation, in accomplishing which he had to compete with an indomitable foe, and with local strategy which had equally defied the utmost efforts of all his predecessors.

If such was the tale as told by the pen of the Roman annalist, what would not the record have

been if King Caradoc had but had his *vate sacro*,—if a few telegrams from our own special correspondent could but reach across the gulf of those eighteen centuries?

But let me put the question I have so often longed to ask,—for when can I better ask its solution than now—Who were the Silures? Whence came the black eyes and hair, the small heads and features, the lithe forms and swart complexions that are described as the physical characteristics of the race located in this district, apparently in such contrast with the large-limbed and fair race whom Cæsar found on his first landing in Eastern Britain, and which have been accepted as the ordinary British type? Were they a Celtic race? and, if so, to which of the Celtic migrations did they belong? or is that theory true which assigns them (with Tacitus) to the Iberian rather than the Celtic stock, and connects them with the population of the Basque provinces of the Pyrenean districts, whom they so much resembled. Or are both these theories consistent with each other, and did the Silures form part of that third Celtic migration that came from the south by sea, and has been called from the country where the migrants longest remained and exercised most influence, the Hispano-Gaelic migration? We are told that there is heard to this day in a few hamlets on the Pyrenees a tongue entirely dissimilar from any that falls on European ears—an isolated surviving vestige of some ancient tribe whose history and migration have been long buried in the mystery of Time: yet these few traditional sounds are of deep interest to the student of those early migrations through which the west of Europe was peopled by intrusive races who first conquered and then united with the native populations. May we venture to suppose that it was from that migration, bringing with it so much that we associate with the Iberian or Spanish stock that the Silurian type was derived?

And if this supposition be admissible, may it be to an old student of agriculture allowable to connect with it collaterally a peculiarity found in this county in the existence of a certain ancient four-footed race bearing striking points of resemblance with the sheep of Spain,—the Spanish merinos? I allude to the little Ryland sheep, whose silken fleeces once formed the unrivalled staple of the commerce of Leominster, when that town was one of the principal markets, indeed the chief emporium of this part of the kingdom.

In concluding an exceedingly interesting and very eloquent address, Mr. Wren-Hoskyns said: The truth is, we are so full of written histories that we are apt to forget what Mr. Newton, our Herefordshire Leyard, so eloquently says,—"*The record of the human past is not all contained in printed books*." Man's history is graven on the rocks of Egypt, stamped on the bricks of Assyria, enshrined in the marble of the Pantheon. It rises before us in the piled-up arches of the Coliseum; it lurks in unsuspected treasure amid the oblivious dust of archives and monasteries; it is embodied in the heir-looms of familiar races, in the relics which affection and gratitude, pride of country or lineage, have preserved; it lingers like an echo on the lips of the peasantry, surviving in their songs and traditions, renewed in their customs with the renewal of nature's seasons. We trace it in the speech, the manners of nations; we dig it out from the barrows and the necropolis; and out of the fragments thus found we reconstruct in museums of antiquities something like an image of the past.

The footprints of those who have gone before us are not the mere subject of literary interest or curious inquiry; they find an instructive response in our hearts which rejects the mere parrot-tale of the showman or cicerone. We are sensible of an occult relation sacred to each individually with all that has gone before us,—with all that will come after: we stand upon a mere point of Time, with an Eternity on either side. It is our especial privilege alone of all created things,—often our penalty,—to look before,—and after:—to remember, and to hope. The vestiges that have been left to us from the past are the links that tie each generation with immense antiquity behind it. Spanning the abyss of time by monumental records, often as unconsciously transmitted as the footprints of those extinct races that pressed lightly upon the soft sand, they reappear to our eyes through the lapse of ages in fossil shapes of almost imperishable durability,—apt emblem of our own poor fragile frames, yet far-reaching thought and destiny.

On the motion of the mayor, thanks were voted to Mr. Hoskyns by acclamation, and after a brief address by Mr. Godwin, warm thanks were also given to the corporation. At the dinner in the evening, the president was in the chair, and several interesting speeches were made.

On Tuesday morning, after service, Mr. Gordon Hills conducted a large party round the cathedral, and delivered a discourse on its history, in which light was thrown on several disputed points: afterwards, the Rev. C. Boutell ably described the monuments. To both these addresses we shall return. In addition to the gentlemen already named, the Rev. Dr. Jebb, Prebendary Scarth, Mr. Thomas Wright, M.A.; Mr. Edward Roberts, F.S.A.; Mr. Blashill, Mr. W. P. King, Mr. J. F. Symonds, Mr. Henry Godwin, F.S.A. (of Newbury); Mr. W. H. Black, F.S.A.; Mr. Holt, F.S.A.; Mr. T. Curley, C.E.; The Rev. F. T. Havergal, Mr. J. Severn Walker, Mr. G. C. Haddon, Mr. Dillon Croker, the Bishop, and others, are taking active part in the proceedings.

COLOURS AND DYES IN EARLY TIMES.

THE subject of colour, now so much discussed in connexion with architecture and sculpture, is interesting in more respects than one. Colour has also a sanitary aspect. The houses we live in, the food we eat, the fluids we drink, and the clothing we wear, display it. Our very tastes, bodily and mentally, are influenced by colour. To its influence and production, in a domestic and sanitary point of view, we will first look. There is hardly anything in nature or art colourless, and a certain colour, to certain minds, produces a feeling of pleasure and comfort, or otherwise. Independently of the fine arts, and of Nature's landscape, we are governed by colour. The female dress or head-gear, or the man's coat or vest, is as often chosen for its dyes as for its texture; but not one out of the ten thousand who are more or less influenced, or who even talk glibly about colour, gives one moment's thought to how these beautiful dyes in articles of their daily clothing are produced. The history of the art, in its relation to civilisation and sanitary progress, possesses much interest and deserves attention.

The early inhabitants of the British Islands understood, not only the art of making several kinds of linen and woollen cloth, but were acquainted with native modes of dyeing them. We are told by Strabo and Dion of the principal colours worn by the ancient Britons, which appear to have been yellow, red, and black; and Giraldus Cambrensis, writing in the twelfth century, tells us that the Irish wore frequently black, which he avers was principally made from the wool of their black sheep. The history, romances, and poetry of the Kelts furnish us with abundant proofs that it was saffron or yellow colour that predominated, and for which the greatest fondness was shown. Of the other colours, red and crimson are often mentioned. Robes of these colours have been often worn. Several Irish statutes, however, bear testimony of the propensity of the Kelts for yellow. Among the Gauls and ancient Britons the principal colours were black, crimson, purple, and yellow, and there were also several among the Kelts. While we learn a good deal from history about colour, the majority of our historians are altogether silent about its production, or of the materials used in its composition. In considerable travel through the British Isles, extending over many years, we have picked up from usages, recollection, and mouths of the people themselves, in distant localities, the information we have been unable to obtain elsewhere. Some years ago, on the coast of Wales, and on the south-west coast of Ireland, we found traces of the primitive modes of dyeing, and the methods used for producing the materials employed in the production of some very beautiful dyes and colours. Yellow was, in former times, and recently, a favourite colour with both sexes, but principally with the fair sex. In England, Ireland, and Wales, women dyed their chemises, veils, petticoats, and bodices, and the men their shirts, vest, and trousers. In Ireland, after the invasion of Henry II., Acts of Parliament were passed to prevent the English settlers from following the Irish custom of dyeing their garments yellow. The English statutes assert that the colour was saffron. We wonder if, by saffron, was meant the crocus, as we cannot find any evidence that the early Irish ever cultivated the crocus. Its introduction into gardens in that

country is of a recent date. It was hardly imported from abroad by the common folk, or even others, as its expense would preclude it from being commonly used. Saffron probably meant any yellow colour. The woad or weld, *Reseda luteola*, sometimes called dyer's weed, used so extensively in this country, was also used among the Irish, and was known to them by the name of *buillmor*, or great yellow. We are aware that the Irish used the plant to dye their woollen and linen stuffs with different degrees of colour, and fixed it with urine. The colour thus obtained was not given to fade; it resisted damp or wet for a considerable period, and possessed another property, thought to be of advantage to the poorer classes—it required little or no washing.

If we are to credit Morryson, the Irish of the period he alludes to, were very sparing of their clothes, and were not addicted to wearing them out by washing, frequently not taking their shirts or chemises off until worn out. The truth of this must be qualified by suggesting that it must be very low orders who would thus wear out their under-clothing without cleansing. It is asserted that washing was not necessary in some instances, as these linen garments became so thick and close by the colour and fixing employed as to become nearly impervious to dirt or wet. This assertion must also be received with considerable allowances. The black colour which Cambrensis speaks of as being general, from the fact of the existence of black sheep being in the country, is not borne out on examination. All the sheep were not black, and we find that the black colours were of a deeper hue; and consequently, if black wool was even generally used, a deeper tint was employed. We find that such was the case. The lower orders, down to a few years ago, in remote districts, had their mantles, trousers, and cloaks of this colour; and the following was the method employed for producing the colour or dyes:—A bog-mire was procured; and this consisted, as all are aware, of decayed vegetable matter of an astringent quality. The colour was fixed by the same means as we have before mentioned, a means still used, more or less, throughout the three kingdoms. The colour produced by the bog-mire was of a jet or deep black. This was a most lasting colour when once properly fixed; the weather could not affect it, and it retained its brilliancy while a portion of the cloth remained. If coarse woollen cloths could be thus dyed by the humble and unlettered of such ineffable hue, it occurs to us that clothiers would be successful with fine linen stuffs also. Persons of rank in England formerly, and very generally in Ireland, had their garments, which were made of fine stuffs, dyed purple and crimson colour.

We find, in some of the ancient Ossianic and Celtic poems and romances, frequent mention of purple (red and blue) garments. Many of the Irish and Welsh peasantry by the seashore, in the last century, and early in the present, were engaged in collecting the mosses that grew upon the rocks and stone, for the making of purple dye. The Irish called it *corcain* and *arcell*, and by the Erse it was known as *corkin*. The fine bright crimson colour was obtained from the finer kind of *corcain* scraped from the rocks, which was afterwards dried in the sun, and reduced to powder; then infused in urine for nearly the period of a month. The *arcell*, or coarse kind of moss, produced the purple colour; it was also similarly treated, and made up into balls with lime. It produced a beautiful purple colour. Early in the present century large quantities of colours and dyes thus made were sold in the public market-place in Dingle. The very same description of moss in nature and property was largely imported to London from the Canaries and the Azores, under the name of Orchil. At the date we are speaking of, 10,000*l.* to 12,000*l.* annually were paid away for foreign moss, and this same *orchil* or *arcell* could be procured in any quantities on the south-west coast of Ireland, and on other sea-beaches in Great Britain. The Irish produced also from this moss, orange and bright scarlet colour. This they accomplished by dyeing the stuff first yellow and afterwards crimson.

Dr. Nicholson, the antiquary, when Bishop of Derry, in 1725, intending to prepare a natural history of his diocese, wrote to his several clergy to make collections in their several parishes. A Rev. Robert Innes, rector of Magilligan, in the county of Derry, responded, and in 1732 the rector published in London seven letters, addressed to his lordship, of a very interesting

kind. From one of these letters we glean a few more facts in corroboration of our own researches and experience. One extract will be interesting:—"The Irish have herbs for diet for physic, and almost all uses. They use a *pentaphyllum rubrum*,—in the Irish language, *crawlean*,—to thicken their milk suddenly, by rubbing their vessels with it; and, by the way, I cannot think it the same with Parkinson's or Ray's, for this carries no red flower, nor any flower but purple hairs, on a strawberry-like button, but whether I mistake them, my lord, I will not be particular. The tops of the yellow ladies' bedstraw they use for dyeing yellow, and the roots for a madder red. Crother, a sort of moss on stones, dyes a good gold colour. Corky, another scurf on stones, dyes a peach colour; the roots of the white water-lily, a black. In a word, we can dye most colours with our native growth, but blue, or what depends upon it. The roots of tormentil (in Irish, *namat*) hath been used by the Irish to tan leather."

It would appear from the above interesting record that the Irish in Dr. Nicholson's day,—or say, a century and a half ago,—had no native method, no plant indigenous to the soil, for producing blue. It might be true as far as Derry was in question, but it is not true of the whole country.

The plant well known in this country as woad was extensively grown in England for many years—it produced a permanent blue dye. This plant must have been known in the sister kingdom also, though not so soon. We cannot say we met with it much in its wild state anywhere except in the immediate districts where it was extensively cultivated, and in places where the seed was likely to be drifted by the wind. Blue, as a general colour, does not appear to be in much repute among the early inhabitants of the British Isles, although we read of the ancient Britons dyeing their bodies with a blue colour. In the present century in the three kingdoms, blue colour in articles of wearing apparel appears to be more sought after than formerly. Blue, for many things, is a more lasting colour than black; while lime and mortar will affect black cloth, and turn it yellowish, blue will resist its effect.* Indigo now is gradually superseding the use of woad. The latter we have known to be greatly adulterated, and which, though sold as woad, fully two-thirds of it was composed of a variety of wild and cultivated plants ground up altogether, dried and rolled up into balls for use. The public have been thus cheated out of their proper colour and dye, cheated in articles of clothing as well as eating and drinking, through believing they were purchasing stuff that would wash and hold their colours fast. A dress, of course, that does not hold its colour, though warranted by the seller to do so, is simply a robbery. The seller knows pretty well from the price which he pays the manufacturer, whether the article is a fast colour or not, and if he sells it as a fast colour to the struggling tradesman or tradesman's wife as a fast colour when it is the reverse, he is obtaining money under false pretences, and he should, without any ceremony, be at once indicted. This is the sanitary aspect of the case, in the interest of the health and living of the poor.

We will adduce a few more particulars concerning the dyes and colours in use by the ancient British and Irish ladies. Dion and the venerable Bede inform us that they dyed their linen a beautiful crimson colour, which neither the heat of the sun nor the continuance of the rain could injure. The colour was produced from a small shellfish called *cochleo*, and was named accordingly *coccine*. We are not told by any of our ancient writers the species of shellfish. We have sufficient knowledge to be certain that it included the periwinkle and a limpet of black, red, white, brown, yellow, and sand colours. The method of obtaining the colour or dye was pretty extensively practised at one time on the western coast of Wales, and on the eastern coasts of Ireland, principally Wexford and Wicklow. The fish was turned upon a stone or some other solid body, with its mouth underneath, and without injuring the fish the shell

was carefully broken. The shell being picked off, a white vein presented itself, extending transversely in a hollow or furrow near the head. This might be lifted out by a pointed instrument. When the periwinkle was used the shell was not injured. In this instance the vein was seen lying on the head. This, being pricked with a needle, emitted a few drops of a milky white liquid. The process might be repeated for four or five days without injuring the fish. If letters or figures were drawn with the liquid obtained from either fish on linen, the characters first assumed a light green, then a deep green, next a full sea-green, afterwards blue, again a deep purple, red, a perfect set of chameleon-like variation, all in a few hours, while exposed to the sun. When the sun has done all it can do, domestic art steps in. By washing it in hot water and soap, the purple colour then becomes a beautiful crimson, which none other of the elements can change,—sun, rain, nor washing. The early Britons are said to have dyed much with this colour, but we doubt it. To dye thus on a large scale, would lead to the destruction of immense quantities of fish. With only six or seven drops to be obtained from each fish, the sacrifice of the little marine molluscs would be something awful to contemplate,—sufficient, we opine, to start into existence a new Society for the Prevention of Cruelty to—Univalves. Some hint that the celebrated Tyrian dye of the ancients was produced from these shell-fish; but it is more likely that the famous Tyrian purple dye was obtained from orchil or corcain, so plentiful on their rocks.

If *cochleo* could be procured in sufficient quantities to dye large pieces of linen, the beauty of the fabric could be enhanced, and also the price, the colour thus obtained being so beautiful, exceeding that of corcain.

Foreign importation, mechanical appliances, and chemistry have of late years been fastly superseding old native ways and means. Yet it is hardly to be doubted that, in the bustle and din of now-a-days, much that is valuable is lost sight of, because it has dropped out of use, at a time when there was no method employed or properly known for utilising it. We have under our very feet material for many things quite equal to what we often send several thousands of miles to procure. Our mountains, bogs, and sea-beaches are mighty and gigantic undeveloped resources of fuel, building materials, food, and minerals. By the talismanic touch of industry and energetic labour, they may be made to yield animal sustenance for our bodily wants and materials for our domestic uses.

Of colour in the concrete and in the abstract much might be usefully written, as also of the manufacture and manipulation of colours for fine art and domestic purposes; but these latter branches of the subject would lead us into extensive technical fields, foreign to the immediate topic.

ARCHITECTURE FOR INDIA.

WE quote an additional portion of Lord Napier's Lecture on Architecture already referred to:—

The march of Mussulman conquest is generally associated with images of desolation, and no doubt in some respects with justice. The disturbance of existing laws and a violent change in the depositories of power must, under all circumstances, be associated with some oppression of productive industry, of arts and of letters, and there was much in the principles of the Mahomedan religion and the practice of its early sectaries to aggravate those inevitable evils. The Mussulman invaders rarely fostered or practised agricultural labour, they rather lived wastefully on the labour of others. They had little respect for the poetry, the philosophy, or the history of the subjected races, the science which they adopted from the conquered they did not much improve, while the maxims of their faith, impatiently confounding worship with representation, prohibited the imitation of the human figure in painting and sculpture. The progress of Mahomedanism was not, however, entirely destructive. Excluded from half the dominion of the Fine Arts, the ardent and the refined genius of the Arabs fired by an enthusiastic belief in the sublime dogmas of the spirituality and unity of God, expended itself in the creation of an order of religious architecture which has never been surpassed in the history of the world. Nor was the secular branch

* See p. 680, ante.

behind the sacred. Bred in the invigorating atmosphere of revolutions and conflicts, many of the Mussulman rulers discovered generous abilities and tastes. The fine arts, in a limited sphere, were the indispensable attendants on the pleasures of their courts, and there are proofs in the memoirs of some that they took a personal dislike in the patronage and practice of poetry, music, gardening, and design. From Granada to Constantinople, from Constantinople to Samarand, and from Samarand to Bejsore, the earth is adorned with the masterpieces of Mussulman piety and taste, and too often strewed with their remains. In contemplating this admirable development of art, it is but just to observe that it started from an advantageous basis. The Mussulmans found in Syria, Egypt, Northern Africa, Spain, Asia Minor, and Byzantium, at the least, in partial preservation, and a new style growing up under the influence of Christianity, which, if in some respects barbarised, was still, as experience proved, possessed of a fruitful vitality, and pregnant with the most beautiful developments. The capital features of the style, whether pure in the Pagan forms or in process of Christian transformation, were the arch and dome. These the Mussulmans adopted and diversified, and having added the minaret, they thus composed a group of architectural forms, in which dignity, elegance, and the picturesque are united with perfect constructive science. The Mussulman forms are, however, not only beautiful and scientific, they are in the highest degree flexible and useful, they unite cheapness with adaptability.

Mussulman architecture requires the least amount of ornament conceivable, though it is capable of receiving a great amount of ornament. As the lines are harmonious and aspiring, the lines alone please the eye. While the Hindu and the Greek require to be loaded with sculptural decorations, without which they would appear poor and bare, the forms and combinations of the Saracenic possess an independent and satisfying grace. But there is not only an economy of ornament, there is an economy of material. The horizontal styles, those which are represented by the pillar and the beam, demand when the spaces to be covered are considerable, and the supports are distant from each other, a vast application of material in its most weighty and expensive form. But the arch and the dome offer, as I have said before, a combination of parts, each small and cheap in itself, but capable together of spanning the largest areas at the smallest cost. The Saracenic forms can also readily be adjusted to any destination. Most excellent in the sphere of their primitive application for divine and solemn purposes, for the mosque, the cloister, and the tomb, they are equally available for habitations of great and small dimensions, for halls of public assembly, for galleries and exhibitions, for railway stations, for repositories of goods, for theatres, conservatories, and lecture-rooms—in fact, for all the diversified requirements of modern social life. I do not know whether it has been suggested that the Saracenic style appears also to be best adapted for iron constructions, and especially in this country. It is true that the dome and the arch, so congenial to iron building, belong to other styles as well as to the Saracenic, for instance, to the Roman; but the proportions belonging to the Roman style are more massive than would be suitable in iron, nor does the Roman offer as a great variety of designs as the Saracenic for screens, railings, perforated surfaces, and other subordinate decorative objects.

I hope I shall not be considered fantastic in remarking, that a feature in the Saracenic architecture peculiarly attractive is the sympathetic manner in which it associates itself with gardens and trees, and with all the forms of natural scenery. For parterres of the regular kind, the geometrical patterns peculiar to the style supply an exquisite frame-work; while the cypress and the plane, the types of aspiring and spreading vegetation, appear to be repeated with a sort of rhythmical concord in the minaret and cupola. It is not in the power of all to admire these harmonies beside the rushing current of the Bosphorus, or on the slopes of the Bythinian Olympus, or at Cairo, where the Caliphs sleep between the city and the desert, or where the dust of Shah Jehan and Mounts Mahal rests under an incomparable canopy, near the waters of the Jumna; but go to the quiet garden at Seringapatam, go to the grove of tamarinds and palms beneath the rocks of Yellere, where the funeral repose is accompanied by

the muttered Koran and the murmur of waters from the well; there you will still feel how the voices of nature and art, of beauty, divinity, and death are blended by the Mussulman builders.

It has been remarked by Mr. Fergusson, in a recent lecture, that the forms of Hindu and Mussulman art have been happily associated in secular buildings. This union has taken place sometimes through the adoption of Mahomedan forms by Hindu architects, sometimes through the employment of Hindu artists by Mussulman princes. Fine examples of the former method are to be seen at Bejeannger, and also at Madura, to which the Naick chiefs transplanted the arts of the Telugu capital on the Toombuddra. Examples of the latter abound among the later works of the emperors of Baber's line. Under Akbar and Shah Jehan it almost seemed as if an attempt had been made to effect a reconciliation between the arts of the Hindus and Mussulmans, corresponding to that which was so happily established for a time in their political and social relations. It must be allowed that the architectural combination is often effective and picturesque, yet I think that the mixture is to be deprecated. The Hindu and Mussulman may borrow from one another with less disadvantage than from the European, and I would even allow that the first may occasionally employ the Saracenic arch combined with their own decorative details; but the Mussulmans should never adopt anything from any foreign source whatever. They possess a perfect style, which can only be debased by alliance. The corruption of the Saracenic is very remarkable in Mysore and the Carnatic. At Seringapatam you may see the Mussulman cupola surmounting a Hindu colonnade. At Wallajahpet, in a mosque of recent construction, the façade is composed of a classical portico with Saracenic pinnacles, while the surrounding cloister is Hindu. Similar degradations may be observed at Madras. There is a handsome tomb, erected in Triplicane about the beginning of the present century, where Roman pilasters and vases, with Hindu details, are all incorporated with a Saracenic outline. The great mosque of Triplicane, constructed in part of noble materials, and in a style of severe simplicity, seems to stand forth as the last protest of a dying art, and to rebuke the degeneracy of the present age. To the Mussulman youth who aspires to taste and knowledge, I would say, as I have said to the Hindus,—respect, preserve, study, and imitate the works of your ancestors, using their examples not slavishly, but with intelligence, modifying them, in their native spirit, to the requirements of the time.

The Governments of India might, in my humble judgment, do well to consider whether the Mussulman forms might not be adopted generally as the official style of architecture. Very little study would render them familiar to the English and native builders. They would be found, after a short experience, to be cheaper than the present forms, and far superior, with reference to shade, coolness, ventilation, convenience, and beauty to all that we see around us. This Government has endeavoured, with the advice of an accomplished architect, to exhibit in the improvements at the Revenue Board an example of the adoption of the Mussulman style to contemporaneous use. Mr. Chisholm would be the first to disclaim and condemn the material, which has been forced upon him by necessities to which we are still subjected; but his design will be a practical demonstration of the views which I have here advocated. He has paid the first tribute to the genius of the past; he has set the first example of a revival in native art, which, I hope, will not remain unappreciated and unfruitful.

SHEFFIELD.

New Music Hall.—The chief stone of a new concert-hall, in course of erection in Barker-pool, has been laid by the Duke of Norfolk, in the presence of a numerous assemblage of people. The edifice will be in the Italian style of architecture, though it will not be very elaborate in its decorations. The principal entrance will be in Barker-pool; and it is intended that the pavement along the whole front shall be covered in, so that no inconvenience may be experienced in wet weather by persons leaving or going to their carriages. The entrance opens into a hall 26 ft. square, on each side of which are waiting-rooms, and two wide staircases, one leading to the floor of what will be called the "great" hall as distinguished from one of less proportions, and the other also leading to that floor,

and affording an entrance to the balcony and to the first gallery. In addition to the waiting-rooms in the entrance-hall, there will be two refreshment saloons. Another entrance to the building will be in Burgess-street, and a third entrance at the end of the hall farthest from Barker-pool. Two distinct staircases lead to the principal gallery, and there are other staircases for the use of the orchestra, performers, and others. Adjoining the Burgess-street entrance there will be the "little" hall; not very little, however, for its dimensions are 60 ft. by 30 ft.; and leading from it there will be several waiting and retiring rooms for musicians, performers, and so on. This hall will be used for rehearsals and for small concerts. At the top of the staircase in the main entrance there are two spacious corridors, one extending along the whole front of the building, and the other running down the western side. By means of these, and by four doors in the various parts of the room, entrance is obtained to the floor of the large hall, the dimensions of which are 120 ft. by 60 ft. In the interior the sides will be broken up by pilasters, and the ceiling will be of wood coved, and decorated with perforated panelling, which will be used for the purpose of ventilation. The height of the hall is 50 ft. in the centre and 43 ft. at the sides. The balcony, which is approached by its own staircase, will be two seats only in depth, with a passage at the rear. Behind that at the Barker-pool end there will be a small gallery, and above it the principal gallery, which will extend the whole width of the end of the building. Near to the orchestra there will be a couple of private boxes. The hall will be capable of accommodating 2,500 persons comfortably, but by removing the seats from the floor upwards of 500 more could gain admittance. The town has long wanted such a building. Messrs. Flockton & Abbott are the architects.

Proposed Art and Industrial Museum.—On September 1st, at the Cutlers' Feast, Mr. W. Bragge, the new master cutler, declared his intention of making it his business, during his year in office, to establish in Sheffield a museum useful to the art industry of the town. On the following day a meeting was held, at which a committee was appointed for the promotion of the work; and Mr. Cole, on behalf of the Science and Art Department, stated what assistance could be demanded from the Government.

The Norfolk-street Improvement.—The Under-Sheriff of Yorkshire, Mr. W. Gray, and a special jury, have been occupied at the Town-hall, in assessing the value of certain property required by the Corporation. The claimants were Miss Elizabeth and Miss Helen Shearwood, of Sharrow, who are interested in some property in Market-street, Commercial-street, and Market-place, which is required by the Corporation for the improvement authorised by the Local Government Supplemental Act of 1858, and which is known as the Norfolk-street improvement. The Corporation were unable to come to terms with the Misses Shearwood as to the value of the property, and consequently a special jury was summoned to assess the value. The property is divided into three parts. Of the first portion the claimants own two-thirds; in the second they have a similar interest, subject to a lease of which nearly twenty years remain unexpired; and in the third they own the two-thirds of an individual moiety or half part, the former owners of the other moiety being the Trustwell Brewery Company, who have sold their interest to the Corporation. The claimants assessed the value of their interest at 5,000*l.* each—in all, 10,000*l.* The amount which the Corporation offered for their joint interest did not reach half that sum. The jury having paid a visit to the property, Mr. Digby Seymour, in opening the case, contended that the sum which the claimants had asked was not extravagant, and in support of this he proceeded to call witnesses. Mr. W. Blackmoor, architect and surveyor, Rotherham, stated that he had made a valuation of the property, and his estimate was 12,693*l.* 6*s.* 6*d.*; adding 20 per cent. for compulsory sale, his estimate would be 15,230*l.* 18*s.* In cross-examination by Mr. Lloyd, Mr. Blackmoor stated that his calculation was based upon the prices which property had recently fetched at auction sales in Sheffield. Mr. William Henry Eadon, of the firm of W. H. & J. A. Eadon, auctioneers and valuers, Sheffield, had valued the property at 12,206*l.*, exclusive of 20 per cent. for compulsory sale. Witness asserted that it would have fetched that sum had it been offered by auction. Mr. Thomas Henry Jenkinson, architect and

surveyor, Sheffield, said his estimate was 12,251l., with 20 per cent. to be added to that amount for the compulsory sale. Mr. Thomas Fenwick, of the firm of Messrs. Martin & Fenwick, civil engineers and surveyors, Leeds, also gave evidence in support of the case of the claimants. Mr. Lloyd then addressed the jury for the Corporation. He said that his clients had made an offer of 2,130l. to each of the claimants for the sake of peace, and in consideration of the costs that would be incurred by litigation. Mr. S. F. Holmes, borough surveyor, was then examined. He said he had been connected with Sheffield public works for twenty-two years. He purchased for 400,000l. the property of the Midland Railway Company which passed through the full length of the town. He had examined and valued the property for which the present claims were made. His estimate was 3,517l. 16s. 8d. for the whole of the property. As to compulsory sale he first of all added to his valuation ten per cent., but as he should have had to deduct ten per cent. in consequence of the property being in moieties, he had put one against the other. Mr. Thomas James Flockton, of the firm of Abbott & Flockton, architects and surveyors, Sheffield, agreed with Mr. Holmes on all the questions of valuation. He only differed in the discount to be allowed for reversion, which would make an additional sum of 114l. Mr. Joseph Nicholson, auctioneer and estate agent, Sheffield, thought Mr. Holmes's valuation was a very liberal one. Mr. D. Seymour having briefly replied on the part of the claimants, the Under-Sheriff summed up. After an absence of about an hour, the jury awarded 1,880l. 2s. 8d. to each of the claimants.

SCIENCE AND ART DEPARTMENT.

THE results of the late examinations in drawing held by the Science and Art Department are as follow:—As respects schools for the children of the labouring poor—in 1,376 examined, 98,544 children and pupil teachers worked 114,964 exercises, being an increase on the numbers examined in 1869 of 282 schools, 16,093 children and pupil teachers, and 19,750 exercises. As respects schools of art and art night classes,—in 394 schools examined, 16,361 students worked 24,370 second grade exercises; an increase of 91 schools, 3,587 students, and 4,330 papers. From 347 schools of art, night classes, and science classes, 13,660 students submitted to the Department for examination 90,869 drawings executed in the ordinary course of the year's study, being an increase of 126 schools and classes, 3,735 students, and 25,440 drawings. In 1869, 75 candidates were examined for the third grade, or art master's certificate. These worked 302 exercises, and 25 candidates were successful. In February last 78 candidates, who worked 316 exercises, were examined, and 27 succeeded in obtaining the certificate. Finally, the total number of schools examined in drawing this year is 1,824, and of candidates 128,634, by whom 230,269 works and exercises were executed, showing a total increase in twelve months of 404 schools examined, 23,418 candidates, and 49,534 works and exercises. In the last three years there has been a total increase of 1,146 schools, 76,412 candidates examined, and 160,867 worked exercises.

THE DRINKING FOUNTAIN MOVEMENT.

A GRANITE drinking-fountain, which has been erected under the auspices of the Metropolitan Drinking Fountain and Cattle Trough Association at the railings of St. Botolph's Church, Aldersgate-street, has been opened for use. The cost of the fountain has been defrayed by the daughters of the late Mr. Ward, in memory of their father, who was formerly one of the churchwardens of St. Botolph.

A drinking-fountain has been presented to the inhabitants of Loughborough by the Venerable Archdeacon Fearon, at the cost of, we believe, about 150l. It has been erected in the Market-place by Mr. Forsyth, of London. A public presentation by the archdeacon has taken place in the presence of a large crowd of spectators. The fountain is of Portland stone. The central portion, square on plan, is 10 ft. high. The lower portion to the level of the marble drinking-basins is of vermiculated rustic work. From this portion spring four Cornish granite columns, having carved capitals, carrying a grained canopy, enriched with a carved cornice, and terminating in a double-light globe lantern.

Within the space inclosed by the columns is a small fountain with convolvulus jet, the water from which falls into a basin below. Jets of water also spring from conventional lions' heads on opposite sides, and serve to supply troughs intended for the use of cattle. The drinking-basins, which are of veined marble, are approached by two steps on each side, and the surplus water from them is conveyed into a small dog-trough.

THE SANITARY CONDITION OF TAUNTON.

WE have lately visited this town, and while we were pleased to see the streets well cleansed and watered, we regretted to find a defective system of sewerage and drainage. The sewage of the town empties itself, or is supposed to empty itself, into the Tone; but the water of the river is on a level with a greater portion of the town. There is, in consequence, for over a mile of its length, little short of a stretched out cesspool. Plans have been often suggested for getting rid of the sewage; but as none of these have been adopted, danger might have been foretold. Capt. Beadon, who owns a fishery on the Tone, has, by his action, opened the eyes of the local functionaries. A few days since he served the Local Board of Health with a notice that unless they abate the nuisance in the river, he will, by an application to the Court of Chancery, obtain an injunction for preventing their sending any more sewage into the river. The Captain has gone so far as to place the necessary papers in the hands of counsel. It remains to be seen now how the local authorities will act. When the health of the inhabitants of a town becomes a primary consideration instead of a secondary one, the right men will be found to be in the right place, but not till then.

RAILWAY MATTERS.

New Metropolitan Railway Route.—A new railway route, by which the stations on the North London Railway will be brought into direct communication with Blackwall, and collaterally with Greenwich and Woolwich, has been opened. This has been effected by the completion of the connecting line between the North London and Blackwall Railways; and the advantage arising from it to the public travelling over the North London system will be, that while the train service has hitherto worked only as far as Poplar, it will now be extended to Brunswick-pier Station, Blackwall, and so form a connection by steamboat with Greenwich and Woolwich. The trains to and from Blackwall will run every quarter of an hour, and the boats to and from Greenwich and Woolwich every half-hour.

Cheap Railway Fares.—The directors of the Great Eastern Railway have determined to abolish express fares, and have placed all the trains on the ordinary fare rate.

Destruction of a Railway Bridge by Fire.—A bridge, to a large extent composed of wood, which crossed the Eek near Dalkeith, on the Waverley route of the North British system, has been destroyed by fire. The origin of the fire is attributed to some red-hot ashes falling from the engine of a goods train. The traffic is considerably impeded. It is carried on by means of a loop-line, which joins the Waverley route south of Dalkeith, and the Berwick line of the North British east of Inveresk.

Railway Traffic Returns.—According to the *Railway News*, the traffic receipts of the railways in the United Kingdom for the week ending September 2, 1870, upon a mileage of 13,767, amounted to 899,769l., being equal to 65l. 7s. per mile. For the corresponding week of last year, the receipts were 872,548l., the number of miles open 13,335, or 66l. 8s. per mile. A comparison of the two weeks shows an increase in the aggregate receipts of 27,221l., and in the number of miles open of 432.

A Tall Chimney at Baglitt, in Wales.

THE new chimney which has been erected by Messrs. Walker, Parker, & Co., Dee Bank Lead Works, is now being completed. It is 91 yards in height; and being built upon a hill, it can be seen for many miles around. A "Steeple Jack" was recently to ascend from the outside to fix the lightning conductor. One of the workmen has been walking, in fool-hardy bravado, round and round the top of the chimney.

ARCHÆOLOGICAL MEETINGS.

SOMERSETSHIRE.

THE twenty-second annual meeting of the Somerset Archæological Society commenced at Wincanton, under the presidency of Sir W. G. Medlicott, bart., of Venn, Milborne Port. The members and friends assembled in the Town-hall for the transaction of the annual business. The attendance included a number of ladies.

After the formal business of the meeting had been gone through, the first paper which was proposed to be read was by the Rev. H. D. Wickham—"Civil Historical Notices of Wincanton and its Neighbourhood." The president, having first read a short statement, extracted by himself from Macaulay, of the battle which took place near Wincanton between William of Orange and James II., remarked that there was a much more detailed account in an old pamphlet, which might be interesting to the society at its meeting in this locality. The president then called the attention of the assembly to the printed programme of proceedings.

Rev. H. D. Wickham said, since that paper was drawn out, a very interesting discovery had come to their notice, which would render it desirable to deviate a little from the form of to-morrow's examination. The deviation would not be much, for it was only about a mile from Wincanton, on property belonging to Mr. Dendy, that a tessellated pavement had been recently discovered, and some other remains, which he thought would be interesting to the society to visit. It would be only to turn out of the way a quarter of a mile, and then rejoin the road, and go on to Cadbury. The discovery alluded to appeared to be the remains of a Roman villa.

Mr. Wickham then read his paper, as announced by the president.

The Rev. Canon Meade read a paper on the history of Castle Cary Church, as gleaned from diocesan and parish registers and churchwardens' accounts. The Rev. Canon, in the course of his paper, said he wished to relieve the parish from a stigma which had been cast upon it. The late Mr. Russ was told by a traveller in Southampton that Castle Cary was a most barbarous place, "because it was the only place where cockfighting was thought to be a practice fitting to be recorded on a tombstone in the churchyard!" On his return Mr. Russ went straightway to the churchyard, and after considerable search found a tombstone on which were sculptured two birds, standing opposite, and apparently ready to peck at each other. However, by dint of careful examination it was found that the old stone was in memory of a respectable family named Swallow. The birds, therefore, that were mistaken for cocks were intended for swallows, and instead of fighting, were meant to be billing; and they evidently formed a rebus upon the family name!

Mr. W. A. Jones, M.A., F.G.S., read a paper on Lord Chief Justice Dyer; the Rev. J. Heale gave an account of Foynting Church; the Rev. W. Barnes, the "Dorset Poet," discoursed on "Somerset and its Language," on each of which a discussion took place.

A visit was then made to the church, which contains a few points of archæological interest, and afterwards the members partook of *dinner* at the Greyhound Hotel, at which Sir W. C. Medlicott presided.

A temporary museum was arranged in the National School-room, and was inspected with much interest by the visitors.

An evening meeting for the reception of papers was held, when the following was the programme:—The president, on the civil war in Somerset, as detailed in an ancient and rare pamphlet; Mr. Emmanuel Green, on the battle at Langport; Mr. John Batten, on the sequestrations in the manor of Catasah; and Mr. Edward T. Stevens, of the Blackmore Museum, Salisbury, on "Flint and Stone Implements."

The programme for next day included an excursion from Wincanton to North Cadbury, Cadbury Camp, Compton Church, and Mapper-ton. Luncheon was provided in the school-room at Compton. The day following the members were to leave Wincanton for Templecombe, Stowell, Milborne Wick encampment, Milborne Port, Henstridge, reaching Templecombe station at 7 p.m. The members were invited by the president to luncheon at Venn.

The report of the council, which was unanimously adopted, contained this paragraph:—"With the view of preserving, as far as may be, all the more interesting monuments of antiquity which are scattered over the country, your

council are strongly impressed with the necessity of placing them under the supervision of the State, and they would therefore recommend that a memorial be forwarded from the members of this society to her Majesty's Secretary of State for the Home Department, to urge on her Majesty's ministers to take such steps as shall effectually preserve the more important remains of past ages from injury and decay."

Mr. John Batten referred to the importance of the clause, and said that the subject had been taken up by the Society of Antiquaries, and this society would do well to follow in their steps. At the request of the president, Mr. Batten drew up and moved the following motion, which was seconded by Canon Meade, and unanimously carried:—"That it be an instruction to the council to procure a list of such memorials of the class referred to in the report as it would be desirable to place under the care of the State, and to obtain, if possible, the co-operation of the proprietors of those memorials in carrying out the wishes of the society."

YORKSHIRE.

The Huddersfield Archaeological and Topographical Association have held their fourth annual excursion. At a special general meeting held in the course of the day, they resolved to change their name to the "Yorkshire Archaeological and Topographical Association." The destination on this occasion was the ancient borough of Pontefract. The meeting comprised members from all parts of Yorkshire. The bulk of the excursionists arrived in Pontefract at a little after eleven o'clock, and were received and welcomed by Mr. William Jefferson, the mayor, who wore his chain of office. Lieut.-Col. Brooke, the president, returned thanks, and the excursionists proceeded at once to examine the objects of interest in the neighbourhood, under the guidance of Mr. T. W. Tew, and the secretary, Mr. Fairless Barber.

Having inspected Swillington Tower and the Upper Guard House, where the courts of the Duchy of Lancaster were formerly held, the party proceeded to the remains of the famous old Castle of Pontefract, where a special general meeting was held, the president of the Association in the chair. The company then heard a paper by Mr. Tew on the history of the surrounding neighbourhood, with especial reference to the castle. They then proceeded to make a minute inspection of the remains of the castle. After admiring the present romantic aspect of the desolate but stately ruins, the walls of seemingly impregnable thickness, which formed a part of the artificial and natural defences of the castle, looking formidable even in their decay, and the remains of the gigantic keep, which has obstinately defied the ravages of ages, the antiquarians turned their attention to those parts of the old fortress which called for special study. After visiting St. Clement's Chapel, they proceeded by a long subterranean descending passage to the magazine, which is cut in the solid rock. The vaulted chamber in Pye's Tower, in which King Richard II. is said to have perished, was regarded with interest, as were also the Barbican and the dungeon, in which we may suppose many prisoners to have languished.

On leaving the castle, the party wended their way to the rock-out hermitage, which is one of the most interesting antiquities in Yorkshire. The inspection of the visitors was much facilitated by Mr. James Fowler, F.S.A., who read a paper on the history and character of the scene. He traced the history from the first mention of the hermitage by Thoresby, in 1703. It seems it was founded in the year 1386, by Adam de Laythorpe and his son Robert, and in 1433 became attached to Nostell Priory. There was a garden surrounding the dwelling of the hermit, which he might cultivate at his leisure, and from this runs a narrow passage, leading to what was the dwelling. An irregular quadrilateral chamber out in the rock is reached, and by descending another flight of steps, access to a spring of water of crystal purity is obtained. On the west side of this secluded dwelling is the cavity in the rock which served the hermit for a chapel. The altar and the reading-desk, also of rock, still remain intact, and on the opposite side to the altar is a settle, which must have been used by the hermit to repose or to meditate on, as did the Sibyl of Æneid in the cave at Cumæ.

From the Hermitage the company went to the Town Hall, where a museum, containing archaeological curiosities, had been made up of loans from Lord Houghton and others of the leading gentry of the district. The MSS. formed the most interesting portion of the exhibition. They

comprised the ancient charters of the town, from that of Richard Cœur de Lion, A.D. 1194. In this, the oldest of the charters, the borough is referred to as "Ponti Fracto." Relics of the earliest ages of the place were shown. The Church of St. Giles; an old house in which King James II. is said to have held his court; and which contains a fine old specimen of wood-carving; and a strange vault below the Malt Shovel public-house were next visited. The company then assembled in the Red Lion Hotel for luncheon.

At luncheon, the party was joined by a number of the distinguished residents of the neighbourhood. The president took the chair, and he was supported on his right by Lord Houghton, on the left by the mayor of the borough.

After luncheon, carriages were taken to All Saints' Church, which is mostly in ruins. The Rev. Sir Thomas Blomfield, bart., incumbent, received the visitors. Mr. J. T. Micklethwaite, F.S.A., read a paper descriptive of the place, which used to be called the Minster of the Moors. During the reading of the paper the company assembled in the transepts of the old building, which have recently been renovated for divine service. Special notice was directed to a remarkable double-stair in the tower, said to be almost the only specimen of the kind in England. A model of the staircase was exhibited in the church. The "New Hall" was the last object inspected by the party. This is an old ruined mansion of the latter part of the sixteenth century. Its history, from the earliest period down to the period when the mansion became possessed by the Earl of Harrowood, was related by Mr. T. M. Tew, who accompanied his lecture with some sketches. Carriages were taken from the "New Hall" to the railway-station, where a large part of the company departed to their respective destinations. The trip was in every respect successful.

NORTH OXFORDSHIRE.

This society has just visited Barford, whose fine old church is now being restored under the superintendence of Mr. G. E. Street. The members of the society, with the addition of two gentlemen of the town, numbering sixteen, sat down afterwards to a dinner at the Bull Inn. Mr. Lockwood, of Kingham, a vice-president, presided. After dinner, the Rev. J. H. Burgess, vicar of Barford, read a paper on the history of Barford.

COMPULSORY EDUCATION IN SCOTLAND

THE subject of Compulsory Education occupied the attention of our fathers nearly three centuries ago. In an interesting volume, lately issued from the Glasgow press, entitled "Fifiana; or, Memorials of the East of Fife," by M. F. Conolly, the following extract from the record of the Kirk Session of Anstruther-Wester appears. As an evidence of the custom of the times, and the zeal of the Kirk Session, in enforcing the education of the youth, it is valuable. We give it in the quaint dialect of the period:—

"Oct. 28, 1595.—Agred the complent given by Henrie Cuningham, doctor in the schooll, the Session think meet that all the youth in the town be caused to com to the schooll to be taught. And that sic as are pure shall be furnished upon the comons expences; and gif any pur refuseis to com to schooll, help of sic thing as they need and requir, shall be refused to them. And as for sic as are able to sustein their bairnes at the schooll, and do their dewtie to the teacher for them, thay sall be comitit to put them to schooll, that thay may be brocht up in the feir of God and vertue. Quibik if thay refuse to do thay sal be callit before the Session and admonished of their dewtie; and if after admonition, they meind not, then farther ordour shall be taken at them at the discretion of the Session. And the magistrats and counsell shall be desyrd to tak fra them the quarter payment for the dayis meat, as it shall be about vnto them, whidder thay put their bairnes to the schooll or not.

"18 of November.—Agred the pure, it is thoet meet that a visitation shall be; and that sic help shall be maid to them that are altogether unable, that they may not travell to themselfs. And the young shall get na almes bot on condition that they com to the schooll, quibik as many as does shall be helpit; and the manner of ther help shall be—they shall haif thrie hours granted to them everie day throw the town to seek ther meat, an hour in the morning fra nyd to ten, at mid-day fra twell to ane, and at nycht fra six hours furth. And sic people as are to be desyrd to be helpit to sic as will gif themselves to any vertue, and as for others to deall lyrdly with them, to dryve them to seek efter vertue.

"April 13, 1598.—Everie man within the town that has bairnes sould put his bairnes to the schooll, and for everie bairne sould give ten sh. in the quarter, and be fried if given most bot a yr, owing pleasure.

"September 7, 1600.—Item agred the schooll.—Agred with Henrie Cuningham, that the pure of the town shall be put to the [schooll], and as many of them as has ingyne, and he takis paines upon them, sall gif fiv sh. in the quarter, quibik the session sall pay. He sall try out the bairnes. They sall be brocht before the Session be the elders of the quarter; the Session sall enter them to the

scule, and try ther perfiting, and sicane recompens according to his paines and ther perfiting. And as for theryr are not able to perfitt, yt thay may reid or wret, whidder it be for want ingyn or tym to await on, sic shall be caused to lern the Lordis Prayer, the Comandes, and Baiser, the heads of the Catechisme that are demanded on the examinatioon to the Communion, quibik travell also the Session will acknowledge and recompense; and as for the standing yearlis dewtie, refers that to the counsell of the town to tak ordour wt."

It will be seen by these extracts from records nearly three centuries old that the idea of compulsory education, is not a modern thought. Doubtless Scotland is much indebted to this wise provision of the Kirk Session (for it was common to other places in Scotland besides Anstruther Wester) that education among even her rural population has been in advance of the same class in England.

There is one drawback, however, to the above pleasing picture of early zeal in the cause of the education of the children of the poor. The Kirk Session, a little more than a century later in Anstruther, undid the good work of their predecessors, as the following record shows:—

"1 May, 1700.—The Session appoints any three elders to clear accounts with the schoolmaster, and pay what is due to him by the Session, against Whitsunday next, and likewise informe him that they have no design to keep any Scholmaster nor Procentor, both upon account of the indisposition of the minister and the poverty of the place." On the 29th of the same month we are told curtly,—"This day Mr. David Ballingall, Schoolmaster, Procentor, and Session Clerk, did dimit."

Though the schoolmaster got the "sack" by the Kirk Session of Anstruther in 1700, he did not go abroad from other towns in Scotland. The disciples and followers of Knox kept knocking at the door in the interest of their church.

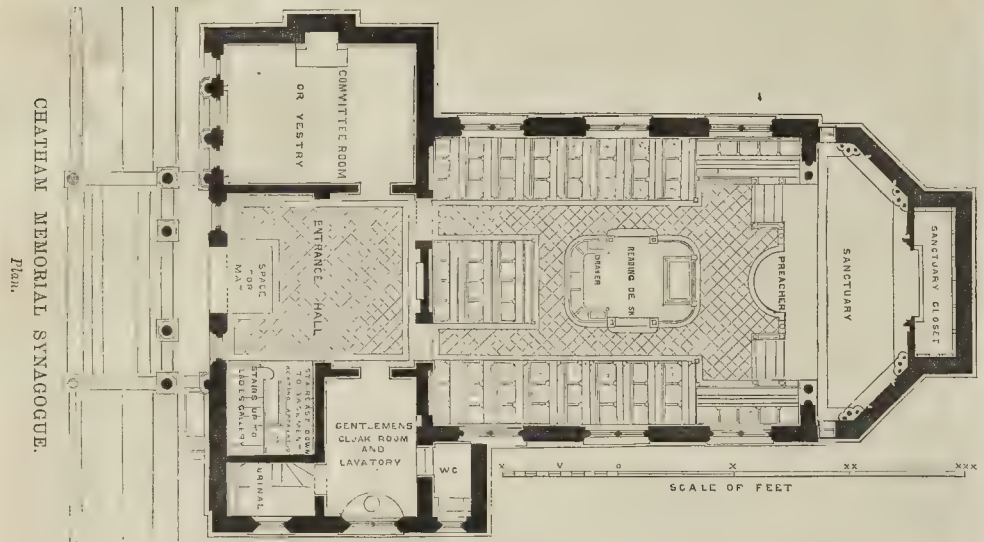
It may be worth while to state that "wee Davie" the schoolmaster's salary was only 16l. 13s. Scots, or 1l. 7s. 6d. sterling, a not very fat salary even at that age, more particularly if he had to perform his triple duties of session clerk, procentor, and schoolmaster.

CHATHAM MEMORIAL SYNAGOGUE.

THE building we are about to illustrate and describe has been erected in Chatham by Mr. Simon Magnus, in memory of his only son, Captain Lazarus Simon Magnus, who was cut off in his prime. Mr. Magnus purchased the site of the old synagogue, the Jewish burial-ground, and some land covered with houses fronting the High-street, and has erected a synagogue, a rabbi's residence, enlarged and adorned the cemetery, and given an endowment for the maintenance of public worship for ever,—expending on these monuments to the departed some 8,000l. The cemetery is approached by a road between the synagogue and the rabbi's residence.

We may premise that a marble tablet over the entrance portico records the cause of the erection and object of the building. And in the wall fronting the street, to the right of the entrance, is the foundation-stone, having an inscription. The tablet within the entrance-hall, "In memoriam," records that Lazarus Simon Magnus was born in April, 1825, and died January, 1865, aged 39.—"May his soul be bound up in the bundle of life everlasting."

The style adopted is that of the Byzantine period, adapted to the requirements of the present age. Accessed from the main road, and separated from it by an ornamental screen, the building is placed on a terrace, and is approached by a broad flight of steps which lead to a pedimented portico, composed of monolithic columns of Mansfield stone, having fluted capitals and supporting semicircular arches. Over this portico is placed the marble tablet before mentioned. Surmounting the entrance is inscribed the Scriptural monition—"Keep thy foot when thou goest to the House of God" (Ecclesiastes v. 1). On the right of this portico, rising to a height of about 50 ft. from the ground, is a tower, which is terminated by a steepled roof, ornamented with gables and finials. On the left is the committee-room, and behind the portico is seen the gabled and octagonal end of the synagogue, with bold wheeled window and other ornamental adjuncts. The whole of the erection is faced with Kentish rag-stone, with Bath stone dressings, having columns and enrichments of red Mansfield stone. Separated from the synagogue is the minister's house, treated in the same style, and being complete in itself. A broad walk divides the last building from the



synagogue; and, from its commencement to its end, affords an uninterrupted view, from the High-street, of the tomb of the deceased Captain Magnus, which, raised on granite steps and platform, and surrounded by marble columns, appropriately and effectively terminates the vista.

Entering from the portico is a spacious hall, on the right of which is the staircase leading to the ladies' gallery, and the retiring-rooms of the gentlemen, and on the left of which is situated the committee and robing room. Immediately facing the entrance is a marble tablet, with the words "In Memoriam" engraved thereon in gilt letters, and an aspiration for the repose of the departed soul. From the hall we at once pass into the ground floor of the synagogue, appropriated exclusively for the male portion of the congregation. The interior consists of a nave of lofty proportions, divided into three compartments by arches composed of serrated and ornamental white and red bricks, with carved stone incised enrichments. These arches, springing from and being supported by clustered and coupled columns of red Mansfield stone, have floriated caps and bases, and rest on carved projecting corbels. On these arches are laid the timbers of the roof, which are of picked yellow deal, wrought and chamfered, covered with V-jointed boarding, enriched with carved fascias exposed to view, and stained and varnished in various tints. The walls, which are of white bricks, interspersed with carved stone enrichments, are pierced with traceried windows, three on each side of the synagogue, filled in with stained glass.

Facing the entrance, at the east end of the building (corresponding with the chancel of our churches), rises an enriched semicircular arch, supported on polished red Mansfield stone columns, bound together with ornamental bands, and having carved caps. On this arch is engraved, in Hebrew and English, the 4th verse of the 84th Psalm,—"Blessed are they that dwell in Thy house: they will be still praising Thee. Selah." Behind this archway, forming, as it were, a frame, and being the entrance to it, is situated "the sanctuary," separated from the nave by a carved stone screen, inlaid with various coloured marbles, and having wrought-iron panelling. In the centre of this screen is formed a convex recess, which will be used as a

pulpit for the preacher. "The sanctuary" is elevated some few feet above the level of the floor of the synagogue, and is approached by broad flights of polished marble steps, with balustrading. This sacred portion of the edifice is designed as an octagonal apse, at each angle of which are disposed clustered pillars of variegated coloured marbles. From these pillars spring carved ribs supporting a domical ceiling, terminating in a skylight glazed with stained amber glass, which throws a subdued light over the whole composition. In the centre of the sanctuary is formed a deep recess designated as "The Ark," or resting-place of the scrolls of the Law (each scroll contains in Hebrew characters the five Books of Moses), which are deposited therein. This recess is inclosed by sliding doors, framed of costly wood, and enriched with arabesque and other ornamentation. The interior is hung with silk hangings and bullion fringes, and is fitted with a dais for the reception of the scrolls. Over the Ark is inscribed in gold letters the sacred warning,—"Know before whom thou standest;" and on each side of the same, surrounded with naturalistic floriation, are the inscriptions,—"Length of days is in her right hand," "And in her left riches and honour." (Prov. iii. 16.)

Over "The Ark" are two stained-glass windows, representing tablets of stone surmounted with "glories," and having the Ten Commandments written thereon in Hebrew. Each side of these tablets has two geometrical stained-glass windows. Under these windows are marble panels, in which are emblazoned, in illuminated writing, prayers for the Queen and Royal Family.

From the centre of the chancel arch drops a cut-glass dish, in which floats "The Light of Memorial." This has been presented by a member of the family in memory of his deceased wife (one of Mr. Magnus's daughters), as is testified by an illuminated inscription which it bears. On each side of the apse stands a candelabrum of five gas-lights.

The sanctuary is paved with Minton's choice tessellated encaustic paving, having polished marble borders.

In the centre of the nave is placed the reading-desk, from the platform of which the minister intones the prayers. It is approached from the floor of the synagogue by flights of steps on each

side, and is inclosed by iron railings, picked out in blue and gold. At each salient point is positioned a pedestal in which are elevated brass pillar gas-standards.

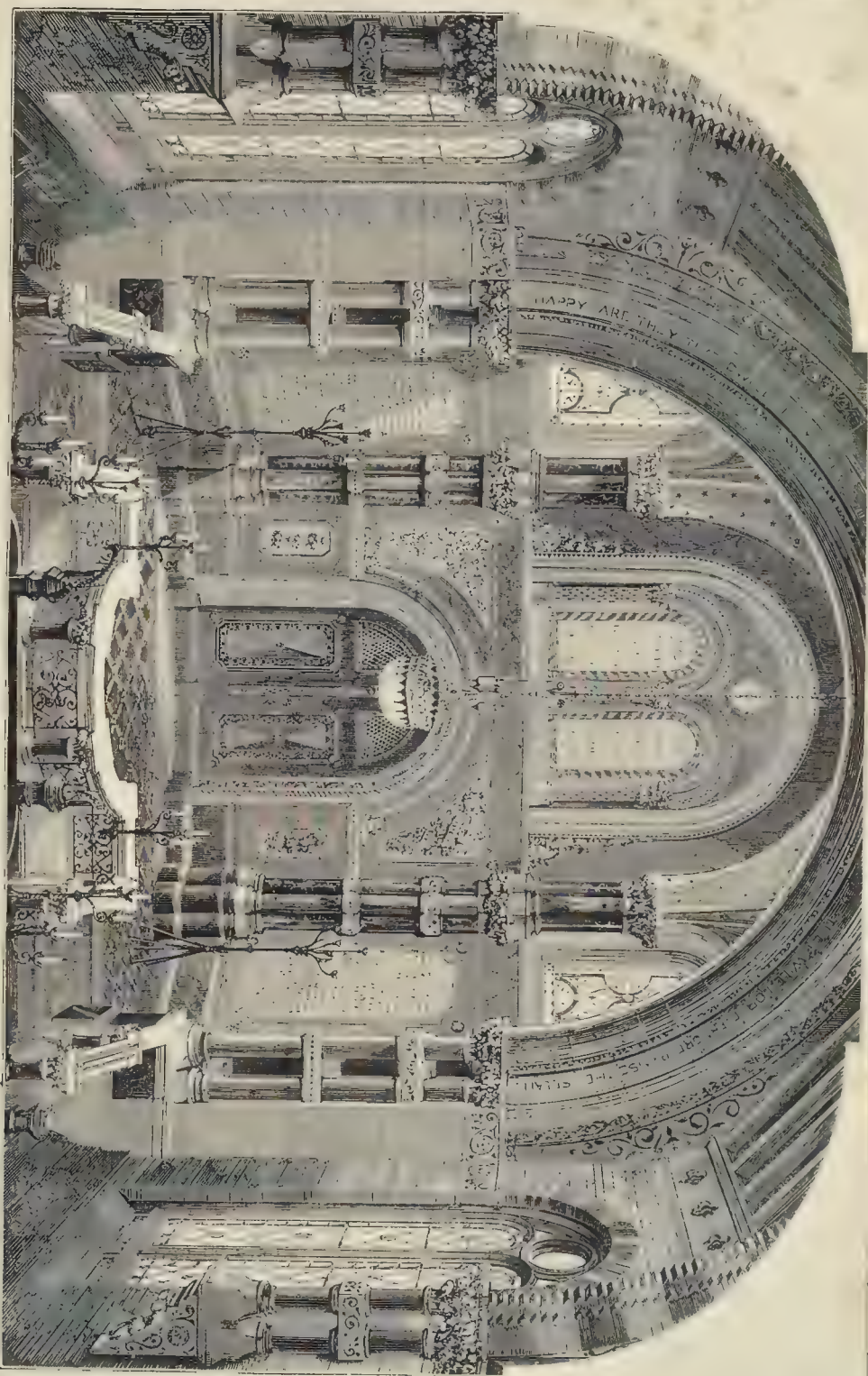
The pewing is arranged on each side of the reading-desk facing the sanctuary, except certain seats reserved for the founder and the wardens of the synagogue, which are disposed on each side of the chancel arch. Each seat is designed to turn up against the back of the same, so as to permit the congregation to stand during certain portions of the services; and each is furnished with a desk and foot-board.

Approached from the entrance-hall by the stone staircase before mentioned, having retiring-rooms, is the ladies' gallery, which, with its vestibule, is situated at the west end of the building, and faces the sanctuary.

The creed of the Jewish faith forbids the delineation of the human form, and the ornamentation has therefore been designed from natural foliage, conventionally treated, and arranged in geometrical combination. The carving has been studied from the plants mentioned in the Bible, and positioned so as to typify the several objects and uses for which the various portions of the building are devoted. Scattered about are to be noticed the lotus, vine, palm, olive, lily, pomegranate, wheat-ear, bulrush, &c. The construction and decoration throughout have been an effort to symbolise the character of the departed to whose memory the structure has been raised.

The architect is Mr. H. H. Collins, of London; the builder is Mr. Alderman Naylor, of Rochester; the gasfittings are by Messrs. Defries, of London, except the gas standards on the sanctuary, which are by Messrs. Brawn, of Birmingham; the ironwork is by Messrs. Jones & Blackstone, of London, and Messrs. Peard & Jackson, of London; the heating, hot water, and gasfittings are by Messrs. Spencelagh & Arober, of Chatham; the stone carving is by Messrs. Candy & Gibbs, of London; and the decorative work is by Mr. John Durling, of Chatham.

The building is arranged to accommodate 150 persons on the ground floor, and has cost, exclusive of the site, about 6,000*l*. The stained glass windows were executed by Messrs. Smith & Miers, Cumberland Market, London; the upholstery was furnished by Messrs. Dawson & Son, of Rochester.



CHATHAM MEMORIAL SYNAGOGUE.—MR. H. H. COLLINS, ARCHITECT.

CASTLE NORTHWICH.

For a considerable period this increasing township has been suffering from a deficient water-supply. The question of constructing water-works has long been before the sewage committee, but it was not until after the drought of 1868 that decisive measures were taken in the matter.

In the early part of the year 1869 a survey of the township and plans were prepared for a water-works scheme, which, having been submitted to the Secretary of State for the Home Department, he gave his assent to the committee raising a loan on the security of the rates to carry out the works.

The principal works are erected near Moss-hill Farm, and consist of a well 6 ft. in diameter, which has been sunk to a depth of 32 ft., and indicates every appearance of yielding an ample supply of pure water.

In the engine-house, which has been built over the well, is a high-pressure horizontal engine, which lifts the water into a water-tower built on the high ground near the Wincanton Branch Railway, the lift being 115 ft. The tower is circular, and 48 ft. in height. On the top is a wrought iron tank, 25 ft. in diameter and 10 ft. 6 in. in depth, and containing, when full, 32,000 gallons of water, or an estimated supply of a day and a half.

A road has been made from the engine and boiler-house to the tower, under which the supply-pipe is laid. The principal main from the tower is laid along Castle-street. The pipes from opposite Waterloo-road take a circuitous course along Navigation-road, Sandy-lane, St. James-road, and Waterloo-road; by this arrangement water can be passed in either direction, and it will prevent the lower district being totally without a supply in case of an accident. On the high portion of the township the pressure on the mains will be 45 ft., and on the lower 100 ft. Hydrants have been fixed on the mains opposite the principal property in the district, which will enable the committee to make arrangements for a fire brigade.

The contractors for the several works were Mr. C. Shaw, of Castle, for the erection of the tower, engine, and boiler house and chimney; Messrs. Milburn & Sons, of Staleybridge, for cast-iron pipes and tank; Mr. E. Sharp, of Lancaster, for valves and hydrants; Mr. J. Ranton, of Elland, for laying pipes; and Messrs. Holford & Shepherd, of Hyde, for the engine and boiler. The works were designed and carried out by Mr. Henry Bancroft, civil engineer, of Manchester.

ANCIENT EARTHWORKS AND ROUND PITS.

DURING the annual excursion of the Somerset Archaeological Society, they visited Oadbury Camp. The Lord Bishop of Bath and Wells, with Lady Hervey, the Rev. Prebendary Scarth, and a large party, were present.

The centre of the camp is a lofty elevated plateau, above 30 acres in extent, and having a radius of view, it is said, of 30 miles.

The Bishop observed that of course the object of the ancient occupants was to take advantage of the natural formation of the ground, and to increase its defences as much as possible. At present, however, the beauty of the view, his lordship added, almost eclipsed its archaeological interest. His lordship welcomed Mr. Scarth as one whom they were all glad to see present to enlighten them.

Prebendary Scarth replied to his lordship that the history of the "camp" went so far back into ancient times that it was almost impossible to say anything of it except by conjecture. The party having seated themselves around the edge of a hollow—forming a natural amphitheatre, the Rev. Prebendary stood in the midst, and remarked that the subject was one which was full of interest, but which it was very difficult to say anything certain about. He thought that all he could say, after examining this camp, and looking round the fortifications of the campment, with the other camps of a similar kind in this country, but more especially in South Wales, and all that line of country which was occupied by the Britons previous to the Roman conquest, when Caractacus so nobly defended his country,—having himself examined those defences, he was inclined to think that everything showed this to have been an ancient British earthwork; and he

thought the remains found within it tended to confirm that opinion. The chief features of this were the very strong ramparts with which it was surrounded, and more especially the entrances. The entrances were particularly curious from the way in which they were fortified, showing that they were of particular importance. He knew of no camp which showed the entrance so well defined as this, except that wonderful work, Maiden Castle, near Dorchester, which was one of the noblest and most wonderful works that existed in this country. He thought the earthwork they were now examining was only second to that. It did not appear to have had any Roman camp within it, as was sometimes found. There was a Roman camp within the British fortification at Clifton, for example. Again, the construction of the ramparts here, so far as he had been able to examine them, was very different from what they found at Clifton, where there was an inner core composed of lime and stone, a mass which could not be cut through. At the Society's meeting last year he had the opportunity of saying something on the camps at Clifton Down, and on each side of the Avon. Their ramparts were a solid mass of concrete, and that led us to suppose that the Romans must have had a hand in the formation of two of those camps at least. Here there was nothing of the kind; the ramparts were composed of flint stones and earth—the simplest kind of ramparts; the sort you would find at Maiden Castle. Then this did not lie at all in the line of a Roman road, so far as he could make out. It lay a considerable distance from the great fosse road, and also the road which ran along the top of the Mendip Hills; and although there might have been vicinal roads near it, it did not appear to have been a main point of occupation in Roman times. That was another confirmation of the opinion that it was an ancient British fortress. He thought on examining the ancient British fortresses they would find that the earlier ones were really the stronger. The indications we had of the way the Britons fortified themselves in ancient times showed that they were by no means unskilled people. He thought they very much depreciated their condition at the time they were conquered by the Romans. He thought the very fact that a chief like Caractacus could stand against the whole Roman force seven years, and could for that time defend himself, showed that our ancient British forefathers were a people not at all to be despised. One point it was necessary to clear up. He did not know if there was a spring to be found within this camp—(a voice: "Yes; three springs")—there might be; but the truth was these great fortresses were not long occupied. They were only occupied in times of great national danger, when the cattle were driven in, and when perhaps the inhabitants of the whole district took refuge. It would have required a very large force to have besieged a camp of those times; and he did not think they were long held as places of permanent occupation, but only for temporary refuge. That belief was suggested to him by an inspection of Maiden Castle; and he saw points of resemblance in the New Zealand "paha." He wished he could have thrown more light upon the camp.

Mr. W. A. Jones said Mr. Scarth would allow him to supplement the interesting observations which he had made by reminding them of what was said by their late secretary, Mr. Ward, who was one of the best authorities we had ever had in this county on earthworks. In the proceedings of the Society he described three types of earthworks, and he placed this amongst the kind which was only occupied in time of war. This camp differed from others in the absence of cattle inclosures. In most of the earthworks which we had in Somerset, and there were many of them, it was very clear that there was a portion which was occupied in time of war, and which corresponded to our keep. Then there was another inclosure fortified, but not to the same extent, and which would be fortified by the inhabitants of the district, who would come there probably as a permanent settlement. And beyond that they would have the cattle inclosure. Of course, at the time they were occupied, the ramparts of these mounds here were much sharper and steeper than they were now and were no doubt surrounded by wooden palings, which would render them still more difficult of access.

Rev. W. Barnes, who was next called upon, wished to speak a few words upon a discovery which had been made at Maiden Castle, inasmuch

as he believed that discovery might give hints for other such discoveries in such strongholds as this and others. Some time ago the farmer who held the land was trying to make a sheep-pen at the top of the hill, i.e., in the outer camp, the one we might assume to be the cattle camp; and within the space of a square sheep-pen he found no less than seven round pits: very round, very clearly cut, and about the size of wells, and from 4 ft. to 7 ft. deep. All of them were filled with a very black, loose, fatty earth, and that earth was found to be mainly of animal and vegetable substances. In the earth were found many interesting objects,—pieces of pottery; one of the stones of a quern; many bones, especially bones of reindeer; those bones showing at the same time what their animal food was in those days. Among the things found in one of those pits was a comb, which, it was shown, could not have been Roman, but belonged to a very early time. It was made of a flat bone—a sheep's, he believed—ground down, and the teeth were cut in the end, not in the side of it. Well, he believed that if the turf were taken off there would be found scores, if not hundreds, of those pits, for they were close together. He was opinion that the pits were made at various times. He had seen one instance where a pit was begun to be excavated, and evidently abandoned because it cut into the circle of another, which was an older pit, but still not so old that they could think fit to dig into it. He made those notes because he dared say they might readily find such pits here, and he hoped it would be tried. It was only to take an iron bar and try over the ground.

The Bishop inquired what Mr. Barnes thought those pits were for?

Mr. Barnes: Refuse-pits.

The Bishop: Not dwellings?

Mr. Barnes: By no means.

The Bishop: But that was one of the common forms of the earliest dwellings—pits where the circles touched one another, and I suppose were covered over with branches. Is that not the earliest acknowledged form of British dwellings?

Canon Meade mentioned Pen Pits, and another gentleman referred to those at Worle.

Mr. Barnes was understood to answer that there certainly were anciently house-pits with coverings over them; but that could not have been the case with those at Maiden Castle, because those pits were round and smooth, and there was no trace of a foot having gone into them.

Mr. Warren asked would they not have been very small?

Mr. Barnes said they ranged from the size of a small well to those of a larger size.

Mr. Warren should think they were rather small for refuse-pits.

Mr. Barnes said they were filled with what was no doubt animal and vegetable matter; and the farmer found it extraordinarily productive when applied as manure. Proceeding to offer a few notes on the "stone age," the rev. speaker said it so happened that speech tallied with history in so many points, and that our history as well as the Celtic speech ran back to the stone age. Now, we had the word "flint" and the word "chisel," both those words belonged to the stone age, and expressed a solid Saxon image. Thus, the Teutonic word for arrow was *flannet* (flint), and *et* was a diminutive added, making *flannet*, or flint; therefore flint meant arrow. Chisel—such as the Chesil Beach near Weymouth—meant hard stone, pebble, or flint; therefore, that word was used when a chisel, or *ceosel*, was of stone. The word "hammer" meant a hard knob, a stone. These words, and many others he might mention, went back to the stone age, and were proofs of the Celtic age of our race.

Mr. E. T. Stevens followed with some remarks on the pits on Maiden Castle. Within the last week he had been negotiating for the purchase of those specimens found there. He would mention that he had particularly stipulated that if there should be any local museum or collector, he would waive all claim. He had lately examined, in the neighbourhood of Salisbury, a great many of those pits; and he had found remains almost identical with those which occurred at Maiden Newton. He had found three combs; and, if indications of workmanship, and also slight indications of shape, had anything to do with it, they would belong to three periods. Mr. Stevens gave a detailed description of the specimens, and also referred to discoveries at

another place near Salisbury, and in the Hebrides, and at "Grimes's Grave," Norfolk. He enlarged at some length upon the interesting evidences of ancient excavations for flints and chalk. The pits at Salisbury were clearly not of that form. He would give them a brief statement of the means by which those discoveries had been made. The ground was trenched for garden purposes, and they found all over the field that black patches occurred. His (Mr. Stevens's) idea was that they had been burning weeds there. The owner cut into the black earth, and he was not satisfied with that explanation. He went to work, and found himself in a chamber of a beehive shape, not at all of the straight sides which were found at Maiden Castle and elsewhere. It was a chamber of earth, about 6 ft. in height and 8 ft. in diameter. He not only found that, but, on working out one corner, he worked into a second, a third, and a fourth chamber of similar shape, and all communicating with each other; and there was likewise a semi-recess, with what object he was not prepared to say. Recently, when it was thought desirable to establish other waterworks in the neighbourhood of Salisbury, they found that the aperture was about 2 ft. 6 in. at the upper portion; it was enlarged downwards, and then slanted out into the chamber, and that was the invariable way in which the approach to these pits was made. Found in those pits were articles the same as they always rendered. There were a bone of *bos longifrons* worked into a hook, a bone ring, bone combs, a bone needle; very few flint tools; pottery, all hand-made, and the ornamentation of which was of a very peculiar and singular character. But while they found until a recent date, no evidence of an iron implement, all the flint tools that they found had been flaked by means of iron implements; and there were rust-marks upon them in almost every case. Mr. Stevens went on to speak of trenches which had been found around some of the pits, containing specimens of Roman pottery.

The President (Sir William Medlicott) said he would mention that through the kindness of Colonel Bennett, the proprietor of this hill, he had received a little pamphlet giving the history of North and South Cadbury, and which contained some very interesting points.

Descending to the main entrance, the party viewed the different lines of defence, and then, at the call of the secretary's whistle, accomplished the healthful exercise of re-ascending the hill.

Mr. South pointed out how very strongly the entrance to the camp was protected. There were eight mounds or ridges, each with a ditch between them; and the road in was curved, so that the attacking force might be taken in flank. Of course, had that camp been well garrisoned it would have been almost impossible for any force to have taken it.

DECORATION OF ST. PAUL'S.

Sir,—In your number of the *Builder* for August 6th, in a letter signed "T. L. D." relating to "Colour and Architecture," it is stated, "a full argument upon the subject is now of the greatest consequence, as so large a sum as a quarter of a million has been suggested to be expended upon St. Paul's Cathedral, London." I quietly acquiesced in the matter; but as further comments have since been made in reference to the letter, I offer the following remarks:—

I quite agree no attempt should be made to make it "vie with the drawing-room or the theatre." I have seen in many churches a painful effect produced by too vivid colouring; in others I have seen the richest colouring in connexion with carving and gold look soft, unobtrusive, and beautiful. I have seen the simplest earth-colours only used in ornamentation, but in such quantity and variety of design, it has been distressing; and I have also seen the whole surface decoration of a church in grey and stone-colour, slightly ornamented with black and red, and the effect has been excellent. It is the correct taste displayed in the selection of ornament and in the combination of colour that produces proper effect.

In all cases the style should be in accordance with the building, relative to its size and proportions, the quantity of light, whether natural or admitted through stained windows, and consistent with the worship offered. If it is where Roman Catholic worship is used, it may be as imaginative, suggestive, and devotional as it can possibly be; but if only used for ordinary preaching services, it would be absurd to introduce anything bright, suggestive, or varied in form which may take off the attention from the speaker.

It is remarked, "All the glorious effects produced by a flood of sunshine on the rich series of mouldings that clothe and charm the pier arches of our English cathedrals are irretrievably lost the moment they are painted." I certainly think it depends upon how they are painted. The most glorious but never seen is the rainbow; if it is simply stone-colour, I cannot imagine any flood of sunshine producing such gorgeous effect as the all-wise Creator's combination of the most vivid prismatic colouring does in that suggestive object of universal admiration.

In England a great part of the year there is a great dearth of such floods of sunshine. Much of the effect of

stone carvings and mouldings is due to the accumulation of dust, dirt, and cobwebs, which, to the disgrace of the proper authorities, are allowed to remain year after year. Age is honourable, and to be looked upon with respect; but what a difference between looking upon an old man in a rag, with unwashed face and uncombed hair, and seeing a well-dressed old man with pink face and white hair.

Our hearty thanks are due to those gentlemen who have brought forward the idea of decorating St. Paul's; and, as much interest has been awakened in the matter, I would suggest that search be made for all the papers, plans, designs, and correspondence of Sir Christopher Wren upon the subject by advertisement in the most public manner, and careful collection by those appointed; and, from what may be gathered, designs may be prepared by competent persons, and publicly exhibited, with specimen of the finished style of work in the same manner the cartoons were at Westminster Hall, that opportunity may be given, to persons who are solicited to subscribe liberally, of seeing the style and effect of what is intended to be done; and, I hope, with Mr. E. L. Cotte (your correspondent), it may spread the fashion of completing our public buildings and create a school of artists capable of doing it worthily.

WILLIAM PYMAN.

ARBITRATION CASE AT SWINTON.

AN important case of arbitration has been heard at the Station Hotel, Swinton. Messrs Messrs Wilson, Tillotson, & Sykes, proprietors of the South Yorkshire Glass Bottle Company, at Swinton, commenced to build a wall round an exposed part of their works. As it belonged to Messrs. Windham & Sons, the Glass Bottle Company, however, asserted their right to it, and continued to build. Messrs. Windham & Sons accordingly instructed their workmen to pull the structure down, which they did. A serious altercation was the consequence, and it ended in legal proceedings being commenced by the Glass Bottle Company. The case was to have been tried at the Leeds Assizes; but, by the advice of counsel, it was referred to arbitration; and the case came on as previously stated. Mr. J. K. Barker, of Sheffield, was chosen arbitrator. Evidence was given, and the arbitrator and the counsel went over the premises, and made a careful examination of the same. No adjudication was made.

SASIES.

Sir,—I read in your impression of last week a very interesting account of New St. Thomas's Hospital, by a working man. With regard to the latter portion of his letter, about the hanging of ashes, I am rather curious to know what system he would adopt to obviate the several inconveniences attached to the present mode. I have made a great many ash-fruits and ashies, and have tried the balance-weight principle; but the idea often occurred to my mind that the ashes could be suspended simply by the elastic pressure of a tongue-shaped springs applied laterally. This method would, I imagine, secure the perfect working of the ash. It would cause it to travel smoothly and evenly, and never allow it to shake or rattle in the wind.

G. L.

ON FORCE AND MOTION.

Sir,—It is said to be a law of nature that all bodies have such an indifference to rest or motion, that if once at rest they must remain eternally so, unless acted upon by some power sufficient to move them. This is undoubtedly true; but that a body, once put in motion, will proceed of itself *eternally* in a straight line, if not diverted out of this course by some other influence, is, I think, a philosophical error. The generally received opinion founded upon this theory, that a cannon-ball discharged in vacuum, and not influenced by gravitation, would move *eternally*, I believe to be an error, and for the following reasons. The distance a cannon-ball is propelled through the atmosphere depends principally upon its shape and the force of gunpowder used; it is therefore probable that a cannon-ball might as easily be projected one hundred miles as one mile, if a commensurate force were employed. The same principle applies to vacuum. Seeing that matter cannot move without a moving cause, there can therefore be no motion without force, and that force must be continuous and infinite in order to produce continuous and infinite motion; so that however much greater distance a ball would travel in vacuum (compared with a resisting medium), its speed must gradually lessen and its motion eventually cease. The question may here arise, what is there to cause the ball to stop? I answer, the force being finite it is evident the distance traversed must be finite also, otherwise we are supposing an effect without a cause. With all due deference to scientific men, I believe the "cannon-ball theory," as I may term it, a complete fallacy.

J. KIRKING.

CASES UNDER METROPOLITAN BUILDING ACT.

FEES.

At the Lambeth Police Court, Mr. Abraham Cohen, builder, of Southgate-road North, appeared to a summons for refusing to pay £2 1s. 3d. due to Mr. Cosmo Alexander Long, the district surveyor for the district of St. Mary, Newington, and part of Lambeth.

Mr. Long said he surveyed the alterations made to the Jewish Synagogue, Walworth-road; but although he sent several times to defendant, he refused to pay the amount of fees.

Defendant said there had really been no additions or alterations to the building within the meaning of the Act. Before the building was completed it was found that the roof was too heavy and caused the walls to bulge. In consequence, three buttresses were built. Those matters were, he contended, necessary repairs, and did not entitle the surveyor to the fees.

The magistrate's decision, according to defendant's own version it was clearly an alteration to the building, and not a repair, as meant by section 9 of the Act.

The surveyor said that section referred to necessary repairs, and nothing affecting external or party walls. The roof was found to be not sufficiently strong, and extra supports had to be put in. The walls bulged so dangerously that brick buttresses were obliged to be erected, and iron rods inserted to tie the work together.

The magistrate said it was quite clear the case for the complainant had been made out, and he should make the order for payment of the amount, with 2s. costs.

THE ROUND TOWERS OF EAST ANGLIA.

In your review of Mr. Waring's work on "Stone Monuments," &c., you state, probably quoting from his book, that "there are about fifty round towers in Suffolk and Norfolk." Allow me to say that there are in these two counties nearly, if not quite, 170 round towers.

Not wishing to incumber your pages with the names of the whole of them, I may refer your readers to the *Journal of the British Archaeological Association*, vol. xli., p. 163, where 165 are mentioned, and this is an imperfect list.

Quoting, I still presume, from Mr. Waring, you say that the round towers in the Eastern Counties are but "a continuation, with adaptation, of the Irish idea in England."

To this I must demur; and I think Mr. Gordon Hills, who has examined, illustrated, and written upon the Irish Round Towers, will do the same. They are, in my opinion, of different date, and arise from different circumstances. The Irish round towers were probably of Christian origin, although of very early date; whilst those in East Anglia were certainly erected between the twelfth and fourteenth centuries.

The reason why the last were built circular is, to my idea, obvious. It was to save angles of freestone, a material not to be obtained, except by importation, in the eastern counties. All naves and chancels in Norfolk and Suffolk built with round towers have scarcely any, and in most cases, no freestone quoins to the internal angles of the windows, doors, arches, &c., but are simply finished in rubble and plaster. In Ireland, however, the case was different; for there was an abundance of good building stone, and it is necessary to find some other reason for building towers in that form.

R. M. THOMPSON.

MAN THE BOATS.

Sir,—The loss of life so frequently occurring in the lowering of boats at sea should induce inventive aid from all quarters, to lessen the danger attending when that duty has to be performed in bad weather.

It would appear that there are five objects desirable to be achieved, viz.:

1. That it shall be impossible that the falls shall foul, either by becoming twisted or by the boat swinging round and causing the falls to foul each other.
2. That the man in the boat shall be able to lower it, having both the falls under his perfect command.
3. That he shall be able to cast off the falls momentarily, and, if necessary, simultaneously; and that they shall not become cast off until the boat has taken the water, nor one before the other, without his intention.
4. That the same falls shall be worked with facility from the poop or quarter-deck when hoisting the boat.
5. That the apparatus for achieving all this shall be readily understood, and not liable to get out of working order.

In the first place it would be advisable that the upper block shall be part of the davit, so that it cannot turn about of itself; so that when lowering the boat its sheaves shall be in an athwart-ship direction, which will give the opportunity to haul on the falls from the deck, which fulfils our fourth requirement.

It would next be advisable that the foremost and aftermost thwarts should be temporarily (to allow the boat to be washed out), but for the time securely fixed, and which could be so managed that it would be impossible to forget it and leave them unfixed (and to thereby cause an accident in lowering or hoisting the boat), by having between two of the knees of the boat an iron catch with a nose like a latch-bolt, which the end of the thwart must pass before it could be secured; and the iron catch should work on a pivot, and have a long iron arm attached to, or rather being part of it, which should, by means of a powerful spring or weight inseparable from it, remain pointing up in the way until such time as the thwart had been secured.

Then, having the thwart secured, we now

require that it shall be strong enough to bear the weight of the boat and man; then we require a block without a strap, but having a very substantial shell made of elm or iron to be attached to the thwart, so that it cannot turn about, but must remain athwart-ships to the boat; this may be managed by having the shell of the block of a square form, and by an axle being passed through it so that a pair of nippers at each end of the block can attack it to the thwart (properly prepared to receive them by having iron staples fixed underneath it), these nippers to work very much on the principle that those belonging to the monkey of a pile engine work, but in this case it would perhaps be advisable that they should not release themselves, but that they should require a pin to be drawn out (upwards, so that it could not fall out of itself), in order to let go the tackle.

Then the upper and lower blocks cannot turn nor allow the tackle to twist, which realises the first part of requirement No. 1.

If at about the boat's length apart two eye-bolts be screwed in a strake at the light water line, and, of course, in each case, into a futtock, and a couple of similar bolts were screwed (perpendicular to the former ones) through the berthing into the stanchions, and if a rope* were attached to each perpendicular pair of these, and strained moderately taut, then, if we have previously passed a good-sized and strong galvanised wire over this rope, and the same to the other, then, having to each ring a guide (or guy) rope spliced, and the end of each guy made fast, one to a ring in one end of one of the lower blocks of the falls with two half-hitches, this will effectually fulfil the other part of requirement No. 1.

With respect to requirement No. 2, this may, perhaps, be effected by Mr. Cooper's apparatus (I do not know exactly what it is), but it could be effected by the following method:—Both the falls having first been rove through (what I shall call) a double tube of, say, galvanised iron (this tube being similar in appearance to that of an opera-glass), then, having the falls conveniently placed in coils in the boat, the man, in lowering, can pay them out at pleasure.

One of the tubes of this double tube could be made to lock and unlock with a spring catch, so that it could permanently remain on the other fall, by having some contrivance (a hole in it and a small line to clove-hitch it to the fall) to that end.

In No. 3, we have not yet seen how to cast off the tackles simultaneously. This could be done by having a very small single block attached to each fall, at perhaps a foot from the lower end of each, and on that part of the tackle spliced to the lower block, and by having a couple of converging small lines rove through these small blocks, and their other ends attached to the vertical pins confining the nippers which attach the lower blocks to the thwarts, then pulling on these small lines will draw the pins and liberate the tackles simultaneously. The whole of the first four requirements are provided for, and care and judgment in carrying these out may show the fifth to be also accomplished; but I submit these suggestions, hoping that persons better informed than myself on seagoing experiences may indicate such improvements as may be possible, and cause the idea to be speedily put into execution.

HENRY AMBROSE.

ACCIDENTS.

Fall of a Building in Market-street, Manchester.—Some time ago the city surveyor condemned a block of old shops situate in Market-street, and lying between Palace-street and Marsden-square, on the ground that the buildings had become unsafe. In consequence of this, says the local *Courier*, Mr. Chestham, the owner of the property, commenced to pull down the two central shops; but about a month ago, when the work was only half finished, a dispute occurred between him and the corporation. The result was that a large portion of the front walls were not pulled down, and remained standing, or rather leaning; and it required a strong nerve in those persons who beheld the threatening

position of the walls to pass by them. On Monday morning the greater part of this mass of old brick and mortar fell, the debris completely covering the temporary wooden side-walk. Very fortunately no one was hurt. The remaining portion of the wall, which was left at an angle of 75 degrees, was pulled down in the course of the afternoon. It was also thought advisable to strengthen the shoring of one of the adjoining shops.

Fatal Accident at a Gentleman's House.—A shocking accident has taken place at Highbury-terrace. A man named William Lorrigan, aged 35, was at work on a temporary scaffold, cleaning the paint of a well-staircase, when, from some cause at present unknown, he slipped off, and fell a distance of 30 ft. In the descent he came in contact with a gas-pipe. The skull was fractured, and he immediately expired.

COMPETITION.

Penrith Cemetery.—In reply to the advertisement in our columns, designs by twenty-six competitors were sent in, and the design marked "Labor et spes," being by Mr. J. P. Pritchett, of Darlington, has been selected.

CHURCH-BUILDING NEWS.

Longbridge Hays.—The foundation-stone of a new school church has been laid at Longbridge Hays, a hamlet on the slope of the hill near Bradwell Wood, in the parish of Wolstanton. The population of Longbridge Hays exceeds 500, and the group of houses now standing there has sprung up within the last few years. There is no place of worship or public school there. The building to be erected will seat 180, and accommodate 125 children for educational purposes. It will be 42 ft. by 20 ft., with a class-room, 16 ft. by 14 ft. Mr. Lewis, of Newcastle, is the architect, and Messrs. Bennett & Cooke, of Burslem, have contracted to do the work.

Brighton.—The memorial stone of the Countess of Huntingdon's Church, North-street, Brighton, on the site of the edifice recently pulled down, has been laid by Lord Shaftesbury.

Darlington.—The chief stone of a new church has been laid at the village of Middleton-One-Row. It will be a chapel of ease for the use of the Middleton parishioners. About 800l. have been obtained towards the 1,600l. which will be required. The church will be Early Decorated, and the architect is Mr. W. P. Pritchett, of Darlington.

Brighthelm.—The cost of rebuilding the tower of St. Leonard's Church is likely to be considerably more than was at first calculated upon. In reply to tenders solicited from well-known building firms, the three following only have transmitted their estimates, viz., Messrs. Lovatt, Wolverhampton, 5,990l.; Messrs. Nevett, Ironbridge, 5,770l.; Messrs. Estcourt, Gloucester, 4,100l. This charge is exclusive of chimneys, stained-glass window, architect's commission, the clerk of the works, or the expense of taking down the old tower, which is estimated to amount to between 700l. and 800l.; but there will be realised about 700l. for the application of the old stones in the completion of the undertaking, whichever estimate may be accepted. The original estimate was from 2,500l. to 3,000l.

Gumby St. Peter's.—A new church has been opened in this sequestered village, which lies near the Barch station on the East Lincolnshire Railway. The old church, a plain, whitewashed building, was erected about 1634. This, after having undergone several alterations, was rapidly falling into decay, when, in 1868, Mr. Fowler, of Louth, furnished a design, which has been carried out at a cost of about 1,300l. The only objects of interest belonging to the old church which could be retained in the new were two brasses.

Oldham.—The foundation-stone of St. Andrew's Church was laid by the bishop of the diocese on the 20th ult. The plan comprises nave, 73 ft. by 29 ft., and 58 ft. high, with side aisles and transepts. The chancel will be 27 ft. by 22 ft., in which are the stalls for choir. The tower is at the east end, forming one of the principal entrances. It is in the Early English style of architecture. The exterior will be faced with red stocks, relieved with bands of different tints, and stone dressings to the several doors and windows. The roofs are of high pitch, with open framed principals, and covered with slates of varied tints, with enriched tiling. Accommodation will be provided for 638 persons, and

the estimated cost is 3,300l. The contractor for the foundations is Mr. J. Robinson, jun., Hyde; and the architect, Mr. John Lowe, Manchester.

Huddersfield.—The new church of St. Andrew, at Lane, Leeds-road, has been consecrated. The edifice is rectangular in form, and comprises nave with north and south aisles, chancel with north chapel for school children, and south chapel for organ chamber and vestry. The porch is placed on the south side, and it is intended, at some future time, to erect a tower and spire, 135 ft. high, at the west end, the foundations for which are already in. The extreme length of the church, from east to west, is 82 ft.; the breadth, 55 ft.; and the height, to ridge of nave, 48 ft. The nave is 55 ft. long by 22 ft. wide inside dimensions, and the chancel 29 ft. 6 in. by 22 ft., and is divided from the nave by a pointed arch of lofty proportions supported in clustered shafts with carved caps. The nave is separated from the aisles by an arcade of two wide bays and a smaller one opposite the porch at the west end. The larger bays are 19 ft. wide, thus affording little or no obstruction to the view, having only one circular shaft on either side. The chancel is separated from the chapels by arcades partly filled in with open wood screens. The nave roof is constructed of hammer-beam trusses, with open traceried spandrels and moulded ribs in square panels which are filled in with plaster, forming a coved ceiling. The chancel roof is similar without the trusses, and with an addition of carved bosses at the intersection of ribs. The aisles and chapel roofs are open, and the whole of the woodwork is stained dark and varnished. The seats are open and drab stained and varnished, and the chancel stalls have open-traceried fronts and carved poppy-heads. The church stands upon an elevated site, and is Late Decorated in character, the windows throughout being enriched with tracery. The edifice is warmed with hot water from an apparatus under the vestry. The font and pulpit, which are intended as memorials, have been erected by Mr. Thomas Earp, of London, sculptor; and the carving throughout the church by Mr. Stevens, of Dewsbury. The west gable presents an unfinished appearance, pending the erection of the tower and spire. The architect was Mr. Wm. H. Crossland, of Leeds and London; clerk of the works, Mr. Jonathan Parsons; masons, Messrs. Thomas & George Rhodes; joiner, William Roberts; slaters, William Goodwin & Sons; plasterer, William Kitching; plumber, H. Garton; painter, George Brighouse. The church is intended to seat 500 persons, and the estimated cost, including boundary walls, was about 4,300l.

King's Norton.—A public meeting of the parishioners of King's Norton has been held, for the purpose of receiving a report from the committee appointed at the Easter vestry to consider the present state of the church. The vicar presided, and read extracts from the report of Mr. Hopkins, of Worcester, architect, in reference to the repairs necessary. These were embodied in the report of the committee, which was read. It stated that the architect recommends a thorough restoration of the whole fabric of the tower and spire, including the removal of all decayed stones, and the substitution of fresh ones; and urges the undertaking the repairs, which he considers necessary, without delay. The committee strongly recommend the acting on the architect's suggestions. The cost of this portion of the work he estimates at about 500l. They consider that the particulars of the restoration specified by the architect, viz., new roof for the nave and aisles (the present woodwork being used up for the latter), the rebuilding of the north wall, the setting upright the pillars and arches of this aisle, the removal of the vestry, and the restoration of the parapet on both sides,—should not exceed in cost 2,000l., making, with the sums required for the tower and spire, a total of 2,500l. The report was approved of, and a committee appointed to carry out the objects of the meeting. The sum of 1,280l.,—about half the required amount,—has been subscribed.

Buckhurst-hill.—St. John's Church has been reopened for divine service. The church as it now stands, consists of two aisles, nave, and chancel. It is of Geometrical Gothic style, the material used being Kentish rag stone, with Bath stone dressings and windows. The new aisle affords additional accommodation for about 150 persons.

Barmby-on-the-Marsh.—The corner-stone for the restoration of the chancel of St. Helen's

* Of Newall & Co.'s patent wire ropes, and which, as would be liable to violent and sudden tugs by the boat when in a storm, should be 3 in. or 4 in. in circumference. These ropes do not run up when wet when once set tight, or stretch like hempen ropes, and for this purpose they would be peculiarly applicable, as being unlikely to catch or impede an iron ring passing up or down them; but as sea-water has a tendency to soften iron, it would be advisable to occasionally inspect their lower ends.

Church has been laid. The work is to be done by Mr. Elliott, of Goole, according to plans prepared by Messrs. Hadfield & Son, of Sheffield, architects.

Bradford.—The contracts for the erection of the new church at Ripleyville have been let. This is the last of the ten churches as the result of the church-building movement begun at Bradford in 1860, and is to be a memorial church erected to the memory of the late Mr. Charles Hardy. A suitable site has been given by Mr. Ripley, and the sum of 1,000*l.* is required to complete the estimated outlay.

DISSENTING CHURCH BUILDING NEWS.

Burton.—The memorial foundation-stones of a new Wesleyan chapel, in Station-street, Burton-on-Trent, have been laid by Mr. M. A. Bass, M.P., and Mr. T. Hazlehurst, of Runcorn. The site of the proposed edifice is a plot of land opposite the Midland Hotel (750 yards in area), which the trustees some time ago purchased from the Marquis of Anglesey for 1,500*l.*; and the style of the chapel is to be Gothic of the Early Decorated period. The elevation to Station-street will have a large gable, pierced by a five-light window, below which there will be a canopied entrance. The tower and spire will together reach the height of 120 ft. to the top of the weather vane. The Union-street elevation will be broken up by four pointed gables, each of which will contain two-light windows, to give light to the body and galleries. The plan of the chapel is in form a parallelogram, being 60 ft. long on the ground floor, 84 ft. on the gallery, and 51 ft. in width. The main body will be divided into four bays by light iron columns, with moulded capitals, these columns being used to support the framed principals of the roof, which will be exposed and stained, and of somewhat elaborate construction, the spandrels being filled in with open tracery-work. The height to the top of the ridge will be 63 ft., and to the highest point of the ceiling line 46 ft. 6 in. The accommodation provided will be for 860 adults. The materials used in the erection will be pressed brick facings, with Bath stone dressings to doors, windows, quoins, pilasters, &c. The spire will be slated in bands of two colours. The design is that of Mr. Edward Holmes, of Birmingham and Burton, architect; and the work let to Mr. Lilley, of Measham, and Mr. D. Bassett, of Burton, for 3,365*l.*

Dudley.—A new Wesleyan Chapel has been opened here for divine service. The facade of the chapel is broken by the introduction of three wide arches, forming the front of an open portico, supported on carved caps and moulded columns. A large wheel window forms the chief feature of the centre gable. The front is flanked on the one side by a tower and steep slated spire, and on the other by a continuation of the principal front. The facade is further broken up by means of buttresses, and flat buttresses relieve the plainness of the sides. The chapel is built of red brick, relieved by Bath stone dressings. The total cost has been 3,000*l.*

Melton Mowbray.—The architect and building committee of a new Wesleyan chapel here have met, for the purpose of receiving tenders for the erection of the proposed building. They were seven in number, and the lowest was considerably more than was expected. Mr. Herbert, of Leicester, 3,015*l.*, less 250*l.* for the material of the old chapel; Mr. Wileman, of Burton, 2,750*l.* net; Mr. Barnes, Melton, 2,699*l.*, less 200*l.* for old material; Mr. Fast, Melton, 2,577*l.*, less 309*l.* for old material; Mr. Perkins, of Leicester, 2,556*l.*, less 246*l.* for all material; Messrs. Stevenson & Weston, of Nottingham, 2,510*l.*, less 156*l.* 10*s.* for old materials; Mr. Robert Weaver, Melton, 2,490*l.* 15*s.*, less 250*l.* 10*s.* for old materials; Mr. Winkles, of Leicester, 2,300*l.*, less 300*l.* for old materials. The lowest tender, that of Mr. Winkles, of Leicester, was accepted, and the old chapel was to be vacated and placed in the contractor's hands by the 23rd inst.

Hull.—The foundation-stone of a new Wesleyan chapel, of large dimensions, has been laid here. The situation chosen as the site of the edifice is in the fast-increasing district round Colman-street. The architect is Mr. Botterill. The edifice will be 90 ft. in length, by 47 ft. in width, in the Decorated Gothic style.

Lightcliffe.—The foundation-stones of a new Congregational church, and a minister's house, at Lightcliffe, have been laid by Miss Helen and Miss Ada Salt. The site of the new buildings is on a piece of ground near the old chapel, and

on the Whitehall-road. The new church has been designed by Messrs. Lockwood & Mawson, architects, Bradford. The edifice is in the Geometric Gothic style, and is to consist of a nave, side aisles, transepts, and an organ-chapel. At the western end of the nave there is to be a gallery for the school children, and at the eastern end there are to be erected convenient minister's, deacons', and ladies' vestries. On the south-west angle of the building a tower and spire are to be erected, which together will rise to a height of 151 ft., and under which will be one of the principal entrances to the church. At the south-east corner access is to be provided by a covered porch and centre vestibules. The greatest internal length of the church is to be 87 ft., the width across the nave 50 ft., and across the transept 66 ft. It will afford accommodation to 500 adults and seventy children. At the west end the nave is to be lighted by five-light traceried windows of two orders, the mullions having moulded shafts and carved capitals and bases. At each transept is a large four-light traceried window of one order. The aisles are to be lighted by two-light traceried windows. The western gable has pinnacles, crocketed gable copings, and is surmounted by a foliated cross rising to a height of 55 ft. The belfry-stage of the tower has deeply moulded and recessed tracery windows of two lights on each face, and filled in with ornamental cut slate louvres. The junction of the tower and spire will present a pierced battlement, octagonal angle pinnacles, pyramidal shingles, and lucerne lights. The whole of the exterior walling is to be constructed of local delf-stone, with ashlar dressings to the jambs, pilasters, and buttress shingles, and each front of the building will correspond in its architecture with the principal facade. Internally, the nave will be divided from the aisles by polished columns of Shap granite, resting on moulded stone bases and supporting carved capitals, from which will spring moulded ashlar arches. The transept and organ-chapel arches are to be of moulded ashlar work also, and they will spring from detached cylinders of Robin Hood stone, supported on carved and moulded stone corbels. The interior dressings of the windows are to be of ashlar work, all banded. The clearstory will be lofty, and lighted by ten single-light windows on each side. The roofs are to be of open timber construction, with dressed framings and spars, and throughout they will have a space between the slates and the ceilings, and will also be covered with felt, so as to preserve an equal temperature winter and summer. The seats are to be of red deal, painted and varnished. The pulpit, lectern, and choir seats will correspond. The heating and ventilating arrangements are to be executed by Messrs. Haden, of Trowbridge. The minister's house is to be erected on the upper portion of the site, and will be of a style to correspond with the church. The cost of building the church and house will be about 6,500*l.*

Reading.—The foundation stone of a new school-chapel for the Wesleyans has been laid by Mr. J. T. Waterhouse, of Honoluh, Sandwich Islands. The site of the chapel is on a piece of land lately occupied by two cottages in Spring-gardens. The new chapel is designed to answer the joint purposes of religious services and Sunday-school. Mr. S. Whiting, of the Grove, is the builder; and the entire cost, including the site, will be about 490*l.* When built, the chapel will seat 200 persons.

FROM AUSTRALIA.

Melbourne.—So far had the new Town-hall advanced towards completion, that its formal inauguration, by latest news, had been fixed for the 9th of August; and the ceremonial was to be on a grand scale. It was proposed in the City Council to vote 2,000*l.* in order to defray the expenses of the occasion, but Mr. Amess, the mayor, at once declared that not a shilling should be expended but what came out of his own pocket. A number of gentlemen have raised by subscription a handsome sum, for the purpose of presenting to him a gold mayoral chain. Vigorous steps are being taken to carry out the designs of the promoters of the Williamston School of Design. Materials and drawings have been purchased, and it is expected that a good start will be effected.

The Belfast Harbour Works.—The object of the works in Belfast Harbour is to preserve the force of the current over the shifting sand, by confining

it between deeper walls till it reaches the deep water outside, making the current from the west act as a constant dredge, clearing a way for itself, and never requiring artificial aid to preserve its depth. Fortunately the material is as abundant and as near at hand as could be desired, the passage being lined with huge blue-stone boulders which are carried on trucks to the end of the wall, and thrown down on the sand, which they rapidly displace by their greater weight till they reach the solid ground beneath. As the walls are extended, not only is all the sand between them carried out by the current, and deposited on the beach at either side behind the walls, but a deep channel is formed a couple of hundred feet beyond them. It is consequently expected that the coasting vessels of lighter draught will be able to come up the river into Belfast before the walls reach the point where the surf breaks over the bar. The width between the walls at their base is 180 ft., and so great is the force of the current that the agents for the Western steamer have already had to get a steam-tug to tow up the lighters to the wharf. The north wall, which extends from the main land, is eighteen chains long, 12 ft. wide on top, with side slopes of 2 ft. to 1 ft., and contains 7,230 cubic yards of stone. The top of it is 7 ft. above low-water mark. The south wall is now twenty-seven chains long, but a great part of this length is extended back from the sea wall in order to form a tramway from the quays. It is but 8 ft. wide on the top, and rises only 5 ft. above low-water mark, containing 5,750 cubic yards. The work was commenced on the 15th of January, 1869, by Messrs. Gibson, Brothers, for the Public Works Department. The large quantity of stone work required has cost 4,500*l.*, which is, we understand, unprecedentedly cheap. It is carried out under the superintendence of Mr. Bell, acting under the district inspector, Mr. Todd. The original plan of the work was given by Mr. Moriarty, the engineer for rivers and harbours to the New South Wales Government, and Mr. Wardell accepted Mr. Moriarty's plan, modifying it only after borings and observations of the currents, &c. The inhabitants of a great part of the Western district anticipate important advantages from this work in transmitting produce to Melbourne and otherwise.

Adelaide.—Captain Sherard Osborne has arrived in Adelaide as the representative of the British Australian Telegraph Company. The object of his visit is to effect arrangements with the South Australian Government in reference to the establishment of a telegraph station at Port Darwin, in the northern territory; and also of a land line from that point to Burke Town, on the Gulf of Carpentaria. The Government of South Australia have been considering whether a direct line from Port Darwin to Port Augusta, at the head of Spencer's Gulf, would not be a better means of communication than the route projected by the company. Another question has been raised—viz., Would it not be safer to bring the submarine cable direct from Galle to Western Australia, than take it round by the Straits of Singapore and Java, where it must be exposed to danger from the coral reefs which lie thick at the bottom of those seas.

Books Received.

A BUNDLE of books from Cassell & Co. is before us. We will take a paragraph or two from some of them. From "Illustrated Travels" we get some account of the Turkistan Museum at St. Petersburg.—"On a raised platform beside the door (where he is kept in countenance by two smaller specimens of the same breed) figures an enormous mountain-sheep, of the argali or 'big horn' species, with the short greyish hair of a chamois, and vast curled horns, more than 2 ft. long and as thick as a man's leg. This distinguished foreigner, however, though ranking first in the collection, is not from Turkistan, but from Siberia; as it were a true-born Russian subject placed as a sentinel over the foreign intruders. Farther on, appear two wide-winged vultures, lean and loathsome as the worst of their kind, fighting over the torn remnants of a hare,—a group which might suggest to the historian a struggle yet to be between Russia and Afghanistan over the carcass of prostrate Bokhara. Around the walls are ranged skulls and bones of strange animals hitherto unknown to Russia; tawny skins of the tiger and ocelot hanging peacefully beside those of the mountain

goat and deer; fish from the waters of the Tchirchik, and birds from the slopes of the Thian-Shan. On the more distant tables appear bright-hued lizards and curious insects, minerals dug from the hills of Khojend, and fossil shells entombed before the name of Russia was known." The "Household Guide" speaks thus as to "Painting Fans."—"The painting of paper fans differs from ordinary water-colour drawing, inasmuch as what is technically known as 'texture' cannot in the former be attained by the use of thick rough paper; the lightness and neatness essential to the fan demand that a thinner and finer paper should be used; and this should be made from linen rag, to enable it to bear repeated folding. The fact of this smooth paper being used renders desirable the employment of stippling rather than of washes, in the colouring. Where gold and silver are required, the painter may use the ordinary illuminating shell gold or silver; or, if he prefers gold or silver leaf, he may use, to fix it, a size composed of gum-arabic, sugar-candy, a small quantity of honey, melted in pure water, mixed with a little brandy, and applied with a camel-hair pencil. This preparation was long kept a profound secret by the fan-makers. When dry, burnishing may be accomplished by piling a number of mounts together, and pressing them." The "Popular Educator" gives us the following as to "Value of the Larch Tree."—"It would be difficult to over-estimate the importance to be attached to the cultivation of this valuable tree in situations where little else could be grown. The Athol family have been celebrated for their zeal in the cause of larch growth. The extent to which their tree-free cultivation has been carried on in Scotland will be best shown by a reference to the following statistics:—14,096,719 young larch trees were planted in the neighbourhood of Blair Athol and Dunkeld. The plantation covered a tract of land 10,324 imperial acres in extent. The trees flourished and grew rapidly, and on felling one, at the ninety-fifth year of its growth, it was found to be 100 ft. long, 10 ft. 6 in. in girth, at 5 ft. from the point at which it was cut through. It contained 368 cubic feet of timber. It has been truly said that the man who plants good trees abundantly stores up wealth for those who follow. An approximate calculation has been made as to the money value of the vast fir forests thus raised by one man's strong will and industry, and the sum arrived at is 6,500,000. In addition to this princely sum we must estimate the thinnings and trimmings as being worth about 7l. per acre of forest. At the death of this noble pine-tree planter, a coffin was constructed from the wood of one of his forest favourites, which, on being felled, measured 106 ft. in length."—Messrs. W. H. & L. Collingridge, of the City Press, announce for publication, early in December, the "City Directory." According to the prospectus, all matters of interest to traders in, and connected with, the city of London, as well as banking, insurance, public companies, parochial and official, will be specially attended to.—Mr. James Hogg, the founder of *London Society*, and sole editor of the first seventeen volumes of that work, has just ceased to have any connexion with it. He is now about to start *English Society*, aided by those with whom he has been long associated. Colour printing will be applied in illustrating it.—Mr. Arthur Hill, A.R.I.B.A., of Cork, has announced his intention of shortly issuing lithographic drawings and photographs, with descriptive letterpress, illustrating the architecture and present condition of Ardferd Cathedral, county Kerry. Mr. Hill says he has two very interesting Celtic churches in hand that will be issued shortly after Ardferd Cathedral, viz., Kilmakadar, near Dingle, and Temple-na-nae at Ardferd.

Miscellaneous.

Melton Mowbray Union Workhouse.—The new infirmary, which has been some time in course of erection, is now complete and occupied. The fever-wards are quite distinct, having separate airing-yards. The nurses' apartments, kitchen, and surgery are in the centre of the building, and in direct communication with both male and female wards. Other extensive alterations have also been made in connexion with the children's wards. The works have been carried out by Mr. J. Fast, builder, from the designs and under the superintendence of Mr. R. W. Johnson, architect, both of Melton Mowbray.

Geography for the Volunteers.—Commenting on the impulse given by the War to the study of geography, and the superior acquirements in this direction by the German soldier over the French, the *Publisher's Circular* says,—"Can we not extract honey out of the carcass of this lion? The educated German soldier, drawn not exclusively from the poor, but from the nobility, gentry, and middle classes, studies his map, knows his country, finds his billet, or the shelter of a hill, or the copse which will conceal him. All his movements are regulated by knowledge; his confidence in his generals is sound, because based upon knowledge; his obedience is not hesitating, because it is not blindfold. Suppose, in the interest of publishers, and of course of the nation, we should propose an elementary study of geography, of fortification, of science, to all our volunteers? Let us presume that prizes should be given away, not only for correct shooting, but for correct knowledge in a dozen duties which the present war has shown to be equally important, would not such not only develop new sources of industry, and therefore new sources of pleasure and true happiness, but also add to the usefulness and efficiency of our volunteer force? One thing is certain—the ignorant, the brutal, the unreflecting soldier is now a thing of the past; and publishers may find future consolation in the fact that Shakespeare's phrase has become a fulfilled prophecy: 'Oh, sir; we fight by the book.'"

A Church by Overtime.—The *Louisville Commercial* states that about fifteen years ago two brothers named Clark, carriage-makers, came from Newark, N.J., and settled in Georgetown, Kentucky. They were Episcopalians, but found no one to worship with them in the place. In the course of ten years a handful of churchmen was gathered, and they bought a site for a church. This done, about five years ago the Messrs. Clark designed an edifice, and to-day it stands a monument to their faith, energy, and skill. "With their own hands they quarried the stone: at times when their carriage business was slack, and when a sufficient quantity of stone was ready, they set to work at the foundation upon which to rear the present structure. When the stonework was finally completed by their own exertions, the brothers began upon the woodwork, all of which was planned, made, and fitted by them, the work being done between six o'clock p.m., after their business had ceased, and twelve o'clock at night. In like manner the entire church, from basement to belfry, has been carried to completion by these gentlemen. The church is Gothic in style, and, if built in Louisville, would cost 15,000 dollars. The amount of money actually expended in its construction was but 6,000 dollars. The Messrs. Clark are now buying old brass and copper from children, which they will use, when enough has been bought, in casting a bell." This church, consecrated by so much toil, has just been completed, and on the 23rd of June it was dedicated by Bishop Cummins.

Value of Land at Wells.—Mr. E. Hippisley, auctioneer, of Wells, sold a freehold estate, consisting of a very good farmhouse, convenient farm buildings, and divers closes of pasture, orchard and arable, containing together nearly 90 acres, and known as the Sugar-loaf Farm. The estate was offered in thirteen lots, and they were all sold, at the following sums:—Lot 1, 39a.0r.31p., comprising the homestead, outbuildings, orchard, and land, 4,200l.; lot 2, 9a. 2r. 10p. of pasture and arable land, 900l.; lot 3, pasture, 5a. 2r. 28p., 500l.; lot 4, arable, 1a. 3r. 9p., 170l.; lot 5, arable and orchard, 2a. 1r. 16p., 230l.; lot 6, pasture, 1a. 1r. 20p., 170l.; lot 7, pasture, 6a. 0r. 20p., 170l.; lot 8, pasture, 5a. 3r. 11p., 625l.; lot 9, pasture, 4a. 2r. 6p., 530l.; lot 10, pasture, 7a. 0r. 20p., 930l.; lot 11, arable, half an acre, 68l.; lot 12, pasture, 1a. 1r. 15p., 172l.; lot 13, pasture, 1a. 3r. 6p., 234l.; making a total of 9,439l.; and with the timber, valued at 137l. 2s., the sum of 9,576l. 2s., being an average of nearly 107l. an acre.

New Building Sites for Dorking.—A few of the leading townsmen, it is said, have joined together and purchased Holloway Farm, situate on the Horsham-road, as a site for building purposes. The land is about 45 acres in extent, and it is contemplated to lay it out in plots of a size sufficient to erect a superior class of villa residences.

Newspaper Press Fund.—Mr. John Byrne, Jun., has been elected Secretary. There were 100 applicants for the post.

A Joiner's Case.—At the Edinburgh Small Debt Court, a case of some interest to joiners has been disposed of by Sheriff Hallard. Robert Watson, joiner, Dalry Park-terrace, sued William Brown, house-carpenter, Charlott-square-lane, for 8s. 6d., which he alleged to be due to him for work done for the defender on the 16th and 17th of June. The defence was that the pursuer left his employment without giving warning; and that this was contrary to the practice of the trade. Several witnesses were called, who spoke as to the rule of the trade regarding warning. Their depositions were to the effect that, after getting his first pay, a workman was entitled to receive from his master, and to give to him, a week's warning, in the event of either party being dissatisfied; but that before getting his first pay a workman could leave or be dismissed without that notice. The Sheriff held it proved that, up to the first pay, master and servant were upon mutual trial; and that if the employer thought the workman incompetent, or if the workman considered the employer severe or disagreeable, they could part company without warning. He found for the pursuer with expenses.

Manchester New Town-hall.—As we stated in last week's *Builder*, the tender of Messrs. George Smith & Co., of London, has been accepted by the building committee for the shell of the superstructure of the new town-hall, at 192,574l., the lowest of eight tenders. Though this contract does not include the upper portions of the two principal towers, nor the internal finishing of any portion of the building, some idea of the quantities of material and labour involved in it may be gathered from a few of the items gleaned from the calculations upon which the tenders were based. Among these calculations are 20 acres of brickwork, if reduced to 9 in. in thickness; 320,000 cubic feet of stone, on the surface of which is to be expended more than 27 acres of labour. There will be 3½ miles of shafts in the building, either of stone or granite, and upwards of 3,000 carved caps to crown them. In the vaulting of the corridor, &c., there will be nearly 3 miles of groin ribs. The roofs will contain 2 acres of slating; of fire-proof flooring there will be ½ acres; and of iron beams about 2 miles in length.

The Penzance Serpentine Works.—On the 23rd ult. the lease, plant, and machinery of the extensive premises recently in the occupation of the Penzance Serpentine and Marble Company were submitted to auction by Mr. F. Inman Sharp, of London, by direction of the manager. The stock was sold in the first instance, and comprised some excellent specimens of serpentine, which realised fair prices. The lease was next offered; the bidding commencing with Mr. Sims, on behalf of a London charity; but, not being equal to the reserved price, the lot was bought in at 800l. The plant and machinery were then sold, without reserve. The sale, says the *Cornish Telegraph*, created considerable excitement in the town, it being reported that a deaf and dumb institution thought of securing the works, which are situated on Newlyn Green, close to the margin of Penzance, in a commanding position, overlooking the Bay, and on the high road from Penzance to the Land's End.

A Self-Feeding Turning Lathe.—This invention, which has been recently patented for Mr. G. Scuncio, is about to be developed by a limited company. One skilled workman, it is said, can readily attend to three or four of them, while the work produced, according to our authority, the *Mining Journal*, is a marvel of perfection. Any desired pattern can be turned out by merely forming the profile upon a plate of soft iron, and plain rods, tapers, and the most complicated designs can be produced with equal facility, and without additional expense. The pattern is fixed around a wheel operated by the screw-worm in connexion with the feed-motion, so that variation when the pattern has to be repeated is practically impossible. Banister rails, billiard cues, table legs, chair rounds, and various other articles of everyday utility to the decorative carpenter, upholsterer, &c., can thus be made with surprising rapidity, and at a low price.

Theatrical Machinery.—The *Gazette des Architectes* (No. 17, 1869-1870), contains a full account, with illustrations, of the stage machinery proposed for the Paris new opera-house, by M. Quéruel, civil engineer. It includes several entirely new arrangements.

Archaeological Excursion to the Herefordshire Beacon.—The Archaeological Section of the Midland Institute have arranged for an excursion to the camps on the Herefordshire Beacon and Midsomer Hills, Malvern Hills, on Monday, the 19th instant. A Midland train will leave New-street Station at nine a.m., arriving at Malvern Wells about eleven a.m. Thence the members of the section will walk to the Beacon Camp, a distance of about three miles. Luncheon will be provided on the hill about one o'clock, after which Mr. H. H. Lines, of Worcester, will conduct the members of the section over the camps, and will read a paper describing them. Dinner will be provided at Malvern at six o'clock, and the members will return to Birmingham by the train leaving at eight p.m.

Artificial Butter.—The manufacture of artificial butter is (says the *Food Journal*) seriously contemplated in France. A Parisian contemporary states that M. Meys, of Paris, has taken out a patent for the manufacture of artificial butter, which, according to the journal in question, is to be used as a substitute for that ordinarily exported to England and Russia. The description of the process is, that animal fat is subjected to great pressure, by which the stearine is extracted for making candles; an oily material being at the same time obtained, the composition of which is identical with that of butter. M. Meys says that he subjects this animal oil to a succession of scientific processes and manipulations till he produces what he calls butter. He has the most sanguine anticipations about the success of his "invention."

The Tower Subway.—At the half-yearly general meeting of this company, the chairman, Mr. P. Barlow, in moving the adoption of the report, said he could confirm the statement in the report of the engineer as to the satisfactory condition of the works. The subway had been opened only two months, and the receipts amounted to 30*l.* a week. Arrangements had been made to diminish the working expenses without impairing the efficiency of the undertaking. They had made the necessary arrangements with respect to the safety apparatus, which had received the approval of the Government inspector. There was every reason to believe that the undertaking would pay the shareholders 15 per cent. The report was agreed to unanimously.

Two Hundred Thousand Wooden Legs.—We have from good authority a fact which will, in some slight degree, bring home to our readers the extent and the reality of the murderous work which has taken place in the east and north of France. It comes to us from a Prussian source, and is almost grotesque in its hideous suggestiveness—two hundred thousand wooden legs have been ordered by the Prussian Government for the use of its soldiers! "So says the *Eastern Post*. In the war of 1866, the wholesale purchaser of these useful articles, King Wilhelm, shed tears at the spectacle of one man whose arms and legs were all gone, and who implored his sovereign to order some one to shoot him, for he had no means himself of ending his misery. Whether Bismarck's expressive eyes were so suffused, sympathetically with his master's, we know not.

Petroleum in America.—The petroleum yield for July last was extraordinarily large, averaging over 15,000 barrels per day, being about 2,000 barrels more than the running average two months before. Three days only of this production suffices to furnish as much petroleum as the entire export of 1861 (1,500,000 gallons). Whereas more than 60,000,000 gallons have been shipped since Jan. 1, 1870. It is going to all countries abroad as usual, excepting to Germany and France. The abundant production, in face of European complications, has brought down the price to 22 cents.

London and Middlesex Archaeological Society.—A general meeting of this society will be held at Monken Hadley, on Tuesday, the 13th, at half-past eleven o'clock, when papers will be read as follows:—"The Antient Topography of Barnet," by Mr. W. H. Black, F.S.A.; "Barnet and its Neighborhood," by Mr. T. F. Peacock. The society will then proceed to Monken Hadley Church, where a paper will be read by the Rev. F. C. Ouse, thence to South Mims Church, when Mr. E. Wright will give an account of the church and parish; and, after a collation, they will go to Chipping Barnet.

Science and Art School, Clerkenwell Green.—The prizes to the successful students at the Government examinations held in connexion with this school were distributed on Saturday evening last by Mr. C. Lamport, who presided on the occasion. Mr. Hodgson Pratt, who founded the school last winter, said that although the attendance had not been very encouraging, he thought it would be wrong to abandon the experiment until it had had a longer trial. He hoped that workmen and apprentices would join the classes, which would be re-opened so soon as a sufficient number of applications had been received. Addresses were made on the importance of technical instruction for all classes of the industrial community.

Strange Conduct of Workmen.—A deplorable fatality is reported from Middleton. A workman, named Dyson, employed at Messrs. M'Dougall's chemical works, entered a retort, for the purpose of cleaning it. He soon felt that he was being overcome by an accumulation of foul air; and, on his crying for assistance, a young man named Thomas Holland entered the retort, and with his aid Dyson was drawn out in an insensible state. The workmen in the place appear to have got confused, and, while directing all their energies to the restoration of Dyson, forgot that Holland was still in the retort. After Dyson had recovered, Holland was thought of; but by that time he had been killed by the fatal vapour.

Depression in the Slate Trade.—The slate districts of North Wales are now suffering from a great falling off in the demand, and consequent diminution of employment for labour. According to the *Investment Circular*, even at the Penryn Quarries, where for many years the demand has been greater than the power of supply, large numbers of the quarrymen have been discharged, and assistance given them by Lord Penryn to enable them to travel and seek employment elsewhere.—strong evidence that the depression is expected to be protracted.

Preservation of Stone.—At the recommendation of Professor Abel, chemist to the War Department, the process invented by Messrs. Gay & Co., of Alton, Hants, for waterproofing and preserving stone and other buildings, to which we referred some time ago, is, by order of the Office of Works, to be applied to a portion of the decayed stone-work at the Houses of Parliament.

Club Rebuilding and Redecoration.—The club-house of the Junior Union Service Club, in Charles-street, St. James's, is now closed, preparatory to the partial rebuilding and entire redecoration and refurnishing of the interior. The cost of reconstruction and embellishment will be very large.

The Metropolitan Board of Works.—This Board will meet on Friday, the 23rd inst., when arrangements will be made for the election of a chairman in the place of Sir John Thwaites.

TENDERS.

For house at King's Norton, Birmingham, for Mr. C. E. Ryder. Mr. William Hale, architect. Quantities supplied:—

W. & J. Webb	£1,385 0 0
Partridge	1,320 0 0
Jones	1,313 0 0
Matthews	1,275 0 0
Moffatt	1,269 0 0
Blore	1,250 0 0
Ravenhill	1,249 0 0
Surman	1,245 0 0

For alterations and additions at Dalston Junction, for the North London Railway Company:—

Axford	£7,810 0 0
Wittaker	7,690 0 0
Mansfield, Price, & Co.	7,283 0 0
Abrams	6,887 0 0
Eaton & Chapman	6,951 0 0
Hill, Keddell, & Waldram	6,874 0 0
Watts	6,974 0 0
Snowball	6,639 0 0
Parsons & Telling	6,435 0 0
Doverwood & Co.	6,369 0 0
Blease	5,993 0 0
Icks, Bangs, & Co.	5,970 0 0

For alterations and re-fitting at the Pitt's Head, Old street. Messrs. G. Knight & Pickering, architects:—

Langmead & Way	£339 0 0
Elms	885 0 0
Stead	893 0 0

For the channel and transcripts only of the church for the new district of Newburn, near Faversham Abbey, for the Rev. Thos. Goss, Messrs. E. Habershon & Brock, architects:—

Court	£1,968 0 0
Ormandy	1,937 0 0
Gradwell	1,740 0 0
Garden	1,690 0 0

For the new Rectory House of St. Paul's, Carlisle, for the Rev. F. Richardson. Messrs. E. Habershon & Brock, architects:—

C. & J. Armstrong (accepted)	£1,600 0 0
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For the erection of chapels at the New Cemetery, Romford, Essex. Mr. R. C. Allum, architect:—

Wood	£2,163 0 0
Chessum	2,100 0 0
Haynes	1,806 0 0
Bloss	1,764 0 0
Potter (accepted)	1,694 0 0

For alterations and additions to Nos. 57, 59, & 60, Gedling-street, Dockhead, for Mr. G. J. Grace, Mr. P. N. Kemp, architect. Quantities supplied by Mr. Edwin J. Styles:—

Martell	£250 0 0
Kent	520 0 0
Dredge	489 15 0
Churchill (accepted)	397 0 0

For the erection of a house, at Caterham Junction, Surrey, for Mr. W. H. Heath. Mr. Ridge, architect. Quantities supplied:—

Cooper (accepted)	£281 0 0
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For pulling down and re-building 137, Fenchurch-street, for Mr. C. J. Kim. Mr. F. Johnstone, architect. Quantities supplied by Mr. C. Kirkby:—

Newman & Mann	£3,285 0 0
Kilby	3,268 0 0
Corder	3,224 0 0
Axford	3,210 0 0
Hill, Keddell, & Waldram	3,197 0 0
Colls & Sons	3,181 0 0
King & Sons	3,133 0 0
Robinson (accepted)	2,984 0 0

For new shops and premises and alterations and additions, for Mr. James Wigan, at Mortlake, Mr. Pope, architect:—

Searle	£2,745 0 0
Little	2,709 0 0
Wheat	2,687 10 0
Dove, Bros.	2,636 0 0
Arvis	2,622 0 0
Brown & Robinson	2,478 0 0
Patrick & Son	2,461 0 0
Bishop	2,450 0 0
Adamson	2,430 0 0
Sharpington & Cole	2,391 0 0
Bowling	2,298 0 0

For Cottage Hospital, Beacons, Cheshire. Mr. W. J. Mason, architect. Quantities by Mr. Geo. Northcote:—

H. A. (see below)	£749 0 0
J. & T. Mason	725 0 0
Haigh & Co. (accepted)	725 0 0
Allen (too late)	713 0 0

Accepted for engineering works and gas-fittings, at Poplar and Stepney Sick Asylum, Bromley, Middlesex. Messrs. Arthur & C. Harston, architects:—

For steam engine and boilers and the fitting-up of the steam laundries, and for cooking apparatus, and fitting-up kitchen and scullery..... Frazer & Sons

For cold-water tanks and mains, fire mains, hot water warming, hot water supply, and for the supply and fitting-up of manual-power lifts..... Jenkes & Co., Fulton

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We are compelled to decline pointing out books and giving addresses. All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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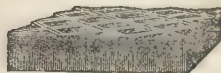
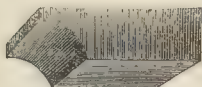
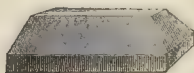
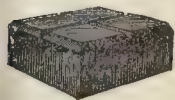
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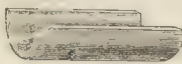
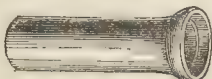
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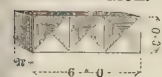
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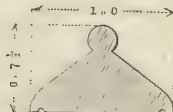
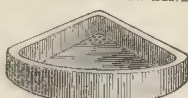
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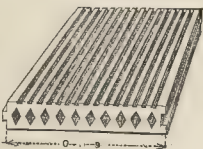
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The Builder.

VOL. XXVIII.—No. 1441.

*Archæologists in
Herefordshire.*

OME very good work was done last week at the Hereford Congress of the British Archæological Association. A continuous account of the proceedings would occupy a great deal more space than we can devote to the subject, unless it were a mere catalogue of places and papers, which would be very uninteresting. We must confine ourselves to dealing with some of the more prominent statements and buildings. It was an eventful time at which the meeting commenced. As one of the speakers said at the opening meeting, in the face of the momentous incidents narrated in the newspapers that day (the 5th), the armies of France destroyed, the Emperor a prisoner,

and a republic proclaimed, it was somewhat difficult at first to bring the mind quietly and fixedly to contemplate such a purpose as theirs. But he thought it must lead them to feel thankful that they were in a position to meet in peace in that city, which, by the way, knew something of a siege 200 years ago. They must be thankful that they could meet there to examine its antiquities, works left by their forefathers, and to point out such beauties as they could see, exchange their little modicum of knowledge, and, as it seemed to him, by these means help to spread that love of country which gave the power when the time arrived to repel the foe who might invade it. After the address given by the president, Mr. Chandos Wren-Hookens, M.P., part of which was printed in our last, the city was perambulated under the good guidance of Mr. Flavel Edmunds and Mr. Kempson. At one opening in the walls, Mr. Edmunds reminded the party of the stratagem practised there in the civil war of the seventeenth century. The Governor of Hereford issued a mandate to the surrounding district to forward men to repair the fortifications of the castle, and the commander of the Parliamentary forces, Colonel Birch, knowing that fact, had sent a wagon up this road, apparently laden with hay, which, when it entered the Barton gate, was intentionally overturned, thus preventing the gate from being closed. As it was being overturned, the hay fell off, and a number of armed men sprang out of the cart, and cut down the guards at the gate. The victors then let in a larger force, which had been lying in ambush in the fields near, and the city was thus taken by surprise. Would such a mild scheme succeed now? Still following the old wall to the bastion in Blue School-street, the solidity of this portion of the structure was pointed out, but it is neglected and falling into a bad state. Mr. Godwin expressed a hope that care would be taken by the town council of this interesting fragment of former times, and in such a way as to preserve without altering it. The expense

would be trifling. Mr. Edmunds said he should be glad if that should be the effect of the visit of the Association to Hereford. It would be a great satisfaction to local antiquaries. The disfigurement of one of the best of the ancient houses in the market-place by huge notice-boards was strongly commented on. The party then proceeded to Coningsby's Hospital, where the coat of arms of the Coningsbys is seen over the entrance. The Coningsbys erected the present building out of the remains of the house originally belonging to the Knights Templars, but which on the dissolution of that order in the thirteenth century, was given to the Knights of St. John of Jerusalem. The arms are remarkable as an example of what is known as canting or punning heraldry. Having no idea of the true meaning of their name, the Coningsbys fancied that it had some reference to "conies," or rabbits. Hence their coat of arms represents on the one side the lattice-fence which kept the conies in their abode, and on the other side the conies enjoying themselves within it according to their fashion. The name of Coningsby has no connexion with conies, but obviously means "King's abode." The chapel of the hospital has a thirteenth-century triplet window, at the east end, and appears to be the earliest work remaining. The ruins of the Black Friars' Monastery behind are later. The open-air preaching cross is a rare example. It is hexagonal, with a pillar in the centre, supporting a groined roof, which is carried by six cinquefoil arches round the circumference. These arches originally were probably open, at any rate some of them. But the structure was restored a few years ago, and all the openings were filled up half way. At the same time it was surmounted with an ugly common cross, evidently without any authority.

As to the ruins generally, it was rightly urged that, if the masonry were pointed, it would be preserved and a good deal of expense hereafter spared. Mr. Kempson said that there was a charge upon the estate for the maintenance of the almsmen and of the building in which they lived, and these claims absorbed it, so that there was nothing for the maintenance of the ruins. Mr. Edmunds thought if the council of the Association passed a resolution, Mr. Arkwright would kindly complete the service which he had rendered to archæology by executing the small amount of reparation that had been suggested.

The Cathedral.

Mr. Gordon Hills, on Tuesday, first led his party round the exterior, and alluded to the circumstance that, although the Norman style of architecture predominated in the interior, there was very little of it visible exteriorly. The central tower is of the Decorated period, and profusely ornamented with the ball flower. There was up towards the end of the last century a western tower, which, however, fell in 1786. This was of precisely the same character as the existing tower. The Lady's Chapel has undergone great renovation of late years, the east end being almost rebuilt outside, though inside the old work has been preserved. Attention was directed to the beautiful cloister of the time of Edward IV., erected for the convenience of the vicars of the church. It then came to the chapter-house. A chapter-house stood there from a very early date; but the building, of which the ruins only now exist, was built in the fourteenth century, and is described in the Harleian MSS. as having the walls painted in panels, with subjects of the saints and martyrs. In one of these panels was represented a group of ecclesiastics with the inscription, "*Dominus Johannes Pratt*," and in the inside of the cathedral was a brass recording the death of the same Johannes Pratt, in 1415, who was a canon priest of the church. The chapter-house was decagonal, a rare form.

It was approached by a side of the cloisters called the Lady Arbour, but he was at a loss for the origin of that name.

Mr. Godwin suggested that an apartment known as the "Lady's Bower" was common in old houses. It was not unlikely that this was called the "Bower of Our Lady." In illustration let us add that in early times the Bower was the name of the Ladies' Chamber. Chaucer and other poets use the term. In the old ballad "Lord Thomas" we have,—

"Up then rose fair Annet's father,
Two hours or it were day,
And he is gone into the bower,
Wherein fair Annet lay."

Mr. Hills next pointed out the architectural features of the great cloister, of which only two of the three sides are left standing. There was no necessity for the fourth side, or *scriptorium*, next to the church, which was used by the monks for writing in. If this had been a monastery there would have been a fourth side. He noticed that all the roofs were covered with lead, which was far more durable than slate, now so often substituted in restoration. Passing next into the garden of the Bishop's Palace, the party inspected the ivy-covered ruins of an ancient church in two stories or crofts, dedicated to St. Catherine and to St. Mary Magdalene. The other remains of the church were destroyed in the last century in order to improve the episcopal palace. Having thus completed the examination of the exterior, the party were conducted over the interior of the noble edifice. Assembled under the tower, Mr. Hills read a paper on the history of the cathedral. There could be no doubt, he said, that from a very early date the precincts in which they were assembled had been hallowed by the existence of a house of God. The first building was said to have been of wood, which was replaced A.D. 825 by a finer church of stone, and that again succumbed to another. Bishop Athelstan erected a new church, as they learnt from the chronicles of Simeon of Durham. He thought it was hardly probable that these churches were built in succession on exactly the same site; it was necessary to maintain one church while its successor was being erected. Bishop Athelstan died in 1055, and soon after his death the church was destroyed by an incursion of the Welsh; and they killed nine canons, who closed its doors against them, pillaged it, and removed all its relics. Yet after the death of this bishop there arose another and yet a finer church. Robert de Losing, who died in 1095, built a church planned after the great church of Aix-la-Chapelle, erected by Charlemagne. This church (Hereford) was said to have been consecrated in 1110, although at that time it could not have been entirely finished. Then succeeded Robert de Betune, who finished the Norman cathedral and completed the west tower. Robert de Betune, or Bethune, did more than is generally supposed. This is proved by a short biography of him written by his successor, one William of Wycumb, and printed by Wharton in the second volume of his "*Anglia Sacra*." When the west tower fell in 1786, the church was, in rebuilding, shortened by one bay. The tower is very different from what it was before the late Dean Merewether directed its repair. There had been great alarm at the condition of the tower, which it was feared would share the fate of the western tower. On examination, it was found that the ugly piers which had been put up in order to support the tower had settled away, and instead of supporting it, they with difficulty supported themselves, and they were removed. The skill with which the late Mr. Cottingham put in piers to carry the tower ought not to be forgotten.

In speaking of the lady chapel, Mr. Hills referred at some length to Bishop Cantilupe and his shrine, which formerly stood there instead of in the north transept, where it now stands. He explained that this shrine had been moved four

or five times. When the party reached the north transept, Mr. Hills said that that part of the cathedral was called after the name of Bishop Cantilupe. He thought that this was unfortunate. It was a belief shared in even by some eminent antiquaries that this transept was erected as a memorial of him. But this, he believed, was an error, as there were evidences that the transept was completed before Bishop Cantilupe's time, and in the time of Henry III., most probably by Bishop Aquablanca, whose tomb was partly in it. After speaking upon this question at some length, Mr. Hills again referred to the shrine of St. Cantilupe, which now stands in this transept. There are a number of armed figures about it, and he said he should like to hear what others had to say about the shrine. It had always been called the shrine of St. Cantilupe, but it seemed strange that armed figures should be put to ornament the shrine of a bishop. It was said that St. Cantilupe was provincial master of the Temple, and that this accounted for the armed figures, but he had never heard of a bishop holding that office.

To make these points clearer, we append, through the kindness of Mr. Murray,* a view of part of the beautiful north transept, a view of the remains of the shrine, and one in the nave. The latter shows Robert de Losing's work (1079 to 1095) and Wyatt's ugly clearstory and roof, poorly painted in Cottesham's time. We are disposed to agree in the opinion that the north transept is rather earlier than Cantilupe's time, who, by the way, held the see only seven years.

The Monuments

were described by the Rev. Charles Bontell, in a remarkably fluent address, treating first of monuments in general, and then of these in particular. The monuments in Hereford Cathedral were noticeable for variety and number, and also for certain peculiarities. They comprised—1. Sculptured effigies, with and without altar tombs and canopies. 2. Engraved brasses. 3. Incised slabs, and slabs sculptured in low relief. The first class included ecclesiastical effigies, of which the finest was that of Bishop Aquablanca, who died in 1269. This effigy retained much of its original colour, and was surrounded by an architectural canopy of unsurpassed beauty. Other episcopal effigies, some much injured, brought down the series till after the Reformation, including eleven effigies all executed at the same time—about 1320—to commemorate the early prelates of the see. They spoke for themselves. It was one of the attributes of the Medieval period that wherever the chisel worked they could ascertain the time of the work being executed within five years—he might almost say within one year. He should be glad when we arrived in our own day at a style of our own and a treatment of our own. Of monumental brasses there were more remaining in Hereford than in any other cathedral. It was observable that from the larger churches the brasses had almost disappeared by the ravages of iconoclasts, or from other causes. Some tons of brasses had been removed, and since the restoration of the cathedral he could detect that some removals had taken place. He dwelt with force on the importance of conservative restoration being observed in the maintenance of our ancient buildings, and not restoration by demolition, and this not only in architecture, but in monuments. Happily in Hereford Cathedral the old effigies had not been cut down and made into new ones, as at Exeter, but they retained their old characteristics. Besides the ecclesiastical effigies there were others of a different character, but not so numerous. There was a fine alabaster effigy of Sir Richard de Pembridge, a knight founder of the Garter—the earliest with the Garter—who died in 1375. There were also numerous slabs, of which two were inscribed, not with brass, but with alabaster. Last, but most important and interesting, was the remarkable monument or shrine of Bishop Thomas de Cantilupe, in the north transept. He died in Italy in 1282, and, according to the custom in those days, it was thought necessary, in order to duly honour him, that his remains should be buried in more than one place. It was customary to erect as splendid a monument in the place where one part of the body rested as at the place where the other part was buried. It had four removals, and there was a fifth during the recent restoration at the cathedral. That was superintended by Mr. Scott him-

self, and had brought to light a remarkable circumstance,—viz., that the slab on which the monument rested was a highly ornamented slab, covered with a perfect cross. On that was built the lower story of the structure, corresponding with what they usually called the altar tomb. Then on the slab which covered the first story of the structure were traces of its having been inlaid with brass, showing enough of a mitre to be recognised. Further, it appeared from the marks on it that it might have been applied to cover the remains of another person. Above that slab was a beautiful arcade of arches supporting the uppermost slab, which still retained iron stanchions, showing that there must have been originally another structure above it. As far as he could learn, tradition had always identified this as the shrine of St. Cantilupe. The objection to that supposition arose from the fact of there being armed figures round it, but he did not see that that was any objection at all. He believed that similar armed figures were to be found on other monuments to bishops. Then the designs were certainly French, and not English, and generally their monumental tombs had designs of armed figures. It was said that the Bishop Cantilupe was "Provincial Grand Master of Templars." He had no authority for such an assertion. He did not know whether this bishop was one of those sainted warriors of whom they read, but he was rather inclined to think that he was not.

We would add that the figures seem to us to have reference to the Watching at the Sepulchre.

Amongst the subjects in the cathedral that led to discussion was the wide wooden chair preserved there, for which considerable age is claimed. Parts of it are unquestionably ancient, probably of the thirteenth century, but it has obviously been made up again in the seventeenth or eighteenth century: portions being made in bad imitation of the original. It is, nevertheless, a prizeable thing. The use of the doorway through the east buttress of the north porch was another matter for discussion. Mr. Hills lessened the difficulty by showing that there was an ancient chantry chapel close to this porch, and he thought the doorway might have been formed to give admission to it. This porch is ascribed to Bishop Hugh, his name and the date, A.D. 1519 are carved on the doorhead, but his work must have been confined to the outer part; the inner porch is obviously not later than quite the beginning of the fourteenth century. The date is in Arabic numerals, and is a very early example of their use in stone.

The well-known metal chancel screen, designed by Mr. G. G. Scott, and executed by Mr. Skidmore, is nothing short of magnificent; but we cannot avoid a strong conviction that it is overdone, and damages the sober beauty of the eastern end of the building. *Per se*, it is admirable, but it seems to us, though we say it with reserve, a little out of place.

But we must keep amongst the old things. A visit was paid to

Magna (Kenchester),

and to the ancient earthworks at *Credenhill*, Mr. Thomas Wright, M.A., Mr. W. H. Black, the Rev. Prebendary Scarth, and others, expounding. The latter gentleman, referring to excavations that had been usefully made on the site of other Roman stations, referred to those lately carried out at Maryport, which had led to the discovery of a number of Roman altars; from which further fact also he deduced the possibility of the existence of valuable relics beneath the soil at Magna, and the desirability of having, if possible, something in the shape of excavations made. We were apt to think, he said, that things had been wholly destroyed, but it was not so. We ought not to say that everything had been done that could be done; and he thought the finding of those altars at Maryport should encourage them to go on and investigate for themselves. Referring to the inscriptions which had been found in the course of the excavations at some of the places named, the speaker instanced that, among others, were some having reference to the *voluntarii*. Thus, when we in this nineteenth century were raising our volunteers, we learned that the Romans had done precisely the same thing. The altars, too, seemed to have risen up to say, "You are no wiser than your forefathers," and so it was. We thought we had originated something, when lo! we unearthed evidence of its prevalence ages ago. They were, as yet, looking upon an unexplored site; his hope was that its exploration might be under-

taken, and that the explorers would be rewarded for their pains.

Mr. E. Roberts, in reiterating this hope, mentioned that at St. Alban's last year excavations were, by a slight expenditure, made, which resulted in the obtaining of a perfect plan of the streets of the city. The outlay for this valuable discovery was, he believed, under 20*l.*; and if trenches were made wide apart in the same way here he had no doubt that an equally good plan might be obtained of Magna. It was exceedingly likely that the walls lay at a depth of not more than 2 ft. or 3 ft. from the surface. He hoped that the advent of the British Archaeological Association might be the immediate precursor of such a farther search as should enable them to make discoveries which should be interesting not only to local antiquaries and to residents in the neighbourhood, but to antiquaries and lovers in archaeology in general.

This visit led to the exposition by Mr. Black, at the evening meeting, of a remarkable theory concerning

Ancient Boundaries and Roman Land Surveyors.

By this theory, Mr. Black traced the position of all Roman towns and remarkable points throughout the whole of the ancient world to certain laws of measurement observed by the ancients. There were, he said, certain officers called *agromensores*—literally measurers of fields—who constituted a college among the Romans, and were a body politic acting as magistrates. To them was deputed the fixing and determining questions of boundary. His theory was, that these *agromensores* drew imaginary lines directly from certain fixed points marked by artificial or natural mounds to certain other fixed points, and that by means of these lines the boundaries of kingdoms, of estates, of fields, and so on, were determined. These lines extended through the whole of Europe, and through the whole of the old world. The ancients, he maintained, had a perfect knowledge of longitude through these means; that before the determination of longitude by the difference of time, all maps were more or less wrong in longitude; that the ancients made no mistakes of this kind; and that their method was to cover the face of the earth with monuments having relation to each other. That art had been lost; but Mr. Black claimed to have recovered it. They must, he added, no longer talk about Druidical remains, nor ascribe to fairies and "the foul fiend" the existence of mounds and stones which were due to other causes. There were, he said, millions of observations marked in the ancient world. He had himself examined the surveys which had been made in 1831, 1834, and 1837 for the Municipal and Parliamentary Boundary Commissioners, and he could state they showed proofs to this day of the amazing accuracy of the ancients. Referring to the boundaries of parishes, manors, &c., he submitted that the traditions which existed as to those boundaries were a proof of the continuity of race, otherwise those boundaries would not have been kept up as they were in the time of the Romans. There had scarcely been any change except under some stupid Act of Parliament, or under some regulation made by people who did not know what they were doing. Where none of those things had occurred, the boundaries were just the same now as they were laid out by the Romans. Enlarging upon this subject, he referred to the boundaries of certain London parishes, and held that they were as clearly to be determined as any proposition in Euclid; and how, he asked, was that to be accounted for except by the theory of a continuity of race. Then he contrasted this state of things with that which exists on the Continent, where civil institutions have been abolished, and where—particularly in France—the old boundaries have been doled to give way to the new-fangled departments. As an instance in support of his argument, he mentioned the fact that a question had arisen as to the boundary of some land connected with Greenwich Hospital, in reference to which he had ascertained that the verdict given by a jury was supported by ancient tradition, and was in accord with his own measurements by the Roman system. Under the Roman system, he maintained there never was a camp, or wall, or military line laid out except under the advice, direction, and authority of imperially-appointed and legally recognised men; and all this work had been done upon geometrical principles.

* From his very useful "Handbook of the Cathedrals of England. Western Division." See p. 746.

Why was it that there were such apparently strange boundaries of countries and parishes? They must look upon Credenhill as an earth-work, as a place where men of science and extreme skill took up their abode, and, as they saw the distant mountains, peaks, and points, not only of this, but the surrounding counties, from thence took their angles and made their observations. Mr. Black went on for some time to argue that all the works of the Romans are clearly demonstrable upon principles of geometry, principles which were known not only to the Greeks and Romans, but to the ancient races of India. The better we knew geometry, the better we should understand the works of those marvellous men of science, whose functions, duties, and proceedings had been involved in remote obscurity. In the course of his address, Mr. Black also touched upon the subject of barrows, his argument being that many of them must be regarded as boundary marks and places only of accidental sepulture.

The theory is so extraordinary and comprehensive that few will be willing to admit the correctness of it without very conclusive proofs; but as we happen to know that it is the result of many years' study, and the examination of many hundreds of places, neither should it be hastily put on one side. A volume on the subject which is being prepared for the Government will soon explain the matter further.

The first outing took place on Wednesday, and included Kilpeck Church, Abbey Dore, Rowlstone Church, and Grosmont Church and Castle.

Kilpeck Church

is one of a well-known group of Norman churches in this county remarkable for the peculiarity of their sculptured ornament. It was described by Mr. Thomas Blashill, and, as many of his observations refer to the group generally, we give them nearly in full. He said that about the year 1134 the benefice was given by Hugh, the son of William Fitz Norman, lord of Kilpeck Castle, to the Abbey of St. Peter, at Gloucester, and it has been assumed that the church which we see here was then already built. However this may be, it clearly belongs to that great church-building period, the first half of the twelfth century. The sculptures have been the subject of much ingenious speculation, to which I need not further refer, as their origin is pretty clearly written on the face of the building itself, and to that I shall have to invite your attention. It is impossible, however, to speak of Kilpeck without some reference to the old church of Shobdon, in this county, in which everything that is peculiar here was much more strongly developed. Shobdon was built about 1141—that is, nine years after the date given for Kilpeck; and they were clearly executed under the same influence, if not by the same hand. Oliver de Merlemond, who built and endowed Shobdon, is said to have made a pilgrimage, while it was building, to the then famous shrine of St. James, at Compostella, in Spain, and as his journey would lie through the best districts of France, it has been conjectured that this may have influenced the design of the building. It is certain, however, that it could only have influenced those parts of the general design which are in accordance with ordinary twelfth-century architecture, and not the peculiarities which I shall have to point out. Observe, first, that the plan and general arrangement of this fabric, and the position of doors, windows, and other leading details, are of a type which was quite common in the twelfth century. I exhibit for comparison sketches of buildings so far apart as East Ham, in the Essex marshes, and Dalmeny, in Linlithgowshire, together with that of Moccas, in this county. The flat pilasters on the walls,—which are first attempts at buttresses,—and the corbel table which runs round the building, are features common not only to the three kingdoms, but to the whole of Western Europe at the same period. To go one step further. The general design of the columns, in which human figures, monsters, and birds are mixed up with foliage and knot-work, was common all over Europe in the twelfth century. I exhibit sketches from the Cathedral of Chartres, of about 1135, and a very remarkable column at the Church of St. James, at Compostella, executed in 1116, five-and-twenty years before the pilgrimage of Oliver de Merlemond. There was, therefore, nothing in the idea that might not have been gathered from that or scores of other churches then erected. But when we turn to the sculptured ornament we find a very curious phenomenon. For while the twelfth-century sculptors generally in Eng-

land adopted eagerly that mixture of Romanesque and Byzantine ornament which was introduced from Normandy, developing it in a fashion of their own, the man who did this work evidently set himself to adapt the ancient style which was then dying out in these islands of the West. And although we see frequent instances in which that style peeps out in the Late Norman work, yet this was the only part of the country in which any determined effort was made to work in that old manner which was doomed to disappear before the great artistic revival then taking place in Western Europe. Both Kilpeck and Shobdon lie outside the ancient boundary of England as defined by Offa's dyke. They were anciently in the diocese of Llandaff, and thus would be much under the influence of the old Welsh and Irish traditions. Now there had flourished in Ireland for several centuries a style of ornament applied to works of a religious character, and distinguished by the great use of fabulous monsters, mixed up with lines or stems curiously reticulated and intertwined. We see many small remains of it in the sculptured crosses of Ireland, Wales, the Isle of Man, and the North and West of England. But it became somewhat plentifully spread over Europe in the splendid manuscripts in the production of which Ireland then excelled all the world. That style of ornament, which was then dying out, was seized by the carvers of Kilpeck and Shobdon, and applied to the purposes of decoration of those otherwise Norman buildings. In the south doorway the general designs are consistent with ordinary English work of the twelfth century. We have the Norman zig-zag and star-shape sinkings. The curious little spur on the base is exactly like one which is used at St. Peter's Church, Northampton. The outer ornament of the arch is what we call the medallion ornament, joined by grotesque masks, as used in the font at Stottesdon, in Shropshire. Some of the medallions contain birds just like those of the twelfth century font at Winchester Cathedral. The tympan is filled with a carving representing the vine. The rim of heads and grotesque figures which surrounds it is consistent with that common decoration called the cat's head ornament, though most of the figures used in it are quite of Byzantine and even Celtic character. The work here generally is done as if by a man who had never been accustomed to carving in stone, but had studied the old Irish manuscripts, bestiaries, or old books of nature, history, or perhaps the carvings in ivory and works in metal which were then spread over all Europe from Constantinople. Then there are one or two signs of the zodiac, and monstrous animals or heads. The figures on the columns are said to be in Anglo-Saxon costume. An ordinary carver would have put them in Norman armour, or in the more graceful shape then being used at Chartres Cathedral. On the corbel table round the building we find such subjects as the lamb, the zodiacal signs, birds of Celtic knot-work, and close to the grotesque heads at the western end is a piece of Byzantine ornament exactly similar to some which exists at Shobdon, and also in the south doorway of Rowlstone. The grotesque heads projecting at the west end are probably the only similar instances in Britain. They appear to be reminiscences of a kind of timber building where the wall-plates were continued beyond the walls and carved into various shapes. However that may be, the prevalence of such grotesque forms is highly characteristic of the Celtic school of ornament. There were, indeed, afterwards adapted and largely introduced in all the succeeding periods of Gothic art, the belief in dragons being quite common down even to the seventeenth century. The learned classified them in species as confidently as a zoologist would now classify a particular genus of animals. The ornament in the west window is almost purely Celtic, and may be compared with that in the Irish crosses and carved stones. The columns at the sides are of the same size as the roll which is above them. This is quite an Irish feature, and betrays a want of knowledge of the relation which a column with its capital bears to the arch which it carries. A Norman architect would have made the column smaller and the arch more square in section with a small roll moulding or zigzag ornament on the edge. The bell cot is modern, and there is no record of the original termination of the western gable. In the interior of the church we have a very fine chancel arch of Norman character, but having figures carved in the place of the side columns. These carry various attributes, as the key for St. Peter, &c. The apse is vaulted with ribs ornamented

with the zigzag, and with a boss composed of grotesque heads, very similar altogether to the work at Elkstone, in Gloucestershire, which we visited at our Cirencester meeting in 1868. The pilasters are a curious modification of ordinary twelfth-century work. I know of nothing exactly like them. The font is one of those large ones of which there are several remaining in this county, as at Bredwardine. I have said that the sculpture here looks like the work of a man but ill accustomed to carving in stone, and ill acquainted with the new style then practised in the rest of Europe. But the work at Shobdon is excellent in all respects, and the design was evidently due to one skilled in the newest development of the Norman style. This, to my mind, shows that their peculiarities are not due to their greater age than other churches of similar plans and arrangements, but to a deliberate intention on the part of the designer to try the effect of the old kind of ornament instead of adopting the new.

Mr. Blashill, who is a rapid and accurate sketcher, made his paper here and at Rowlstone Church, which he afterwards described, particularly interesting by exhibiting a number of drawings of similar buildings and parts elsewhere.

Mr. Black contended that Kilpeck Church was earlier than the date named. The "Book of Llandaff" stated that it was consecrated about the year 1100. He also maintained that it ought not to be ascribed to the Normans, but to the British. This led to an interesting discussion, of which we would gladly give particulars if space served.

Abbeystora,

a most charming example of Early English emerging from Norman, was described with considerable fulness by Mr. Gordon Hills. A very interesting matter turned up here in the shape of a miniature slab bearing the incised figure of a man, and a small inscription on each side. The figure is that of a bishop, and the stone itself is about 15 in. long by 9½ in. at the top, tapering to 9 in. at the foot of the figure. The inscription is much defaced towards its commencement on both sides, the first word being entirely defaced. As it stands it reads thus:—

A : PONTIFICIS : COI

XPSTE : JOIA

After some little pains the original was thus restored:—

SERVA : PONTIFICIS : COR :

SANCTVM : XPSTE : JOHANNES,

or, "O Christ, preserve the holy heart of Pontiff John."

We need scarcely speak of the value of this stone, and the pleasure the successful reading of the inscription gave, serving as it does to confirm the opinion often expressed in these pages as to the connexion between miniature effigies and heart-burial in other places. The stone, at present loose, should be affixed to a wall, and carefully preserved.

In the north transept was also pointed out a sepulchral stone in the floor, purporting to mark the last resting-place of "Elizabeth, daughter of Thomas Semis, who died at the age of 141." On careful examination, it was found, as might have been expected, that the figure 1 before 41 had been introduced afterwards.

At Grosmont Church, Mr. Seddon, who is conducting a partial restoration there, joined the party, as did the Earl of Mar. The Rev. Mr. Twynning, the rector, and Mrs. Twynning, had kindly provided unexpected refreshment, but "Time and the hour" permitted only very partial enjoyment of it.

On Thursday the members went to Leominster Church, where, we understand, they found in the great west door and window over it carvings evidently by the same hand (if there be any dependence to be placed in manner) and of the same pattern as those on the doorway at Rowlstone; like also to those parts of the Kilpeck carvings which are most English in appearance. Now, this west doorway has a pointed arch externally, with round arch internally, and round arches in the rest of the work, thus strengthening the opinion of those who date Kilpeck late in the Norman period. Monkland, Stretford, Dilwyn, and other churches were also visited and described, Sir Henry Baker, bart., and the Rev. Dr. Heather assisting.

Thursday was devoted to one single object,—

Lanthony.

The distance and difficulty of the journey, as well as the interest attaching to the Priory, pre-

cluding any enlargement of the programme for that day. A number of the excursionists gathered for this journey, and nearly seventy met at the Priory. The showers which fell occasionally were not sufficient to deter any from going who had put down their names, and the occurrence of a fall just when luncheon was over caused an improvement of the occasion, Mr. E. Roberts giving an amusing account of his pedestrian journey over the mountains the previous evening, and Mr. Gordon Hills a succinct history of the several monastic orders.

The description of the Priory was undertaken by Mr. Roberts, and he commenced by comparing its foundation with that of Finchale, near Durham, from his own paper on it, from which he read extracts to show that it would apply word for word to Lanthony. Both were originated by hermits who wore only mail and sackcloth; both churches were dedicated to St. John the Baptist and the Virgin Mary; both were out of the ordinary tracks, and very difficult of access. The churches and monastic buildings also were nearly identical in plan, the varying slopes of the sites causing slight variations. In one respect only was there doubt, namely, in the position of the prior's lodging; no foundations had been sought, but he ventured to predict that if they were they would be found in a place similar to that at Finchale, where no one had suggested it, namely, to the east of the chapter-house. Having referred briefly to the hermitage of "William," one of Hugh de Lacy's retainers, in 1103, and to the subsequent accession of Ernesin, he stated that every writer whose works he had seen had followed the same statement, taken from a history by a monk (translated by Atkins in the "History of Gloucester") and Giraldus Cambrensis (who wrote his "Itinerary" in 1188), namely, that this priory was finished in 1116, prior to the removal of *Lanthonia secunda*, near Gloucester, in 1136, which took place in consequence of the extreme disquiet that the monastery suffered by reason of the marauding inhabitants of the district, and the consequent warfare, insults, and plunderings. Giraldus gives sufficiently distinct descriptions to induce us to think that the church and buildings were really completed. It seemed as if none who had described these recently had the slightest idea of discrediting Giraldus; but, inasmuch as not one single stone of any part was cut before 1190, he had to come to the conclusion either that Giraldus must have written his *Itinerary* much later than is supposed, or that there were previous buildings which had made way for those now existing.

The whole of the church, and the greater part of the other buildings, are of one period, the chapter-house and two buildings adjoining alone being twenty years later. Mr. Roberts said that he, of course, expected to see a purely Norman monastery, which would be extremely interesting, but what was his astonishment to find it purely Early English in every part, with just so much of the Norman feeling about the earlier portions as to impart a tone of simplicity and severity.

So far as his researches went, the novelties he had to name were a discovery of a prior, John Adams, who had not been given in the list; a north chapel to the choir, corresponding with that on the south side, generally called the Lady Chapel; the more certain nomenclature of the various portions which had erroneously been appropriated, namely, a treasury or sacristy next the south transept; the day-room next the chapter-house; and the refectory on the south of the cloister. The present inn is not the site of the prior's lodging, but was the dormitory with storage beneath; a considerable part of this cellage remains, and indicates a period certainly more than half a century after the supposed completion of the monastery. The dormitories on the east of the cloister did not extend over the chapter-house and sacristy, but ended with the day-room, next to which was the stair. There was no stair from this dormitory into the church. The cloister was of wood. The gateway and hospitium were at a distance westward, with the entrance from the south. It was in the space between this and the church that the rabble, mentioned by the monk of Lanthony, broke in while pursuing a neighbour: thus his description decides the site of the hospitium.

Mr. Roberts had found that there were two benefactors of the same name, one being a nephew of the other, and who died in 1185, fifty years after the first; and he suggested that a mistake had been always made by previous

writers in their identity; the second, by his benefactions having provided the means to build the monastery. The first Hugh de Lacy had founded the original monastery, of which the adjoining church probably was part. This had been called a parish church, but there is no parish of Lanthony, the monastery being in Cwmnyo parish. The church which remains is certainly earlier than the monastic church, but is still not early enough for the date of 1115; it is in the monastic enclosure, and is, very curiously, within 8 ft. of a building southward, which must have been either an infirmary or workshops. The mill-race remains, lower down, and a modern mill on the site of the old one.

A substantial luncheon, sent from the Scudamore Arms, was served in the dormitory, part of the modern inn, and the company returned by the coaches up the beautiful valley surrounded by the Black Mountains to Llanvihangel, and thence by rail to Hereford, thoroughly pleased with the day's excursion.

The President's Breakfast, at his residence, Harewood House, on Saturday, was numerously attended, and the reception by himself and Mrs. Hoskyns as kind and genial as could be wished.

We have omitted mention of the evening at the Palace, where the Bishop and Mrs. Atlay entertained the Association, and must make an opportunity to return to it, and to refer to some of the papers which were read then and at other of the evening meetings not yet mentioned.

HANDRAILING.

SCIENCE AND WORKMANSHIP.*

THE subject of the following notice suggests a variety of matters for important discussion, in the interest of architecture, the architect, the builder, and the artisan. As most of these matters are germane, and highly illustrative of the character, customs, and practice of our workmen, in the past as well as the present, we will, as the time is not inopportune, touch upon some of them. In the history of modern building, in its various branches, the progress of constructive carpentry and joinery calls for particular consideration. The workman's position and his work, and the methods by which he has been in the habit of performing it, are an interesting and instructive study. Its examination during our own time, and in our country, exhibits a phase of society and an existence of ways and means which one would have thought to be scarcely compatible with the pursuit of architecture, and the high and acknowledged status of its professors. But the explanation is at hand, the absence and want of facilities for the education of the workman in years past, have been fatal to him, not only as a mere member of society, but as a skilful workman. The architect might possess all the education and enlightenment the practice of his profession required; but that, after all, was of but small moment for the artificer. Where the schoolmaster's work was left undone, the future mechanic had nothing to hope or build upon but self-culture and experience. If the proper stamina were in him, he partially, or perhaps in rare instances wholly, succeeded in conquering immense difficulties. By constant application in the practice of his calling, he technically educated himself, assisted by the experience of older hands, and by a study of the best methods that came under his knowledge. The young workman of the past strove to better his fortune and improve his skill by travel, and in his honest quest visited other places in the kingdom, for the double purpose of improvement and employment. By these means many of our workmen of the past became skilled, and more capable of undertaking and accomplishing work, and of drawing upon their own resources when a difficult job presented itself. These experiments furnished them with examples to apply in new or similar situations, and if they were not always correct in execution, they were at all events in possession of the most practical method in use, or known at the time among their fellow-workmen. Thus stood matters, more or less, within man's memory, in the building profession. The few who were partially educated were the better workmen, if personal vices did not interfere; and the unlettered were inferior, save where their large experience and a happy natural talent and quickness of perception stood them in stead. Good, solid, well-framed, and well-

finished work is to be found in many of our old mansions and noblemen's dwellings: elaborate and excellent in design, and with a good facial finish. In our old churches the open-timbered roofs are miracles of construction in design and masterly workmanship, and in many of our old city residences and country seats, there are windows and door finishings, stairs and wainscotings, worthy of every admiration and praise viewed in the light of the past. In one branch of the building trade, however, our praise must be qualified. The timber staircase and its adjuncts was always, even under the best circumstances, a heavy, overloaded, and badly-constructed piece of workmanship. Faulty plans were compensated for by massiveness in size, elaborate detail, and superfluity of ornament. As years grew and modes of living changed, economy of time, space, and expense became matters of vital interest in construction; hence practical methods, as well as ready ones, became a necessity with builders and workmen alike. Here, then, we have the uprise of modern modes and methods which have worked so many and vast changes in the art of building. The construction of staircases as now built compared with what they were fifty years since, is as dissimilar as can well be imagined. That part of the branch called hand-railling is entirely and almost completely revolutionised. A succession of novel posts is superseded at their points by the continued handrail, and what was once abrupt, heavy, and cumbersome to the sight and feeling, is now easy and flowing. This change has not been effected without considerable delay, disappointment, and failure in the progress of the science. The workman has suffered, as well as the builder, and the client or owner has, to his sore grief, been left at times a legacy of maimed construction, which was an eyesore to him through life, and which he had good reason to remember to his dying day. Towards the close of the last century improvement in the modern method of planing, constructing, and putting up staircases, and arranging the handrails on a more scientific system, began to show itself. In the works on carpentry by Pain and Price, there was little or no improvement in staircases or handrails advanced. In the publication of the late Mr. Peter Nicholson, the first edition of which appeared at the end of the last century, the first practical attempts were put forward, and the then existing forms of staircases and handrails were laid down with accuracy; and methods with plans were given for their more correct working. The subsequent and several editions of Nicholson's works, since edited and improved by himself and others, have further advanced the subject, and placed the science on a more practical and certain footing for the manipulation of our workmen. To the ordinary class of mechanics, with which our workshops were filled some forty years ago or less, the methods laid down by Nicholson, though scientifically right in most ways, were at the same time complex and bewildering from the number of "lines" introduced. Geometry was applied to construction correctly, but hand-railling instead of being simplified for the service of the workman, became to him a bugbear to be afraid of, and to be avoided. Consequently the progress of the science among our artisans was slow, and the quick and initiated reaped the harvest, and grew intolerant in their assumptions and demands.

We might relate many amusing traits of character connected with the career of staircase hands; traits, indeed, absurdly amusing, as well as reprehensible. The proficient staircase workman some years ago were as intolerant in our buildings as were the poor hand-sawyers before steam-power was applied to cutting timber. To be possessed of the knowledge of "laying down the lines" for the stairs, particularly the handrail, was considered the very acme of skillful joinery; and the workman who prided himself in the knowledge was the pet of the workshop. It was generally taken for granted, that no matter what way the ranks were thinned, the staircase-man was sure to be the last that was discharged.

Such a state of things as this, where there existed a paucity of skilled labour, even in one single branch of building, was sure to beget evils,—and evils, and lasting ones, it did beget for a time. We have known the little-mindedness of men in this part of the trade to be such that they would not work beside the "vulgar herd" of their fellow workmen. They would be provided by the foreman or

* The New Elements of Hand-railling. By R. L. Riddell. Philadelphia: Claxton, Remsen, & Hafflinger. London: Trubner & Co., Paternoster row.

employer with a bench for their own exclusive use. We have known some of these exclusive fellows descend to some very low tricks. Sooner than let a fellow workman benefit who might be working near them, they would draw a number of useless intersections of lines across the drawing-boards, and sometimes across their moulds, so that in their absence no one of their brother workmen could make head or tail of the drawing. The staircase-hand of the old school had many privileges and exacted much, but his place has passed away. The science is not confined to a few, and, with the aid of early primary and technical education, in a few years this branch of the building craft will be thoroughly understood and practised.

If plans of staircases were properly studied and laid down, we should not have such a number of ill-formed abortions. The hand-railing of a stair is more or less a failure when the plan is bad, but, even over a bad plan, a graceful and well-finished handrail may be made to range, presupposing the handrail workman knows his business. Sufficient attention is not given, even by some architects who ought to know better, to the placing and planning of the stairs. As for builders who design and build for themselves, or clients who employ and direct builders in what they require done,—under these circumstances the stair has fallen into bad hands or stands in terrible danger. It is even thought by some of these people, that any space (and some times even place) in the building will do to put the stairs in. People are in the habit of talking as loosely and as cavalierly of the matter as if the stairs could be stowed away as easily as the broom or some other similar household article, "out of the way." It is little wonder, indeed, that many of the stairs in our dwellings are such wretched and creaking affairs. Squeezed into small places, two flights are often found where there is scarcely room for one; and it would be a libel upon the name to call either the handrail or well-hole what they are supposed to be, but are not. The stairs should not be accommodated to the building, but the building should be accommodated to the stairs; in other words, a proper plan, where height, breadth, easy approach, easy ascent, and a proper provision for light, should be primarily considered. Given sufficient room and sufficient light, nothing short of a perfect staircase ought to be the result; and this is no longer only possible, but positively certain, in the hands of skilful workmen.

We now come to the workman, his work, and the workmanlike manner of accomplishment. The publication under notice is entitled, "The New Elements of Handrailing," and it furnishes plans and methods designed to meet various situations. The work is an American one, and is entitled to a careful consideration at our hands,—the interest of the workman and the employer, comprising the general interest everywhere. We have spoken of it before, but this is a new edition.

The author submits that he has, in handrailing, to use his own words, "carried the system of practice to a more comprehensive, yet condensed point, than others have yet obtained."

The great object of the writer, as we learn from himself, is to introduce shorter and simpler methods of working, to save time and material, and to place the applications of the science in the power of every workman. Let us say honestly, that Mr. Riddell is partly successful. He has improved upon the works of Nicholson and his followers in this country; but we must dispute some of his claims, nevertheless. The work contains forty plates, comprising plans, the method of getting out and applying the moulds in every case. Amongst the number are treated are circular, elliptical, and platform stairs; stairs with quarter circles and winders; straight stairs, with cylinders at landings; stairs with three or several winders; and the method of laying down the moulds for each, and of forming their different wreaths, ramps, side-wreaths, and joints. The first three plates comprise nearly the whole of the elementary lessons, afterwards elaborated upon by the author in detail.

The author gives clear and concise instructions, and particularly in connexion with the first plates, his illustrations are homely, as well as correct, and cannot fail to be understood with a little attention on the part of the young workman.

The first lessons in hand-railing are practically demonstrated in cutting a cylinder obliquely to section, as every carpenter or joiner or

mason knows, is an oval or ellipse. As every point of the rail must stand over its plan, to be correct, the importance of a proper idea and understanding of the ordinates and tangents belonging cannot be overvalued. Staircase hands were formerly in the habit of doing what is called "springing the plank," throwing its edges up or down in getting out the twist or wreaths. This was quite unnecessary; and, as our author remarks, and all practical staircase hands must agree with him, "no matter what pitch or inclination a wreath may have, its minor axis, wherever situated, remains level." The ordinate alone changes both axes in their position on the surface of the plank. The edge of the plank, in every given pitch or rake, should give a perfect plumb line; and this it will do, when the minor axis is a dead level. These are essentials in hand-railing.

In the treatise under notice some capital instructions are given in different forms of stairs on fixing the position of risers. In platform stairs it has often been noticed, when the cylinder was a large one, that the rail and the string have an ugly and crippled look. This is not so noticeable in stairs with a small cylinder. The position of the riser being placed upon the spring line causing these defects, a better mode is shown by our author for fixing the position of the riser at the cylinder and getting-out moulds, for working the wreath of the hand-rail for the same. Similar methods are shown farther on in the work for meeting similar defects in string and hand-rail, in stairs where there are winders, and the cylinder is small.

Before proceeding further, we must take issue with the author on the subject of Kerfing. He claims to be the first who introduced the system, and he descants rather glowingly on its advantages and merits. Kerfing, as applied to the bending of the strings of circular or elliptical stairs, both inside and outside, is nowise a new invention or introduction. The system of kerfing has been long practised, with more or less success, in Great Britain. The author points out its advantages for other forms of work, such as the bending of mouldings, soffits, framings, &c., but we must remind him that to each of these things it has been long applied. To the circular heads of door frames and sash frames and other curvilinear work in carpentry and joinery, the method of kerfing, for bending to required forms, is no new practice, but a rather old one. We agree with the author that it may be successfully applied in many descriptions of work, where time and economy of material is a consideration. Much time and labour are without doubt spent, or were spent formerly, in building up forms, cylinders, cradles, and drums, for bending and testing purposes. The time expended was not, however, wholly spent in vain. The system produced mostly solid and regular work. In many descriptions of curvilinear joinery it is still indispensable to use forms and cylinders, and we do not see as yet how it can be wholly avoided, no matter what amount of time it may take. The practised workman must use his own judgment, and will need the concurrence of his employer very often in adapting new methods to the execution of difficult or hurried jobs in hand. The system of kerfing is not an American invention, but a British practice, and the idea had not its growth in the head of our author; it was practised years before he was born; he, however, improves upon it. In common class, and painted work, it will serve its ends for the strings of stairs, without any other finish than from the saw and plane; but where neatness of finish is required in hard wood, and even in deal or pine, a veneer is necessary.

Passing from the subject of kerfing to the subject of forming the moulds for the wreaths of the handrail, and their application, we must commend the instruction given, and award praise where praise is due. If the learner or workman proceed according to the practical methods laid down by Mr. Riddell in his book, proper stairs and handrails, ranging accurately over their plans, will be the result. This is a desideratum; for one-half or more of the handrails put up at present are in winding, or do not range, and no amount of dragging, or bracing, or contriving will cure the evil when they are wrongly constructed. The construction of the scroll and curtain step is passed over in this work, the author merely remarking that it was formerly the custom to have them, but that now they are superseded by the adoption of panelled octagon ornamented newels, with a side curve. This is not exactly the case. Though the newel

system, plain-turned and octagon-panelled, is in use, the scroll and the curtain step system is still extensively practised. Some give it the preference. We consider, where the economy of a few inches of space is no consideration, that the scroll and curtain step gives a graceful and artistic finish. Before the scroll and curtain are superseded, it will be some time, we think. Both are capable of much improvement. The string, instead of sinking abruptly to rest behind the first riser, should get a curvilinear sweep beyond it, forming a falling and diminishing curtain independent of the first step, the scroll following the same example. Thus the curtain could be made a more graceful copy of the scroll above it.

Mr. Riddell is certainly an innovator, and his methods of demonstration are as fixed and unalterable as the rules of the science he inculcates. He does not trouble his readers or workmen about a series of face, or outside and inside falling moulds. He lays down his plans and elevations, draws his ordinates and tangents, marks their place on his mould, applies it to the plank, squares and works off from centres the surplus stuff. Thus are his wreaths and curves formed, and his system of handrailing made easy. There is no need in these days of advanced and practical methods to grope the way in handrailing. If workmen are but intelligent, and have the advantages of a little education, most of them, with such instruction as Mr. Riddell's book affords, may master the situation, and become good staircase and general hands. They must, however, lay their minds down intently in their work, for skill will not come without hard toil, and a love for their trade. In these days of technical instruction, and the many facilities for its acquirement, the future artisan stands a good chance for worldly advancement. On parents and on the State devolves a duty, and we trust, for the interest of society at large, that this duty will be kindly but rigidly performed. If so, a time may arrive when bad workmen will form the minority, and not the majority, and when a shame will attach to bad workmanship, instead of being winked at and passed over.

Before leaving the subject of our notice, we may mention two or three matters more connected with the practice of staircase and handrailing, evidencing, as it does, much change in the progress of constructive carpentry and joinery. Stairs were formerly built step by step upon their carriage-pieces, the workman applying his story-rod and level as each step or tread was put in its place. Now stairs are mostly put together in flights at the bench, brought to the building, and fixed. The handrails are also prepared at the bench, and a correct workman might even dispense with the practice of "horsing," and cut every division to its exact length, and make every joint perfect. This is not done, however. The workman's methods in handrailing were too uncertain heretofore for him to trust to himself in matters of nicety; therefore a surplus length was left upon the straight rail until the staircase was put up in the building. It was the practice formerly to cap handrails with mahogany, the under portion being deal or some other wood. The grain of the mahogany or oak was placed crosswise. This system is disappearing; handrails in all dwelling-houses or public buildings with any pretensions to respectability should be solid. The continued handrail is now, and has been for some years, the fashion. Of course there are a variety of forms of staircases. Some with closed and open strings, stairs of straight flights with cylinders, stairs winding round a newel the whole height of the building, circular, elliptical, dog-legged, and composite. Some of the oldest forms of these are still in use, and are adopted to suit various emergencies of taste, situation, or pocket. Stone stairs, which are common to large buildings or public offices in England, are common to most houses in Scotland. The system of flats in the latter country renders the staircase isolated, as it were, and the common property of a number of owners or tenants. Stone stairs with ornamental and traceried iron balusters, and a solid mahogany or oaken polished handrail, when well executed, are a pleasing piece of workmanship. Methods are given in Mr. Riddell's book which will meet almost every variety of handrail, whether intended in connexion with stone or iron. In the case of the construction of a side rail, projecting from a circular wall and resting on iron brackets, a very good method is given for making and fixing the handrail.

We shall now say a few words as to the "get up" of the book. The paper is good, the print-

ing is bold and clear, and, together with the plates, which are well engraved, the whole mechanical finish of this Transatlantic work is most creditable.

In the volume under notice, a serious omission or oversight on the part of the binder has occurred, which, we trust, is not repeated in other volumes of the work. Plates 11, 12, 13, and 14 have no letter-press description to accompany them, while plates 9, 10, 15, and 16 have their letter-press description repeated twice. The publishers should look to this, and see that no defective volumes are issued. A similar oversight is likely to have occurred in other volumes: one displacement often causes many. The introduction to Mr. Riddell's work is sensible, and his practical hints for young beginners are excellent and commendable. A portion of his preface might have been unwritten; but, as the book is an ambitious one, the author must be forgiven his minor faults.

In conclusion, we can cordially and safely recommend "The New Elements of Hand-railing" to the sober attention of the building mechanics of this country. To one and all it will be found most useful. It dispenses with useless lines, simplifies the method, places everything clear to the understanding, bases construction on unerring scientific principles, and thus it is a valuable medium and auxiliary in the technical education and moulding of the skilful and practical workman.

A PLACE CALLED NEWLYN.

It is in Cornwall, two miles from the heart of Penzance in a westerly direction, and on the same side of the beautiful bay as Penzance is. It is a town whose inhabitants are mostly engaged in fishing and in the employments connected with it. It is a town whose houses are perched and stuck about in a ragged, anyhow manner. You get into what you fancy the heart of the place, and walking on up a steep, shiftless, aimless sort of a street, out of Newlyn, as you fancy, you get more into it than ever. The heart of the place, as we innocently took it to be, is just one side of the place, the foot of the town, the place where the houses were the limit of the beach, and a dirty, sprawling stream, crossed by a low arch (Newlyn County Bridge), lounged along over mud, and dirty pebbles, and past garbage, and seaweed, and old boots, and bits of crockery, and fragments of glass, and logs of wood, and a heap of pebbles, and by the side of an old boat or two long past use, to the sea. (Note well, no one ought to go on the beach unless he can see where he is stepping.) Goodness knows where the heart of the town is. On going up the hill, houses are on all sides. Breaks between the cottages, paved with pebbles, lead from the street into small, open, paved courtlets, with an open kennel down through the centre, to which the paving is sloped. On one side of the courtlet would be the cottage or cottages, white outside as whitewash could make it or them; on the other side of the court, the stores for the nets, &c., called *cellars*; and at the end a blank wall, staring with whitewash. The paving is of small, smooth, brown pebbles, picturesquely relieved by the whitewash, and also by the thin, slow, bluish stream of sewage in the kennel. At last we found a high cliff, the boundary of the sea, and houses perched almost on the very verge, and we found another public-house, and another beach,—this time of sand, not pebbles,—and at last there was an end of the town. There are about 3,000 inhabitants. On the first blush we were disappointed in the estimate of the population, for there seemed no end to the place. Well, now, in this town of 3,000 inhabitants, how many *garde-robes*, public and private, do you think there are? You give it up. Then cutting the place in two, how many *garde-robes*, public and private, do you say there are in the moiety nearest Penzance, to serve the wants of 1,500 people? Should you say 200 or 300? Well, I have just inspected the place, and I could not find, or hear of one. 1,500 inhabitants of a town without a *W.-C.*, or anything approaching it! It is a fact, but I will make assurance doubly sure, I could not hear of one, but we will say there are six—6 for 1,500 people! The inhabitants empty their slops on the pebbly beach; in the months of a surface-drain at the foot of the hill, made to catch the surface-water coming down at least half a mile of road; and in the stream. Some of them have to carry their slops,—by which they mean their unli-

nary refuse and sewage matter,—about 100 yards, yet most of the houses are exemplarily clean; if it had not been for that, goodness only knows what would have become of Newlyn by this time!

Yet, as so much fever was continually in the place, and the streets, and the courtlets, and the beach, and the stream smelt so badly, and looked so filthy, the Board of Guardians thought something should be done; and, at last, the Highway Board thought something should be done (for Newlyn has no Local Board of Health, and its population is poor), and they went to work as only a Board of Guardians and a Highway Board can: they thought a sewer should be made, or, as they call it a *bolt*; they had heard, bless you, all about sewers, and knew as much about them as you, or I, or any other person. They knew they were splendid things for carrying off dirty water underground, unknown to anybody, though they may be walking and talking with each other over them: so they resolved upon making a *bolt*. It was a matter of secondary—pooh! of tertiary—importance, where the sewer was made, or how it was made, as long as it was made: a sewer was the thing, and therefore a sewer should be made, and they made it at the foot of the aforesaid hill. It was placed, where as it happened, it could drain perhaps ten cottages, and it emptied on the beach, and in six months after it was laid down, it was choked "bang up full," as my informant told me, "and my cellar is full of slush and mud. Good job I had got no fish there, as it would have spoiled them." There is no trap or *clack* at the debouch-pipe on the beach. But they made another sewer or bolt; or rather the Highway Board did that on its own hook. It cannot be less than 50 or 60 yards in length; it is not in connexion with a single house! but a month is at the land-end for reception of slops, and it is so elegantly contrived, that when once water gets in, it cannot by any possible means get out, for the mouth is lower than the debouch. These Boards had made these sewers, yet somehow Newlyn was still sickly, and still undrained, and dirty; they must do something, and so they did another clever thing: the surface-water drain that was made by the county to protect the county bridge (which I have said crosses the filthy stream) from the floods that came down this half-mile of hill, is used by the people in want of any proper accommodation, to hide their slops in. Of course a little of that made it dirty, and these clever authorities caused, through their Inspector of Nuisances, proceedings to be taken against the County Surveyor for allowing this surface drain to be a nuisance, and the justices of the peace, with their usual amount of sapience, sitting in solemn conclave at Penzance, told the County Surveyor he ought to know better (or what was tantamount to it), it was of no use—he must keep his drain clean; not a word to the inspector about the cause,—the want of privies, the want of sewers,—oh! no; the effect of the want was quite enough for them to deal with at one time. Now is not this a fine, well-grown instance of gross incompetency in the powers that be? It is very hard that England should be poisoned, her pretty sea-line defiled and made unhealthy, and her streams nauseating, simply because the men who have the power of making things pleasant and pure are thick-headed and uneducated.

Why cannot there be a guiding and directing central power for towns and highway boards? Why should the inspection of our towns be left almost entirely to the *Builder*?

What bad things the Truro people called "Pro!" yet most of his remarks have, we find, been attended to, and more work is in progress, though very slow progress, we must say.

Penzance is by no means a clean place, or a fragrant-smelling place; in all its surroundings it is but little, if at all, superior to Falmouth: yet Penzance shows an earnest wish to be clean and nice; Falmouth is profoundly indifferent or intensely antagonistic to any attention being paid to sanitary arrangements. The consequence is that Penzance is full of tourists; Falmouth is positively empty, and it deserves it. After "Pro's" articles appeared, now just twelve months ago, Falmouth promised to turn over a new leaf, and be good: she employed an engineer, received his plans, talked over them, and, I understand, adopted them, and yet not a stroke has been done towards the work, and when we were there last week, we were told what we were positive we should hear unless things were rectified, namely,

that fever was gaining ground in the place, and choleraic complaints were prevalent; so that which we feared twelve months ago has come to pass: the punishment stage has been reached, and Falmouth will now know how awful the punishment is for inattention to sanitary matters. Strangers will avoid Falmouth; but it is hard the shopkeepers there should be doomed to starve or work harder than they need, because the authorities will not make the place fit for visitors or for themselves to live in (and yet it is not too hard, for have they not themselves elected the authorities?), while at Penzance the shopkeepers can live and rejoice? But it serves Falmouth right, for the remedy must be obvious, even supposing its average intellect not a whit superior to that of a Highway Board.

If the directors of the Cornwall Railway would be good enough to tell their engine-drivers that to whistle in the shrillest tone for half a mile on entering a station when the signals are right, is a trifle too much; and, above all, by not practising quaverings with their whistles, they would confer a boon on travellers. Of all engine-drivers, none can beat the Cornish at frightful whistlings; they particularly delight in the brake or danger whistle, we perceive; and, at the same time, if they would ask the red-headed person in a policeman's uniform who collects the tickets at Penzance station, to speak and act civilly to passengers, it might possibly be of service to the public.

PRO.

COLOUR AND ARCHITECTURE.

SIR,—The chief reasons which those who advocate the employment of colour in our church restorations offer for the universal adoption of the practice, may be stated to be the following:—

1. Because Gothic architects not only used colour in their churches, but designed them to be painted.

2. Because the use of stained glass in windows, which was part only of an entire system of coloured decoration, necessitates the use of colour also on the walls, arches, and other parts of a building.

As you have opened your pages to the discussion of this question, which is one of paramount interest at the present moment, you will perhaps permit me to offer a few remarks on these two postulates, and on the conclusions to which they are supposed to lead.

They both depend on an assumption, of the correctness of which no proofs whatever have as yet been adduced. Such proof as we have, in fact, rather tends to an opposite conclusion. Of the large number of churches that I have visited on the Continent and in Great Britain, very few exhibit traces of colour; and of that small number, still fewer contain remains of coloured design coeval with that of the building itself. Nor do these coeval paintings, where they exist, afford any ground for supposing that they were the work at that time, any more than in the present day, of the same hand that designed the building in which they are found. For architectural subjects, where they occur in the rare cases to which I refer, although evidently intended to represent contemporaneous work, are most incorrectly and ignorantly drawn; and the ornamentation, whether of foliage or other detail which is found in them, shows a style different from, and generally very inferior to, that of the carved work of the period.

Nothing is more probable, in fact, than that the duties of the architect in those days were limited, as they commonly are at the present time, to the design and construction of the building; and that the painting, stained glass, and further decoration were subsequently added, as the community for whom the structure was raised became more ambitious or more opulent, and were designed and carried out by a very different set of men, specially occupied with these works, and belonging possibly to the school or class of artists which illuminated manuscripts, designed tapestry, and emblazoned heraldic devices.

At all events, it appears impossible to maintain, until it is proved by more cogent facts than any that have been hitherto adduced, that the architects of the Middle Ages were the authors of the tawdry finery with which some of these noble buildings were subsequently clothed,—chiefly, as I believe, in the fifteenth century,—simply because these traces of colour have been discovered, and still exist in a certain limited number of early buildings.

It is indeed incredible that those who de-

signed the perfect masonry which is to be found in most of our cathedrals and abbey churches, and took the trouble of searching for, and transporting to the spot, often from great distances, stone of pure colour and fine grain,—of moulding it into rich forms and contours for the creation of an infinite variety of delicate effects of light and shade,—and of so preparing and dressing its surface, as to give it that effective texture so peculiar to Gothic work, and so agreeable to the eye; and who so arranged and disposed, in visible lines and in well-adjusted counterpoise, the beds and joints of all this admirable stonework, in pier, wall, arch, and vault, as to produce in the structure that evident union of constructive boldness and complete repose, and in the mind that feeling of elevation and of perfect satisfaction which the masonry of no other style or order of building—that the world has seen is capable of producing;—it is monstrous, I say, to pretend that those who designed and realised these grand effects, more than half the charm of which is derived from the material itself, and its manifest constructive reality, intended to cover them up, deaden, and obliterate them with a coat of paint! Had this been their real intention, better far to have used material more suited to their purpose; for all building materials, except perhaps marble, fine-grained ashlar stonework offers the worst surface for the application of paint. Better far would it have been for the end in view, and far more durable as regards the paint, to have built rubble walls, and coated them with plaster.

Hence, indeed, arise the defects that have shewn themselves in some of these modern painted works; as, for example, in the Chapter-house of Salisbury Cathedral, where the paint and its thick prefatory coating are already coming off, it is said, in large patches.

I cannot, in fact, understand how it is possible to suppose that the architects of these buildings designed that they should be painted; but, supposing any of them to have been so treated subsequently, as some conjectured, I can picture to myself, without difficulty, how, having delivered them in the condition to which, happily, many of them have been recently restored, their designers groaned over the indignities to which they were thus submitted by the clerical or professional decorators into whose hands they fell, and into the hands of whose successors in this line, unless the voice of common sense and good taste be raised energetically and universally, they are likely again to fall; for church restoration has, in many recent cases, taken this flagrant form. The clergy are urged to put more "warmth" into their churches, or, in other words, and more truly, to set their walls in a blaze; the church decorator is beginning to assert for himself a place among the handicrafts-men of the country; and, although the goddess of the day is not Diana of the Ephesians, her pretensions are active and wealthy; and it is impossible to say how much mischief Fashion, these new interests, and the combination of adequate means and misdirected zeal may cause to our national monuments, unless this false taste, this hankering after the colour-pot and the gold leaf, be not speedily corrected and suppressed, or diverted into other channels.

Limiting my remarks this week to the consideration of this preliminary question of precedent and authority, I will, if you will permit me, next week enter on that of stained glass, and the arguments derived from its use in favour of this universal application of gaudy colours.

EDMUND SHARPE.

THE SISTINE CHAPEL AND ST. PAUL'S CATHEDRAL.

In the endeavour to assist in giving a general description of the great series of paintings in the Sistine Chapel, it is to be hoped that in no long time some one or more of our great public galleries, as the British Museum, the South Kensington Museum, or the Royal Academy, will publicly exhibit in a convenient way, so as to be seen without difficulty, the complete series of autotype *fac-similes* of it, so put together as to fairly represent and reproduce, on a sufficient scale, the ceiling as it really exists. By this means, and by this means only, will the public have an opportunity of seeing for themselves what is meant by painting and "decoration," and what it really is to paint the ceiling of a church or public building. It is a subject just now of very especial interest, as is evinced by the great efforts being made to raise

subscriptions for the decoration of St. Paul's Cathedral (a far finer building, be it observed, than the Sistine Chapel, and far more worthy of wealth and genius being spent upon it); so that it is worth some little thought and trouble to come at the full meaning of these frescoes, and at some probable means of doing something, if not equal to them, or even like them in any way, at least to try to follow in the track marked out by the great painter who did this work of the Sistine. Most true it is that we have not in this age any man equal to Michelangelo as a decorative artist, or, in other words, one capable of moulding the generally received and what may be termed orthodox style of decoration to a great and new purpose; or if we had, we are all quite sure and certain that he would have but small chance of employment in such a work, or in such a place, as St. Paul's, or Westminster. But still through the Sistine work something may perhaps be done towards indicating a way of going to work better than through a common shop. To help this we now simply outline a description of the great series of subjects which fill the Sistine ceiling, and complete the story told on it by the painter, reserving for distinct notice some remarks on the purely manipulative part of the work, and how such might be, perhaps, imitated in St. Paul's: rivalled, of course, it could not be. We have the panels which run down the centre of the ceiling, and the "Holy Families" which run round it, and the prophets and sibyls which also run round it, and the great sculptural figures which complete the architectural framework of it.

The prophets and sibyls which surround the chapel are twelve in number. They prophesy of the coming of a future King and Redeemer of Israel and man. The prophets on the part of the children of Israel, and the sibyls on the part of the Gentile or Pagan world. From the whole number of Hebrew prophets, Michelangelo has selected these:—Zachariah, immediately opposite the Prophet Jonah, and over the entrance to the chapel; Joel; next the Delphian Sibyl; the Erythraean Sibyl; Isaiah; Ezekiel, the Cuman Sibyl; the Persian Sibyl; Daniel; Jeremiah; the Lybian Sibyl; and lastly, and immediately over the Last Judgment, Jonas.

Thus, with the Prophet Jonah is completed the series of prophets and sibyls, and which, with the "Holy Families," fill the whole ceiling, with the exception of the great centre panel, regarded as one subject, and a complete idea in itself. One is at a loss to conceive where the might of the painter has best displayed itself, every part being alike masterly and perfect as far as it goes, and as far as the intention of it demanded. The purely architectural and sculptural portion of the work is of such consummate execution, and so full of life and artistic power, that, were it alone, it would make this ceiling unique and without rival anywhere.

We more especially, in this short notice of it, refer to the series of figures which go to make up and "decorate" the purely architectural idea of the centre of the ceiling, but take no part in the story which it was the object of the great painter to tell on it. They represent the human form in almost every variety of attitude and posture. They are shown as sitting or reclining opposite each other, between the panels which contain the story of the Creation, and add not a little to the interest of the whole work artistically, though they do not, as it would appear, help the story itself. Each figure is a great study, full of intense force and life. Nothing, indeed, in the whole range of art can possibly surpass in vigour and in masterly drawing, and in life and variety of action, these naked human forms. They are twenty in number, ten on each side of the ceiling, and are arranged in groups of four, one at each corner of the panels on which are the great subjects, painted on the centre and flat of the ceiling. Thus two figures always face each other on the same side.

Although these great figures occupy but a subordinate part in the idea of the ceiling, they are, in a certain sense, the most curious and interesting part of it. They show how universal and comprehensive was the mind of Michelangelo, and how he condescended to small, and what many would consider almost contemptible, details. No drawings or points show it, but the autotypes, which are *fac-similes* of the paintings themselves, do. These figures are not engaged in mere posturing, but are holding up by folds of cloth the circular panels which run round the ceiling, under every alternate subject in the centre of it, and the mode in which this is done is almost as wonderful and inventive as the drawing and con-

ception of the great prophets and sibyls themselves. Both the hands and feet of these nude figures, both male and female, are engaged in the work, and nearly every possible posture and way in which these circular rings could be held up or kept steady by the united action of the hands and feet are shown. These folds of cloth which support the panels are held, in some cases, by rings let into the stone seats on which the figures may be seated, and the feet are employed to tighten the cloth fold as the outstretched hands and arms pull it through the slit in the ring which it holds up. We are not aware that this has ever been noticed by any one before who has attempted to describe this work of Michelangelo; but there is enough in it of invention and wonderful drawing to make the fortune of any ordinary painter. One would hardly have thought that Michelangelo, with his mind occupied with such lofty subjects as the ceiling portrays, would have had such trifles in mind at all; but his vast genius was all comprehensive, and nothing was really trifling or little to him. These figures, as we have said, sit opposite each other, so that the long fold of cloth running through the slits in the rings holding them up and steadying them by the joint action of each two of the figures, and the whole action of each figure, are the result of the effort to tighten the cloth, and thus to steady the ring. How impossible is it to manufacture fine art or inventive art? Here, do we not see the greatest artist that perhaps the world ever knew, at least in modern days, employed for weeks in painting these magnificent forms thus triflingly engaged?

If the reader, when opportunity offers, will go through, even in a cursory way, these sublime compositions, and will think but for a moment of the influences which brought them into being, and the money they cost (a very poor sum indeed), the age in which they were executed, and the ruler under whom they were given to the world, he will have cause to feel truly thankful that so many circumstances got together to produce such a result. The ignorance or knowledge of the time in which Pope Julius and Michelangelo lived asked for decoration, and demanded, at the same time, so fortunately for us, that decorations should mean painting and sculpture, and not merely manufacture and business. The unhappy "East end" of St. Paul's is, we must presume, an accomplished fact, and remains only to be filled in with imitation mouldings, panels containing nothing, and bits of gilding; and the whole building is to cost, so it is stated, a quarter of a million to complete in the same way! Might we not here suggest that before the nave is touched, some other plan suggested by the Sistine ceiling should be thought about, and that instead of "imitation panels," filled with emptiness, being painted on the roof of this nave, the panels already there, and put there by the architect of the building, should be filled in with genuine painting by a Painter?

SOCIAL SCIENCE CONGRESS.

THE forthcoming annual meeting of the Social Science Association, to be held at Newcastle-upon-Tyne, on the 21st to the 22nd inst., bids fair to become a great success. The local authorities are using every means in their power to do all they can to find the best accommodation for the delivery of the addresses, and the holding of the discussions. Besides which their efforts are unceasing in making provision for *sourees*, excursions, and private hospitality. We understand the special questions in the various departments will be introduced by good papers, and by experienced men. Papers on the sewage question are being contributed by several gentlemen of different views. The sanitary laws will be taken up by Mr. W. H. Michael, barrister-at-law, and the Right Hon. Sir Charles Adderley, M.P. Dr. Letheby will read a paper on the Adulteration question. Other papers of importance in this department, on water supply, cottage hospitals, and construction of sewers, will be read. In the economy and trade department, the special questions are as follow:—

1. Is it desirable that the railways should become the property of the State?
2. By what means may the labour market throughout England be more equally supplied; with special reference to local and temporary distress?
3. How far is it desirable and practicable to establish courts of conciliation, or arbitration between employers and employed?

4. How far is it desirable and practicable to extend partnerships of industry?

The two latter questions will be discussed under the able chairmanship of Mr. Rupert Kettle, the county court judge, a gentleman who has interested himself much in the disputes between masters and workmen.

Papers on the Arbitration and Conciliation question, will be read by Mr. John Jones, of the Iron Trade Offices, Middlesbrough; by Mr. John Kane, of Darlington; and by Mr. William Owen, of Hanley.

The partnership of industry question will be treated by Mr. H. C. Briggs, of Seafield Works, Dundee, and Mr. E. O. Greening, who has had great experience in the working of the principle. There are a number of other papers in this department, of a miscellaneous description, and most of them on very important subjects.

As usual there will be a working men's meeting, and two *soirées*, besides several excursions to places of interest, among which may be mentioned the Roman wall, the manufactures on the Tyne, and Alnwick Castle, the residence of the president, the Duke of Northumberland. A ladies' conference will also be held in connexion with the association. The arrangements are now nearly complete, and a large and influential gathering is fully expected.

THE DRAWINGS FOR THE HOUSES OF PARLIAMENT.

We have reason to believe that the law officers of the Crown have declared that the drawings for the Houses of Parliament are the property of the Crown, and that these have been formally demanded from the architect. Whether their opinion applies to other cases we do not know. Doubtless, however, it refers only to this special case, in which there may or may not be peculiar circumstances. It will now be for Mr. Barry to comply or not, as he may think proper. He has shown himself ready to support the rights of the profession, and if called on by the general body and indemnified by it against expenses, would probably still further resist, and allow the question to be tried in his name. We cannot expect, however, that personally he will longer refuse compliance; no friend, indeed, would advise him to array himself individually in a court of law against the Government, to whom he is at the same time looking for future employment. Unless, therefore, the profession at once unmistakably declares itself on the subject, he will doubtless now feel himself bound to place the drawings at the disposal of the Government, with a firm, though respectful, protest.

A PLANING SAW.

THE invention and improvement of wood-working machines is a matter of considerable importance, and we watch with interest all steps in that direction. The "General Joiner," and some other machines to which we have drawn attention on several occasions, might be much more widely employed than they are. Their use spreads.

Lately we have examined, at the works of Messrs. Mansfield, Price, & Co., a machine known at present simply as "Llewellyn's Patent," which is applicable to the squaring, planing, grooving, and rebating of wood; and when used as a saw, performs the operation of planing on each side simultaneously. It does its work very well, and is likely to be useful to builders, cabinet-makers, pianoforte-makers, and others. The chief point of the invention lies in the form and arrangement of the saw-teeth.

THE IRON AND STEEL INSTITUTE.

THE annual provincial meeting of this Institute has been held this year at Merthyr-Tydfil, with excursions to Dowlais and Swansea. The Duke of Devonshire, as president, and the Marquis of Bute, were present, with other notable persons. Mr. Bessemer, who was present, was elected president for the next year. The meeting continued for four days, Monday, Tuesday, Wednesday, and Thursday, in last week. Papers on the Geological Features of the South Wales Coal-field, by Mr. W. Adams, of Cardiff; on Pumping and Winding Machinery, by Mr. G. C. Pearce, of Cyfarthfa Iron Works; and on the Condition of Carbon and Silicon in Iron and Steel, by Mr. G. J. Snelus, of Dowlais, were read

on the first day. On the following morning an excursion to the Plymouth and Cyfarthfa Works took place; and papers on Pyrometers, by Dr. C. W. Siemens, F.R.S., and on the Efficiency and Durability of Plain Cylindrical Boilers, by Mr. Jeremiah Head, of Middlesbrough, were read in the Temperance-hall, Merthyr. The excursion to the Dowlais Iron Works also took place. After the inspection of the works, a sumptuous champagne luncheon was partaken of in the reading-room. On Thursday, Swansea was visited for the purpose of inspecting the Landore Siemens Steel Works and the Swansea Copper Works. The mayor of Swansea invited the party to luncheon in the Mackworth Arms Hotel. Friday was devoted to an inspection of the Monmouthshire Iron Works.

The meeting has been regarded as a great success.

MONTACUTE, SOMERSET.

THE interesting and ancient church of this town is undergoing restoration. During the course of the work several interesting features turned up. The restoration will cost over 2,000l. The parishioners have agreed to raise 1,600l. of that sum by rates. The chancel and the roof of the nave, which also require repair or restoration, are to be undertaken at the expense of Mr. W. Phelps. Mr. William Pudden, of East Coker, in the same county, is the contractor. Money has been raised by the aid of a bazaar, and several handsome donations on the part of private individuals, have been given. Not the least worthy of mention is the gift of 25l. from Mr. G. Mitchell, of Brompton-road, London, who was formerly a poor lad living in the village of Montacute, and is now a flourishing tradesman.

STRASBOURG CATHEDRAL.

Few cathedrals in Europe are better known to the general run of men than that of Strasbourg, and just at the present moment every one must feel a certain amount of anxiety on account of the danger with which this magnificent temple is surrounded. We may any day hear that this church, which is one of the wonders of Europe, has been reduced to a heap of ruins. Let us hope, however, that it will be spared so sad a fate, and that, whether the French retain possession of it or it is handed over to its original builders, the Germans, it may still remain uninjured for future generations.

The cathedral of Strasbourg is of various dates, the earliest portions being the transepts, choir, and two eastern chapels, which, we need hardly state, are not of the age attributed to them—i.e. the tenth century,—but are, without doubt, the works of the end of the twelfth century. The choir or chancel consists of a large semicircular apse and the portion of the church between the transepts. It is raised some 20 ft. above the level of the nave and transepts, and beneath it is a crypt, half above and half below ground. This crypt is divided by slender columns into three equal aisles; it is entered from the west, by flights of steps descending to it on either side of the steps approaching the choir above: it is lighted by windows or openings in the side walls looking into the transepts. The "crossing" which forms the western portion of the choir is roofed over with an octagonal cupola, lighted by four small Romanesque windows. Each transept opens into the "crossing" by two arches instead of one. This arrangement is rendered necessary by the transepts being divided down the centre by a spine of columns. All these columns are circular except one, which is shown in our engraving. It consists of a cluster of eight shafts, of which the alternate ones are carved into statues of angels and prophets, wonderfully fine examples of thirteenth-century sculpture.

Opening out of the east side of each transept is a chapel on a lower level than the rest of the church, and divided into three aisles by columns. These two chapels or crypts may be of a slightly earlier date than the transepts, and are, consequently, the earliest portion of the existing church. Above the double arch leading into one of these chapels is a kind of triforium. In front of it runs an exceedingly elaborate flamboyant pierced parapet, leaning over which is a well-executed statue, life-size, said to represent Erwin von Steinbach, the architect of a considerable portion of this cathedral.

The nave is a most glorious example of the

earlier portion of the fourteenth century or end of the thirteenth; it is, in fact, one of the noblest Gothic naves in existence, of grand dimensions, nearly 50 ft. in the clear, and over 100 ft. high. The clearesty is pierced by superb four-light windows, filled with magnificent stained glass coeval with the building; below these is a triforium consisting of four two-light openings, with glazed windows at the back also filled with stained glass. The main arches supporting the triforium and clearesty are of noble proportions, richly moulded, and supported upon clustered columns of great beauty. The aisles are also lighted by four-light windows, also full of stained glass, as, in fact, is every window in the building. Opening out of the aisles are two very large Third Pointed chapels. The church contains some fine furniture. A stone pulpit, of most complicated design and elaborate execution, in a fine state of preservation, and adorned with much delicate and beautiful sculpture. A font of equal beauty, both in design and execution, stands in the north transept beneath a deep Romanesque arch. The organ is also a very valuable example of ecclesiastical furniture; it is bracketed out from the third arch of the nave from the west end, and is a good example of flamboyant woodwork, richly decorated with colour. We must also notice the well-known remarkable clock standing in the south transept.* Perhaps no cathedral in Europe presents such a magnificent view as the grand perspective which strikes the eye of the beholder upon entering the western door of Strasbourg Cathedral. Not only is the architecture magnificent, but the colour is equally superb. Every window glows with the richest stained glass, and the walls are built of a dark crimson stone, which has received a magnificent tint from time.

It is not our purpose again to describe the exterior of this cathedral, of which we have often spoken. We will not, however, pass it over without pointing out the two exquisite statues of the Church and the Synagogue attached to the doorway of the south transept: it is not too much to say that the best Greek sculptors never produced anything more beautiful than these two figures. They date from the commencement of the thirteenth century.

Much as we admire the cathedral of Strasbourg, we cannot extend that admiration to the spire or the west front, which are, undoubtedly, the least admirable of the whole church in point of design. The spire cannot be compared with its neighbour at Freiburg, or with that of Vienna or Chartres.

Several other churches in Strasbourg deserve notice:—

St. Thomas's is a beautiful Romanesque building, with a graceful fourteenth century nave and much fine stained glass. It now forms the chief Protestant church in Strasbourg.

St. Peter's the Elder contains a fine rood-screen of stone, well vaulted. This church is divided by a wall. The chancel is used by the Roman Catholics, and the nave by the Protestants.

St. Peter's the Younger is also divided in a similar way between the two religions. Like the former church, it contains a fine rood-screen, and in the chancel windows there is a good deal of fourteenth-century stained glass. In the modern panelling surrounding the chancel series of very curious and beautiful old pictures have been introduced. These pictures are works of an Alsatian artist of the fifteenth century.

The church of St. William also contains a stone rood-screen and much fine stained glass.

St. Margaret's contains three superb stained-glass windows in the apse.

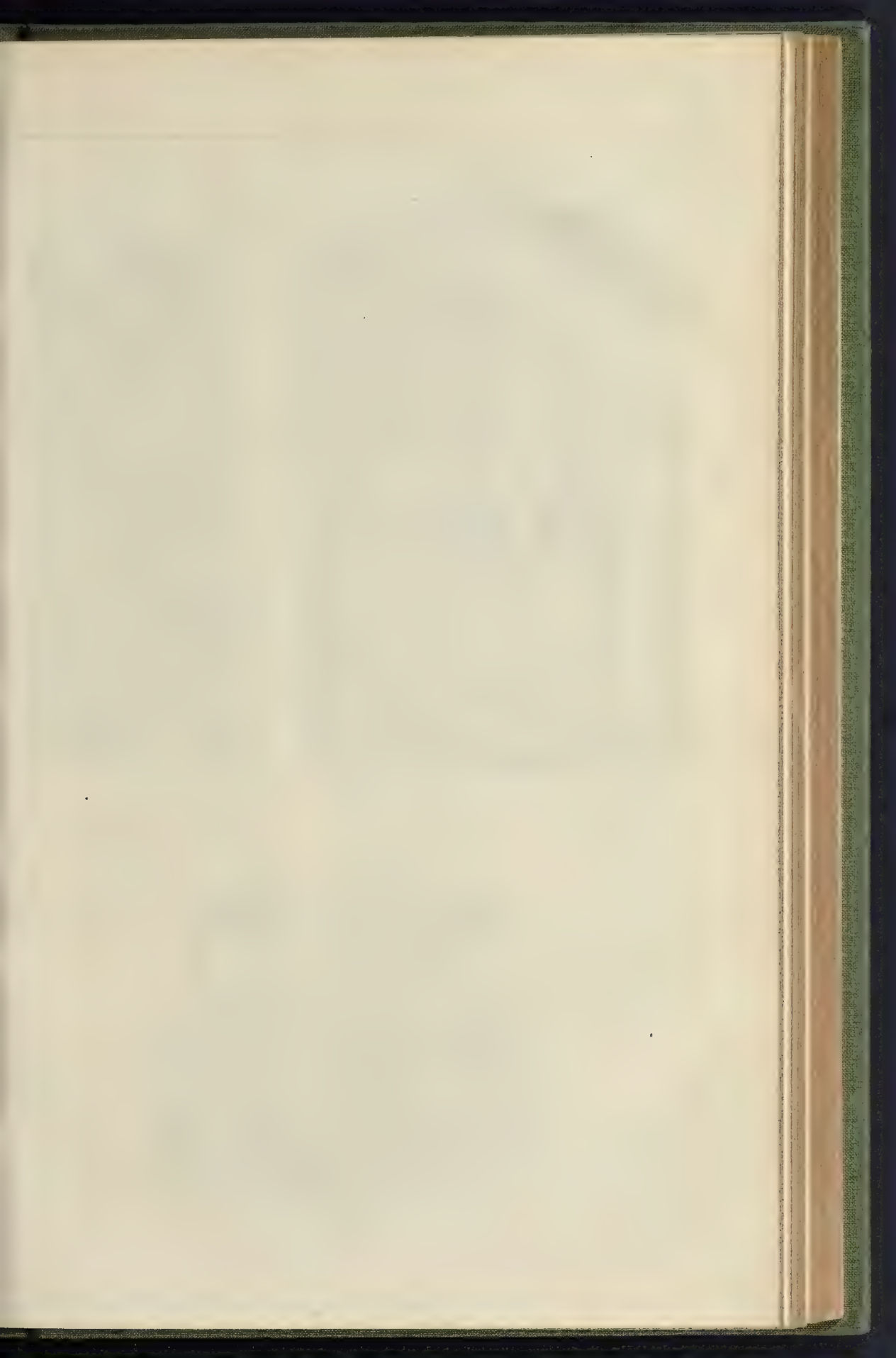
The (former) Dominican Church, now used for Protestant worship (except the choir, which is used as a library), possesses a most superb stone rood-screen, divided into nine vaulted compartments. This church has a row of columns down the centre of the nave.

Strasbourg also contains some good domestic architecture, and one or two ancient towers, one of which is roofed with glazed tiles in patterns, and still retains its ancient *breteches*. This tower is given by M. Viollet-le-Duc, in his invaluable "Dictionnaire."

We sincerely hope, though it can scarcely be expected, that all these interesting works may escape uninjured from the present danger which threatens them.

* The report that the organ and clock here described have been destroyed, seems to us unlikely from their position in the church. That they may have been injured is possible, but we hope to find out that the news is entirely devoid of foundation.

† Said to be destroyed.



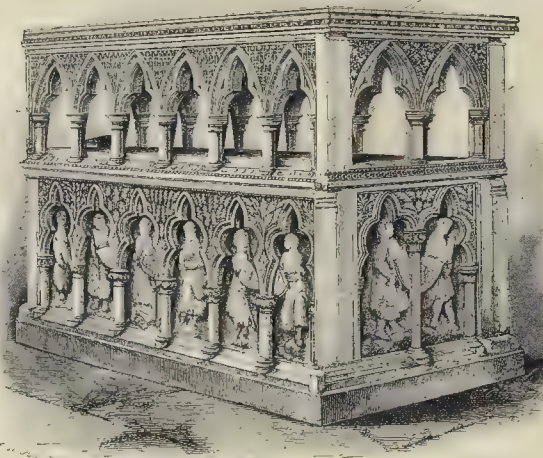
HEREFORD CATHEDRAL.



ARCHES OF NAVE.

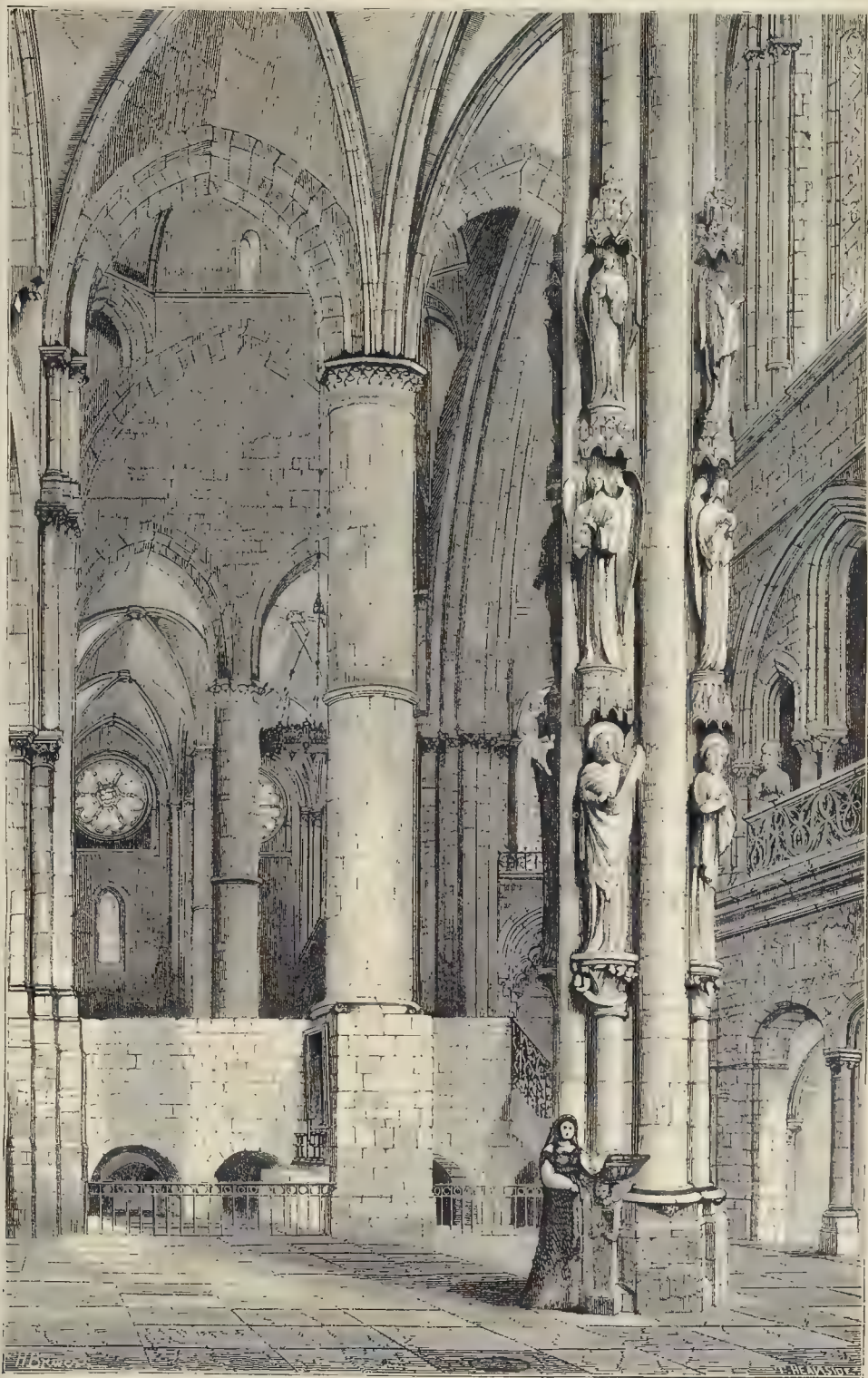


BAY OF NORTH TRANSEPT.



SHRINE OF BISHOP CANTILUPE.

See p. 737, ante.



STRASBOURG CATHEDRAL: VIEW IN THE TRANSEPT.

NEW ORPHAN HOUSES ON ASHLEY-DOWN, BRISTOL.

ANOTHER "brief narrative of facts relative to the New Orphan Houses for 2,650 children on Ashley-down, Bristol," has been issued by Mr. George Müller, and is a very interesting one, inasmuch as we are enabled to trace by it the progress of his enterprise from its commencement. As in former years, many gifts have been sent in kind or in substantive articles to be turned into cash. The motives assigned by the various donors for sending their offerings, and the modes by which they state the amounts of those offerings to have been measured, are as various as the gifts themselves. Some of the special considerations noted are almost grotesque in their character. One donor, on page 28, states that having bought a horse, the soundness of which he doubted, he determined, if he turned out well for twelve months, to give it to the orphanage. The horse had turned out well, he states, and he encloses his money. Another sends 2l. 2s., because he has been enabled to effect a difficult building alteration! Mr. Müller has been enabled not merely to meet the current expense of the year for the various departments of his great work, amounting to 37,700l. 18s. 9d.; but he had, he tells us on page 36 of his little work, more in hand when the accounts were made up than when the year commenced.

A SELF-SUPPORTING GAOL.

THE annual report of Mr. Caldwell, governor of the self-supporting gaol of Dunedin, Otago, New Zealand, has just come to hand. It is dated the 26th of April, and is for the year ending the 31st of March, 1870. The following is a summary of this interesting document.—The votes of the Provincial Council for the year in respect of the gaol department were—salaries, 3,912l.; departmental contingencies, 2,210l.; tools, materials, horses, &c., 1,400l.; works and buildings, 50l.; total, 7,572l. 15s. Of this sum 6,701l. 10s. 8d. have been expended, leaving a balance of 871l. 4s. 4d. in favour of the gaol, and showing a decrease of 680l. 12s. in the expenditure, as compared with that of the previous year. The total value of remunerative labour performed by the prisoners during the year, with miscellaneous items, 7,117l. 16s. 6d., being 416l. 0s. 10d. in excess of expenditure on the gaol. This amount is somewhat less than the profit of the previous year, which is accounted for by the fact that during the twelve months the price of every man's labour has been reduced by 1s. per day. That this establishment is fully self-supporting seems to have caused considerable discussion and some surprise among those interested in and connected with prison discipline, not only in New Zealand and Australia, but in Great Britain and Ireland. Mr. Caldwell, premising that no charge whatever is made for work in the gaol for the purposes of cleanliness and order, or clerical assistance, or for cooks and servants, shows how the result has been obtained in the employment of prisoners in the removal of Bell Hill, containing 21,944 cubic yards of rock, to form a retaining wall in the harbour, and on board the harbour dredge, in a jetty extension, and the erection of a reclamation wall, repairing streets, &c., tradesmen's work being accounted for weekly. Every article manufactured or repaired is charged according to the price which the gaol department would have had to pay in the market, or at the rate of 6s. daily for carpenters, blacksmiths, painters, and plumbers; and 6s. for stonemasons, tailors, and shoemakers. The number of prisoners received during the year was 770, including 74 Maories, 19 debtors, and 11 re-appearances. Of these 642 were males and 128 females. The highest number of prisoners was 187 on the 21st of March, 1870; and the lowest 95, on the 18th of October, 1866. The daily average, during the year, was 130.61. The average daily number of female prisoners was 9.95, of whom one-third were employed in washing the prison clothing, and the remainder in making shirts, flannels, and under-clothing. Respecting the Maories Mr. Caldwell says, "In accordance with arrangements with the General Government, 74 Maori prisoners arrived on the 6th of November, 1869, under sentence, 12 of seven and 62 of three years' servitude for high treason. Nearly one-fourth were not fit for anything like labourous work. The remainder were powerful body of men, but untrained to regular

continuous labour. They were unaccustomed to clothing, but in an incredibly short period appreciated the comfort of the prison dress. They have been employed in the Botanical Gardens, at the High Schools, and in reclaiming streets, at 2s. 6d. per day, and in breaking road metal at 2s. per day, the total amount of their earnings during the five months being 640l. They are well behaved, industrious, and strongly attached to their chief, Riharo Watone Ngawakaturu, who has a paramount influence over them, which is exercised in behalf of order, regularity, and discipline. There is no race more easily trained and controlled by judicious management. They are very devotional, and attend prayers with much apparent earnestness and sincerity. One of their favourite indulgences is writing to their families and friends in the north. Immediately after their arrival one of the oldest of the hapu died, and since then four more have fallen victims to diseases they brought with them—asthma, disease of the lungs, dropsy, paralysis, and general decline."

INIGO JONES'S "YORK STAIRS."

SIR,—Have you noticed the present condition of the Water-gate? I could not regard it from the end of Buckingham-street the other day, without mingled feelings of regret, and even anger, that a monument so fine should now occupy a site so absurd and out of place.

Is there nothing contemplated as to a future position for it? Could it not even yet be made to occupy an honourable place along the "Thames Quay?"

I venture to bring this under your notice, in the hope that you may feel disposed to take up its forlorn case out of respect to one of England's greatest architects.

It may be I am anticipating other people and their plans: if so, I would ask pardon, but intercession is surely not altogether uncalled for.

R. P. W.

FALL OF A WEAVING SHED IN MANCHESTER.

A FATAL accident, involving the loss of a life and injury to several other persons, has occurred at the weaving-mill belonging to the executors of the late Mr. T. C. Faulkner, and occupied by Mr. Johnson, in Portugal-street, off Poland-street, Oldham-road, Manchester. The mill, which is an old one, is two stories in height, and both the ground floor and the floor above were filled with heavy iron weaving-frames, there being about 100 looms on each floor, and at the time of the accident there were fifty-nine operatives at work on the premises. While the weavers were engaged at their work a large portion of the middle of the upper room—a space occupied by eight looms—gave way, and without the slightest warning, carrying with it the operatives engaged in that part of the room, and burying them, as well as those who were at work in the room below, in the tons of machinery, flags, and debris which fell. Happily, there were only a few persons at work on the looms in the upper floor at the time. One woman, however, was killed, and several other persons were injured. The accident was caused by one of the iron pillars in the centre of the shed giving way. It suddenly sank about 3 ft. The arches, which are 12 ft. span, had only about 12 in. rise.

At the inquest, Mr. Levi Slater, the manager for Mr. Johnson, said the mill had been built about ten or fifteen years. The only way that he could account for the accident was that there was a sewer underneath, and that the pillar had worked its way into the sewer. The pillar stood on a solid block of stone, about 2 ft. square, which he supposed must have gone down first. The pillar was used as a drain. He felt sure there was no perceptible giving way of the soil.

Mr. Johnson said he had occupied the mill about five years. His impression was that the pillar had sunk. It and some others were used as drains in order that they would open into some horizontal drain.

Mr. J. G. Lynde, city surveyor, said that the column being used as a water-pipe, there would be at the bottom a hole from which there would be a short branch pipe into a drain. He could only account for the sinking by supposing that the water escaping at the junction would gradually sap the foundation of the column. The best construction would be to have brick foundations going down several inches below the

bottom of the drain. He thought the fall would be quite sudden, owing to the construction of the floor.

The jury returned a verdict of "Accidental death," and expressed the opinion that the foundation had not been constructed with sufficient care, and recommended that no person should be employed until the safety of the other pillars had been fully examined.

NEWHAVEN IMPROVEMENTS.

WE are glad to see that Newhaven is looking up, and that our suggestions in the beginning of the year are likely to have a practical effect. The harbour and the town, as we have previously pointed out, stand sorely in need of improvement. The old ship-building yard, we learn, is taken, and ship-building and repairing, on a large scale, it is said, may soon be expected to be in operation. Newhaven has some natural facilities and resources that can be readily developed. We have pointed out her possibilities, and, with a little energy and public spirit, these possibilities can be changed into realities.

The completion of the fortification at the mouth of the harbour is expected to result in benefiting the town. The Ouse between the bridge and the mouth of the harbour requires to be deepened, and there is work always for the operations of a dredge. The river also requires to be embanked, and proper landing-wharfs constructed on either side. These are some of the pressing and present wants of the town.

MIDDLE-MEN HOUSE-OWNERS.

SIR,—University, collegiate, and church house property is invariably the most neglected. Complaints to the owners are always met by referring tenants to their inexorable solicitor-agent, to whom they are "farned." His reply is, "You can leave." But that means ruination to shopkeepers and manufacturers. These legal tyrants keep within the law, exacting the highest rents, and ignoring repairs. The real owners of these houses should hearken to oppressed yearly and quarterly tenants, and not permit helpless honesty to be crushed by their grasping under-tenants.

I could relate more (with names) than it would be safe to publish of these "middle-men." R. T.

SASHES.

In reading the letter by "G. L." the following thoughts occur to me:—That, as the lifting sashes will probably continue to be preferred, it is advisable to render them as free from objectionable qualities as possible. If the pulley styles be perfectly straight and parallel, and if the sash styles be carefully prepared to one thickness, and scarcely touched in cleaning off, and if the sashes be properly fitted, there will not be much room to allow them to rattle, but the corner of the sash may catch if not taken at the middle in lifting it up.

Springs, instead of weights, were used in some cases in old houses, but the amount of friction against the (in that case) solid jambs would cause them to work very badly.

Might it not be possible to have in the edge of each sash style a mortise at the top and one at the bottom, and an iron box to fit it easily, and having underneath a couple of spiral springs to prevent its readily going quite home in the mortise? If, then, an axle roller were in the cast iron or brass box spoken of, and the springs of proper power, then the sash would go up and down without weights.

HENRY AMBROSE.

SIR,—In your number of this day's date I observe a letter respecting an improved mode of securing window-sashes. Now, I have often wondered why we should have window-sashes at all, because they are open to so many objections.

1. It is very inconvenient, and especially for weakly persons, to lift them up or pull them down.

2. The cords are very liable to break, or become detached from the weights, thereby rendering them comparatively useless.

3. They are very difficult to clean, and often dangerous.

I have often wondered why our builders do not adopt the French style of windows, which ignores sashes altogether. The French folding windows are easily opened, are easily and safely

cleaned, and are not liable to get out of order. Where the two sides meet, they are not joined by a simple rabbet, but one is convex and the other is concave, so that the joining is almost air-tight. And then the beautiful bolts that shoot up and down with the same motion render them perfectly secure.

I am not a professional, and therefore am unable to say whether sashes are continued from custom or prejudice, or whether there are any economical or sanitary reasons for the continuance of them; but I must infer, from their almost universal adoption, that the trade has some justifying reason. As, however, the French plan appears to me vastly superior to the English, I shall feel greatly obliged if some of your correspondents would kindly inform me why the sash is adopted in preference to the French folding window.

M. H.
* * One reason is, that the slightest opening of the latter produces a draught at sitting level, while the other may be opened above while close and safe below.

FOUL GASES AND ABSORBENT WALLS.

SIR,—I wish to make a note, as a builder who has had large experience in sanitary matters in old drains, cesspools, and fever dens, and has not lost the opportunity of trying experiments. In any fever house you will see on the walls and the lath and plaster, a dark, dirty, cloudy colour, which is greasy; and by cutting it out where it is seen, and causing it to ferment, you will find it contains foul vapour. It must ferment under a round glass, air tight; the foul gas will be found on the glass. The cause of its getting into the wall in most poor localities is this,—the people live in poverty, and they mostly lie close to the wall, and in the summer months it ferments. A weak or sickly child takes the foul gas by lying close to the wall, and illness follows. If these spots are not entirely removed, the portions left will increase and spread. No bedstead should be nearer than 4 in. to any wall. Some years ago, when the cholera raged in King-street, Regent-street, the bedsteads lay close to the wall. When the houses had to be cleaned, in cleaning the walls, the stains were a long while getting rid of; and the medical officers at that time who attended on the sick may remember how the walls had to be scraped for the grease that was upon them. From that time I have cut out these signs to learn what they contained. Whoever studies an old lath-and-plaster house will not repeat so doing.

F. W. J. NASH.

BUILDERS' BENEVOLENT INSTITUTION.

WE wish to draw the special attention of our readers to the advertisement at the head of our list of this week. From it they will find that the annual dinner of the Builders' Benevolent Institution will take place on Thursday, the 27th proximo, or in six weeks hence. Meantime, those desirous of promoting the interests of the Institution by becoming stewards are requested to forward their names to the secretary, at the office, 4, Vernon-place, Bloomsbury-square.

AN IMPROVED LODGING-HOUSE IN BIRMINGHAM.

AN endeavour has been made in Birmingham to provide accommodation for working men who at present are obliged to have recourse to common lodging-houses. The premises are, 376, Summer-lane, formerly the Sydenham Medical College. They have been fitted up with great consideration for the health and comfort of the occupants. There are 13 first-class, 33 second-class, and 24 third-class beds; the first each in a small room by itself, the second in open rooms, and the third in open rooms—two persons to sleep in a bed. The charges for these are the same as in common lodging-houses—namely, 4d. a night for the second-class, or 2s. a week; and 3d. a night for the third-class, or 1s. 6d. a week. The first-class beds, giving privacy which the common lodging-house proper—or rather improper—knoweth not of, are 6d. a night or 3s. a week. The rooms are heated with hot-water pipes; and whereas they are licensed under the Common Lodging-house Act, for ninety-three beds, only seventy are placed in them, so that there is no overcrowding. Each first-class bed has its own washing-place; for the other classes there are lavatories. A large kitchen, constantly in charge of an attendant,

supplies the means of cooking, which is done by the lodgers themselves, and each lodger has a separate locker for his food. The washing is done in a laundry at a fixed charge, or by the lodgers for themselves. The kitchen serves also as a common sitting-room, and smoking will be allowed there; but a superior and very comfortable sitting-room, supplied with papers and books, is provided, in which smoking is not to be allowed. The premises have been adapted to their new purpose by Mr. Douglas Williams, architect, New-street.

NEWPORT ARCH, LINCOLN.

SIR,—In revisiting this my native city, and passing beneath that glorious old Roman relic known as "Newport Arch," I was equally astonished and disgusted to see that it had been desecrated by the erection of a red-brick urinal affixed to its northern side.

As this old edifice is one of the very few perfect specimens of Roman architecture in Great Britain, and one of the finest ornaments of Lincoln, I think that something should be done to remove this disgrace to our ancient city.

As local appeals would in all probability be disregarded, could it not be urged, through the medium of your valuable paper, upon the Corporation (i.e., the Local Board) of this city that so shameful a disfigurement should be abolished.

LINCOLN.

* * It will, we hope, only be necessary to point out the mistake that has been made to have it rectified.

LEEDS UNION-INFIRMARY COMPETITION.

THE design by Mr. Walker, Leeds, has obtained the first premium. The second was awarded to that by Mr. W. Bakewell, which includes several points of merit. The *Yorkshire Post* says,—The other five designs, which, with those receiving the prizes, make up the seven chosen by the committee from the aggregate number sent in, are well worthy of study. "Sanitas" (No. 8), is remarkable for its ornamental character. There are two pavilions, with an administrative block, and an open space is left which may be used as a recreation-ground. In this plan Sherrington's ventilators would be used. "Experientia" (No. 19) provides for two pavilions, also having a space which might be used as a recreation-ground. Each patient would have 1,217 cubic feet of air. The administrative department is disconnected from the main building. This candidate believes that windows, gratings, and other ordinary means of ventilation would be sufficient for securing a proper supply of good air. "Leeds" (No. 18) shows the administrative block in the centre, there being two pavilions, each having three wards. Foul and fresh air flues, with regulating ventilators, would be introduced for ventilating purposes. "Poina" (No. 6) has the same number of pavilions as "Leeds," and his administrative block is situated in the same manner. He would place a sunlight in the centre of the ceiling, and have an air-shaft with flues leading outwards. The last of the seven which we shall refer to is that marked "Economy" (No. 2). It provides for three wards in each pavilion, and there would be adopted by the designer the plan of having a ventilator of the "hit or miss" kind at the top of each bed. The manner adopted at the Chorlton Hospital of ventilating the windows is recommended.

WELLS AND CESSPOOLS.

SIR,—I know very little of sanitary arrangements, but I am sure ours are wrong, and I should feel more comfortable if you would tell me roughly whether they are "as usual," or "dangerous," and also tell me the kind of person to superintend their improvement. We feel quite at sea; should we consult a builder, architect, nuisance-inspector, or whom? I mean as to details. I inclose an accurate drawing of the most objectionable parts. You will see a square "well." This is bricked round 2½ ft. deep, bottom made of clay. Its primary use is to receive the washings of the yard, bedroom slope, &c.; the sediment and large pieces accumulate, the liquid passes off to the right through a fine grating.

But on the left side of the "well" is a passage, horizontal through its whole length, meant for an overflow for the underground rain-water cistern.

Plainly, what must happen is—

1. Well gets full, in time, of rubbish, grease, &c.
2. Overflow being only 1½ in. above drain, all sewage passes into rain-water tank.

And this is what did happen! Imagine our consternation. The water grew worse, gave off sulphuretted hydrogen in large quantity, and led to these revelations.

Add to this the cesspool, whose surface, when last examined, was 1 ft. below surface of stuff in well, and 2 ft. above surface of water in cistern, and we found it to be all not of solid, but quite liquid sewage, stinking frightfully.

One side seems made of loose stones; the others we cannot get at. Its opening is 1 ft. square, and can be covered, but the privies adjoining cannot well be closed.

The whole ground about the house reeks with horrible smells; every crack seems to conduct up the effluvia, and yet the former owner of the house assures us that the drains were planned "by a London architect." I shall hope to see a reply in your next number.

W. F. HOWLETT.

Briercliffe Vicarage, Burnley.

* * The condition of things here described is dangerously bad, and should be remedied immediately. A good and intelligent builder will see at once what should be done.

CHURCHES NEAR LONDON.

St. John's Church, Clapham.—This church, which has been closed for repair, was re-opened on Sunday, the 4th inst. *St. John's* is a modern church, of the Classic order of architecture, and had internally but little ornament. It has now been entirely repainted and decorated; the ceiling, cornice, and entablature have been ornamented with stencil work, and the whole picked out in varied colours to harmonise with the style of architecture. The cost of the works, which will amount to over 500l., will be met by a subscription from the seat-holders. The decorations and repairs have been carried out under the superintendence of Mr. A. C. Morton, architect, London. The contract was taken by Mr. A. Clement, Clapham; and the decorations have been done by Mr. H. Mestwerdt, Brixton.

Christ Church, Lower Clapton.—This church, the first stone of which was laid on the 30th ult., is rectangular, and comprises a nave 90 ft. by 30 ft., by 64 ft. high to the ridge; aisles, 12 ft. wide; chancel, 40 ft. by 25 ft., by 56 ft. high; vestry (north bay of chancel) and organ-chamber (south bay), each 26 ft. by 16 ft.; and narthex, at west end, 30 ft. by 8 ft. In addition to the double entrance at the narthex, there is a north porch and a vestry porch. The nave is separated from the aisles by an arcade of five arches, springing from Hollington stone shafts and Portland caps and bases; the shafts, caps, and bases to the chancel arcade being all of Portland. The aisle windows are small single lights; but in the clearstory is a range, on each side, of ten two-light windows. Over the narthex is a rose-window 17 ft. diameter, the chancel having a five-light window over the reredos, and two two-light windows at the side. On the south of the sanctuary is a sedilia of three seats, with marble shafts, traceried heads, shields with armorial bearings of London and Canterbury, &c. The materials are of brick and stone, coloured brick bands externally, and white, red, and black bricks internally, in bands, arches, devices, &c., the decorations being numerous and elaborate. The roof is open framed, stained and varnished. The nave seats are of deal, varnished, and the stalls to chancel of oak, polished. The pulpit will be of stone, and the font of stone and marble. The architect is Mr. Wigginton; and the builders are Messrs. Axford & Whillier. The style is fourteenth-century Gothic; the accommodation for about 700; and the cost, 5,565l. There is to be no tower or spire, but provision for two large bells is made in a bell-cote over the chancel arch.

Christ Church, South Hackney.—The architect of this church, recently mentioned in our pages, writes:—"Instead of 'Portland and Bisham' stone for the exterior, it should have been Hollington, with Bath for the tracery of the windows; and, internally, it should have been Portland for shafts, caps, and bases, to nave arcade, and Bath for corbels to principals of roofs and sedilia. The tower and spire will be of brick and stone, instead of 'Bisham' stone (evidently a corruption of Brick and), the stone being from the white measures of the Hollington quarries. This stone (largely used by me in Staffordshire, &c.) I introduced into London in

1863, and, owing to its excellent weathering qualities and its great strength, the demand for it has become considerable. In your allusions to the architectural features of the South Hackney churches, you surely forget those of the parish church, built by Mr. Hakewell (illustrations of which find a place in your "Buildings and Monuments,"—a continuation of which work would be acceptable), and of which you have before spoken well. Notwithstanding the difficulties attending the site of Christ Church, I trust your verdict upon it at its consecration will be different to that recorded on the 27th ult. upon its neighbouring edifice."

Hampstead.—Sir T. Maryon Wilson, bart., the lord of the manor of Hampstead, has given a site for a new church about 300 yards beyond the Swiss Cottage, on the Finchley-road. It will be dedicated to the Holy Trinity.

DERBY AND ITS BUILDING TRADE.

As an old county town, Derby displays no mean share of the art of the builder and the cunning of the architect. A great deal of its modern progress may be attributed to its being chosen as the depot of the Midland Railway Company. The company may be said to have been the chief projectors of St. Andrew's new church, which was, a few years ago, built, from designs by Mr. Scott, at a cost of about 12,000*l.* The convenient hotel which bears the company's name and the railway station, 1,050 ft. in length, all show forth the results of the formation of such companies. In addition to the station, the workshops, buildings, &c. (some of which are 200 ft. in length), are numerous. The company's engine-house is a sixteen-sided polygon building, 134 ft. across, with a conical roof, and is in every way adapted to the vast locomotive power it covers. The London and North-Western, it may be stated, is just now engaged in building a large goods station, in order to more efficiently provide for its traffic.

In the town itself several buildings for business purposes are just now being erected, which show a considerable improvement both in style and finish on those which still survive the march of progress around. They are chiefly shops, and are built of brick, with stone carvings, which give them a clean and somewhat picturesque appearance. Amongst its more recent erections may be mentioned the new market-hall of 1864 and the town-hall, which was restored in 1842 with a rustic base, carvings in relief, and clock tower.

As to church architecture, the town is by no means despicable. The Church of All Saints, the tower of which owes its date to the reign of Henry VII., is noble. It is built in a rich florid Gothic style, with pinnacles and buttresses, and possesses a very striking appearance. The St. Alkmund's New Church has also a spire, 205 ft. in height; as have also the St. Andrew's and the St. Mary's Roman Catholic Church. Derby has its county asylum; its large and commodious infirmary, established so long ago as 1806; its county prison; its mechanics' institute; and its Arboretum, all of which have special claims.

Mr. Bass, M.P. for Derby, who recently purchased and presented to that town a recreation ground, at a cost of 5,000*l.*, has announced his intention of providing, at his own expense, free public baths. It is referred to the Local Estates Committee to obtain plans and tenders for the construction of the baths.

"ON FORCE AND MOTION."

Sir,—Your correspondent, Mr. J. Kipling, says there can be no motion without force, but I say there can be no force without motion. If this be true, what becomes of his argument? M. D. A.

SURVEY OF AYLESBURY.

Sir,—A short time since an advertisement was inserted in your columns for tenders for a survey and map of Aylesbury; and, as no official notification has been sent on the matter, perhaps it may interest some competitors to know that a tender of 15*l.* has been accepted. As, to my own knowledge, this is not the lowest by some two or three at least, I should like to call the attention of your readers to it. I think architectural competitions are very unbecomingly at times, but there is a slight excuse where *facts* are involved; but I think such proceedings as these, viz., to invite tenders for a survey, and then leave the competitors in the ignorance of the matter of the decision, and select the tender without regard at all to lower competitors, is, to use a common phrase, rather a "shady" proceeding. If the Aylesbury Local Board, or any one else, has a reference to a particular surveyor, it seems somewhat at odd times to put several others to the trouble and expense of giving an estimate for no purpose. C. E.

STAIN FOR FLOORS.

Sir,—Can any of your readers oblige me by informing me of the best permanent stain for the margins of bedroom or other boarded floors? I have never found in my experience any method of staining floors which was not speedily disfigured by the traffic to which they are ordinarily subject. If any one else has been more fortunate, I should be grateful for his assistance and advice. E. I. B.

TREATMENT OF BUILDERS.

Sir,—I shall be much obliged if you will inform me in the *Builder*, if I can make any demand of the trustees of the Primitive Chapel here (Whitstable). They had advertised for tenders, in our local paper, for alterations and building a new gallery, not reserving themselves any right of rejecting any tender. Four estimates were sent in, and the lowest man would not accept it, as he had a mistake of 10*l.* in his estimate, mine was the second tender. In a few days after I received an invitation to tender for it again, with a small addition of extra work to the extent of 10*l.* I wrote then, declining to send another; when the principal called on me, wishing me to alter my decision, and send in again, and they would keep it open until the following Wednesday; which I did, and mine was the lowest tender; but still they gave the work to the highest; so I should feel obliged to you for the information, as I consider I am very badly treated. I should not have thought anything of it if they had reserved the right of rejecting any tender.

J. LAWSON, Jun.
* * If the circumstances be as stated, our correspondent would doubtless be able to recover his expenses.

YOUR LIFE: OBSCURE.

Sir,—Long usage has made us familiar with a ridiculous sentence. *Literati*, presenting a biography of somebody, announce to the world that the life of him is just out; the Life of Julius Caesar is only 7*6* *ed.*; penny periodicals inform "Young Gentlemen of Great Britain" that on purchasing the *Life* of Jonathan Wild they will be presented with the *Life* of Jack Sheppard; or that Oliver Cromwell's can be had in parts. Surely, if we wish for the biography of a man deceased, we do not desire to take his life. R. T.

WASTEWATER.

BLACK was its face with depth; the fitful winds,
That fain would kiss its sultriness away,
Withdrew rebuffed; and somehow I was 'ware
Of phantom shapes that rose above with sobs,
Ehaded, and sank again. Each vision mine,
As at day's close I came, sudden at end
Of an e'er-arching grove, upon my quest,
The gloomy mere. The arid Scree, whose steep
Rise sheer above, whereon no herbage grows,
Nor foot can stand, reverberate the noise
Of luckless stones that plunge and seek their doom.
Yon lonely osman, like a spectre, dips,
And cleaves a trackless way, O'er level moss,
Morass, and long dark grass, the mountain cones,
Like giant warders at the head, do keep
The passes of the land, to human foot
Forbidden under peril, where abides
Some dreaded Genius hateful of our race.
The lurid radiance of the setting sun
Unwelcome gleams on these upland peaks,
Whose sides are dim, and whose ravines are dark.
Never saw I a natural aspect
So menacing and stern. It surely hides
Some untold horror. — I know it now;
It is that ominous and forbidding tract
Through which Childe Roland to the Dark Tower came."

JAMES HIBBERT.

CHURCH-BUILDING NEWS.

Worcester.—St. Andrew's Church will be reopened during the second week of September. The funds collected for its restoration being insufficient to complete the whole, a portion only of the work has been carried out. The south chapel has been rebuilt in the style of the fifteenth century. It has a moulded plinth, two two-light Perpendicular traceried windows, a doorway having a four-centered arch, the outer mouldings formed into a square, and the spandrels filled in with tracery. At the termination of the labels are two carved heads. The door is of oak, with tracery and ornamental iron hinges. A pierced quatrefoil parapet extends along the whole south facade of the chapel, and at the western end is a buttress with a detached pinnacle rising from the weather-table. The upper portion of the buttress, which rises above the pierced parapet, is formed into an octagon, and terminates with a crocketed pinnacle. A new roof, having oak ribs and carved bosses, has been substituted for the old decayed one. The north chapel and north aisle have been rebuilt in the same style, and the old oak roofs restored. The south chapel is now lighted by means of two four-light Perpendicular traceried windows, and the north aisle by means of four two-light windows, alternating one with the other, without cusping to the tracery. Those without tracery are taken from the remains of an old example in the church. New floors have been laid to the south chapel, and also to the north chapel and

aisle, and the passage to the latter paved with Godwin's encaustic tiles. The work has been done by Mr. Warner, builder, under the superintendence of Mr. Hopkins, architect. The restoration of the chancel, the nave, and tower, and the south aisle, and the new fittings to the whole of the church, still remain to be done, and the committee are only waiting for means to proceed still further with the restoration.

Bolton.—The new church of St. Bartholomew, Westhoughton, which has been re-erected by Mr. John Seddon, at a cost of about 6,000*l.*, has been consecrated by the Bishop of Manchester. The building has been designed by Messrs. Canliffe & Freeman, of Bolton, and is capable of accommodating 831 persons, the east window, by Messrs. Clayton & Bell, of London, has been erected by the parishioners in commemoration of the liberality of Mr. Seddon. Its cost was about 300*l.* A peal of bells has been presented to the church by Mr. E. Haddock, one of the wardens.

Swanscomb.—A vestry meeting has been held to consider the question of enlarging and restoring the parish church. The rector occupied the chair. The chairman said the amount required was about 1,000*l.*, but the subscriptions already gathered in were only 92*l.* 0*s.* 1*d.* The expense of repairing the chancel would have to be borne by himself, and would amount to 200*l.* The church was one of the oldest in the kingdom, the main body having been built in 1150, and the steeple probably two centuries earlier. It was four hundred years since the last restoration of the church, and it would be a great disgrace if things continued in the state in which they now were. A resolution was passed unanimously that the work be done.

Alston.—The new church which has for some months been in course of erection at Alston, has been opened for divine service by the Bishop of Durham. The edifice is not yet complete, the gas and warming apparatus being still required, as well as some minor matters in the interior ornamentation. The most important deficiency is the tower. As yet this has only been raised a height of 30 ft., but the plan is for it to be 55 ft. high, and topped with a spire of 60 ft. These arrangements will be carried out as funds allow. The church occupies almost the same site as the old one, and while the workmen were engaged in digging the foundation they discovered the foundation of the original church that was erected in the eleventh century. The upturned stones bore traces of carving and decoration. The present church is built in the style of the thirteenth century, and consists of a nave, south aisle, chancel, and transept, the latter forming the vestry and organ-chamber. White sandstone has been used in all the walls and partitions. The columns dividing the aisle from the nave are of polished granite from the well-known quarries at Shap; and the pillars in the chancel arch and in the screen dividing the chancel from the transept are of Frosterley marble, from Weardale. The building is well lighted on all sides. The oriel window is a four-light, with some simple tracery above, and in the west is a large circular subdivided window. Side lights are in the chancel, and in the nave are large two-light windows, a clearestory being above at both sides. All the windows are of plain glass, except one. This is a two-light stained glass window, one compartment of which represents the Last Supper, and the other the Baptism of Jesus in the Jordan by John the Baptist. An ornamental screen of wrought iron is intended to divide the transept from the chancel, and on this will be fixed a system of gas-burners, while the same will be done at the other side. The rest of the church will be lighted by means of three gas stars in the nave, and two in the aisle; and the apparatus will be provided by Messrs. Walker & Emley, of Newcastle-on-Tyne. The warming apparatus will be supplied by Messrs. Combe & Son, of Glasgow. The sittings, which will accommodate about 420, are of varnished deal, and were supplied by the contractors, Messrs. C. & J. Armstrong, of Carlisle, builders, by whom the whole of the work has been executed, under the immediate superintendence of Mr. J. W. Walton, of London, architect. Mr. Maby, of London, sculptor, carved the pulpit and font. The whole cost of the church, including the tower and spire, is estimated at nearly 5,000*l.* One-tenth of the whole sum up to 5,000*l.* expended is to be defrayed by Mr. Thomas Wilson, of Shofley, and the sum now subscribed is about 2,800*l.* This sum will require to be increased by 800*l.* before the expense of the church, irrespective of the

* "Childe Roland to the Dark Tower came;
His word was still — I know it now;
It is that ominous and forbidding tract
Through which Childe Roland to the Dark Tower came."

See Robert Browning's remarkable poem upon it.
— *Fragment in King Lear.*

tower, can be defrayed. Subscriptions for the new church were at first set on foot by Mrs. Salvin, wife of the late vicar, who gave 200*l.* towards the object in view, and the Lords of the Admiralty, who are patrons of the living, gave 500*l.* Parishioners and others have subscribed very liberally.

Stoke Poges.—The chapel of ease at Holly Bush Hill, in this parish, has been re-opened after an enlargement and restoration. The chapel was originally built for and used by Dissenters; but some little while before the death of the late vicar, the Rev. John Shaw, it was found by them so unnecessary, that the owners offered it to him for purchase, and it was forthwith bought, and licensed, and used for evening services in its original state. Soon after the present vicar succeeded to the living the building was considerably enlarged, and open seats substituted for the former pews; but the work of the last few weeks has changed the character and appearance of the original Dissenting Chapel. A chancel, with triple lancet windows, has been added, a new open wooden roof has been raised upon the old walls, a west window inserted, an entrance-porch built, and a bell-turret erected. The entire work has been executed by Messrs. Knight & Sons, builders, Stoke Common.

Little Cowarne.—The parish church of Little Cowarne has been re-opened, after restoration. The church, which is of very ancient date, and is united to the living of Ullingswick, consisted, prior to its restoration, of nave and chancel, with western tower, which, if it had ever been carried up at all, had been reduced, at some time longer ago than memory goes, to the level of the nave. The rafters of the roof of the nave were so decayed that the easternmost half, for about 17 ft., had been taken off quite short, and put on at a lower pitch, which gave the church the appearance somewhat of consisting of three short chancels, the western portion of the nave being the highest, the remainder something lower, and the chancel roof lower still. The nave was a thirteenth-century building, but all the windows excepting one had given way to square openings, the original dressings having probably been built into the nearest wall. No trace, however, was left of them so far as was visible, though when the wall came to be pulled down the workmen came upon the portion of the head of a window, which established the fact at once,—that the building was of the thirteenth century. The chancel was probably of even an earlier date than that. There was, at any rate, a small lancet window on the north side—and still is—which is early Norman, though whether it occupies its original position or not is questionable. The entire building being in a ruinous condition, its restoration was contemplated as long ago as ten years, Mr. F. R. Kempson, architect, of Hereford, having been employed to survey the church and to prepare plans for its restoration in 1860. But nothing was done for a long while from the difficulty of raising funds. At last it became peremptorily necessary that something should be done, the roof or greater part of it having fallen in. The matter was then taken up again, and the modest renovation which has now been carried out was resolved upon. This consists of the entire rebuilding of the east and south walls of the chancel, and the rebuilding in part of the south wall of the nave, the opening out of the chancel, which was formerly separated from the nave by a very small and insignificant arch, and the substitution in place of the latter of a lofty arch nearly the entire width of the chancel. The tower also has been thrown open to the nave, and is divided from it by an arch corresponding in height and of nearly the same width as the tower itself. The latter has likewise been raised about 10 ft., and is surmounted by a saddle-back roof, having transverse gables on the north and south sides, in which belfry windows, with stone louvres, have been inserted. The windows on the north and south sides of the chancel, the lancet window on the north side of the nave, the porch doorway, and the west window of the tower have all been preserved. A new three-light east window has been placed in the chancel and new windows are also introduced on the south side of the nave in character with the architecture of the period. The floor throughout have been laid with encaustic tiles of plain pattern from Mr. Godwin's manufactory at Lugwardine. The roofs are new, and are of red pine-wood; and the chancel has been fitted temporarily with deal seats and book-desks. Owing to the paucity

of the funds there are no permanent benches or pews, the accommodation being met for the nonce by chairs and stools and a few very ancient benches, which must have been so used in the church for centuries. Neither, for the same reason, is there any pulpit—only a lectern, which is made to serve the same purpose. The work has been carried out by Messrs. Morris & Bilton, of Ocle Pritchard, the architect being Mr. F. R. Kempson, of Hereford and London. The actual cost of the restoration is 500*l.*, of which sum 300*l.* have been raised.

Hadleigh.—Many hundreds of pounds have been expended within the last few years in restoring the exterior and interior of the parish church, and an effort is now being made to substitute open benches for the present high pews. The rector (the Rev. R. T. Wheeler), presided recently at a public meeting in the town-hall, to which all classes were invited. Mr. Wheeler stated that his curate's brother, Mr. Valpy, an architect, had that day kindly surveyed the church, and taken great trouble in making a report, which showed that the cost of the work necessary to be done would be somewhere about 1,100*l.* He announced that the Rev. Hugh Pigot, a curate at Hadleigh, had promised to present the church with a new pulpit, in memory of the late rector, the Very Rev. H. B. Knox. He concluded by stating that he should head the subscription list with a donation of one hundred guineas, an example which was immediately followed by Mr. Joseph Rand. Mr. William Grimwade put his name down for fifty guineas, and Mr. Robinson followed with a similar amount. Mr. Hardacre gave thirty guineas, and then followed numerous smaller sums, the total amount promised at the meeting being 665*l.* 18*s.* 6*d.* Mr. Wheeler invited ladies to take subscription cards, 137 of which were distributed. Letters were read from Col. Anstruther and Sir C. R. Rowley, expressing their readiness to add their names to the subscription list. The amount now subscribed is between 700*l.* and 800*l.*

Llanerfyl (Montgomeryshire).—The parish church of St. Eryl has been re-opened, having been re-built on the old site. The new church consists of nave and chancel, western bell-turret, vestry, and south porch. The old nave roof has been restored and refixed, and the font repaired and provided with a cover. Messrs. Maw & Co.'s encaustic and enamelled tiles have been used for the reredos and floor within the altar-rail. The open seats are of pitch pine. The chancel stalls, pulpit, lectern, and other fittings of oak are from the old church. The west window is filled with stained glass by Messrs. Dons & Davies. Accommodation is provided for about 200 persons. The total cost of the building is 1,500*l.*, and the work has been executed by Mr. Morgan, of Llanerfyl Caereinion, from the designs of Mr. E. Haycock, jun., architect, Shrewsbury.

Little Marcle.—The new church dedicated to St. Michael, at Little Marcle, has been consecrated by the Bishop of Hereford. The body of the church consists simply of nave and chancel, after the manner of many of our small mountain churches; it has the additions, however, of a north porch and small vestry on the same side, and of an organ-chamber on the south side, as well as a bell-turret at the west end, containing three small bells. The style is Geometrical. The edifice is built of native red sand-stone, with Bath-stone dressings, the former, as well as the site, being the gift of Earl Somers, the stone, which is hard and durable, being quarried at Fixley, not far off. The architect has treated the building freely with Bath stone. The nave is 41 ft. long by 20 ft. 9 in. wide internally, the chancel being 20 ft. 3 in. in length, and narrowed to 18 ft. wide; the division between the two being effected by a pointed arch, carried upon circular shafts resting upon carved corbels. The roof of the organ-chamber is arched on the inside, and the vestry has an external doorway, fireplace, and window on the east side. The benches are of red deal, varnished, the chancel fittings being of oak, and the floor throughout is laid with Lugwardine blue and red tiles, laid in square. The several windows are glazed in alternate diagonal lines of white and green-tinted cathedral glass; but figured glass windows, the gift of the Rev. Osborne Gordon, rector of East Hampstead, Berks, are being prepared. The roofs are covered with Broseley tiles of red and blue. The whole work is executed by Messrs. Wall & Hook, of Brinscombe, near Stroud (who also carried out the restoration of the church at Preston, in this immediate neighbourhood), under the direction of Mr. J. W. Huggall, of Oxford, the architect.

Thetford.—St. Peter's Church has been under restoration for the last few weeks, and is now re-opened. The restoration and re-arrangement have been entirely confined to the interior. At the east end, the floor of the sanctuary has been raised two steps, space not allowing of more, and a modern door filled up which formerly opened almost on the altar-rails. The new floor and risers are laid with Minton's tiles. On the south side a carved oak sedilia is placed, and a carved oak credence-table, picked out with gold, on the north side. On this side a difficulty arose, owing to one of the aisle arches coming within a few feet of the east wall, and consequently leaving some portion of the sanctuary open on that side. The architect, however, has got over this difficulty by a little low screen of oak, studded with Medieval diapera painted in the oak panelling. The walls both north and south are decorated with borders, texts, and symbolic devices. The sanctuary is shut off from the chancel by an oak rail, supported on standards. The east window was presented by Mr. S. C. Bidwell, also the cost of the painting above it. The tracery of the window is a design in the Perpendicular style. The glass which fills it is by Messrs. Ward & Hughes, of London. The upper part of the window is filled in with figured painting. The four lower compartments are filled with simple painted quarries. The church throughout, *i.e.*, chancel, nave, and aisles, has been re-arranged, and is now filled with open benches of varnished deal. In the chancel, where the choir sit, the seats have more elaborate bench ends, and have small sunk circles filled in with tracery of various patterns, and picked out with green and red. The front rows of seats have desks supported on iron standards, supplied by Messrs. Hart, who also supplied the new gas standards throughout. The carved oak lectern, executed by Messrs. Frank Smith & Son, of London, from a design by the architect, has been purchased with money collected by a lady. The large gallery at the west end of the church still remains, as the want of funds have alone prevented its removal. It contains the organ. Nearly thirty sittings have been gained in the body of the church by the new arrangement. The whole work has been carried out from the drawings of Mr. A. E. Brown, of London. The contractors are Messrs. C. Bishop & Son, of Diss, and Mr. R. Cornish, of North Walsham. The whole of the painted decorations have been executed from the designs and under the immediate superintendence of the architect by Messrs. King, of Norwich.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Holloway.—The "Church of the Sacred Heart," in Eden-grove, has been opened for divine service. It is in the Early Geometric Gothic style, and consists of a nave and chancel, together about 90 ft. long, with north and south aisles terminating in chapels dedicated to our Lady and St. Joseph. The westernmost bay of the north aisle is occupied by the tower, which is at present only partially completed. The structure is of brick throughout, the internal facings of the walls being lined with red bricks, relieved with bands of black, and stone dressings. The reredos and high altar will be of Caen stone and marble, and will contain statues of St. John and St. Margaret, with other sculpture in panels. The stained glass in the east window above, for which a design has been prepared by Messrs. Hardman, of Birmingham, under the direction of the architect, will be devoted to subjects illustrative of "the devotion of the Sacred Heart." The main columns of the nave and chancel arcades are of blue pennant stone, with floriated capitals, carved by Messrs. Farver & Brindley, at the expense of a member of the congregation (Mr. Holland), who made the cost of the internal carving a special gift, in addition to his other subscription. Attached to the church and sacristy there are boys' girls', and infants' schools, with class-rooms adjoining, capable of receiving over 200 children, and a clergy-house containing accommodation for the pastor (Rev. C. J. Keene) and other two priests; while, in the basement, besides other rooms, there is a large kitchen from which it is intended to dispense soup and other necessities to the poor during the winter months. The architect is Mr. F. H. Pownall, of London; and the works have been carried out under contract, by Messrs. Carter, of Holloway-road, builders (Mr. Jarvis

ting as clerk of the works), at a cost of between £500. and 7,000l. The buildings form an effective group, facing the end of Eden-grove.

Stanningfield.—A new chapel has been opened here. Sir Edward Gage has erected, at his own expense, the chapel and school-room for the use of the Roman Catholics in this and the surrounding parishes. The chapel, built at the north end of the pastor's house, and in a line with it, is a plain little building. On the east side is a porch by which the chapel is entered, hile on the opposite side, at the southern end, the sacristy door, from which there is a private passage into the dwelling-house. Inside the chapel is as plain and unpretending as it is externally, but the state of the walls, which are not yet dry, prevents any attempt for the present of permanent decoration. It is lighted on each side by three two-light windows, while at the north end is a larger one of three lights, the altar being erected at the opposite end. The materials are the same as those used in the chapel at the hall, brought thence to do service here. The school-room, which stands just beyond the chapel, built of wood, its dimensions being 30 ft. by 2 ft., and it will afford ample accommodation for the children generally attending it,—about thirty in number. The whole of the work has been executed by Mr. Fate, of Lawshall.

SCHOOL-BUILDING NEWS.

Sancton.—The foundation stone of Jackson's Memorial Schools has been laid in the village of Sancton, near Market Weighton. The new schools are to be erected on the site of the old one, on ground immediately adjoining the churchyard, from the designs of Mr. Charles Holt, of Bolton-le-Moors, architect (brother of the vicar), and are estimated to cost nearly £500. Mr. John Porritt is the contractor for the woodwork, and Mr. Harland, of Newbald, for the masonry. The structure will be 70 ft. in length built principally of stone, and consist of school-room 50 ft. by 20 ft., a class-room, 20 ft. square, with offices and porch. The school is one of a group of five in the district, in connexion with the National Society, is under Government inspection, and is one of those towards the support of which Miss Burdett Coutts liberally subscribes. Although avowedly a church school, the conscientious scruples of the parents are regarded, the principle of a conscience clause being recognised.

Chester.—The corner-stone of new British schools has been laid here by the Hon. Norman Grosvenor, M.P., for the Marquis of Westminster. The site selected is near the school premises at present occupied in Windmill-lane. The building which will be Gothic in style, and occupy three sides of a quadrangle, presenting the inner side as a front, will be a brick one, with ornamental dressings. It will consist of two stories, with a height of 14 ft. to each, and an entire flight from the ground line to the ridge of 38 ft. In the ground floor there will be a girls' school-room, 69 ft. 2 in. long by 18 ft. wide, and a separate class-room projecting towards the front at the northern end, 13 ft. 7 in. by 12 ft. 2 in.; while the angle at the opposite end will be formed by the infants' school-room, 34 ft. 8 in. by 18 ft. There are separate entrances for girls and boys, by means of a lobby at this end of the building; and the boys will have to ascend a staircase to reach their schoolroom on the upper floor, which is 78 ft. by 18 ft., exclusive of the wing of 18 ft. by 16 ft. 6 in. extending over the infant-school and entrance to the girls' school; and there is also a class-room at the opposite end corresponding in size to the one below. Internally, the school will be lined up to a height of 5 ft. with glazed tiles, and the brickwork above whitewashed. The rooms will be well lighted, and ventilation obtained by sashes in the upper part of the windows, so as to avoid draughts. The architect is Mr. T. M. Lockwood.

Chester. The builder is Mr. Ray, of Nantwich. The buildings will accommodate about 100 children in the three schools, for boys, girls, and infants.

Wheolock (Cheshire).—New national schools, comprising separate boys', girls', and infants' schools, are about to be erected here, on land given for the purpose by Sir Charles Shakerly, Bart., who is also a principal contributor to the erection of the schools. The plans have been approved by the Privy Council. Mr. Sugden, Leek, is the architect.

Leicester.—St. George's new school-rooms are now erected, and opened. Messrs. Millican

& Smith, architects, gave their services gratuitously in designing and carrying them out. The building is situate in Colton-street. The Decorated style is adopted, though the building is somewhat plain. The red Leicester bricks are used, with Bath-stone traceries to the windows, and copings to the gables, the principal of which are surmounted with ornamental ventilating turrets, also in Bath stone. The shafts to the doorways are in red Mansfield stone, from the quarries of Mr. Robert Lindley. In the embattled gable of the entrance, next Colton-street, there is a sculptured effigy of St. George and the Dragon, which, together with the masonry and the carvings, was executed by Mr. John Barratt, of the Humberstone-road. The contractors for the building were Messrs. J. Hutchinson & Son. The interior is very simple and plain; the wall is painted several yards high, and above is limewashed. There are three rooms—the infants', girls, and boys—the first named projecting from the other rooms. The boys' and girls' rooms are about the same size, but the other room is much smaller. The cost of the building is something over 2,000l., of which there are about 300l. to raise.

Dorchester.—The new school buildings of the Dorset County School Company have been opened. The building is in the Venetian style. The principal façade, facing the south-east, consists of a centre pavilion of three stories, side wings, and end pavilions of two stories. The head-master's residence, the school department, and the domestic offices are designed to be entirely separated, and yet so arranged that they are convenient to each other, and that the head-master has control over the whole building. The head-master's residence occupies the east end. The principal or school entrance is in the centre pavilion, marked by a projecting hood, carried on stone corbels. The entrance hall is ornamentally treated with white and red bricks and stained woodwork. Right and left open out corridors. In the rear and central with its entrance door facing the principal entrance, is a dining-hall 70 ft. by 28 ft., lit with windows on each side, and at one end the room is also finished with white bricks, with a sufficient amount of red bricks to give an ornamental appearance. The corridor on the left of entrance communicates with the school department, consisting of three large class-rooms, a school-room, lavatory, box-room, &c.; and on the right of the entrance the master's private rooms are in front of the building, and the kitchen and various offices at the back. A door at the end of this corridor communicates with the head-master's residence. This residence has a distinct and separate entrance opening on to an entrance-hall, communicating with dining, drawing, and visitors' rooms. A stone staircase communicates with the bed-rooms on the first floor. A wing running north from the east and at the back of the master's residence contains various offices. There is placed the tradesmen's entrance, matron's room and matron's store, larders, cellars, and laundry, with drying closet and fittings complete. A stone staircase on the right of the main entrance leads to the boys' dormitories on the first floor, ten in number, with masters' bed-rooms. In the central portion on the second floor is a large dormitory for junior boys, also with a master's bed-room overlooking it. There is also a room fitted up with baths, and a wardrobe room with separate divisions for the clothes of each boy, the whole heated by hot water. In communication with the matron's department, and isolated from the main portions of the building, is an infirmary. The building is supplied by water from the works at Dorchester. Generally the heating will be by open fires in the various rooms, but the dining-hall and drying-room in the laundry will be warmed on the Rev. H. Moule's patent principle. Closets and urinals for the boys are provided in the playground, and are fitted up on the same patent's earth system. The façades are faced with white Poole bricks, relieved with red in bands and arches, with Bath stone dressings. The roofs are covered with slate. The gratings were supplied by Mr. John Galpin, of Dorchester, who also fitted up the range and hot-water supply. The present building is calculated to accommodate 150 boys. The dining-hall will for the present be used as a chapel. The grounds consist of ten acres of land, a portion of which has been laid out for a kitchen garden, the remaining portion being set apart for cricket and recreation-ground for the boys. The designs were prepared and carried out under the personal superintendence of Mr. G. R. Crick-

may, of Weymouth. Mr. Gregory was the builder, Mr. Gorard being clerk of the works and Mr. Chapman foreman. The original contract was accepted by Mr. Gregory at 4,243l. The site is on the Charnminster-road, about a mile from Dorchester, and above the village of Burton.

Colchester.—At Myland it is intended to have new schools erected from designs by Mr. E. C. Hakewill, of London, architect, at a cost of nearly 1,000l. Mr. Joseph Grimes, who will build the schools, has purchased the material of the old church and will use up a portion of the same in their erection. The site is on an eminence adjoining the present church, and near the village. It is the gift of the Countess Cowper. The buildings will include separate schools for grown children and infants, and residence for teacher, and will be constructed of stone rubble.

Much Deuchurch, Herefordshire.—New schools have been opened here by the Lord Bishop of the diocese. The schools have been erected by Mr. J. Rankin, the owner of Bryngwyn, at his sole expense, for the benefit of the children of the parish. The architecture is Gothic, and the work has been successfully accomplished, from the design of Mr. F. R. Kempson, of Hereford, by the contractors, Messrs. Coleman & Son. The woodwork is of pitch pine, with the exception of the flooring, which is of oak. The stone carving was the work of Mr. J. Welsh, Jan., of Hereford. The opening of the schools was also made the occasion for the holding of the harvest thanksgiving services.

Bristol.—The corner stone of new Day and Sunday Schools, in connexion with St. Thomas's Church, Cropper-lane, has been laid by Mrs. F. S. Powell, of Horton Hall. The schools are to accommodate 700 scholars; and the estimated cost, including the value of the site, is 3,300l. Towards this amount about 2,700l. have been promised.

PROVINCIAL.

Market Drayton.—An addition to the few buildings in the town boasting of any pretensions to architecture has just been made in the erection of a New Bank and premises, in Cheshire-street, by the Manchester and Liverpool District Banking Company. The building is a detached block, situate on a plot of land bounded on the east side by Bell-lane and on the west by Cheshire-street. The building is of Gothic character, of red stone and yellowish brick, and is seen from all sides. The architects in designing the building have made each front equally good in detail. The building is two stories high, covered by a high-pitched slated roof, with ornamental finials. Under the eaves is an enriched cornice of bricks, and all the windows have stone quoin dressings. The banking-room is 33 ft. long by 24 ft. wide, and is fitted up with mahogany counters and desks, specially designed to accord with the style of architecture of the building; the space for the public before the counter is ample, and is provided with seats, desks, and a fire-place, and connected with the private room. On the floor level of the bank, and attached thereto, are a fire-proof strong-room, inclosing the safe, a clerk's room, and other conveniences. The manager's house contains entrance-hall, two entertaining-rooms, kitchen, scullery, and bed-rooms, and is fitted up with every modern convenience: there is a private door for the manager between the house and the bank. Between the building and Bell-lane there are a garden, terraces, and lawn; the porches, dwarf walls, gate-piers, and broken outline of the building, and the colours of the materials used, form a combination which harmonises with the old timbered buildings of the town. The boundary walls have been built straight, so as to improve the line of roadway, and a considerable quantity of land has been given to Bell-lane, so as to widen the road. Messrs. Swindells & Little, of Manchester, have been the contractors, and Mr. Harrison, clerk of the works; Mr. Fox, of Market Drayton, has done the plumbing, glazing, and gas-fitting; and Mr. Naylor, cabinet-maker, of Manchester, the bank fittings. The whole of the work has been executed by the several contractors, under the superintendence of Messrs. Barker & Ellis, of Manchester, the architects.

Society of Engineers.—Arrangements have been made for a visit of the members of the society, to the works of the Croydon Irrigation and Farming Company, on Tuesday, the 20th of September.

FROM SCOTLAND.

Edinburgh.—The Prince Consort Memorial, so far at least as the sculptor is concerned, is now approaching completion. The design was one of three submitted in public competition by Mr. John Steell, R.S.A. It consists of what may be generally described as a great pedestal, supporting a colossal equestrian statue of the Prince, and itself enriched with bas-reliefs and subsidiary groups of statuary. The structure, oblong in ground plan, is formed in three stages. The first of these, which presents faces of plain masonry about 4 ft. in height, has at each angle a square projection, designed to support a group of figures. Over this rises the second stage, which is to have its sides covered with quotation, from Prince Albert's published speeches. The third stage, or pedestal proper, is richly moulded and exhibits on each side the bas-relief in bronze illustrative of the Prince's tastes, or of leading events in his life. Under the centre of each bas-relief a group of emblematic objects, suggestive of the Prince's honours and pursuits, will rest on the ledge formed by the projection of the second stage beyond the base of the third. The groups of statuary for which places are provided on the first stage are designed to represent people of all classes in the act of approaching the Prince with looks and gestures of reverence and affection. In accordance with Mr. Steell's expressed wish, the execution of these subsidiary groups was entrusted to other Edinburgh sculptors. That representing the aristocracy was undertaken by Mr. Brodie. The figures standing for the army and navy were assigned to Mr. Clark Stanton. The late Mr. McCallum took the group representing labour; but after accomplishing the greater part of his task, left it to be finished by Mr. Stevenson, who had also allotted to him the figures intended to denote science and literature. Of the four groups, only the one last mentioned now remains to be completed, and that, says our authority, the *Scotsman*, is nearly ready for casting. The other three stand complete in the bronze in Mr. Steell's foundry, where also may be seen the emblematic groups to be placed below the bas-reliefs. Of the bas-reliefs themselves, all designed by Mr. Steell, three are finished. With regard to the equestrian statue, which will of course form the leading feature of the monument, matters are so far advanced that, were the erection of the pedestal fairly commenced, Mr. Steell could easily finish his work within the time required to complete it. Meanwhile, some delay has taken place in respect to the pedestal, in consequence of the resolution adopted about a year ago to substitute Peterhead granite for freestone. Since this decision was come to, Mr. McDonald, of the granite-working firm of McDonald & Leslie, Aberdeen, has been systematically setting aside the largest and finest blocks; so that the monument may show the produce of the Peterhead quarries to best advantage. It will, however, require nearly twelve months to execute the commission for granite work, after the order shall have been given. The date at which the monument shall be finished depends on the time when the pedestal can be definitely ordered. That, again, depends on the raising of the 1,000*l.* or so which are still wanting to make up the extra cost of red granite. It was originally arranged that the monument should be erected in the Queen's Park, but of late a feeling has been gaining ground in favour of a site within the city; and it seems probable that the decision formerly arrived at will be reconsidered. A large proportion of those who take an interest in the question would seem to have a preference for Charlotte-square. One suggestion is, that the monument might be placed at the east side of the square gardens, opposite to the end of George-street, with the horse's head turned to the south.—Workmen have been engaged in placing in Greyfriars Church the sculptures by Mr. Hutchison, R.S.A., in memory of the late Rev. Dr. Lee. The monument in the church is twofold. A medallion, in high relief, of this divine, occupies a niche on the right-hand side of the wall, going towards the pulpit; and a figure, representing the Angel of the Resurrection, has been placed on the opposite side. The medallion and the figure are both of the finest marble. Besides these sculptures, the subscribers to the memorial commissioned Mr. William Brodie, R.S.A., to execute a bust of the rev. doctor, which is to be placed in the library hall of the University, in which Dr. Lee held the Chair of Biblical Criticism; and a suitable stone, with a copy of the medallion will be placed over Dr. Lee's grave in the Grange Cemetery.

Dundee.—Mr. Gilbert Scott, of London, who lately inspected the Old Tower, Dundee, with a view to its restoration, has forwarded a report on the subject to the local committee. A special meeting was called for the purpose of hearing it read. Provost Yeaman occupied the chair. The report stated that the tower was not only one of the noblest in Great Britain, but that the originality of its design and the bold simplicity of its entire ideal, united with its wonderful effectiveness, gave it a very high rank among the works of our great Mediæval architects. He had not been able to meet with any distinct account of its erection, but he supposed it to date from the close of the fourteenth century, when Scottish architecture assumed a very distinctive and national form. He was of opinion that the original termination of the tower was after that of St. Giles's, Edinburgh, the resemblance of the upper stages of the two towers being most marked. The Dundee tower, however, was much the best in design, which led him to think that at Edinburgh must have been of a little later date, and imitated from it. He was unable to discover when the original termination was moved, and the present smooth house substituted. The house, he supposed, was erected as a watch-house, and from its age he was disposed to put it at the time when the fleets of Henry VIII. and Edward VI. made frequent descents upon the east coast of Scotland, and when a lofty point of observation would be important and useful to a large seaport town. The tower, as a whole, he said, was in a substantial condition, but externally it was much decayed. After referring to various details in regard to restoration, Mr. Scott concluded his report by recommending the employment of a thoroughly practical mason and an efficient clerk of works to undertake the necessary work. The cost of restoration would be at least 5,000*l.*, and possibly might exceed that sum. The meeting expressed the opinion that the report was a very valuable one, and resolved to ascertain from the various canvassing committees the amount of the subscriptions obtained. It was calculated that 3,300*l.* had been subscribed; and if, on investigation, this was found to be the case, it was understood that operations at the tower would be immediately begun.

Books Received.

Architectural Iron Constructions. By W. & T. PHILLIPS. 1870.

This little work, the first of a series, ought perhaps rather to be called a "Handybook upon the Use of Wrought Iron," as its object is not so much to propound any new theory, or introduce any new formula, as to methodise and apply in a practical and accessible manner the results and deductions of other larger and more elaborate works on the strength of materials and the theory of strains.

The work, when complete, will consist of five parts. 1. Beams and Girders, the pamphlet before us. 2. Fire-proof Floors. 3. Roofs. 4. Buildings. 5. Bridges.

The first part, now published, commences by comparing the various formulae for timber, pitch beams, cast-iron beams, riveted beams, calling attention to Phillips's Patent, and finally dealing with beams of homogeneous rolled wrought iron. The formulae are quoted *in extenso* in each case, and some examples are given showing the comparative cost, strength for strength, of the different materials. Lattice girders have also a special formula adapted for them and the various advantages attending their use in certain situations are clearly pointed out and illustrated by the plate.

A valuable part of the book will be found on page 17, which contains a table showing the safe distributed load in tons, &c. for clear spans or bearings, from 7 ft. to 40 ft. in the clear, of solid rolled girders, varying in depth from 4 in. to 12 in.

Given the weight to be carried and the bearing in the clear, a reference to this table will at once give the requisite section, large or small, of wrought iron required to do the work, and its weight per foot run.

To the educated and practised engineer the work is no more than a handy book of reference, but we cannot help thinking that, though really a trade book, it embodies in a concise and accessible form information that will be valuable to architects and builders, in regard to its subject matter.

Miscellaneous.

Recreation for the Working Classes.

The prospectus of the People's Garden Company has just been issued. Its patrons are stated to be Lord Lyttelton, Sir Harcourt Johnstone, M.P., Mr. T. Hughes, M.P., Mr. E. Beales, M.A., Dr. Hodgson, Mr. W. B. Carpenter, M.D., F.R.S., and Mr. Henry Solly. The company has been formed, it is remarked, "with the object of securing for its shareholders and members land to be laid out as gardens and recreation grounds in order to afford to the toiling multitudes, irrespective of class or country, healthy, rational, and elevating enjoyment, so necessary now that the extent of building has covered the former vacant spaces of the metropolis, and rendered the dwellings of the people generally so crowded and their surroundings so insalubrious." The prospectus goes on to state that the great object which the company has in view is, that its shareholders and members with their families may enjoy the exhilarating country air, fine music, and such recreation as will tend to the healthful development of body and mind. The company has secured a plot of 50 acres of land beautifully situated, and being the larger portion of Old Oak Common, near Willesden Junction.

The National Education League.—At a recent meeting it was resolved that it is necessary that the organisation of the League should be maintained, both as regards the central office and the branches, for the following, amongst other purposes:—

1. To assist in putting the Education Act in operation so as to secure, as far as possible, the establishment of unsectarian, compulsory, and free schools.
2. To promote amendments in the Act, by converting the permissive into obligatory clauses, and securing the recognition of the principle of religious equality in rate-aided schools.
3. To resist the increase of Parliamentary grants to sectarian schools.
4. To watch the progress of educational legislation with reference to the Irish system.
5. To influence public and Parliamentary opinion by meetings, publications, petitions, and all other available means in favour of a national, unsectarian, compulsory, and free system of education; and with this view to secure the return of members to the House of Commons pledged to support the principles advocated by the League.

The Alexandra Palace and Park.—An effort is being made by Mr. Francis Fuller, of Whitehall gardens, and his friends, to organise a company to purchase the Alexandra Palace, with the view of opening it for the people of North London. It is proposed to form a company for this purpose on the Tontine principle, with a capital of 650,000*l.*, in fully paid-up shares of 20*s.* each, with power to issue debentures bearing interest at 5 per cent. per annum, to the amount of 150,000*l.* if necessary. The shareholders first registered, up to the amount of 500,000*l.*, will be those alone entitled to the ownership of the park, palace, and contents, which it is estimated will be worth, at the close of the Tontine in 1880, about one million and a half sterling. It is a pity that so fine a building as the Alexandra Palace, occupying a most picturesque suburban position, should be allowed to remain idle, when it might be profitably utilised for the purposes of public recreation.

Ancient Winchester.—The Winchester Gas Company have employed a number of men in laying down in the High-street, from the Market-place to the City Cross, an 8-in. main, in lieu of the old 4-in. one. In course of the excavations, which were necessarily carried down several inches deeper than before, the workmen came upon an ancient metalled road, from 3 ft. to 3 ft. 6 in. below the present road. The pitching of this ancient road was visible from time to time as they went along, whenever there had occasion to dig deep enough; and at the entrance or turning to Parchment-street, the road formed of flat stones, similar to our modern crossings. The road thus brought to light is thought to have been the *via alba* of the Romans, and macadamised by them in the same way as the remnant of the Roman road from Winchester to Sarum, which may still be seen branching off from the Romsey-road to Flower Down.

Birmingham and Sir Rowland Hill.—At the Birmingham Exchange the ceremony has taken place of presenting to the members and to the public a marble statue of the late Sir Rowland Hill, who was a native of that town. The statue is of Carrara marble, 6 ft. 9 in. high, and placed on a pedestal 4 ft. in height. The sculptor is Mr. Peter Hollins, of Birmingham.

St. George's, Hanover-square.—The annual report of Dr. Aldia, the Medical Officer of Health, on the sanitary condition of the parish, has been issued in a printed form. It states that—

The total mortality (1839) shows a decrease of 112 as compared with 1838 recorded in 1838-9, representing an annual death-rate of 20 per thousand, instead of 21.3 in the previous year. But deducting the deaths (282), of non-residents at the preceding hospitals, the death-rate now was 16.9 per thousand, which is the lowest that has hitherto been obtained for the whole parish during last fourteen years. The annual death-rate throughout the metropolis, during the same period, was twenty.

the cleansing of the Serpentine, Dr. Aldia says, "a great outcry was made when the operations for emptying the lake first commenced, fearing a few unexpected warm days, but no pressing of fever took place in my district, though situate in its immediate neighbourhood."

Under the Workshops Regulation Act,—

Forty-one establishments were visited against fifty-five of the previous year, and it was necessary to issue notices to the owners against inflicting the same in future,—while thirteen were convicted,—one of the manager of a model establishment, superintended by a committee of ladies of rank, leaving ten of whom there were no grounds for complaint. No more convictions would have occurred, had not young women whose evidence I took been summarily dismissed, in one case, on the day the summons was taken out, so that, without knowing their addresses, I could not be called as witnesses: and, in the other, three witnesses gave either false evidence to me, or committed perjury afterwards in the Police Court, Marlborough-street.

I am sorry to record this case of failure on account of untruth; but, at the same time, it is the only example that has come under my notice. I can, therefore, testify to the general truthfulness of women, who must be sometimes placed in very trying circumstances from intimidation and threats of being dismissed by some of their employers, unless they can be shown to give false evidence.

Gas Purification.—The referees appointed by the Board of Trade have been experimenting on purification of gas, especially from sulphur. In a report, that in regard to purifiers, as well as scrubbers, "the gas in some cases was found to contain more sulphur when it had been purified than when it had been taken from the report. The addition to the purity in one set of experiments (lasting a month) was at the rate of 34 per cent., and in the other set (lasting an equal time) as much as 50 per cent. In another set of experiments, tried on at another gas-factory, the results were simply nil, the gas coming out as it went in. After the gas enters the gasholders, there are further intricacies. The water on which the holder floats absorbs sulphur, ammonia, and phuretted hydrogen from the gas. A hotting sun on the exterior may so warm the metal as to vaporise the filmy coat, and the impurity which is evaporated then "goes off with the gas." Thus the gas will leave the holder in worse state than it entered it, a fact which is known to occur sometimes, though the cause does not seem to have been distinctly appreciated. These curious investigations, and others of a like nature, are still pending. The referees have invented a new description of purifier.

Mechanical Appliances in American Agriculture.—The farmer in the great Northern States is left very much to his own resources when executing many tasks which in our communities are managed by hired help. We find the explanation of the fact that the first reaping-machine was perfected in the United States. The Americans have multiplied their discoveries, many of which, such as the reaping-machine, exhibited in London in 1852, are hardly known here at all. The latest of the kind is an "automatic grader," which cuts, binds, and delivers its sheaves of bundles of grain without wasting labour. A reaping-machine is no novelty, but that that cuts and then binds up the sheaves is something new. According to a Chicago paper, we are aware of grain were cut clean and bound by in two hours and a half. There is virtually no labouring class to denounce machinery as a hindrance to employment, and as a mischievous device to capitalists to grind labour into poverty and misery.

Men and Women of the Age.—Mr. S. C. M. announces for early publication "A Book of Memories of Great Men and Women of the Age," with whom he has been, more or less, personally acquainted; comprising nearly all the literary Celebrities of the present century. It will be extensively illustrated by portraits, birth-places, homes in which they lived, and places in which they were buried.

Condition of Workmen Abroad.—A series of tables, compiled from reports of our Consular Agents abroad, has been issued, from which the following details are extracted. In France agriculture supports more than one-half of the total population of 38,067,064. Commerce and industry support more than one-third. Among the producing population are 10,884 employers in the building trades, and 480,388 workmen. Wages for carpenters are 4s. 9½d. per day; brickmakers, 2s. 9½d. to 4s. 9½d.; masons, 2s. 9½d. to 4s. 4½d.; painters, 4s. 9½d. The rate of wages has risen 25 per cent. since 1853, but the cost of food has risen 50 per cent. since 1855. In Belgium, out of a total population of 4,800,000, there are 1,000,000 men and masters, engaged in agriculture; 156,803 in commerce; and 866,947 in manufactures. Two-fifths of the population are engaged in manual labour. Wages for skilled labourers are stated at 8s. 6d. to 8s. per day; journeyman carpenters and smiths, 1s. 4d. to 1s. 8d.; carpenters on their own account, 4s. to 6s. per day. The workman's food is generally poor, and the houses deplorable. First-rate native work is hardly to be obtained; and every new undertaking is started by foreign money and enterprise. The Belgian workman is noted for producing a cheap article.

Lunatic Asylums in Ireland.—From the nineteenth report on the district, criminal, and private lunatic asylums in Ireland, recently published, it appears, that on the 31st of December in the past year there were in the country 6,316 lunatics in public, and 639 in private asylums, 5 in gaols, 2,907 in poorhouses, 45 in Lucan, supported by Government, and 170 in the Central Asylum; making a total of 10,082 registered lunatics, besides 6,579 living at large with relations or friends. A comparison is made with the numbers recorded in 1860, showing that there is an absolute falling off of 174 in the total number of insane persons in Ireland, and that 2,567 of those at large in 1860 have been absorbed into various asylums. The total number of persons discharged during the year was 1,625, of whom 1,011 are returned as recovered, 471 improved, and 143 unimproved. The total expenditure for the support and maintenance of district asylums for the year was 140,034l., being an increase of 7,506l., as compared with that of the previous year. The Central Asylum now contains 185 beds, an average of 70 men and 36 women being usually employed on industrial work.

Albury.—The building operations at Albury Park being finished, a more frequent residence of the Duke and Duchess of Northumberland there is anticipated. A new billiard-room has been erected, of lofty proportions, and panelled in polished walnut and oak, and with new plate-glass windows on the north and west sides. There is also a new steward's room, a large, but, from its being lighted from the top, a rather gloomy apartment. Various additions and alterations have been made in the cuisine department, and the stabling and coach-houses have been remodelled. Not the least interesting improvement is the fitting of electric bells over the entire house. About 12,000l. have been expended on the improvements. The whole of the work has been carried out under the superintendence of Mr. George Roavell, who, previous to leaving Albury to assume the office of surveyor to the Duke's extensive Northumberland estates, was presented by the principal tradesmen employed on the work with a testimonial, in the shape of a gold watch and chain, of the value of fifty guineas.

Tin Pipes.—The invention of Mr. H. Haines, Liverpool, relates chiefly to a peculiar mode of forming ingots of lead and tin combined. The said compound ingots are formed in moulds by the aid of mandrels or cores, with one metal concentrically within the other; the perfect union of the two metals composing the ingot being insured by the application of muriate of zinc or muriate of tin, or both, to the interior surface of the lead ingot, previously to casting the interior ingot of tin.

The Teign Valley Railway Seizure.—The workmen who seized the plant of the contractor for the Teign Valley railway, after it had been sold by auction under a bill of sale, as security for wages, amounting from 200l. to 300l. due to them, surrendered the property, after a week's possession, on the advice of their solicitor.

Sewage at Hertford: the Town Council.

At the last quarterly meeting of the Hertford Town Council the important question of the disposal of the sewage of the town was brought under their consideration. A report was presented by the sub-committee, in which they recommended irrigation as the only satisfactory way of dealing with the sewage difficulty. A proposal from the Ware Local Board to take the Hertford sewage was considered, but they regarded the terms demanded (400l. a year for twenty-five years) excessive, and were of opinion that the corporation might carry out the works themselves at a smaller outlay; they therefore caused a scheme to be prepared by Mr. Grindle for disposing of the sewage by irrigation upon lands near Gallows Plain.

Statue of the Queen for Liverpool.

Shortly after the erection of the statue of the late Prince Consort, which stands in the open space in front of St. George's Hall, Liverpool, the corporation resolved to erect a companion statue of her Majesty, at a cost of 5,000l., to be also erected in front of the hall, and the work was entrusted to Mr. Thornycroft, under the approval of her Majesty. The statue, which is an equestrian one, and corresponds in size to that of the late Prince Consort, has been executed at the bronze foundry of Messrs. Elkington & Co., of Birmingham. The granite pedestal on which the figure will stand has been finished some time.

A Claim against the ex-Borough Surveyor of Batley.

Recently, Mr. James Wetherill, late Surveyor to the Batley Town Council, was summoned before the local magistrates, to show cause why he refused to pay 1l. 15s. 9d., the cost incurred by the General Works Committee in taking down and rebuilding a portion of a structure erected by him, but which was not in accordance with the plans he had deposited. Mr. Thos. Dean, town clerk, appeared in support of the complaint, which was duly made out, and defendant was ordered to pay the sum claimed and costs within seven days.

A Wheel.

There arrived at West Hartlepool, on Tuesday, a monster fly-wheel, intended for the rolling-mills of Messrs. Richardson & Sons. It measures 22½ ft. in diameter, and 17 in. by 13 in. thickness of rim, and weighs 25 tons 5 cwt. In order to transfer it to West Hartlepool—a thing impossible to attempt on the railway—a special carriage, weighing 7 tons, had to be built for its conveyance, and besides, some chains, of about 4 tons, were employed, making, with the wheel, a total of about 37 tons; and to move this no less than thirty-two horses were used.

The Old Tower, Dundee.

This interesting structure is about to be restored. Mr. Scott, who was called in, reported that he had not been able to meet with any distinct account of its erection, but he supposes it to date from the close of the fourteenth century, when Scottish architecture assumed a very distinctive and national form. The cost of restoration would be at least 5,000l., and possibly might exceed that sum. It is understood that 3,300l. have been already subscribed; and that operations will be soon begun.

The New Home and Colonial Offices.

It is believed that all the tenders delivered on the 15th inst. for the erection of the New Home and Colonial Offices, contained a stipulation that the general conditions of the contract were to be based on those agreed upon, for general adoption, on the 1st of August last, between the Council of the Royal Institute of British Architects and a Committee of London Builders.

Art Journals in Paris.

Should the war unhappily continue another month, there will scarcely be a literary or scientific journal published in Paris. In addition to a previous long list, we hear of the suspension of the *Moniteur des Architectes* and the *Chronique des Arts*.

The Defoe Monument in Bunhill Fields.

The monument which has been erected in Bunhill-fields Cemetery, by the united subscriptions of 1,700 of the boys and girls of England, to the memory of Daniel Defoe, will be uncovered on this Friday, the 16th inst.

Buried Alive.

A tradesman of Penzance has been killed while assisting in excavating ground for the foundations of some houses in the town. A sudden fall of earth covered him, and he died almost as soon as he was dug out.

Unwholesome Filling-up of Excavations at Liverpool.—At a recent meeting of the Toxteth Local Board, Mr. Darsie called the attention of the Board to the practice of filling up excavations where building operations were to be carried on, with ashes from middens, a probable cause of disease. He especially referred to a pit to the rear of Park-grove, about forty yards from the dwelling-houses, from which clay had been taken, and which was being filled up with these ashes. Mr. Hall, the surveyor, said it was one of those things that ought to be stopped at once. Ultimately, it was resolved that the clerk should address a letter to the mayor, asking the corporation to interfere with the further deposit of midden ashes at the place in question.

TENDERS.

For house in Kew-road, for Mr. C. Corben. Mr. George Truefit, architect:—
 Colls & Son.....£1,984 0 0
 Messum.....1,793 0 0
 Carter & Sons.....1,744 0 0
 Williams & Son (accepted).....1,823 0 0

For the removal of St. Peter's iron church from Chippenham-road, Harrow-road, to Fulham, for the Rev. R. C. Cardwell. Mr. W. B. Sargeant, architect:—
 Kent (accepted).....£135 0 0

For the construction of about 3,000 ft. of new road, with drains, &c., at Margate, for the Rev. J. Back and Mr. C. T. Hatfield. Mr. F. Allen Edwards, architect:—
 Hayward.....£3,852 0 0
 Whittick.....2,885 0 0
 Carlisle.....2,883 6 10

For the erection of a new sea-wall, at Margate, for the Rev. J. Back and Mr. C. T. Hatfield. Mr. F. Allen Edwards, architect:—
 Hayward.....£2,623 0 0
 Carlisle.....1,391 15 11
 Whittick.....1,384 0 0

For the town sewerage works, construction of tanks, outfall works, &c., at Cleethorpe, Lincolnshire, for the Sewer authority. Mr. Alfred Edwin Skill, engineer:—
 Acott & Henshaw.....£3,339 9 9
 Hudson.....3,160 0 0
 Hartley & Parkinson.....2,609 9 9
 Cawkwell & Co.....2,083 10 3
 Ryan & Co.....2,143 0 0
 Pearson & Co.....2,820 16 0
 Metcalfe & Sons.....2,800 0 0
 Gregson.....2,698 14 6
 Compand.....2,675 0 0
 Storey & Jagger.....2,683 13 0
 Hayward.....2,643 0 0
 S. & W. Paterson.....2,342 0 0
 Dickson.....2,419 15 4
 Waller.....2,406 0 0
 Pawkes & Sons.....2,374 5 10
 Walker.....2,342 0 0
 Young.....2,240 4 9
 Coker.....2,240 2 0
 Chapman.....2,115 12 6
 J. & A. Brown.....2,052 0 0
 C. Brown.....2,015 16 1/3
 Bancroft (accepted).....1,975 0 0

For finishing villa residences, at Montem-road, Forest-hill. Mr. Robinson, architect:—
 Neate.....£2,814 0 0
 Price.....2,607 0 0
 Capps & Risco.....2,458 0 0
 Warr.....2,282 0 0
 Westall.....2,160 0 0
 Hutchison.....2,050 0 0
 Stanning.....1,904 0 0
 Hurst.....1,972 0 0

For house and shop for Mr. Beall, Westcott. Mr. F. J. Dibble, architect:—
 Lakpe.....£359 0 0
 Lynn & Dudley.....348 0 0
 Taylor & Clear.....340 0 0
 Putney.....316 0 0
 Hamblin.....305 0 0

For the erection of a house, stables, &c., on the Bath-road, Slough, Bucks, for Mr. R. Little. Mr. E. Corfield, architect:—
 Thompson.....£3,000 0 0
 Ruston.....3,121 0 0
 Hollis.....2,923 0 0
 Sargeant.....2,730 0 0
 Russell.....2,595 0 0
 Goodchild.....2,080 0 0

For alterations and additions to 60, Grange-road, Bermondsey, for Miss Hunt. Mr. Nicholas Lake, architect:—
 Kelly.....£445 0 0
 King & Sons.....449 0 0
 Greenwood & Son.....440 0 0
 Ashton.....427 0 0
 Preston.....357 0 0

For laying 4,876 yards of pipe sewer, in the district of Stroud-end, Stroud, Gloucestershire. Mr. W. H. C. Fisher, C.E. surveyor:—
 Clark.....£2,690 0 0
 Savage.....2,938 14 4
 Drew (accepted).....1,850 0 0

For building a cottage residence, for Mr. Burgess, Acton, Middlesex:—
 Black.....£209 0 0
 Walker.....281 0 0
 Thompson & Smith (accepted).....280 0 0

TO CORRESPONDENTS.

G. T. T. C. N. H. R. T. J. H. D. W. A. H. J. H. A. E. W. H. C. J. D. H. T. R. W. M. F. H. J. W. D. R. A. T. C. C. H. T. H. H. F. H. R. F. A. E. W. L. R. P. F. D. T. W. C. G. G. R. W. L. R. D. T. (All the names should be given. Are all the tenders recent?—Define several cases as to "grinding money" have been reported in our pages.)

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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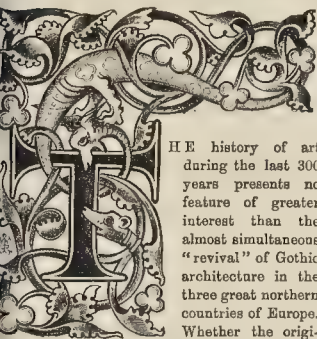
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VOL. XXVIII.—No. 1442.

The Revival of Ecclesiastical Architecture in Holland.



THE history of art during the last 300 years presents no feature of greater interest than the almost simultaneous "revival" of Gothic architecture in the three great northern countries of Europe.

Whether the origination of this movement can be claimed by England or France is disputed. We claim it for England, where the earliest works of great merit erected in the revived style are to be found: still, it must be admitted, that in the study of the art and its history the French were early in the field; and though Germany can lay no claim to having originated the movement, neither England nor France can point to works of such magnitude as the completion of Cologne, Ratisbon, and Speyers Cathedrals. It is now our purpose to lay before our readers an account of the extraordinary revival of ecclesiastical architecture which has, within the last few years, taken place in the little kingdom of Holland. We say that this revival is extraordinary for three reasons: firstly, because Holland is the last country in Europe where we should have thought of looking for anything like enthusiasm about ecclesiastical art; secondly, because the neighbouring kingdom of Belgium, with which Holland was originally united, has done so little in the way of reviving Gothic architecture; and, thirdly, on account of the great number and size of the churches now being erected or recently completed by the Dutch.

Before commencing any description of the numerous works which we shall have to mention in this article, we shall make a few preliminary observations upon the causes which have fostered the revival of Gothic architecture in Holland.

It is asserted that one of the causes which led to the revolt of the Belgian provinces was the jealousy which existed between the Roman Catholics and the Protestants, and that, had the Government of the Netherlands acted with the same spirit of religious liberty and toleration which has since distinguished it, Holland and Belgium might still be under the same king; but the interference of the Government of the Netherlands with the internal affairs of the Roman Catholic Church, more especially in the fair of the Jansenist Archbishop of Utrecht, raised the suspicion and opposition of the whole Roman Catholic party in the country, which, combined with other influences, ultimately led to the separation of 1830, when the southern provinces of the Netherlands, who were entirely Roman Catholic, broke away from the northern Protestant portion of the kingdom.

As at present constituted, the religious parties in Holland are divided as follow:—Protestants

of the Geneva Confession, or Calvinists, number 1,942,387; Roman Catholics, 1,234,486;* Remonstrants, or Arminians, about 100,000; Lutherans, about 50,000. There are about 150,000 Jews; and 8,000 or 9,000 Jansenists. From these few general statistics of the various religions in Holland, our readers will be prepared to hear that the great movement in favour of ecclesiastical architecture is confined almost entirely to the Roman Catholics, as it is not to be expected that the Calvinists would give great countenance or support to such a movement, and the Lutherans and Jansenists are too few, and too scattered, to undertake such a movement; and thus the greater portion of the churches which we shall have to notice are in Limburg and North Brabant, which are (with the exception of the Grand Duchy of Luxemburg) the most completely Roman Catholic portions of the kingdom of Holland. It is necessary before proceeding further that our readers should understand the exact position held by the Roman Catholic Church in Holland. Although there is no State Church in Holland, there are two *Established* churches,—the Calvinist and the Roman Catholic. The clergy of both religions are paid by the State, and certain grants allowed for their schools and keeping their churches in repair. Only enough, however, is allowed for the absolute necessities of religion, i.e., enough to keep the walls of the various buildings from falling, and their roofs weather-tight,—any ornamental works must be carried out by subscriptions made amongst the various congregations; and in the case of new churches, the Government generally, not always, gives a small sum of money to assist the work, if it can be proved to their satisfaction that there is an *absolute necessity* for it, and no difference is made whether it is a Protestant or a Roman Catholic place of worship which is required. In fact, to such an extent is this spirit of religious toleration and equality carried that when the present Pope, in the year 1850, re-established the Roman Catholic hierarchy in Holland, the Dutch Government not only abstained from opposing that measure, but increased the income of those amongst the clergy who were raised to the episcopate, and acknowledged them as the representatives of the Roman Catholic Church, so that all communications between that Church and the Government were carried on through the bishops. Within the last two years a separate "Minister of Worship" has also been appointed by the Government at the Hague. The Roman Catholic Church in Holland now is divided into five bishoprics and one "vicariate." The archbishop is at Utrecht; his arch-diocese comprises the provinces of Utrecht, Guelders, Drenthe, Friesland, and Groningen.

The diocese of Harlem comprises North and South Holland; the diocese of Breda, Zealand and the western portion of North Brabant; and that of Bois-le-Duc, the eastern portion of the same province. The diocese of Roermond is for the duchy of Limburg, and the vicariate of Luxemburg for the duchy of the same name. In the dioceses of Roermond, Bois-le-Duc, and Luxemburg, the ancient churches for the most part belong to the Roman Catholics. In the other portions of Holland they are almost entirely in the hands of the Calvinists. The Roman Catholics also possess the ancient cathedrals of Roermond, Bois-le-Duc (the most beautiful church in Holland, and of which we shall give views in a future number), and Maastricht (where the bishopric has not been restored).

Not only has the revival of Gothic or Ecclesiastical architecture been in the hands of one religious persuasion, but it has also been almost entirely the work of one architect, and he still a young man, Mr. Cnypers, of Amsterdam and Roermond. Before that gentleman began to

build churches, which is not more than twenty years ago, the condition of ecclesiastical architecture in Holland was most deplorable. Gothic architecture was almost unknown for such purposes, and the mongrel Italian style in vogue could not be exceeded for ugliness or unsuitableness to the sacred purposes for which it was required. The examples of this style are very numerous, and some of them, we regret to state, have even been perpetrated within the last eight or ten years.

In order, however, to trace out how this wretched style, which we must call the "Greco-Dutch," came into existence, we must go back to the time of the Reformation in Holland, and trace its development step by step. As will be probably known to our readers, the Reformation in Holland took place half a century later than in England, and thus in Holland we find beautiful examples of early Renaissance work in the churches; such, for instance, as the stalls at Dortrecht, the pulpit at Bois-le-Duc, the side screens at Breda, and the greater portion of the stained glass at Gouda. Not that Gothic architecture ceased to be used, for we find at Gouda, Breda, Delft, and Amsterdam, Gothic work which dates from quite the end of the sixteenth century. The churches built after the Reformation (that is, within the first century after the change of religion) are of a most singular style, a kind of round-arched Gothic, with very clumsy Italian detail. A good example of this style is the (so-called) "Nieuwe Kerk," or new church, at the Hague, an ugly but not unpicturesque building. Very few churches of this date exist in Holland. This singular style was succeeded by regular Italian architecture; but with the tall bulb-shaped spires and turrets, to which the Dutch were so attached, and high-pitched roofs grafted on to it. The Catholic and Protestant churches at Rosendael, the Lutheran church at Maastricht, and several churches at Rotterdam and Amsterdam, are good examples of this style. This kind of architecture lasted down to about the year 1780 or 1790. Spires of this date (between the years 1600 and 1790) are to be found all over Holland. Perhaps the most graceful are those of the cathedrals of Bois-le-Duc and Breda, of the churches at Gouda, Boxtel, and Helvelius, and of the town-halls of Alkmaar and Groningen. All these spires consist of a series of lanterns and bulbs, placed one over the other, crowned at top by a slender pyramidal spire, finishing in a vase or cross.

After the year 1780 or 1790 we find the dome frequently used, and the style becomes more classical. Good examples of churches in this style are the two older Roman Catholic churches at Rotterdam, and the churches of St. James and St. Mary, at Bois-le-Duc. The two latter churches are remarkably clever, and we have rarely seen the internal supports of a dome better arranged. We were, unfortunately, unable to learn either the exact date or the name of the architect who built these two remarkable churches. Out of this pure Italian style by degrees grew the terrible architecture to which we have given the name of the Greco-Dutch. It consists in mixing up the heaviest features of Greek architecture with the fanciful style of ornament which one is accustomed to see upon Dutch clocks. A wonderful example of this detestable style is the Roman Catholic church at Bergen-op-Zoom, the front of which is a regular Dutch clock-case, enlarged. Scarcely less hideous are the churches of St. Peter and the Protestant church at Bois-le-Duc, the Catholic churches at Delft, Breda, and Dortrecht, and we grieve to say this style is not quite abolished even now.

Few examples of the "Brummagem" Gothic are to be found in Holland; in fact, we know of only two or three churches to which this term may be fairly applied. They are the Roman Catholic church at Schedam (the interior of

* These figures are taken from the census of 1865.

which is undergoing great alterations, from the designs of Mr. Cuypers, and will in a short time be really far above reproach; the "New" (Protestant) church at Rotterdam, an abominable octagonal building; and the new church now building by the Jesuits at Maestricht.

The earliest real Gothic church built in Holland was the Redemptorist Church at Amsterdam, from the designs of Mr. Molkenboer, erected between the years 1845 and 1850. It is a poor building, vaulted in plaster, and possessing neither tower nor spire, and not particularly ecclesiastical in arrangement. About fifteen years back Mr. Cuypers commenced his fine church at Wijk (a suburb of Maestricht). This church may be looked upon as the first really satisfactory building of the kind erected in Holland during the "Revival." It is a cruciform building, consisting of a nave and aisles, transepts, a spacious single choir (over 60 ft. long), and a tall western tower, crowned by a slate spire. The whole church is built of brick, with stone dressings sparingly used, and internally the church is vaulted throughout in brick with stone ribs. Its dimensions are as follow:—Entire length, including western tower, 163 ft.; width across transepts, 91 ft.; width of nave and aisles, 61 ft.; height to the vaulting of nave and choir, 62 ft.; height to top of spire, 221 ft. The style chosen is that of the end of the thirteenth century, very simple and plain,—in fact, the exterior, notwithstanding the flying buttresses of the nave, has rather a bare and bald appearance. The tower and spire are excellently designed; but the small *flèche* at the intersection of the transepts and nave is too small, and the pitch of the roof is not high enough. Internally the general effect of the church is very good, and is much helped by the decoration, which is harmonious in colour and well designed. The walls are rather too thin, and the columns want boldness. There is no triforium, and the blank space below the clearstory windows gives an appearance of flatness to the nave of the church. The furniture of this church is all good. The choir is arranged in a Ritualistic manner, with excellently carved stalls on either side, and a lectern in the middle. The altars, have oak retables, well carved and judiciously decorated. All the windows of the nave and transepts are filled with mosaic glass arranged in geometrical patterns, which has a good effect. We cannot, however, say the same for the stained glass in the choir, which is far from satisfactory.

Although Maestricht has the honour of having built the first really satisfactory Gothic church of modern days in Holland, the ecclesiastical works carried out in that city since the erection of the church at Wijk are anything but what we could wish them to be. The new Franciscan church was commenced about eight years ago, and has been very completely carried out. It consists of a nave and aisles of five bays, and a choir the same length. The style chosen is that of the latter part of the fourteenth century. The nave is separated from the choir by a solid stone roof-screen, the centre of which is pierced by a doorway, on each side of which is an altar. The choir has two rows of stalls on each side, a lofty stone "sacraments house," and a very elaborate stone altar. The defects of this church are firstly its sham construction, the vaulting and all the arches being turned in plaster; secondly, the wiryness of its detail; and thirdly, the wretched decoration which disfigures, rather than assists, the architecture. The church was erected from the designs of Mr. Weber, of Roermond.

A third church is now being erected at Maestricht, for the Jesuit order. It consists of a nave and aisles, with an apse at the east end, and three turrets at the west end. Internally, everything is done in plaster, and the whole thing is as bad as possible. The design is by a lay brother of the order, and it is a caution to amateurs not to build without professional assistance.

The Cathedral Church of St. Servais is being excellently restored by Mr. Cuypers; but of this restoration we shall have occasion to speak on a future occasion.

A good church, very similar in plan and general arrangement to that of Wijk has been erected at Maesbracht. The architect is Mr. Cuypers.

At Roermond the Cathedral Church of St. Christopher, a large late fifteenth-century building, is being restored by Mr. Cuypers. The portion of the work at present in course of execution consists of filling all the windows with

mallions and tracery, every vestige of which was destroyed during the last century, at which time also the church was whitewashed, and robbed of as much of its interest as possible.

Another and still more important work of restoration being carried out by the same architect, is the completion and renovation of the beautiful Romanesque Minster Church at Roermond. This building, the most beautiful example of twelfth and thirteenth century architecture in Holland, is, after a lapse of six centuries and a half, being completed by the addition of the four lofty towers contemplated by the original architect. The whole of the interior as well as the exterior is to undergo a careful and complete restoration. The portion of the work already carried out does great credit to the architect; and when we state that all the plans for this work have been signed and approved of by M. Viollet-le-Duc, who was the consulting architect to the work, we need scarcely say that this restoration is highly satisfactory.

As we shall give a view of part of this church, and also a description of it, we shall have occasion again to refer to this restoration. The episcopal seminary at Roermond was erected some years since from the designs of Mr. Weber. It does not add greatly to that gentleman's reputation as an architect.

The restoration of the Roman Catholic Cathedral at Utrecht (formerly the Franciscan Church) has been previously mentioned in our pages. On the whole the work is a satisfactory one. The architect is Mr. Van der Brink, but all the woodwork, stalls, pulpit, altars, &c., were designed and executed by Mr. Engleberger; and the superb decoration, which is by far the cleverest portion of the whole work, was designed and executed under the direction of Mr. Kleinerz, of Aix-la-Chapelle, the talented artist who is now decorating Ste. Maria zu Capitol, at Cologne, and the Cathedral at Aix-la-Chapelle. The great similarity of this decoration to some that we have seen by Mr. Cuypers led us, in our former notice of this church, to attribute the work to that gentleman. The new Catholic Church at Arnheim is also from the designs of Mr. Van der Brink. Although the general effect of the interior of the church is pleasing, the detail shows great ignorance of the true principles of Gothic architecture, and the tower and spire are quite Brummagem.

The magnificent Cathedral Church of St. John at Bois-le-Duc, or s'Hertogen Bosch, as it is called, in Holland, is undergoing a partial restoration, from the designs of Messrs. Hoesmans & Veneman. Although we wish to do all justice to the work of these gentlemen, as we were treated with great courtesy by one of them, we cannot bestow unmitigated praise upon this restoration, and for two reasons—in the first place, we cannot approve of the destruction of the fine Renaissance roof-screen which adorned this church, nor are we satisfied with the restoration of the sculpture in the great north front. However, we shall refer to this on another occasion, when we shall give views and a description of the cathedral.

A new church for the Redemptorist order was erected some six years ago in the same town. The architect was Mr. Van Vaecker. The church consists of a nave and aisles the same height, a short chancel, two side chapels, short transepts, and a lofty *flèche* at the intersection. The style chosen was a mixture of Second and Third Pointed Gothic. We cannot say much in favour of this building. The exterior is too spiky, and the interior is entirely executed in plaster. The whole church is decorated in colour, the effect of which is far from good, and has a dingy appearance, probably caused by the use of stone colour instead of white.

The above-mentioned Church of St. James has been charmingly decorated by Mr. Cuypers. The dome has a kind of conventional colonnade, painted round the lower portion of the drum with figures rather severely treated. There is a great deal of dead white in this decoration, which has a charming effect. There is some stained glass, too, which is not bad in its way. We must continue the subject in another article.

Ragged School, Manchester.—We learn that Lombard-street Ragged School and Working Men's Church is so fully attended that a new building is projected, to accommodate from 600 to 700 scholars. We are glad to hear it; but we recommend a revision of the façade designed. As shown by a lithograph published, it is terribly ugly.

ARCHÆOLOGISTS IN HEREFORD.*

THE Palace at Hereford, where the Bishop and Mrs. Adlay received the British Archaeological Association on the 7th inst., as we briefly mentioned in our last, is a very remarkable building, the greater part being contained within a Norman Hall, of necessarily great size. This size will be tolerably obvious when we say that it now includes a drawing-room, dining-room, entrance-hall (all lofty and grandiose apartments, Modern Italian in style), and the Bishop's own private rooms. It must not be supposed that the Norman building to which this immense hall belonged had many other apartments of corresponding size and dignity. The fact is, as many of our readers know, that a Norman mansion consisted of little more than a hall and a large bedroom or two. In the hall they ate and drank, men and master, the former sleeping there also. *Avia* in old Latin, and modern too, for the matter of that, means a palace and a court. The Saxons called such a building a *heall*, the French a *salle*. Thus, therefore, while in old times one apartment, to speak broadly, was called an *aula*,—a noble residence,—we now call many a noble residence, with many apartments, a Hall. The roofs of these Norman halls were often supported by ranges of wooden pillars. It was the case at Hereford, where there were two ranges, forming it into three aisles, and the ancient roof and Norman capitals of wood may still be studied.

At the meeting in the Palace, the Rev. W. L. Beavan described the

Mapa Mundi,

preserved in Hereford Cathedral, and concerning the approaching publication of which we spoke not long ago. This map has been an object of interest to geographers and antiquaries since the year 1780, when a description of it appeared in Gough's "British Topography." Nothing was known by those who first studied the map either of its connexion with the Cathedral of Hereford or of its date, except what was gathered from internal evidence. Mr. Lelewel, from the style of its penmanship, conceived that it was executed about 1220. M. d'Arveaz, ingeniously comparing the course of historical events in the fourteenth century with the political divisions as indicated in the map in respect to France, Burgundy, and Flanders, concludes its date to have been between 1313 and 1320. English antiquaries (we are following Mr. Beavan) have pronounced the style of writing to belong to the twenty years from 1290 to 1310. But recent researches into cathedral records have fortunately furnished us with sure ground as to its proximate date, and as to its connexion with the cathedral. Richard of Haldingham, having previously held office in Lincoln Cathedral, was endowed with the prebendal stall of Norton in Hereford, and retained his prebend from 1290 to 1310. He was subsequently connected with the chapter of Salisbury, and became Archbishop of Berke. It can hardly be doubted that the map was executed while he was prebendary of Hereford, and the period which is thus defined satisfactorily coincides with the conclusion of the English antiquaries from the style of the work. The map is drawn in accordance with the notion which, with modifications from time to time, was the prevailing one in Christendom for more than seven centuries, from the time of Orosius and St. Augustine, until travellers in distant regions became more numerous, observant, and communicative. The habitable earth is represented as a circular island, with the "ocean stream" flowing round it. Jerusalem is placed in the centre. Asia occupies nearly the whole upper (or Eastern) half of the circle, while Europe holds the lower quarter on the left hand, and Africa that on the right. This arrangement is common to most of the Medieval maps of the world. But the Hereford map is distinguished from the rest by its great size, its elaborate drawing, its illustrations of objects in natural history and of historical facts, and its numerous inscriptions, many of which are of great interest in an archaeological point of view: and it may be regarded as the most complete representation in existence of those speculative notions of our forefathers regarding the earth, which speedily gave way upon the advance of actual geographical knowledge in the fifteenth century. The interest of the map is greatly increased by the decidedly religious character of its chief illustrations. In a sort of

* See pp. 720, 737, ante.

gable over the circular border is a striking and curious representation of the Last Judgment; and in the map itself the eating of the Forbidden Fruit in the Garden of Eden, the Crucifixion on Mount Calvary, and other events in Biblical and ecclesiastical history, are prominently shown. Many of the legends partake of the same character. This fact, together with the peculiar form of the drawings, has furnished ground for a conjecture that it was intended for an altar-piece of one of the chapels of the cathedral. The map, which has formed at various times the subject of numerous essays, is elaborately drawn in colours on vellum, and shows that its author must have been a distinguished calligrapher. But the ravages of time are too perceptible in the work, and some parts can only be deciphered with difficulty. It is obviously desirable that a very correct copy of it should be made while it is still possible to reproduce the colours of the original, as well as the drawing and the writing. A document so important in its bearing, not only on the history of scientific knowledge, but on the legends of the Middle Ages, should not be suffered to perish, and ought to be placed within easy reach of students at home and abroad; and it is therefore proposed to publish a *fac-simile*, executed with the utmost care in coloured lithography, to be accompanied by a photograph of 15 in. in diameter, by which the critical accuracy of the copy may be perfectly tested with the aid of a glass. Letterpress will be added, which will contain all that is known of the author, copies of the whole of the legends in the map with explanations, and a critical examination of the map and of its place in the history of cartography. It is expected that this work will be published about the latter part of the year (1870), and specimens of it, admirably executed under the direction of Mr. G. C. Haddon, architect, of this city, were with the original exhibited.

Mr. Havergal, responding to a request made to him that he would say a few words, wished every one to know that those who had undertaken this work had done so not in the hope of deriving any pecuniary advantage therefrom to themselves, but solely in the hope that they might add something worthy to English literature, and in the wish to do that justice which had never yet been done to the famous Hereford map. Taking occasion, in speaking upon this subject, to refer to the ancient chair of the bishop preserved in the cathedral, Mr. Havergal directed attention to the close similarity between the chair in question and that in which in the *Moyna Mundi* the Pope was seated. The resemblance of the two was so close that he could scarcely see how any one could avoid coming to the conclusion that to have drawn that chair on the map the author must have seen some such one somewhere, and he suggested that that particular one was no other than the old chair at present in the cathedral.

On the same evening a paper on

The Ecclesiastical Statesmen of Hereford,

by Mr. Henry F. Holt, was read, treating especially of Bishop Aquablanca and St. Thomas de Cantilupe, of whose monuments we spoke in our last. Aquablanca was a great favourite of King Henry III., and the king, to mark his personal esteem for him, presented him with two mitres, as appears from the following warranty still existing. The first, dated 1239-40, runs thus:—"Pay to Master Joseph, the goldsmith, 12 marks for a certain mitre, purchased and given by our command to Peter de Aquablanca, Bishop of Hereford." The second is dated February 11th, in the twenty-fifth year of the reign of Henry III., and runs thus:—"Pay from our treasury to Edward, the son of Odo, 82l. for a certain mitre, made by our command for the use of the venerable Father Peter, Bishop of Hereford, of our gift." These mitres remained the insignia of Hereford's bishops, and were used by the majority of his successors until the Reformation. Mr. Holt's account of Cantilupe (a descendant of the Norseman family of Champ de Loup—Campus Lupi—and son of William de Cantilupe, governor of the Castle of Hereford, 1202), was very interesting, and included some fresh information, but we are forced to pass it over.

We must add to the account we gave of the visit to the curious group of Norman churches in the morning, before going to the bishop's, Mr. Blashill's account of

Rowlstone Church.

The main portions of the church, he said, ap-

pear to belong to the period between 1130 and 1150. Its twelfth-century work, although possessing some peculiarities which I shall have to point out, is generally consistent with the Norman type, and free from ornament of the Celtic class. Yet there is a piece of foliage on the south doorway similar to some that I pointed out at Kilpeck, and exactly like that which is used in a similar position at Shobden. The sculpture in the tympanum of this door, which represents our Lord in an aureole, supported by four angels, is also like that at Shobden, except as to the position of two of the four angels. This carving has been said to have reference to the text "I am the door." But it is really and solely that most favourite subject with all early Medieval artists which is known in England, France, and Italy alike as a "Majesty." We find it as early as the fourth century (?) in the catacombs of Rome, where Christ is represented blessing, with his right hand open, and having a roll in his left. It was used profusely and with many varieties in sculpture, painting, stained glass, and manuscripts, and, of course, over doorways also. Sometimes in large churches an attempt was made to represent in some measure the striking scene described in the fourth and fifth chapters of the Revelations. There is the Lord sitting on the throne, surrounded by the rainbow like unto an emerald. At the four angles of the subject are the four beasts, which, in process of time, were considered to be symbolical of the four Evangelists, and on the arch above and the lintel below encircling all are the four-and-twenty elders. Here we have simply the Lord in an aureole, supported by four angels. The sculptor, for the sake of increasing the size of the tympanum, has brought it down below the upper line of the capitals, and has also adopted the heavy roll moulding of the arch of the same thickness of the column below. These were local peculiarities, of which other instances may be given as that of Bredwardine; and they were also adopted in Ireland and in Wales in the twelfth century. Two remarkable pieces of sculpture exist at the sides of the chancel arch. In each of these is the figure of a saint with an attendant angel, in the traditional flowing costume used in early sculpture, and with bare head and feet, and the flat nimbus behind the head. Those on the north side carry each a cross and book. The practice of placing the attributes of the Apostles in their hand, as the keys in St. Peter's, was then only of recent introduction at the time these figures were cut, and it would not be easy to identify them if those on the south were not placed with their heads downwards—a plan indicating that the figure on this side, if not the other also, is intended for St. Peter, to whom the church is dedicated. This was a very favourite subject with the Medieval artists. Peter having been by tradition supposed to be crucified in that position by his own desire. Samuel Dowling, who was authorized to go through Suffolk in 1643, breaking all the pictures and figures which he could find, makes this entry in his journal in reference to the Church of Allington:—"In the chancel was Peter's picture, and crucified with his head downward, and there was John Baptist and ten more superstitious pictures." The best known instance of this subject is the remarkable altar-piece painted by Rubens for the Church of St. Peter, at Cologne. In the figure at Rowlstone the saint carries in one hand a long label, in allusion to the tradition which attributed to each of the Apostles one sentence of the creed. The cooks, which are finely sculptured on the adjacent capitals, doubtless refer to Peter's denial of our Lord. The birds carved on the string-course are of the same kind as those already seen at Kilpeck. They are set amongst tussle of herbage, and are excellent specimens of twelfth-century carving. The two iron brackets fixed to the walls of the chancel seem to be of the fourteenth or fifteenth century, and they are hinged so as to fold against the wall, and have each five prickets for holding the ends of long candles, which would go through the rings above. Alternate ornaments of cooks and fleurs-de-lis, cut out of thin iron, are fixed on both sides. The two brackets differ both in size and in design, and were probably not the work of the same hand. They are the only examples of this kind in England. The chancel is ceiled with an oak ribbed and panelled ceiling of the ordinary type, though there are not many specimens in Herefordshire churches. The old porch of this church had a similar one, very much decayed. To the archaeologist this district possesses unique attractions. In the church of

Kilpeck we have the very last struggle of the decaying style of Celtic ornament. In Rowlstone we see the Norman work of the twelfth century with its Roman, perhaps Byzantine influences. In the neighbouring church of Garway, built by order of the Knights Templars, the sub-arch of the chancel opening is of a pattern which, if not Saracenic, is at least quite foreign to the native Norman style. Besides these, few village churches are without substantial remains of the later or transition Norman, and in the remains of Abbey Dore we see how the native English architects—although greatly under the influence of a foreign order of architecture—knew how to throw aside the influences which then prevailed in France, and to work out for themselves a beautiful style of architecture which, as the Early English, in its own way rivals the choicest specimens of Continental art.

An Unfinished Effigy.

The church at Gromont presents the peculiarity of a gigantic unfinished effigy, lying between two of the arches in the nave. It is merely roughed out, the head and arms being the most finished. It is said to commemorate one of the earls of Lancaster, who died in the thirteenth century, and has necessarily a curious and unusual aspect.

At the evening meeting, on Thursday, after the visit to Leominster and other Churches, the Rev. Canon Jebb read an elaborate paper, treating of

The Origin of Written Alphabets,

a subject on which we are completely in the dark. He considered the art of alphabet writing was too subtle, too perfect in itself, to have ever originated in man. He thought it impossible for human intellect to have devised it, and he attributed it to Divine origin. He had a strong impression on his mind that it was not very probable that alphabetical writing could have been deduced from ideographic writing, for entirely different powers of mind and thought were requisite for the one to what was required for the other. All ideographic writing was imperfect; it expressed images, and not words. Any one who was acquainted with the Chinese characters knew how imperfect they were. They must supply many of the words by their own thoughts, and different expressions might be given by different persons to the same characters. Whether it was the same as regarded the Egyptian characters could not be said. As yet the Egyptian characters were but imperfectly understood; but the different versions that had been given of them showed that they were very imperfect means of communicating thoughts. As to the ideographic characters found on the outside of buildings in Central America, he thought they were analogous in their forms with the Chinese. He had little doubt that in the course of time the keys to these ancient monuments would be discovered. It had been suggested, and with some show of reason, that it was probable the art of alphabet writing was communicated to the Israelites by Moses, and that in all probability the Tables of the Law were the first instance of this art. He merely stated this as something worthy of consideration. He thought all our letters might be traced to the most ancient alphabet in the world. He enumerated many nations the characters used by which he traced with modifications to the Phœnicians. Dr. Jebb then alluded to the extraordinary monument discovered near Sidon, a few years ago, by the Duc de Greve. On it was, in characters well defined, a Phœnician inscription, about thirty lines long, stating who the individual was that was interred, and the subject of the inscription was a severe reprobation of any one who should attempt to open the tomb, and the utterance of maledictions and the vengeance of the gods on the spoilers,—that "Their fruits might wither from the bough and their roots decay from the stem,"—altogether a poetical inscription. He believed this was the longest Phœnician inscription yet discovered; and, with one or two slight exceptions, the characters were the same as those lately discovered on the Moabite stone. This appeared to him to be one of the most clear connections of the Greek with the Phœnician.

Mr. W. H. Black's review of the

Archives of Hereford

had been looked forward to with much interest, and did not disappoint. The remarkable skill and fluency with which that gentleman, glancing

through an old Latin document, picks out its object, and conveys it in English to his audience, is now well known. The first to which he referred was one issued by John, minister of the church at Hereford, in which it was stated with respect to all the parishioners who should come to hear mass in the chapel of the Virgin Mary in this church of Hereford in honour of the Virgin, and should say prayers for the Church and State of England, and for the souls of John, Lord Breton and his wife, or should offer their goods, or give anything charitable for the maintenance of the same chapel, the indulgences granted by any other Catholic bishops were confirmed. It was dated 1271.

This, it will be seen, proved the use of the Lady Chapel before 1271.

Mr. Black said the next document to which he would call their attention was a bull of Innocent IV. It stated in this bull that whereas some of the canons had received their entire revenues they were unwilling to contribute, as others, towards the support of the fabric and the expenses of the cathedral, the Pope authorised the enforcing of a regulation made by the bishop and by a major part of the dean and chapter for compelling the payment by deduction of the rateable proportion of contribution to be paid toward the fabric and the expenses of the cathedral. This was a very important document. No doubt to it must be ascribed the erection and beautification of many parts of the cathedral. Another little document, with one seal broken, was an acknowledgment of money value of a legacy received (a palfrey and a ring), left to "John," Archbishop of Canterbury, by Thomas St. Cantilupe, Bishop of Hereford. The archbishop's seal was attached to the document, and it was very sharp and fine. The next document he would refer to was one of the most interesting. It related to a love affair of Edward I. It appeared that the king had sworn that he would have a certain lady. She married somebody else and the king married somebody else, and the difficulty could not be got over without a suit being regularly instituted in Rome. There was, as usual a commission of delegates to determine the matter; and this instrument set forth the proceedings and the sentence, which, of course, absolved them from all further ecclesiastical difficulty about it. Mr. Black, who was loudly applauded, then proceeded to describe some of the city documents which he had inspected. He had, he said, in his hand, the first charter of the city, but they must not suppose that it created the corporation, because it was an old Roman corporation. It was given by Richard I., and it gave permission to the citizens of Hereford in Wales, for the sum of forty marks of silver, if they aided in enclosing the town, to hold the town with all their liberties, forms, and customs. He could not touch upon all the charters, of which he thought there were thirty-one; but there was one document in which Edward III. gave pardon to the men of Hereford, and withheld all wrath and rancour which he (the king) had against them for certain transgressions and trespasses till the feast of All Saints. This was dated the 23rd of October. Other city charters and documents were referred to by Mr. Black, and particularly one which threw some light upon the position the chief bailiff of the city held in relation to other towns. It appeared that Hereford was considered the principal city of all the market towns from the sea to the Severn. Mr. Black then read a document relating to certain regulations to be observed and duties to be performed while the city was in a state of siege. For instance, if any citizen received letters or messengers from the enemy without informing the authorities, he should be led at once to the market-place, the common bell should be tolled three times to call the people together, and the offender should be required to abjure his city with his wife and children, and never to return to it unless he obtained a special licence to do so.

One of the papers read on Friday evening was by Mr. Severn Walker, and had for its subject

Detached Church Belfries,

with special reference to those found in the county of Hereford. Having enumerated various existing and demolished belfries detached from churches, he observed that they varied in character from the poor little structures in Herefordshire to the magnificence of Magdalen, Evesham, and Whalton. No certain rule could be given for their position—placed east, west, north, or south, often not parallel with the church, and at

almost every degree of distance from the church. The detached belfries of parochial churches very rarely occurred except in West Norfolk and in Herefordshire, in which districts it appeared to be a localism. The former county contained five examples—at West Walton, East Dereham, Wisbeach, and Ferrington. At Beccles, in Suffolk, was a grand perpendicular tower south of the church. At Berkeley, Gloucestershire, and Brynally, Brecknockshire, the towers were modern, but they occupied the sites of Medieval structures. Herefordshire, however, boasted the greatest number of detached belfries, and to these he then directed attention. They were seven in number, and might be divided into two classes: those which differed from the ordinary church towers only in being more or less separated from the main building—Ledbury, Bosbury, Garbury, Holmer, and Richard's Castle; and those which had a character peculiar to themselves, viz., Pembridge and Yarpole. Mr. Walker then proceeded to describe these towers in detail. Ledbury was by far the finest church tower, architecturally considered. It stood on the north side of the church, about 4 ft. from the north-west buttress of St. Catherine's Chapel, and about 35 ft. from the aisle wall. It is in the Early English style, divided into four stages, with massive buttresses at the angles. Here, within a battlemented parapet, rises a lofty stone spire, rebuilt by Robert Wilkinson, who erected the tapering spire of St. Andrew's at Worcester, about the middle of the last century. Selwood speaks of a chancel-house being attached to the tower. Bosbury tower stands at the south side, at a distance of upwards of 80 ft. from the aisle. It is 29 ft. square, divided into three stages by set off. Having described the other Herefordshire detached belfries, Mr. Walker concluded his paper by some brief observations as to the reasons for detaching these belfry towers from the churches. He thought, probably, they owed their unusual position to the caprice of their designers alone.

A Saxon Consecration Deed.

Amongst the places visited on Saturday was the church at Peterstow, which during the last few years has been restored. The visitors were received at the church by the Rev. Canon Jebb, who gave an interesting description of his church. One fact of considerable interest is that the canon has the original record of the consecration of the church in the time of King Harold. The church was founded in the year of the Conquest, or a little before, and Canon Jebb thought that they had some of the remains of the work of that time. In the north wall of the nave there was a round Saxon or Norman window, very deeply spread. He did not think he was presumptuous in putting the date of this window at the foundation of the church. He was very obstinate, he said, and his belief was there was still some work of the Saxons to be found there. It was remarkable how many churches were said to have been destroyed by the Normans, but he inclined to the belief that in many cases they made use of the materials they found ready at hand. The window was the only evidence of Saxon remains, except some masonry in the outside of the church.

At the concluding meeting the *pièce de résistance* was a valuable paper by Mr. Edward Levien, M.A., on

The Hereford Missal,

premising that a Missal was the book which contained the rites, ceremonies, and prayers to be used in the celebration of the Holy Communion. It is a very common mistake to call all illuminated MSS. "missals." At the British Museum it is a circumstance which occurs almost daily that persons come and ask permission to see the "illuminated missals,"—meaning, of course, some of those MSS. which are remarkable for artistic beauty, but which the applicants, owing to their ignorance of what a missal really is, confound with every other class of MSS., although these, as so many among us know, relate to almost every conceivable subject, and are by no means confined to matters theological or ecclesiastical. But even among "experts," so to speak, books are sometimes described as "missals" which are not so. Thus, for example, that celebrated volume which is now in the British Museum, and which is known as the "Bedford Missal," is not *ipso facto* a "missal," but a "Book of Hours," and it is a positive truth that a former keeper of the MSS. was once applied to for leave to copy the illuminated "missals," which were under his

charge, so that he might, had he been maliciously minded enough to have noticed the trifling error in spelling, have appropriately referred the enthusiastic but unorthographic student of the fine art to the armory in the Tower of London. Missals and other ancient service books of the Ancient English Church but rarely occur for public sale. It may be taken as a general rule that they are all extremely valuable, and the "Hereford Missal" is the rarest, and therefore of course, the most valuable of them all. In the summer of 1858, the British Museum was fortunate enough to add to its treasures a perfect copy of this work, having obtained it from that learned and painstaking writer and collector, Mr. William Maskell, who has prefixed to it the following memorandum in his own handwriting:—"I obtained this volume in the spring of 1858; it had been just found, lying open on the floor in an old house in Bristol, among some hundreds of other books which had belonged to the English Franciscans, and which had been brought by them to England from their convent in Belgium during the troubles of the first French revolution." This unique volume was printed at that famous Rouen press, which produced so many magnificent works between 1485 and 1550.

This particular work was printed in 1502, at the expense of one John Richard, a merchant. After describing the illustrations, Mr. Levien said there is one more point in this Missal upon which I will pause for a few minutes before I conclude, and that is its peculiarity in one of the offices, to which I am sure the ladies, at any rate, will not object to my referring. I allude, of course, to the marriage service. It is to be noted that, although the rest of the book is in Latin, that portion of the interesting but awful ceremony which involves the putting on of the ring and the plighting of the troth is to be said in English, "*in materna lingua*," as the Rubric has it, "*sacrosancte doctore*," as if there was to be no mistake about it, and in order that neither of "the high contracting parties" should be able to plead ignorance of the objections by which they were hindering themselves, on account of their want of a classical education. As the words in which these obligations were couched, are different from those at present in use, you will, I trust, forgive me for trespassing still further upon your patience by repeating them. The words run thus, "J. N. underfyng y N. for my wedded wyf for beter for worse for richer for poorer yn seknes and yn helthe til deth us departe as hollychurche hath ordeyned and thereto y same plytth y N. my trowth;" and the bride is to repeat the same words to the bridegroom, substituting, of course, "husband" for "wyf," and adding "to be boxom to ye til deth us depart," &c., so that, although the gentleman might have his fits of "meagrim," the lady undertook to be "boxom," i. e., lively and sprightly, till the day of her death. This may possibly have been practicable in "merry England in the olden time" but it would certainly not be deemed compatible with "the rights of women," as they are so strenuously advocated in the nineteenth century.

We must here pull rein. Several other matters might be usefully mentioned, but we cannot afford more space. As it is, our readers will probably admit that we were correct in saying at starting, that some very good work was done at the Hereford Congress of the British Archaeological Association.

WAR AND EDUCATION.

WAR topics naturally occupy public attention almost exclusively. Literature has taken a fiery tinge. The daily journals can find no room for subjects such as, at other times, would command large type. For a few days "the Row" was paralysed; and the weekly issue of new books came to a standstill. In art, in industry, in speculation, every one is pausing for a moment, aghast at the great events which are taking place under our eyes, or waiting for the next telegram.

Without overstepping the prescribed limits of our own columns, or invading the provinces of the periodicals especially devoted to military science, or to military history, there is much which the present campaign forces upon our attention, which lies on ground familiar to our readers. Strategy, tactics, and descriptive literature, we altogether pass by. But the war has already taught, and must yet teach, lessons of the utmost importance, of a more general

ture, as well as some of a nature especially germane to our columns. The architecture of war, or the relation of military science and practice to the works of the builder, has received ample and most important illustration. No less have the mechanics of war been exhibited under new light, and even of more importance, as deeper and wider in their scope, are those loud and eloquent lessons which speak of the confusion existing between the educational state of a country, and its military prowess and national defence. We have long seen that national wealth would shortly be admitted to be little more than a fraction of the educational state of a country. It now almost seems as if the same might be said of national existence.

With regard to the architectural lessons to be derived from the war, they are, as we write, loud and repeated, although it may well be said that the most signal of them all is as yet unpronounced. In a word, the idea is this. The importance of fortresses is greater than ever. The fortification of towns and cities is a cruel mistake—that is to say, their fortification by walls and ramparts. The fortress that is of vital importance in the modern chess-game of war is a military place pure and simple—as a nest for soldiers, placed so as to command a defile, a river, pass, or railway; armed as to give cover to its defenders; built on the live rock, so as to set the art of the miner at defiance; provided with water by wells and springs pierced within the very heart of the fœd, so as to be incapable of being cut off by the enemy; walled according to the best methods known to military science, and armed with heavy guns, which, if they attain the at present largest size of 600 pounds, will have for some time the calibre of the most powerful siege guns that it is yet practicable to place in the trenches. A properly provisioned and munitioned fortress of this kind, containing a garrison proportionate to the strategical importance of the spot, may be made virtually impregnable, except by famine. With our late improvements in the preparation of food, with the meat extract of the Liebig Company, the Swiss condensed milk, the new German sausages, the salt biscuit, and the most carefully-stored grain and flour,—such a fortress might be easily provisioned for three years. Had Metz and Strasbourg been fortresses of this kind, and in this good order, it is more than problematical whether a cautious strategist would have ventured a march on Paris.

On the other hand, the cruel error of attempting to combine city and fortress is pregnant with disaster in the case of the two great arsenals of Lorraine and of Alsace. Fortified, in its time, by Vauban, and since materially strengthened, furnished with that best of defences, a wet ditch, or series of ditches, in which the water can be raised or lowered by the defenders, these cities were intended to form great offensive centres for warlike operations. The idea that they would have to resist any formidable invasion, is one that no Frenchman could have allowed himself to entertain for a moment. But under actual circumstances, not only has the presence of the large city population involved suffering of a magnitude which our enemies shrink from inflicting, but the absolute military influence of the presence of so many non-combatants has been in every way prejudicial to the defence. A large garrison is required, greater labour is entailed on every soldier, the points of attack are more numerous and more wide apart, and the provision that might prove ample for the soldiers, shrinks rapidly before the consumption of the inhabitants. The speedy acquisition of Metz has not been a point of strategic importance—that Strasbourg has; as the railway communication across the Rhine is impeded by its guns. Thus the terrible expedient of bombarding the town itself lay, according to the admitted laws of war, at the discretion of the general commanding the besiegers. It is true that the King of Prussia ordered a procedure which would lay in ashes a town of German origin and history to be suspended, as a striking contrast to the vindictive destruction of Kehl by General Uhlrich, and to the malignant melodramatic shame of the shelling of Saarbrück. The point we wish to bring out is, that while the purely military fortress of Phalsburg has held out, to the honour of its garrison, and as an appreciable item in the defence of the country, the mixed character of Strasbourg has caused a great national disaster. Even if the citadel should hold out longer than the city, the military loss will have been more, and the military defence weaker,

than in the case of a simple fortress, while the fact of drawing fire on a city of 70,000 inhabitants (the main use of the walls of Strasbourg) involves at once a political evil amounting to positive disaster, and an amount of useless human suffering most painful to contemplate.

In fact, the breadth and precision of the line drawn between combatants and non-combatants is not only a redeeming feature of modern warfare of the utmost importance, but it is one on the preservation of which depends the answer to the question whether war, with its new and terrible means of destruction, shall or shall not imply total extermination. Any confusion of the line of demarcation between regular hostilities and murder can lead only to the great increase of the latter. In the confusion of character caused by walling in civilians and soldiers together, nothing is more probable than such a mingling of all occupants and defenders in one indistinguishable mass, as shall lead to total extermination on the success of the siege. And it must be borne in mind that it is a military axiom that the resistance of any place that is not relieved is only a question of time.

The lessons thus terribly taught us have this direct home application. We should make Pembroke our great arsenal, rather than either Portsmouth or Plymouth. At Pembroke the severing of the military and the civil element is and can be more distinctly effected than at any other place of naval importance in the United Kingdom. The few streets of workmen's houses that surround the dockyard might be swept away without any compunction. The immediate defence from the promontory crowning the head of the bay is good. The dockyard is situated at the head of a noble arm of the sea, or inland salt lake, the narrow entrance to which is capable of admirable defence. Within lies the Stack Rock, now fortified, which alone would sink any foe within the gap. In the harbour the whole navy of England might ride in safety; and on sailing, a vessel is in the open sea in half an hour. In all our systems of defence these great peculiarities should be borne in mind. Very few spots in the world are so fit for a naval centre as Pembroke.

With regard to the mechanics of war, we do not wish to enter at this moment into the military questions of the relative value of the several arms. Our own attention has been long and not unprofitably turned to the subject; and our Snider rifle is a far more effective instrument than either the clumsy Chassepot, or the heavier, but somewhat better finished, needle-gun. It is likely, however, that the latter weapons may better bear being knocked about, and certainly our own rifle requires to be used by a man more handy with his fingers than is needful in order to turn round the bolt-shaped handle of either of the other weapons. But the great mechanical feature of the war has been the service rendered by the railway system. The importance (to which we have just alluded) of any given fort, depends now in very great measure, on the fact of its command of a railway line. Metz has been turned, in this respect, by the admirable expedient of constructing a temporary line of railway. The advance of the German host has been made at a rate hitherto without any precedent, by the service of the German railways. Distance, in strategy, is measured only by time, and distance has been reduced to a degree which Von Moltke has precisely calculated, but of which we can only say that it must be less than the half of that reckoned in any former calculations. Other mechanical appliances have been pressed into the German service. Traction engines, the enormous power of which we are only beginning to realise in this country, are employed to move heavy guns into position. And captive balloons, although to our surprise they do not seem yet to have been employed, are in preparation. The admirable service of a secret underground telegraph is said to have been discovered, and out, between Strasbourg and Metz. The field telegraph, for tactical purposes, has, no doubt, been organised as carefully as is now the case with that of our own Royal Engineers. Of the pontoon service we have heard but little, but it is, no doubt, efficient. The increased venom of the engines of death has not been such as to give great advantage to either side. But the command of the railway system has rendered possible an invasion in mass, which the preparation and the provision of border fortresses, properly proportioned, armed, and provisioned, must have, to say the least, materially delayed.

While we can thus already see, with no indistinct vision, some of the lessons which the states-

man and the military architect and engineer cannot fail to draw from the terrible experience of our French neighbours, there is yet another which comes with more momentous force to ourselves. We have more than once insisted on the importance of bringing up our national education—in other matters than Latin and Greek—than reading, writing, and arithmetic—or even than the higher mathematics,—to the level of more educating nations. We know, from the reports of our own Education Commissioners, as well as from those of foreigners, that we occupy all but the lowest place in Europe in this respect. In the rapidly evaporating Roman States, indeed, and wherever the priest has his own way, thick and utter darkness is the object successfully attained by what is called education. Next to priest-ridden countries, come professor-ridden countries—or those in which competitive examination is adopted as a test of merit. This has been especially the case in Austria, which is called, *par excellence*, the *pays à l'examen*—an examination country. We are at present cheerfully and contentedly engaged in promoting ourselves from the first of these categories to the second. In France, while very much of the rural part of the country may still come under the sacerdotal extinguisher, there is a great amount of scientific, practical, and industrial education. But, throughout the entire country the schoolmaster has been handicapped. A central impulse has been given which every yeoman or school has been compelled to obey. [The first object of the entire and severe course of schooling prescribed to the French boy was to make him a good Imperialist. Hence the terrible inability to look fact in the face, or to serve or save the country, of which each day furnishes such disastrous proof.]

Now when we see this one-sided or no-sided education brought into contact with the broad and paternal culture of Germany, the results are even more striking in war than in peace. Of all the Germans round Metz, there was hardly a man who had not an idea of the plan of the campaign. He knew the object of that great silent strategist who had moved king and princes, and *corps d'armée*, like pawns on the board, though he might little understand each individual move. He intelligently received, and faithfully obeyed, orders. He regretted having to leave his home; but, meantime, his life was at the service of his country.

The French army, judging from their own reports as well as from those of English visitors, were in the very opposite position. Not a map of the seat of war was to be seen. Even the officers sent up in Metz thought that they were brought to the front to defend that city. The soldiers thought nothing, except that they were betrayed. They formed a class apart from the officers, though the latter rise from the ranks. They mistrusted them, and even fired upon them, and, if we can believe but the half of the tales of plunder, conceited ignorance, and utter carelessness that we hear of, marshals, generals, and even subalterns, driving luxuriously to war, as to a promenade, in the rear of their regiments, we can hardly wonder at it. Thus the educated and uneducated army, the armed nation, and the paid machine, came in collision. With what result?

Since the introduction of mercenary troops into warfare first spread from the example of the ever-contending Italian States, the great question of the natural relation between the army and the nation, between the State and its armed means of defence, has not only been a study for the statesman, but a problem involving very shifting and inconsistent elements. Into that long and interesting history it is unnecessary here to enter. The last case of the problem has now received a solution so decisive that none who regard the matter from the scientific point of view can hesitate as to the import of the facts.

The two opposing forms in which military defence is organised (or is thought to be organised) by modern civilisation have been brought face to face. The balance has never for an instant wavered. And although in the scale that has kicked the beam it is easy, after the event, to recognise certain elements of failure, that may be thought foreign to the question of principle, it may yet be seen that, for the introduction of these foreign and disastrous elements there has, practically, been found ample room in one system, and little or none in the other.

On the one hand, we have seen a professional army, reckoned, less than three months since, not only the finest in the world, but the finest that had ever been seen in the world. This army

was permanent, mercenary,—raised, indeed, not by voluntary enlistment, but by conscription, yet possessing an *esprit de corps* that very rapidly transformed the conscript into the soldier. To the perfection and the brilliancy of this great military engine the resources of a nation of thirty-seven millions and a half of people were freely consecrated. It was the first object of the French Budget, the chief pride of every Frenchman. Not only was the army petted, not to say pampered, as the *élite* of the nation, but it was formed on the principle of giving disproportionate value to picked corps, as compared with the great arm of most great generals, the infantry. Such was the prestige of this army, such the amount devoted to its production and maintenance, to its terrible and secret artillery, and to its brilliant guard, cuirassiers, and "dark faces with white silken turbans wreathed"—that we are told that an English Cabinet Minister declared his belief that it would be in Berlin within three weeks from the time that its leader threw down the gauntlet.

In opposition to this *chef d'œuvre* of the pratorian system was an army of altogether different organisation. It was one formed on the old-fashioned principle that every man is the natural defender of his own hearth, and that, in case of need, he is bound to pay, not only in purse but in person, the cost of that defence. Having known what invasion was, and having drained the bitter cup to the very dregs, the Germans betook themselves to prepare a mode of prevention, with that same patient, steady, unflagging, undemonstrative, successful energy which a phlegmatic and resolute race have brought to bear on so many difficult problems of her vital interest. If the nation could but be prepared to rise in arms as one man, or rather as a succession of men, advancing decade after decade, the standing army that they would require would be only such as was useful to keep up the *cadres* of the organisation, and to educate the lads who, year after year, arrived at the age of military discipline.

So admirably was this great system ordered, so ample were the preparations of the heavy and costly material of war, so prompt and effective the means of transit, that at the first great call, when the wolf was indeed coming, the mighty engine started without a check. Peasants and nobles, learned men, wealthy men, busy men, walked rapidly and quietly to their nearest dépôt. They came out armed and in uniform, in bodies that flowed, like contributing rivers, to the frontier.

The one grand advantage supposed to be possessed by the standing army was its instantaneous capacity for movement. The trumpet had but to be blown, and the troops were on the march. For the concentration of the citizen army, on the other hand, a certain delay was unavoidable. It entered into the calculations of the strategist. Each day, from the date of the order to arm, brought two army divisions to the standard. But it so turned out that the machine that was to be ready for instantaneous service was out of gear. The professional army did not work, and the citizen army did.

It does not follow that a standing army is necessarily a source of private plunder. But it is no less certain that the pratorian troops, which were thought the finest in the world, have thus failed at the hour of need. It cannot be urged, henceforth, that the vast expense of a standing army gives a reliable safeguard to a great country. The evidence, so far as it goes, is the other way. And it is clear that a well-ordered citizen army can be raised, and armed, and sent to the point of danger with a celerity hitherto undreamed of.

We cannot but believe that the German system will, for the future, be the European system. That there will be many to deprecate its introduction into this country we do not doubt. It is a strong characteristic of the Englishman to resist improvement to the last hour, and then to effect it with more haste than good speed.

But apart from the domestic question, we trace in the grand German crusades an arguery for the future education of the world. To take every lad, before either stature, or gait, or habit, is formed (often boorishly formed), and, as soon as he is able to endure a certain amount of hardship without checking his growth, to give him an education at once physical and moral,—to teach him to march, to ride, to fire, daily to pass many precious hours in the free open air, and even more than this,—to give him habits of order, of precision, of cleanliness, of truth; to teach him how to obey, and thus how to com-

mand; to tell him practically that he is a citizen, and that he has duties that he owes to his country; and to redeem him, at this critical age, at once from idle frivolity and from the prematurely contracting pursuit of gain,—this will be a gain for the future generations of Europe not unworthy of the blood that has been shed to acquire the lesson. Nor is there any reason why the education of the soldier citizen of the future should be physical and martial alone. The State is responsible for bestowing the best cultivation on the youth whom she organises as the seed-plots of her armies. The finest education given in this country is (or rather was, before recent changes) that of the Royal Military Academy at Woolwich. Five terms of that wholesome discipline converted the pale and over-worked schoolboy (for all had to work in order to pass the barrier of Chelsea) into the vigorous, healthy, well-taught, reliable soldier. The battle of Sedan means that we shall not allow Switzerland and Germany to remain the only free countries that educate their youth for all the duties of grave and martial manhood. It means that every boy in Europe shall, sooner or later, be taught how best to become a man. The cad will, under the good influence of the drill-sergeant, attain some title to self-respect, in learning to respect his superiors. "Peace it bodes, and a quiet home, and successful rule, and due supremacy;" and we may hope that peace will be more likely when war is no longer a trade, but is regarded as either the "worst of crimes or the most sacred of duties."

ARCHITECTURE AND NATIONAL POLITY.

Most of our readers probably found a good deal to interest them in the detailed description of the celebrated Taj-Mahal sepulchre at Agra, recently reprinted in our columns, from a paper read at a meeting of the Institute of British Architects, by an English architect whose professional occupations had taken him to the East for a time. Did it occur to those, however, who may have followed with interest the account of the impression produced on the eye of a northern architect by the actual inspection of one of the most beautiful and characteristic specimens of the architecture which has grown up under a tropical sun—of fountains and flowers, of marble radiant in the dazzling glare, of cool green shadows and inland gem work—did those who tried to picture to themselves the *fairly-looked* *ensemble* take due note also of a statement, made incidentally in the course of the description, as to the means whereby the work was carried out. We re-quote the short sentence referred to:—

"The whole cost is said to have been about three millions of our money. It took seventeen years in building, and the labour was all forced, the workmen being kept on a daily allowance of rice."

This is not so fascinating as some of the other details mentioned in connexion with the Taj-Mahal, nor is it strictly an architectural detail at all; and yet such a statement suggests considerations of no slight import with regard to the past and future progress of architecture as a national art. Assuming its historical correctness, it certainly falls in singularly as a corroboration of the reflections which the consideration of some of the great architectural monuments of Egypt suggested to me of the most brilliant and comprehensive intellects of modern England, too early lost to us. Those who are acquainted with that remarkable fragment of a "History of Civilisation" in which Buckle made the attempt to generalise all history under one great law, will perhaps have already recalled the passage with which we ask leave to cap Mr. Emerson's short and bare statement of fact:—

"The mere appearance of those huge and costly buildings which are still standing, is a proof of the state of the nation that erected them. To raise structures so stupendous, and yet so useless, there must have been tyranny on the part of the rulers and slavery on the part of the people. No wealth, however great, no expenditure, however lavish, could meet the expense which would have been incurred, if they had been the work of free men, who received for their labour a fair and honest reward. But in Egypt, as in India, such things were little regarded, because everything tended to favour the upper ranks of society, and depress the lower. Between the two there was an immense and impassable gap. . . . The people at large were little better than beasts of burden, and all that was expected from them was an unremitting and unrequited labour. . . . Hence it was that, the industry of the whole nation being at the command of a small part of it, there arose those vast edifices, which inconsiderate persons admire as a proof of civilisation, but which in reality are the evidence of a state of things altogether degraded and unhealthy."

Here we see that the conclusion deduced by the philosophic historian as to the political and social state of one nation, from the aspect of buildings erected at a time concerning which we have little historic records, agrees remarkably with the known facts connected with the erection of a building with a similar object, in a country very similarly situated, at a period comparatively near to our own. For, despite the vast difference, architecturally and artistically, between the Pyramids in Egypt and the Taj-Mahal in India, the object of both was the same, viz., the glorification after death of individuals who had been marked out from their fellow men mainly by the hereditary succession to dynastic rule, who regarded themselves, and were regarded by others, as beings set apart to be honoured and obeyed with unquestioning submission by every one around them, and who therefore were only exercising their natural and admitted rights in compelling from others, *bono gré mal gré*, as much labour as they wanted for any object which might seem good to them. There is no civilised quarter of the earth where such an idea of the rights and duties of government would not now be, openly at least, repudiated; and tendency of things everywhere is more and more towards an open labour-market and free choice and action on the part of the labouring class. But, if Buckle's theory as to the relation between great buildings and compelled labour be held as of general application, the progress towards greater liberty and equality must then, it would seem, be necessarily a progress adverse to the production of great architectural monuments, and so far therefore entailing on us at least one loss as against its immense social and humanitarian gains. In what degree, and under what reservation, would such an apprehension be a just one?

The gist of the question lies very much in the meaning which we attach in this case to the word "useless." We are apt to say that a thing is useless when it can subserve no practical need, no purpose or part in the outward machinery of life. But in this sense all architecture is more or less "useless," since it is almost of the very essence of architecture, artistically considered, that it should involve a stepping beyond the mere hard necessities of practical requirements, should consist in the beautifying of what might, without any such illustration, be equally "useful," though unsightly. And so long as there are any persons in existence to whom the sight of a beautiful architectural design is a source of high pleasure, so long it would be impossible that we could call any building which fulfilled this condition "useless" in the widest sense of the word, of no value to any one, however little practical purpose it might serve, however small its rentable value. Only such structures as the Egyptian pyramids, of great cost, of no beauty, architecturally, and serving only to gratify a vain and shadowy ambition on the part of an individual, could with full truth be spoken of as "stupidous and yet useless." A building which, like the Taj-Mahal, is a contribution to the sum of artistic beauty on the earth, is so far to be judged on different grounds. No one, at all events, regrets now the fact of its existence. And yet buildings, of this class are, in one sense, illustrations of the fact that architecture of the most purely ornamental and (if we may use the expression) sentimental character has generally flourished more luxuriantly under a despotism of one sort or another, than in a free and independent society; that it has shown more affinity for the feudal than for the federal type of institutions. When those who build have to pay, and are willing to pay, honestly, the market price for the labour and material wanted, there are always prudential considerations to weigh against the desire for architectural grandeur, and the latter will always be in rather under than over the due proportion to the actual necessities of the building. To put these considerations entirely or in any great measure in abeyance, one or other of two conditions must be presupposed. Either the builder or builders must have power to compel labour and wealth to their own ends; or they must be possessed by an abnormal enthusiasm which will render them indifferent to expenditure. Of the first case such a building as the Taj-Mahal is a notable instance. Despite its exceptional beauty it could at the time have had no interest or value, probably, except for the king whom him it was to build it, and perhaps for the architect who looked for lasting fame through its means. To the workmen employed on it the building was probably an unmitigated "bore," or something

[illegible]

* From a paper by Messrs. Reade & Goodison, read before the Mechanical Section of the British Association, by Mr. T. M. Reade.

The subsoil drain and pipe rest to have invented is partially the result of our experience in laying sewers in sand. At our suggestion, Messrs. Brooke & Son, of Huddersfield, the fire-clay pipe manufacturers, have worked out the invention in a practical form; and we are now commencing to use it in the sewerage works at Birkdale. The primary object of attainment is this, to get a dry subsoil wherein to lay the pipes that the cement joints may have time to set and become watertight; and, by securing more time for the laying of the pipes, laying a greater length at a time, and the prevention of disturbance or drawing of the pipes while preparing the next excavations to ensure greater certainty and perfection in the gradients and

junctions, and consequently improve the general system of pipe-sewerage. That this is of the utmost importance none who practically understand the subject can doubt; for the difference between brick sewers and pipes often means whether sanitary work can go on or be stopped.

The subsoil drain is in internal section a semicircle, and varies in diameter according to the diameter of the superimposed sewers; for 2-ft. pipes we purpose using drains 1 ft. diameter; for 1 ft. 6 in., 9 in. diameter; and for 1 ft., 6 in. diameter. The length is the same as the pipes in the sewer, that is, either 2 ft. or 3 ft., as the case may be. The larger pipes we use in 2 ft. 6 in. lengths. Each pipe is socketed, and the sides being brought up square a shoulder is formed, on which the moveable bricks forming the rest, which also fit the top of the drains and the curvature of the pipes, are laid. The pipes in the sewer above are arranged so that they break joint with the subsoil drains, and the ends of each sewer-pipe rest on the adjoining subsoil pipes. It will be seen that this arrangement secures ample space under the sewer for making the cement joints good.

The operation of laying the subsoil drains is somewhat similar to that previously described as the mode we adopted for laying pipe sewers before employing this invention, the only difference being that the joints are made in clay alone, and from the small size of the pipes they can be handled and laid much more readily; slight imperfections in the gradients also will not be of the same consequence as in the sewers. When a sufficient length is opened out we commence laying the sewer pipes upon the brick saddles or rests, which have previously been accurately laid to the proper levels from eight rails in the usual manner. As this can be done without hurry or confusion a more perfect sewer is the result.

The subsoil drains are continued through some of the manholes, and are united to the main sewer at intervals, discharging their contents into sunholes, which retain the sand that may be brought down by the water, and which then can be readily cleaned out when necessary. In each of the intermediate manholes where the subsoil drains are carried through, they will be fitted with a disc plug on the top for the purpose of flushing.

When the flushing valves, to be hereafter described, are down, the removal of any of these disc plugs will allow of any portion of the drain being flushed with a good head of water.

It will thus be seen that while we retain all the advantage of subsoil water, we avoid the evils of running sand, which, if not attended to, accumulates in the bottom of the sewer, cakes with the sewage matter, and obstructs the flow. Perhaps some may think it would be better to keep the flow of subsoil water entirely separate from the sewage, by continuing the drains through or round all the manholes, with provision for admitting the subsoil water into the sewers wherever required for flushing. Special cases undoubtedly require special treatment, and in the case of wet gravelly ground it may sometimes be an advantage when using the subsoil drains to carry out a separate system; but in running sand the case is different, for without a certain number of sunholes the drains would infallibly get choked, and to fit the subsoil drains with separate manholes and sunholes would unnecessarily complicate the sewerage works, besides introducing other evils. As a rule, we are in favour of introducing subsoil waters into sewers, as a constant flow tends to sanitary efficiency; but where the sewage is to be used for irrigation, it may in some cases render it difficult to dispose of the whole of the sewage, especially where pumping has to be resorted to. There are, however, to our mind, so many objections to a separate system, that we should not adopt one, except for very special reasons.

None can lay down rules and formulae for inflexible guidance in engineering matters. All that can be done is to state principles, and the intelligence of the engineer must be his guide in their application.

Though primarily, the object sought in the mention of the subsoil drain and pipe rest was the more perfect construction of the sewer proper, it possesses the additional merit of reducing the permanent level of the subsoil water to a lower level than does the ordinary sewer, and is a distinct provision for that object instead of an accidental accompaniment of sewerage works.

Brick sewers it is common to construct with invert blocks, when the subsoil is wet, and they make a very true foundation to build the sewer

upon. In running sand we find it very much better to construct the inverts with flanges, and to bed them in clay, as a precautionary measure for keeping the sand out of the sewer. After the sewer is completed, it is unnecessary to keep the invert drain open, as the brick sewer, being porous, admits the subsoil water, and effectually drains the ground. During the construction of the sewer the invert blocks act as subsoil drains, and very much facilitate the work.

The experiments we have already made with the subsoil drains have thoroughly satisfied us as to their efficiency. We find that when they are laid, the sewer can be constructed with extreme facility with perfect joints, and that the effect of the sewer-pipes breaking joints with the sub-drain is not only to strengthen the sewer at the joints and prevent drawing, but to ensure perfection in the gradients. The subsoil drains are, in fact, a foundation for the pipes of the sewer, and the sewer itself can be as readily constructed upon them as if the ground were perfectly dry. Those who have had experience in running sand will see this is no small advantage, independently of the draining of the subsoil which will necessarily occur.

We have begun to use the subsoil drains, or "blocks," as the workmen already call them, in the sewerage works we are carrying out at Birkdale, and when by their aid we get the 10,000 yards of intended pipe-sewers completed, we shall be in a position to state the results, and to give further information to any engineers who may ask for it.

The conditions of perfect sewerage may be summed up thus: true gradients, as quick as can be obtained, but increasing gradually from the outlet to the branch sewers; perfect construction; requisite depth below the surface; provision for draining the subsoil water to the level of the sewers; adequate flow of water in the sewers; abundance of flushing power; constant flushing and sufficient ventilation; and real active supervision in the executive. But above and beyond that, the abolition of cesspools, middens, and stagnant pools, together with a perfect house-drainage, are essential. Often, when sewerage works are completed, the whole of their utility in a sanitary point of view is vitiated by criminal neglect of the house-drainage. It is not merely sufficient to connect existing drains or the overflows of cesspools with the sewers; they should be thoroughly examined, abolished, and the drainage reconstructed where necessary. We have no doubt that defective house-drainage is in most cases responsible for local outbreaks of fever and other diseases rather than the main sewers.

CONSTRUCTION OF OVENS.

A CORRESPONDENT sends the following notes on the construction of modern ovens.—They are built of various sizes, from what are called four-bushel ovens to ten bushels. A good-sized oven, to hold 140 or 150 loaves, is 11 ft. by 9 ft. Particular care is always observed in these proportions, as deviation makes a great difference. We have seen ovens erected for certain departments in the Government of this country by very clever clerks of the works, who adapt an oven to bake a certain quantity of bread to the place they build it in, and not the place to the oven. Great care must also be exercised in the construction of the flue. The floor being laid in concrete, with tiles on it, a flat arch is turned over with small bricks, which arch is brought from the four sides to a point in the centre. At one end is an opening for a door, generally 2 ft. by 14 in. At either side of the door, forming the corner of the oven, is an opening which contains the fire, and the opposite corner an opening to the flue, which flue, when it cannot be carried immediately up from the oven, and has to traverse a longitudinal space, should be three times in perpendicular height to its length, and terminating at top with a bell-mouthed opening.

Some slight innovations in the construction of the fireplace have been made from time to time, for the saving of fuel and prevention of smoke. When a batch of bread is required to be baked a fire is lighted, the flue damper is opened, and as soon as the oven is properly cleared of smoke, the time will depend upon the quality of coal employed, also the state of the atmosphere. The best and most economical plan is never to let the fire out, always keeping a clear coke fire in the grate. When properly heated, the oven should be as free as possible from soot; if soot

hangs about the roof and sides it indicates that the flue wants sweeping, or there is something wrong in it. It is best to rather over-heat it, and let it cool. When the dough is ready, an iron stopper is placed against the opening of the fireplace, the furnace-doors shut, and the flue damper closed. Some pieces of oak wood, called *bailes*, are placed against the sides, the floor properly swept, and the bread placed in. The heat of the oven should be from 444 deg. Fahr. to 450 deg. In two hours (if quarter loaves the bread is ready, having lost one-tenth of its weight. When the bread is taken out of the oven it is left to cool, and a further loss of weight occurs: the loss at this period depends upon the skill and manipulation of the workman, and the ingredients he employs.

If the floor of the oven is too hot, it will give too thick a bottom crust; the contrary, if the roof is too hot. A good workman will tell the difference immediately, by his hand; to an unskilled person a piece of paper is the best test—held midway between the floor and roof, it will soon show from which the heat comes. The use of a long mop formed of pieces of old woollen cloth, called a *devil*, dipped into water, is the best remedy for this. Flour thrown into the oven is also used, but it is a bad criterion; old flour will get quite black, when new flour will not brown. We have stated that the time of heating depends upon the quality of coals. Having tried the various kinds of coal in the three kingdoms, having visited and inspected a baker's oven in every town of the three kingdoms and the Channel Islands, for the purpose of ascertaining the quality, a slow-burning coal of a bright flame is the best, not a *swift-burning* coal, as most encyclopedists state. From the result of a large number of trials in a properly-constructed oven, we find that a mixture of Silkestone and Newcastle coal is the best, or, in other words, two-thirds non-bituminous to one-third bituminous.

THE LADY'S BOWER.

SIR,—With reference to Mr. Godwin's suggestion as to the "*Lady's Bower*" at Hereford, perhaps you are not aware that most Catholics in their houses have a small room which is used as an oratory, and during the month of May, or, as we call it, in religion, the *Month of Mary*; this oratory is frequently fitted up as a *Bower*, with a statue of "*Our Lady*" enthroned. Hence "*Our Lady's Bower*." A.

VALUE OF PROPERTY.

Penwith.—Mr. Jackson, auctioneer, introduced for competition the Brackenbrough estates, situate in the parishes of Heskett, Hutton, and Lazonby. The estate of Brackenbrough and the four farms adjoining, containing in all 895a. 2r. 22p., were at first offered in one lot, and were bid for to 31,000l. The lots were then tried in detail, the Brackenbrough Farm, consisting of 355a. 3r., being first put in competition, without, however, meeting with any response. Blackeyes Farm, consisting of 103a. 3r. 20p., was then tried; and, failing to command more than 4,000l., was withdrawn. For Robinson House Farm, 114a. 3r. 13p., there was no offer; and Kitty House Farm, 30a. Or. 5p., was bid for to 1,020l., but this sum falling short of the value placed upon the property by the vendor, no sale was declared. The Low Grounds Farm, comprising 289a. Or. 24p., was next put up. This property is of freehold tenure, but, after being run up to 10,600l., was withdrawn. The estate and farms were again submitted in a lump. The auctioneer said it was no use delaying, and he might as well intimate that the reserve price was 37,500l. Mr. Murray, of London, immediately bid 100l. more, and the estate and farms were knocked down to him.

Colchester.—The following properties were sold by auction by Mr. Edward Smith, at the Red Lion Hotel:—The Weathercock Farm, West Mersea, consisting of 125a. of arable and grass lands, chiefly freehold, with residence and agricultural buildings, together with two cottages, was disposed of to Mr. James Brown, for 6,625l.

Kempsey.—Messrs. Hobbs offered for sale, at the Crown Inn, Kempsey, some freehold investments at Broomhall, Kempsey. The property was divided into two lots, the first of which, that of The Lower Broomhall, comprising 20a. 3r. 15p. of arable and pasture land, fetching 1,480l.; and lot 2, comprising 8a. 1r. 32p. and known as Capell's Hills, realising 710l.

Carlisle.—Mr. C. P. Hardy, auctioneer, offered for sale the Howard Arms Inn, Lowther-street, together with all its accessories, and a grocer's warehouse adjoining; also two dwelling-houses, Nos. 18 and 20, Lowther-street, in the occupation of Mr. John Norman and Mr. Henry Hill; a shop and dwelling-house, No. 14, Lowther-street, in the occupation of Mrs. Matthews; and four cottages in Key's-lane. The total rent of the property is 124*l.* 17*s.* Ultimately the reserve price was declared to be 2,000*l.*, and Mr. Hardy paid an advance on that sum would insure a sale. Mr. Hodgkinson, after some time, offered 5*l.* over the reserve, and the property was knocked down to him.

Malvern.—Messrs. Bentley & Hill sold several lots of freehold building land at Malvern. Lot 1. A valuable piece of freehold building land, free from land-tax, fronting the main road from Cradley to Great Malvern, and adjoining the Crowleigh Park Hotel, adapted for the erection of a villa residence, and containing 1,210 square yards, 90*l.* Lot 2. Land fronting the above road, and also fronting a newly-made road leading to Great Malvern and the Link Railway Station, suitable for the erection of a first-class villa residence, and containing 2,147 square yards, 210*l.* Lot 3. Land opposite to the last lot, and containing 1,260 square yards, 150*l.* Lot 6. A plot of land in North Malvern, containing 1,000 square yards, 170*l.* Lot 13. Containing 1,200 square yards, situated opposite the Malvern Rural Hospital, 95*l.*

Rochester.—A sale of freehold land and dwelling-houses, by Messrs. Cubb, took place at the Bull Hotel, Rochester. Lot 1, house and 12 acres of land, freehold, 1,120*l.* offered; this did not reach the reserve price, and therefore the lot was not sold. Lot 2, freehold field of 3 acres of land, sold for 220*l.* Lot 3, "Burnt House Field," 8*ac.* 2*r.* 18*p.* of arable land, sold for 550*l.* Lot 4, the "Malthouse" cottages, and gardens, containing 9*ac.* 1*r.* 36*p.*, sold for 850*l.* Lot 5, two enclosures of marsh land, 9*ac.* 0*r.* 4*p.*, sold for 500*l.* Lot 6, rich marsh land, 2*ac.* 1*r.* 37*p.*, sold for 120*l.* Lot 7, marsh land, 5*ac.* 1*r.* 13*p.*, sold for 240*l.* Lot 8, the Burnt House Farm, in the parish of High Halstow, containing 32*ac.* 2*r.* 34*p.*, sold for 1,270*l.*

Ombersley.—Mr. Hadley Bowling-green, Mr. Nathaniel Taylor, auctioneer, submitted to public competition a small freehold estate, consisting of a house, outbuildings, and nearly four acres of land (all pasture), let at 30*l.* per annum, situate at Chatley, in the parish of Ombersley. The property was knocked down for 710*l.*

FROM AUSTRALASIA.

Melbourne.—The friendly societies of Emerald Hill have joined together for the purpose of supplying a want long felt there; viz., a large hall in which to hold public meetings and balls, and for the use of the different lodges. The matter was left in the hands of delegates, who called for competitive designs, the one selected being by Mr. Geo. B. Johnson, and which forms the subject of an engraving in the *Australian Illustrated News*. The design provides on the ground-floor to the Coventry-street front two shops, 21 ft. by 17 ft. 6 in. Connected with each on the various floors are parlour, bedrooms, kitchen, and a spacious cellar, same size as shops. In rear of the shops are ladies' and gentlemen's retiring-rooms, fitted up with lavatories; refreshment saloon, 50 ft. by 18 ft. 6 in.; two committee-rooms, 21 ft. by 21 ft. 6 in.; and the remainder of the site is taken up by the dispensary, with dispenser's quarters, hall-keeper's quarters, and a large store cellar, connected with large hall by a trap-door, for storage of forms, &c. The first floor, towards Coventry-street, is occupied by suites of offices. In the rear is the large hall, 100 ft. by 50 ft. This is fitted at one end with stage and proscenium, under which, on a mezzanine floor, are two green rooms; at the other end is a gallery. The upper floor is entirely occupied by two large lodgerooms, 31 ft. 6 in. by 27 ft. 3 in., with ante-rooms, store-rooms for regalia, &c. Attention has been paid to the mode of exit in case of fire, there being four staircases available in such an emergency. The design is in the Venetian Palazzo style of architecture. Tenders have been got for the erection, the lowest being 8,000*l.*

The works in connexion with the Graving Dock at Williamstown, which have remained at a standstill for two months, are now to be resumed. They were suspended in consequence of a strike amongst the workmen,

who demanded that their hours of work should be reduced from ten to eight hours, the period now fixed by Government regulation as a day's labour on all public works. The contractors refused to reduce the hours of labour without making a corresponding reduction in the rate of wages, and the men accordingly struck. As the regulation in question was made subsequently to the commencement of this work, the contractors asked to be relieved from their obligations; but this the Government refused to do, alleging that if the contractors chose to employ men by the hour instead of by the day they could obtain labour at practically the same rates as formerly. The Legislative Assembly was appealed to, but a majority decided in favour of the Government, who will enforce the contract.

The construction of the North-Eastern Railway is going on satisfactorily, and a large number of men are now employed on the works. The ceremony of turning the first sod was performed by the Commissioner of Railways on the 20th June, and since then the contractors have been busily engaged in pushing on the works. The necessary offices for the staff of the contractors are built at the Melbourne end of the first section, which is light work, and will be completed, according to the present anticipations of the contractors, in about five months.

The Roman Catholics resident in West Melbourne have a church dedicated to St. Augustine in progress. The foundation-stone was laid in December last. The design is by Mr. T. A. Kelly, of Elizabeth-street, architect. It is in the Decorated style. The extreme length of the church is 85 ft., and width 45 ft.; the nave, 68 ft. long by 25 ft. wide, terminates in a polygonal apse 18 ft. wide; the aisles are each 12 ft. 6 in. wide, and the same length as the nave; porches and a vestry are added at the southern or chancel end; an organ gallery occupies the northern end of the nave. The principal feature in the facade is the tower, surmounted by an octagonal spire, terminating with a wrought-iron cross, at a total elevation of 100 ft. The spire is ornamented with gables and open pierced bands. A large and ornamental five-light window occupies the north gable, while the aisles are lighted by two-light traceried windows. The principal entrance will be under the tower, and consist of a deeply-recessed doorway, having banded shafts in the jambs. Internally, the church is divided into three naves by cast-iron columns, having the spandrels of the circles filled in with enriched and foliated open metal-work. The total height to ridge of roof from floor-line is 28 ft. The materials employed in the construction are blue-stone, Geelong free-stone, and pressed cement. The accommodation afforded will be about 600 sittings, and the total expenditure 2,500*l.* The execution of the works has been undertaken by Messrs. Reid & Stewart, of North Melbourne.

The Presbyterian Church at Kororo is in the Early English style of Gothic architecture, from the design of Messrs. Reid & Barnes, architects. It is cruciform in plan, the nave being 70 ft. long and 35 ft. wide. The transepts have a depth of 12 ft. 0 in. by 21 ft. wide; the height from floor to ceiling is 36 ft., and to top of ridge 48 ft. A tower, with porch, flanks the front gable, forming the front entrance to the church, the tower and spire being 115 ft. high. The place which, in Anglican churches, is appropriated to the chancel, is, in this case, occupied by the vestry, 21 ft. by 15 ft., at each side of which, in the angles, are two entrance-porches leading to the church and vestry. The walls are to be built of bluestone, with brick and cement dressings, the roof covered with slates. A large three-light window occupies the front gable, and two-light windows are placed in the minor gables of the transepts; the side windows are two-light, each of the windows being spanned by a single arch. The internal walls are to be plastered, the ceilings diagonally boarded, which, as well as the timbers of the roof, are to be stained and varnished. The church will seat 400 persons, and is estimated to cost 3,000*l.*

Much light, of rather a sinister sort, has been thrown on the great Melbourne telescope. By comparing Mr. Severn's criticisms on it with the report of the board of visitors and the annual report of the Government astronomer, a mystery which previously surrounded the instrument has been dispelled. There is a general agreement between all the witnesses as to the instrument's badness of definition. When at its best it makes a star look like the ace of clubs. If an attempt be made to remedy this defect by altering the focus, a more circular figure is obtained, but it has a

dark centre. It represents the stars to be illuminated cart-wheels. The counsel for the defence say that the telescope is not intended for star-work. It is a space-penetrator for revealing faint nebulae. But the instrument that distorts one object will distort another.

Dunedin (New Zealand).—The new Athenæum and Mechanics' Institute, Dunedin, is situate on the south-east side of the Octagon, next but one to the South Australian Hotel, and comprises a shop-frontage and a large hall and other premises at the back. There is a steep fall from the Octagon backwards, and this is made available for kitchens, cellars, &c., as required. The front consists of two shops, with an 8-ft. corridor between them. One of these is 18 ft. by 30 ft., and the other 15 ft. by 30 ft., and each has cellars and kitchens, and large living-rooms above them. At the end of the corridor there is an entrance-hall, 12 ft. by 23 ft. 6 in., leading to the reading-room, which has an area of 36 ft. by 35 ft., and to the library of 34 ft. by 18 ft.; also to a magazine-room of 14 ft. Mr. David Ross is the architect.

BARNES'S HOME AND INDUSTRIAL SCHOOL, ARDWICK, MANCHESTER.

The results of the Manchester Certified Industrial Schools, at Ardwick, have been gratifying, and from time to time enlargements of the building have been effected, until the present accommodation, for upwards of 200 children, occupies all available space, and renders further extensions impracticable. Aware of the inadequacy of the existing accommodation, the committee proposed to erect an additional school, capable of accommodating 200 children, in the neighbourhood of Manchester, but in an agricultural district, where a quantity of land adjacent could be had for garden and farming purposes, and adapted to the employment of spade hands; so that, in addition to the usual in-door industrial occupations, the boys may be fitted for out-door and agricultural pursuits. They were about to make a vigorous effort to collect the required sum, when Mr. Robert Barnes, an old friend of the Institution, called upon the governor, and having examined the plan which had been prepared, generously offered to pay the whole cost of building and furnishing, and to purchase a few acres of land, and has since carried out his purpose by paying over to the chairman and the governor the sum of 12,000*l.*

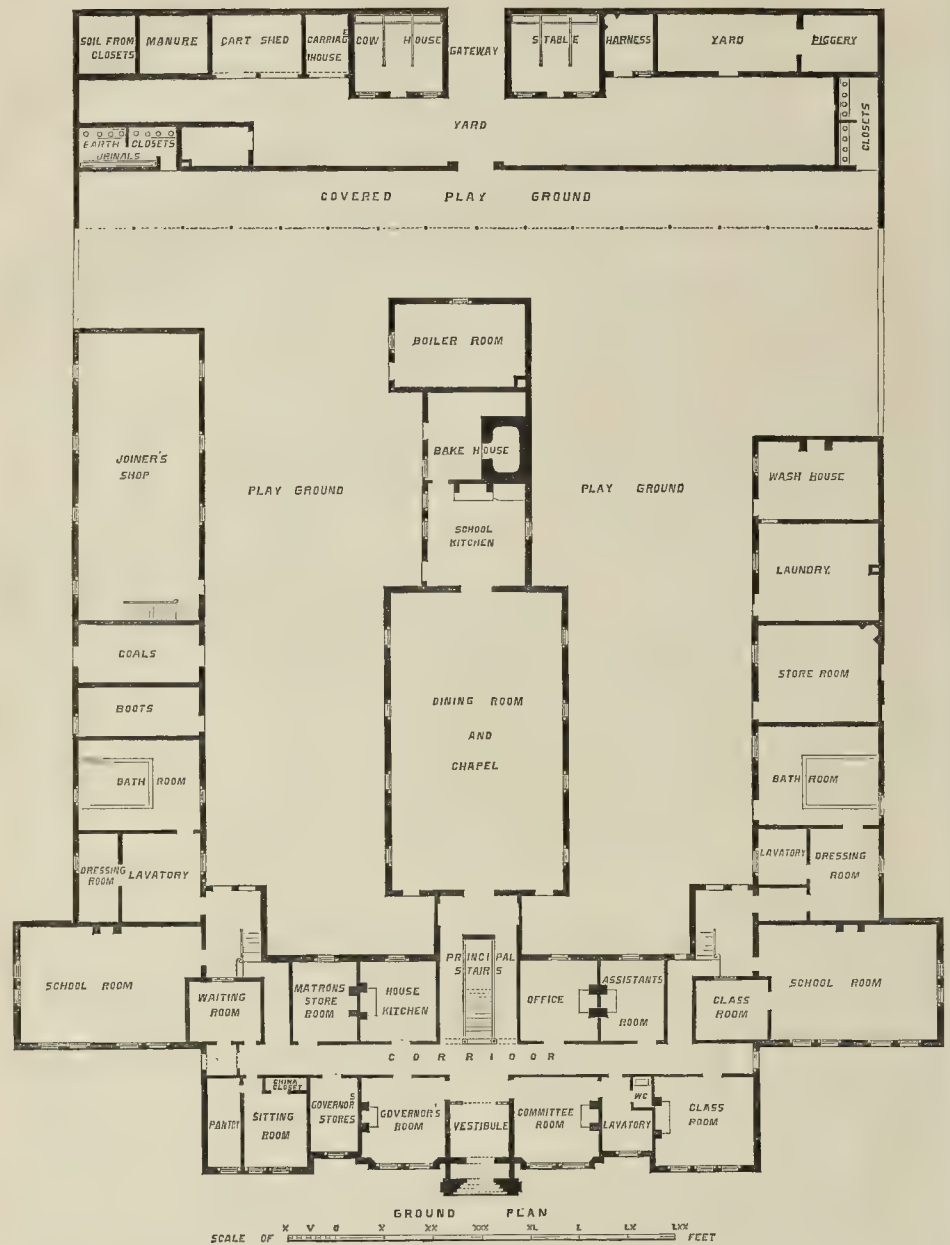
The building, to be called "The Barnes's Home and Industrial School," is being erected on an elevated plot of land on the Bank Hall estate, at Heaton Mersey, about five miles from Ardwick, and is a spacious structure in the Gothic style of architecture. We give a view of it, and the ground plan.

The total frontage is 196 ft., and the depth 242 ft. The central part of the building is three stories high, with side wings two stories high, built of brick with stone dressing. The principal feature in the front elevation of the central part of the building is a tower with chamber for the reception of a clock, surmounted with a slated spire, the total height of which is 111 ft.

The principal entrance is under the clock tower leading to a spacious hall, thence to a corridor running right and left the full length of the building. There will be accommodation for 200 boys, with resident masters, assistants, servants, and residence for the governor and matron.

The ground plan contains two school-rooms, each 40 ft. by 24 ft., designed as wings, series of class-rooms, and master's rooms; the chapel and dining-hall, 60 ft. by 35 ft., and 23 ft. high, at the end of which are the school-kitchen, cooking apparatus, bakehouse, and boiler-house, situated in the centre of the play-ground, leaving a space between the right and left wing for the recreation of the children. In the front are the governor's residence, committee-room, assistants' rooms, and offices, and in the side wings are store-rooms, bath-rooms, laundries, lavatories, drying stove, and workshops two stories high.

The principal staircase is approached from the central part of the hall from an arcade of red Runcorn stone columns, carved Bath capitals on moulded Yorkshire stone base. Over the arcade, niches are formed for the reception of busts. There is a central flight from the hall, returning right and left to the first floor, lighted by a large window. The staircases for the boys are at each end of the side wings. There is a side-



BARNES'S HOME AND INDUSTRIAL SCHOOL.

Plan of Ground Floor.

entrance for tradesmen at one end of the corridor, and a waiting-room for their accommodation, and for the children's friends who may from time to time visit them.

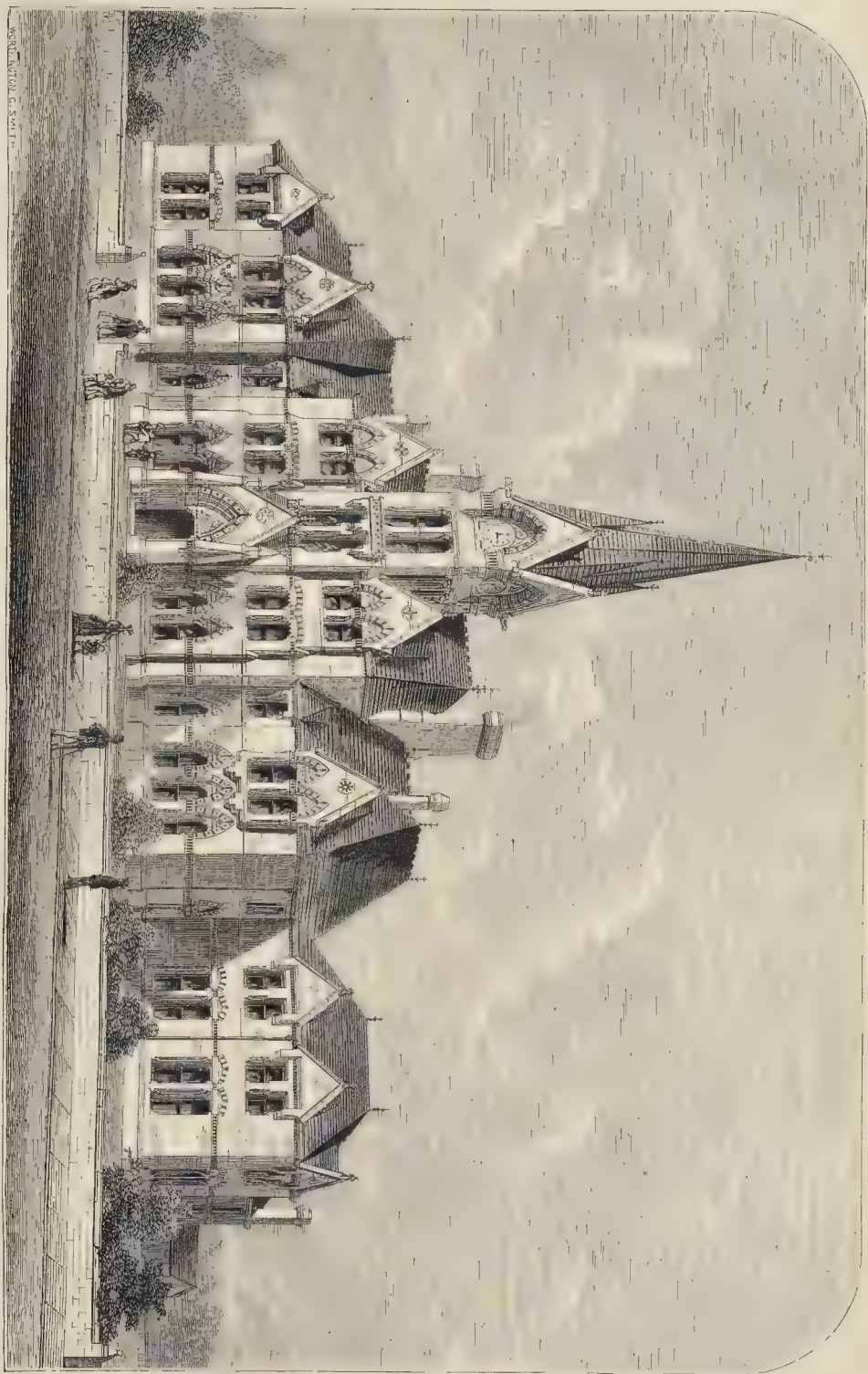
The first-floor contains governor's, matron's, master's, assistants', and servants' bedrooms, bath-room and dormitories for the boys. The sick-ward is on the second-floor, isolated as much as possible. Shafts are constructed for the admission of fresh and extraction of foul air. In

the basement story are the storage and keeping cellars. The building is heated by means of steam-pipes. At the back of the school premises are the farm buildings.

The total cost of the erections, with the fittings and the site, will be about 12,000l. The contractors are Messrs. Thomas Clay & Sons, of Manchester and Audenshaw; and Mr. Henry Finchbeck, of Manchester, is the architect.

The committee propose, as soon as possible

after the Barnes's Home is opened, to supplement the grant of 3,000l. by the City Council, with a sum of money to be raised by voluntary effort, for the purpose of establishing a Third Branch in the City, the object of which will be to provide food and free education for some 150 children; also a dormitory for girls who may be committed under the provisions of the Industrial Schools Act, with a view to training them up for domestic service.



W. & A. G. & S. 1870.

BARRE'S HOME AND INDUSTRIAL SCHOOL, NEAR ARDWICK, MANCHESTER.—MR. HENRY PINCHICK, ARCHTCT.

THE BRITISH ASSOCIATION.

At the fortieth annual meeting of the British Association for the Advancement of Science, held at Liverpool, Professor Huxley, the president, delivered an address chiefly on the moot question whether living matter always arises by the agency of pre-existing living matter or by *biogenesis*, as he called this view; or the contrary, which he named *abiogenesis*. He entered closely and fully into the evidence *pro* and *con*, and then said,—

"To sum up the effect of this long chain of evidence—it is demonstrable that a fluid eminently fit for the development of the lowest forms of life, but which contains neither germs nor any protein compound, gives rise to living things in great abundance if it is exposed to ordinary air, while no such development takes place if the air with which it is in contact is mechanically freed from the solid particles which ordinarily float in it, and which may be made visible by appropriate means.

It is demonstrable that the great majority of these particles are destructible by heat, and that some of them are germs or living particles capable of giving rise to the same forms of life as those which appear when the fluid is exposed to unpurified air.

It is demonstrable that inoculation of the experimental fluid with a drop of liquid known to contain living particles gives rise to the same phenomena as exposure to unpurified air.

And it is further certain that these living particles are so minute that the assumption of their suspension in ordinary air presents no such slight difficulty. On the contrary, considering the lightness and the wide diffusion of the organisms which produce them, it is impossible to conceive that they should not be suspended in the atmosphere.

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On the influence of minute organisms in the production of diseases, both in insects and in animals, the Professor said,—

There can be no reason for doubting that among insects contagious and infectious diseases of great malignity are caused by minute organisms, which are produced from pre-existing germs, or by homogenesis; and there is no reason that I know of for believing that what happens in insects may not take place in the highest animals. Indeed, there is already strong evidence that some diseases of an extremely malignant and fatal character to which man is subject are the work of minute organisms.

Looking back no further than ten years, it is possible to select three (1863, 1864, and 1869), in which the total number of deaths from scarlet fever alone amounted to 39,000. That is the return of killed, the maimed and disabled being left out of sight. Why, it is to be hoped that the list of killed in the present bloodiest of all wars will not amount to more than this. But the facts which I have placed before you must leave the least sanguine without a doubt that the nature and the cause of this scourge will one day be as well understood as those of the *pébrine* are now, and that the long-suffered massacre of our innocents will come to an end.

And thus mankind will have one more admonition, that 'the people perish for lack of knowledge'; and that the alleviation of the miseries and the promotion of the welfare of men must be sought, by those who will not lose their pains, in that diligent, patient, loving study of all the multitudinous aspects of nature, the results of which constitute exact knowledge, or science."

We cannot give any account of the successive proceedings of the Association, but we shall select for notice a few points more especially within our province.

In Section G (Mechanical Science), Mr. C. B. Vignoles, C.E., in the chair, the sewage question was treated of in presence of a numerous attendance of members of Local Boards of Health. In this section, Mr. J. Bailey Denton read a paper "On the Extent to which Existing Works and Practice militate against the Profitable Utilisation of Sewage." He pointed out that there were few instances in which irrigation and natural filtration had been associated; they were, however, sufficient to support the conclusion that no system of irrigation should be adopted in which filtration did not form a part.

Mr. J. N. Schoolbred followed with a paper "On the Sewage of Liverpool and the Neighbourhood." His conclusions were that the district of Liverpool and its neighbourhood is favoured by nature with above the average amount of facilities—first, for the collection of its sewage by water carriage, and then in finding, at a comparatively short distance, an outlet in the river Mersey for the larger portion, which it deems advisable to get rid of in this manner. It was again fortunate in having an outlet which, at present at least, secures immunity to the town from the unpleasant consequences which sometimes arise from creating an acknowledged sewage nuisance. Should the town itself at any time prefer to derive some benefit out of this refuse which it now throws away, or should changes in the law, said to be shortly contemplated in regard to the disposal of town sewage, compel it to seek another method of disposing of this refuse, it might be seen that nature provided for this new want, and that the town of Liverpool possesses, at no excessive distance, a most suitable and extensive site for utilising its sewage by irrigation upon the land, with, at the same time, a certain market in itself for the vegetable produce of that irrigation.

Mr. W. Hope, V.O. (of the Sewage Farm at Barking), remarked that the sewage committee of this section were of opinion that there should be an Act of Parliament to prohibit the construction of sewers which were made of impervious material. Professor Reynolds showed that, as at Bedford, sewage could be applied to land without being a nuisance to the neighborhood, provided that it was put upon the land before it had been many hours in the drains. Mr. Brierly, of Blackburn, expressed a confident opinion that sewage irrigation, under proper management, could be carried out successfully without the slightest nuisance, as at Carlisle, even in the immediate contiguity of dwellings. Professor Ansted condemned the sewerage works at Aldershot as a nuisance beyond all question. Mr. Rawlinson regretted to have to give a flat contradiction to a man so eminent as Professor Ansted; but the Professor had been telling this meeting what he deified him to substantiate, and had made a very gross mistake. The question of sewage irrigation would not be made better or worse by false advocacy. With regard to the irrigation carried on at Aldershot, if ever there was a success, or if we might ever hope to have a success in utilising sewage, without committing offence,—and he said it looking Professor Ansted straight in the face,—they must take Aldershot. Let Professor Ansted investigate it as he had done, and ascertain the facts. It had been his duty, on behalf of the Government, to investigate a complaint that the sewage farm at Aldershot was causing a nuisance. His report had appeared in print. A portion of the sewage of Aldershot was devoted to the irrigation of land as bad as the world could produce,—as the Lincolnshire farmers said of the fens, "worth nowt an acre,"—and now that land let at 25s. an acre per annum. There was no nuisance, and there was a living vegetation. If fresh

sewage were put into carriers having a putrid deposit, then there was fermentation and offensive effluvia. The gentlemen who discouraged sewage irrigation had not carried their investigations far enough. Professor Ansted read a note, which he had made at Aldershot, to prove his assertion. Mr. Hawley replied at great length to Mr. Rawlinson, and asserted that Professor Ansted's assertion was "true in every word." At Aldershot the stench was abominable, and the land and vegetation were killed by over-saturation. The land had been let at 25s. a year; now the tenant paid no rent, and received a subsidy of several hundreds a year to occupy it for Government purposes. He deprecated "blue-bookism," and advocated the chemico-mechanical system for the disposal of sewage as the best. Mr. Glazebrooke warmly advocated the sewage irrigation system; and the discussion was sustained by Professor Williamson, Mr. J. Wyatt (Bedford), and Mr. Grantham.

In the same section (G), Colonel Sabine, C.E., read a paper "On Pneumatic Transmission through Tunnels and Pipes." He said that for the purposes of transmitting light parcels by means of pneumatic tunnels, he would employ hydrogen gas in the proportion of 1 to 2½ of atmospheric air, than which it was a better agent, and the plan would be economical, by reducing the size of the large tubes required when common air was employed. Small pneumatic tubes might be worked more profitably than large ones, and the working of small tubes for transmitting letters between the several post-offices in London and other large cities had already proved their economic practicability. As to applying the principle to railway traffic, passenger and goods, he did not believe that a pneumatic line working through a long tunnel could ever be applied so economically as to be equivalent to steam power. Captain Rowett read a paper "On Ocean Telegraphy." He advocated the general adoption of hemp instead of wire cables for ocean telegraphs. He concluded by stating his belief that the cost of laying a hemp cable across the Atlantic would be less than half that of the present cable, and that messages could be sent at a considerable reduction from the present tariff.

In other sections of the Association meeting, Mr. F. B. Grison, F.A.S.L., read a paper entitled, "Anthropological Note on Carved Stones" recently discovered in Nithdale, Scotland; and General Sir H. C. Rawlinson, K.C.B., read one "On the Site of Paradise," taking as his data the cuneiform tablets found among the ruins of Nineveh, and executed in the seventh century B.C.; those tablets being, even at that early time, copied from still earlier tablets. The conclusion arrived at was that the site of the Garden of Eden was in reality the land of Babylonia.

The Chemical Section, during the meeting, formed themselves into an excursion party, which visited the works of the Union Plate-glass Company at St. Helen's, where the various operations were explained and illustrated. The melting by means of Siemens's regenerating furnace, the casting, annealing, grinding, and polishing, excited much interest among the excursionists. A very curious influence exerted by heat upon diamonds was brought to their attention. When a diamond is used to cut hot glass it will only last for one day, and it assumes a milky appearance. Diamonds in constant use for cutting cold glass last about three months. Each diamond costs from 35s. to 45s., and is about three times the size of an ordinary glazier's diamond. Hot glass is not more readily than cold glass.

At the general meeting of the Association it was resolved to hold the next annual meeting at Edinburgh, a little earlier in the season; and the next following at Brighton.

Trade Outrage.—A supposed trade-union outrage was committed at Orgreave, near Rotherham, between Saturday evening and Sunday morning. The brickyard belonging to the Fence Colliery Company was entered during the night, and 24,000 bricks destroyed by being trampled upon. Derrick, the man who conducted to make the bricks, keeps aloof from the union, but says he has received no complaints from the members. The police have examined the premises, and discovered traces indicating that three men must have been concerned in the outrage. A clue has been found to the supposed offenders.

ODD NOTES ON SASHES AND SASH-HANGINGS.

Sir, — The experience of a carpenter's "mouse" on sashes and their fastenings may awaken some recollections and elicit some kind and useful words in the columns of the *Builder*.

I need hardly explain my name or situation. A "mouse" in technical language of the builder's workshop means a small cylindrical slip of lead, to which is attached a cord or string, and it is sent as an *avant courier* through the pulley-box, with the end of the sash-line.

You see, sir, my occupation is a useful and indispensable one, and it is often a most irksome and disagreeable one besides. In my agency, I can only compare my position to that of a little apprentice sweep, who is forced by a heartless master to ascend or descend narrow chimney-shafts and corrugated openings, where there is no proper passage, the consequence being, like mine, that the poor little fellow sticks in the chimney, and cannot be burned out, as is often wished. I have, since my earliest days, been connected with sash-making and sash-breaking, and I ought to know something about hanging sashes;—be hanged to them! Pulley-boxes I detest; they have always been a mousetrap to me; many of my kindred have been immolated, crushed on the axes, and broken on the wheel,—sometimes severed in twain, and their shattered remains buried in an accumulated *débris* of brick, plaster, and chips behind the boxings. My first messages or errands in early life were performed in the interest of the lead weights family. A sympathetic feeling existed between us, for we were born of the same material. As years advanced, *Lead*, which took the lead, was discarded, and the case-hardened ironmonger sent iron in his place. I must not trouble you too much, however, about my own sorrows. As an experienced "mouse," I protest against my longer employment. This may seem paradoxical or suicidal; be it so. If sashes are to be hung, let them be suspended without rope or chain, and if there is no one clever enough, or willing to do it, let us be spared in the mean time the frightful exhibition of the stretched rope. I know a secret about hanging sashes; I received it on the death-bed of a brother "mouse;" it is known to only a very few. I will, Mr. *Builder*, reveal it to you, because I know you have our interest at heart. I would have revealed it long ago to the world, only I feared its adoption would still perpetuate the rope system. It has, however, an advantage over the present one in use, neither the rope nor the pulley-boxes are seen. The secret lies in a nutshell. The pulley-boxes are sunk in the sash frame, opposite the meeting-rails of each sash; so, when the sashes are acting in their places, the sill of the bottom sash never rises above the centre of the frame, where the pulleys are sunk, nor does the top rail, when the top sash is lowered, come below the centre; thus are the frightful ropes and pulley-boxes hidden.

A "mouse" has seen this plan in operation: all that is needed is proper fitting to hang the two sashes from their centres, also proper provision, behind and below the frame, for the passage of the weights; they will, in this case, go down a great deal further than in the old plan. I do not want to see it perpetuated, but if there be some folk who desire to hide both rope and pulley-box out of sight, here is a plan for them with "a mouse's compliments." I have seen during my experience sashes hung in a variety of ways, and as no one feels where the shoe pinches but the one who wears it, I know a little of the pain and trouble belonging to each. When a young "mouse" in my teens, I have helped to hang sashes with weights and sheaves, acting somewhat similar to the weights of an eight-day clock. Two weights were sufficient to hang both pairs of sashes: the principle of action was that when you pulled one sash down the other was necessitated to rise the same distance. I have helped to hang sashes where the pulley boxes were sunk in the head of the sash-frame, and I have helped to hang them with chains. I have seen sashes hung with cords without weights, the weight of one sash being made to hang the other. This was done by connecting the sash-line of both sashes, passing through a pulley-box, or over an axle, constructed for the purpose; the pulley or axle being stationed centrally at the top of the stile, near the head of the sash. When one sash was raised, the other lowered accordingly. An improvement on this expedient might be made by sinking the pulley or axle in the head of the sash-frame, instead of the

stile. Two small brass pulleys might be made, to sink flush with the stuff, to avoid weakening the strength of the wood, by using a large box and axle. Another advantage (if the method possesses any) is, that an unsightly fixture is removed from the face of the stile, where it is in the way, to the head where the simpler contrivance can be adjusted, and sunk out of the way. Here is another method: let the spiral springs, with a cork core, be sunk in a centre-bit hole, a distance from either end, on the hanging side of the sash. Let them show, at least on each side, a $\frac{1}{2}$ -in. projection, before they are forced back by the necessary pressure needed, in pushing the sash into its place. The reactive pressure of the compressed springs will be more than sufficient to hold the sashes for a long time in their place, and allow them to work up and down. This idea may be improved upon, in a variety of ways, to suit large or small sashes, common-place work, and respectable and highly-finished work. The amount of friction must be studied in each case, and how to overcome it, when too great, and how to lessen the defects arising from its application. The skillful workman needs no instruction from a "mouse" on that subject.

I have, of late years, looked with much pleasure on the several attempts made to hang sashes, without enlisting the service of a "mouse," to perform the ignominious duties of a "Calcraft." I have seen sashes hung without sash-line, with springs, with a facing of leather, with corks, with chains, with cogged-wheels, and with a variety of tongue-shaped springs and nondestructive contrivances, fastened in laterally and sidewardly; I must, however, in candour confess, that none of these methods, though many of them possessed peculiar advantages, were anything like satisfactory, and that, with all its obvious defects, the old system as yet is the best, and perhaps the simplest.

A spring requires a hard, unbending, and somewhat smooth and even substance to press against, not the wood itself, but an insertion of a brass or iron slip, to act up and down upon, and against. It requires also that the sashes be closely fitted, with little freedom, and perfectly square, but this is not always to be had, though indispensable. Though the same exactness should be observed with line-hung sashes, the principle of suspension by weight makes a difference. The weights acting on the pulley lessen the power or lift required to raise the sash, a very slight effort only being required in well-balanced sashes.

When springs are used, and when the sashes are heavy, the force required is more than what ladies' fingers would like to exercise. As a "knowing mouse," I would advise all workmen to fasten the sash-line two-thirds the way up from the bottom, or hanging position of each sash. In old sashes, that require re-hanging, it is necessary to fix on the line near the top, as the freedom is so great from "wear and tear." By doing this the sash rises more evenly, and is not liable to get angulose and "stick."

I am almost tempted here to say something about sash-fasteners and window-blind appliances, but before venturing on such a perilous enterprise, I must secure your protection, as well as the law. If I did not, I fear the Brummagem hardware man and his patrons, the "Jerries," would waylay and slay me for "spoiling trade;" that's the word, Mr. *Builder*. Some day, however, I will open people's eyes about builders' ironmongery, tons of which are "made to sell," like the houses it is used in. Oh! if but this captive "mouse" could speak, he could unfold a tale that would cause an earthquake in Brummagem, and would cause the "Jerries" to expire in the greatest agony. I was treated, by an old master of mine, the other day, to a sight of the Workmen's Exhibition, and I was curious to see the different sash "shifts" and appliances there exhibited. I have not time now to describe them in detail; suffice it to say, not one of them can be called an improvement, though some of them are certainly innovations. I blushed for my country and my kindred, to see such folly and madness exhibited and called "improvements." I have no doubt some of the inventors expect gold medals, and will certainly vent their ire upon the "back-stair influences" that voted them only "Honorary Mention." They may feel lucky indeed, and highly honoured, if they even succeed in obtaining the latter. With one or two exceptions, I never witnessed such clumsy workmanship, and such a murdering of time and butchery of materials, as some of these sash-hanging improvements exhibit. I left the build-

ing disgusted, and I went home, thanking my good fortune that I was still

"AN EXPERIENCED MOUSE."

P.S.—I must add an authentic anecdote, by way of postscript. During my early days, one of the first practical lessons of usefulness, besides boiling the glue-pot, was to learn how to make a "mouse." The youngest apprentice was generally called upon to do it. A young country lad, I remember, on one occasion, was called on suddenly by his master to go to the office and bring a chisel with him, to cut a slip of lead to make a "mouse." The boy, not being a very bright specimen, and not thinking of the bore of a pulley-box, cut a large piece of lead, and procured a hammer as he was desired, to beat it round. He next tied on a piece of string as thick as a chalk-line, and, when he considered his work done, he brought it to his master, who was in waiting. "What the d—l, Jack," said he, eyeing the young hopeful, who had brought something like a mason's elongated "bob." "What on earth is this?" "It's—it's—a mouse, sir," stammered the bewildered youth. "A mouse!—be hanged, you stupid urchin!" replied his master; "why that's not a mouse, but a rat."

FORCE AND MOTION.

IR asking how can a finite force produce endless motion, Mr. Kipling seems to consider hypothetical cases, impossible in themselves, but, given by way of illustration, are statements of veritable possibilities. We cannot conceive of a force of expulsion without the finite idea of a fulcrum, and the idea of a fulcrum involves the idea of a force existing which must stop the motion imparted. If a cannon-ball were not acted on by gravity, it would continue to move without weight, and there could then be no power of expulsion from the cannon. To assume conditions, then, which will expel the ball is to assume conditions which will stop it. In these remarks I only wish to be observed, any measure of the necessity of the resisting air to explode the powder,—a necessity, however, which the hypothesis involves.

Perhaps our next conception of a force given with the slightest of fulcrums is the force given by breathing. Thus we read, God "breathed into his nostrils the breath of life." Perhaps the truest conception is that the power which can keep ceaseless motion is an ever-rolling ball, indeed, the Eternal Life.

HORACE FIELD.

Sir,—The opinion expressed by Mr. Kipling, that a finite force communicated to a projectile in a vacuum could not communicate an infinite motion, is doubtless correct; but it must be conceded that an infinite force communicated to a projectile in a vacuum would cause an infinite motion, and it were perhaps impossible to prove that a force communicated to a projectile could not, if that projectile could in its passage suddenly enter an endless vacuum, then become infinite.

It is our duty to make what discoveries we can, yet we shall always be right in deferring to the opinions of distinguished mathematicians until we can clearly prove them to be wrong.

The unequalled Sir Isaac Newton observed that the "inertia" is a passive principle, by which bodies persist in their motion, or rest, and receive motion, in proportion to the force impressing it, and resist as much as they are resisted.

According to this last sentence, a body moving in a vacuum (which body would receive no resistance) could have to impart no resistance, and would therefore have to impart none of its force, which would, therefore, continue undiminished to impart infinite motion to the projectile.

The term *vis inertiae* has been used by the followers of Leibnitz, to denote a force inherent in a "body only while in motion, which actually carries it from place to place by acting upon it always with the same intensity in every physical part of the line which it describes."

It were perhaps possible to, in some degree at least, prove this by actual experiment. A ball projected in the atmosphere will be acted on by agents,—first, by the propelling force; secondly, by direct resistance of the atmosphere; thirdly, by its downward pressure or gravitation; fourthly, by gravity; possibly, fifthly, by centrifugal force; and sixthly, by slight magnetic or polar attraction, and possibly by solar and lunar attraction or repulsion, according to their places at the time; for if the moon did attract the water (and cause the tides) more than the earth, may she not attract the earth more or less than the iron or other metal that is in or upon its surface? and in such were the case, the relative specific gravities of metals and water would vary with the moon's phases.

If a chamber a mile long were made sufficiently high and perfectly vacuous, the second and third seconds would not set on a ball passing down it; and the fifth, sixth, and lunar and solar influences need not be considered, as they would be small in any case.

Let through an air-tight hole in the end of the chamber, we were to fire a rifle-bullet with such a charge of powder as should cause it to strike the ground at the other end of the chamber, then gravitation would necessitate the ball's describing what would be (were said to the earth's centre parallel, which we know they are not) a parabola, and the direction of the ball, when it should arrive at the parallel, would be the result of the dual action of retardation caused by gravity and its diminished velocity. Acceleration caused by gravity would now begin to unite its force with that of the velocity. Now, whether the ball increases the actual rate of feet per second of the ball in the latter half of the parabola must depend on the angle of inclination at which the shot was fired: if at only 2 deg. or 3 deg., then the diminution of velocity through resistance would (if such, independent of gravity, could exist in a vacuum) be greater than the increase of force caused by acceleration; but, if the angle of inclination were, say 88 deg., then acceleration would cause a surprising increase of the rate and force of descent of the ball from the vertex of the parabola, at which point it would have lost nearly the whole of its velocity.

Adopting a small inclination to fire from, and using a necessarily greater charge of powder in consequence, then retardation and acceleration will cause but little alteration in the velocity, which must sensibly diminish under the hypothesis that force is always finite. If, therefore, a plant were placed in the vacuous chamber, and near the rifle, and of a thickness such that a bullet would only go through it, and if the same plant were placed at or near the end of the chamber, perhaps a mile distant, then, if the bullet would still, with the same charge of powder, go through it, then it would appear probable that force is infinite.

It were difficult to discover either the tendency or truth of the assertion made by "M. D. A.," that there can be no force without motion, as force is not necessarily at all times active; it may be passive, and unable, without an additional force, to cause motion. The lateral pressure of water in a reservoir, for instance; also when a horse-shoe magnet retains in suspension a piece of iron,—there will be the force of attraction, without motion perceptible to us.

HENRY ADDRESS.

THE AYLESBURY SURVEY.

SIR,—My attention has been drawn by a letter written by "C. E." in your last issue of the *Builder* to the above. I think my tender was the lowest, viz. 105*l*. I am of the same opinion as "C. E." that the tender was not for a survey, and to leave the competitors in ignorance as to their decision, and select one considerably in advance of mine, is indeed a most unfair and "dark" proceeding.

P.S.—If mine is the lowest tender, I believe I am entitled to the work by the wording of the advertisement, and from my conversation with Mr. Bailey Denton.

SIR,—I was one of the competitors for making the above survey, and, in common with others, was put to the trouble, loss of time, and expense of making two tenders, as the Local Board were not satisfied with their first tender. Now, as I sent in the names of fifty-nine parishes, &c., together with a list of some fifteen or twenty towns, amounting altogether to upwards of 320,000 acres, which had been surveyed and mapped by me, I have a right to ask that my tender be rejected; and why one nearly half as much again as mine was selected; for without knowing at all who was appointed, and without explanation to that gentleman, I will venture to say his claim to that appointment could not have been superior to mine; and I consider a great wrong has been done me, and that the affair altogether was a "huge farce."

THOS. L. BATH.

SIR,—The letter of "C. E." in your journal of the 17th inst., tends to explain something more than the want of courtesy due to gentlemen whose professional abilities have been called in question by the local Board of this town. Having been invited by public advertisement to compete for this undertaking, and confined in the delivery of estimates to a period so circumscribed as to require extension, those who complied with the first publication claim some explanation of the merits upon which the Board made its selection, seeing that there were lower estimates than the one adopted.

Public competition is well enough, so long as the public reap the benefit, but impartiality should be the rule of the governing power. Presuming the absence of local ability, and the necessity of extraneous aid, the latter being sought, without reservation in the circular of instructions, on behalf of the Board, to repudiate the acceptance of the lowest or any tender, those who staked their chance upon an honourable decision expected fair play and an acknowledgment of the trouble to which they had been put.

The proximity of figures between a number of estimates lower than the one accepted, was so close as to justify the adoption of the lowest.

The railways will have the supreme satisfaction of knowing how judiciously their local Board looks to economy in its expenditure, seeing that others would have required less for doing this work, and that it would have been executed with equal credit, accuracy, and despatch.

FAIN FLETCHER.

CONSUMPTION OF SMOKE.

At Hammersmith, Mr. William Wigmore, a builder and contractor, of Walham-green, appeared to answer an adjourned summons for using a furnace so constructed as not to consume the smoke. The defendant declared that he had a furnace within the meaning of the Act. He said it was only a small portable engine with a fire-box. According to his view, a furnace to be unlawful must be set in brickwork, and be of a permanent character. Mr. Fegham closed at a dictionary, which described a furnace as an enclosed fire-box. Mr. Sandison, the Government engineer, said there would not be any difficulty in constructing an engine of that kind so as to consume the smoke. He had seen several engines so constructed. This evidence was confirmed by another engineer, and they both stated that they saw black smoke issuing from the chimney of the defendant's furnace, and 8*l*. 12*s*. 3*d*. costs. The defendant expressed an intention to appeal against the decision.

COMPENSATION CASES.

THE HOUSE OF DETENTION.—BENNETT V. THE JUSTICES OF MIDDLESEX.

This was a compensation case, tried in the Sheriff's Court (before Mr. Under-Sheriff Churchill and a special jury), for some premises in Woodbridge-street, Clerkenwell, required for the enlargement of the House of Detention. The claimant, as a gold-beater, sought compensation for his removal and establishment in other premises, which he had recently taken in Turnmill-

street, and which would require an outlay. The claim made on the Justices was 3,056*l*., which was resisted as excessive.

Mr. Horace Lloyd, Q.C., and Mr. J. O. Griffiths were for the claimant; Mr. Littler appeared for the Justices. The case lasted till nearly five o'clock, and a good deal of evidence was given on both sides. There was a wide difference in the evidence of the surveyors. Mr. Farmer (Debenham, Tewson, & Farmer) was the principal witness, besides the claimant, in support of the amount mentioned, and on the other side Mr. F. J. Clark (Farebrother, Clark, & Co.) and Mr. Edwin Fox (Fox & Bousfield) were called. A claim was made for a reinstatement in the new premises, which were more extensive than the old place, and that claim had been only recently started. Mr. Clark mentioned, that as surveyor to the Justices of Middlesex, he had laid out some 40,000*l*. to enlarge the prisons, and this was the only case he had not settled. By the premises now immediately required, one side of Woodbridge-street would be taken, and the House of Detention would be isolated from houses.

Mr. Lloyd asked for full compensation for the loss Mr. Bennett would sustain. The claim for his interest, &c., was 1,617*l*., and for compensation about 1,400*l*. In the course of the case it was stated that the net profits were agreed upon as 883*l*. a year.

Mr. Littler ridiculed the claim made as preposterous, and denied that it was a case for a reinstatement of business, arguing that the new premises were not required, except for a larger business, which the respondents were not to be called upon to pay. It was an unfortunate circumstance that additional room was required for the criminal classes of the county, and all that could be expected to be given was a fair compensation.

The jury retired after the under-sheriff had summed up, and, after a consultation, assessed the interest in the premises at 599*l*. compensation at 65*l*., and fixtures 400*l*., making 2,654*l*.

Mr. Littler said an offer had been made to that amount. Mr. Lloyd replied that the offer was without considering the interest of the under-tenants, whom the county would now have to satisfy.

THE BRITISH MUSEUM.

SIR,—Permit me respectfully to make two trifling suggestions to the authorities of the reading-room of the British Museum. The first is that, by way of ventilation, a little fresh air be now and then admitted into the corridor leading from the great hall into the reading-room. One of the skylights could easily be made movable for the purpose, and the strong musty smell, at certain times sickening, would thus be got rid of. The other is to fix a few hat-pots in the lavatory. Owing to the absence of these, the scarcity of soap (as a rule), and the dreadfully damp towels, a wash really becomes an unpleasant operation.

A little fresh air, too, would not hurt this place; in spite of the perfection of every apparatus there is always a close, unpleasant smell.

A. C. G.

HANDRAILING HANDS.

SIR,—I have just read (in last week's issue) your notice upon "Handrailing." I hope your numerous readers in the trade will rouse themselves and master the great difficulty, so that in a short time instead of only one man in a shop being considered competent to undertake the work of a staircase and handrail, it will be given out the same as any other job, each man taking his share, and so end a monopoly which is a disgrace to our times; affording, as it does, such facilities for the working man to obtain a perfect knowledge of geometry, and so dispense with that blind method of working, "the rule of thumb."

I have seen many instances of what you refer to respecting the intolerance of staircase work a few years back, when to put the job into the hands of any but the "Sir Oracle" of the shop, the great practical geometrical professor, would have been thought as bad as if at the present time the decoration of St. Paul's were intrusted to an East-end theatrical scene-painter. I hope you will insert this, as it may tend to awaken the dormant faculties of some of my brother workmen.

F. D.

FALL OF HOUSES NEAR GLASGOW.

On Tuesday forenoon the back front of two large four-storied houses in course of erection, and nearly ready for the roofs, at the corner of Belmont-crescent, west of the bridge at Kelvin-side, suddenly burst outwards near the bottom, and fell, burying eleven of the workmen in the ruins. About fifty men employed in the neighbourhood immediately rushed to the spot, and began to remove the rubbish, and extricate the sufferers. In a short time five were taken out dreadfully crushed and quite dead; three seriously injured, were removed to the infirmary, and the rest were able to walk to their homes. If the walls that fell were of the faulty construction of those left standing, the cause of the catastrophe is clearly indicated. But this, no

doubt, will be thoroughly investigated before the Fiscal. It is astonishing that the speculative building operations largely going on in this and other suburbs of Glasgow should be regulated by no Buildings Act, nor be under the official supervision of qualified surveyors. This accident, if accident it can be called, will show the necessity of speedy legislation in this respect. The sanitary arrangements are also very far from what they should be, and should receive immediate scientific attention.

MONUMENT IN MEMORY OF DEFOE.

A LOOK-BACK to earlier volumes of the *Builder* is satisfactory in this respect, amongst others, that we are reminded how many things have been done, how many alterations made, how many wants supplied, the necessity for which had been there pointed out. As to the want of a monument to Daniel Defoe, for example, and the general neglect of the graves of other eminent individuals in Bunhill-fields Cemetery, reference was made again and again in our pages, and years passed without attention. Ultimately, however, the want became apparent; the grounds have been put in order, after a fashion; some of the monuments repaired; and last week Mr. Chas. Reed, M.P., with appropriate speech, unveiled a monument that has been erected by subscriptions of "the boys and girls of England," and is inscribed:—

DANIEL DEFOE.
Born 1661; died 1731.
Author of "Robinson Crusoe."

A second inscription glorifies a religious publication, in which the appeal to the boys and girls is said to have appeared, and ought to be on one next week at farthest. The monument is of white marble, and consists of a small obelisk on a pedestal, a common affair, so far as design is concerned, without a morsel of art in it, but fairly executed, so far as regards workmanship, by Mr. Horner, of Bournemouth.

In respect of this want of art, the new monument agrees but too well with the rest of the memorials. What a dreary expanse of unmitigated ugliness this burial-ground presents! Not a spice of imagination or taste anywhere apparent, and yet how full of interesting associations it is. The coarse common sculpture in the monument to the immortal dreamer, Bunyan (restored in 1862), is fast decaying.

THE OSWESTRY AND ELLESMERE COTTAGE HOSPITAL.

The formal opening of the Oswestry and Ellesmere Cottage Hospital took place lately. The new hospital, the foundation-stone of which was laid, with Masonic honours, on November 1, 1869, by Sir Watkin Williams Wynn, bart., M.P., has been erected at a cost of nearly 2,000*l*. Towards the building fund all classes and creeds, notably including working men, for whose special benefit the institution is intended, have contributed liberally.

The style of the building is Cottage Gothic, and it is faced with Fenn's Bank bricks, from the yard of Mr. Savin. The sills and heads and stone dressings are of Cufa stone, from the quarries of Messrs. Dennis & Co. The string-course is terra-cotta, manufactured at Ruabon by Mr. J. C. Edwards. The three gables have ornamental Gothic barge-boards. The entrance is formed by stone columns, with carved capitals, and an arch with carved spandrels, on which is inscribed on a ribbon intertwined in the carving, "I was sick and ye visited me," the work of Mr. G. Landucci, of Shrewsbury. Over the entrance is a balcony for the convalescent patients to sit in and enjoy the fresh air.

On the ground-floor is a large dining-room, 21 ft. by 13 ft. 6 in.; surgical store-room, 10 ft. 6 in. by 10 ft.; matron's sitting-room, 16 ft. by 13 ft.; larder, 10 ft. 6 in. by 9 ft.; kitchen, 18 ft. by 13 ft.; scullery, 12 ft. 6 in. by 13 ft.; wash-house, 14 ft. by 13 ft.; laundry, coal and wood sheds, bath-room, large ward for four beds, 21 ft. by 20 ft.; small ward for two beds, 18 ft. by 12 ft.; and a nurse's kitchen with a window looking into each ward. The hall, 16 ft. 3 in. by 14 ft. 3 in., and a side corridor, 15 ft. by 5 ft., are laid with a tessellated pavement supplied by Messrs. Boote, of Burslem, the colours employed being blue, black, buff, red, and white. The out-houses are fitted with every convenience, the washhouse containing two boilers, and non-absorbent troughs by Mr. J. C. Edwards, of Trevor, and the laundry a stove capable of heat-

ing twenty-four irons. The kitchen is fitted up with Flavel's cooking range, supplied by Mr. E. Shaw, of Oswestry, to whom was also entrusted the bell-hanging arrangement. Slate shelves and zinc ventilators ensure the coolness of the larder.

On the first floor are two wards and nurse's kitchen, corresponding with those on the ground floor; also a sitting-room for the nurses when off duty, a general store-room, matron's store-room, a linen store, and two bedrooms. On the upper floor are four bedrooms, one having Rufford's bath, with shower-bath fitted up in it for the use of the nurses. The walls of all the wards are cemented with Parian cement, and lined 3 ft. 6 in. high, with turquoise and white tiles, supplied by Messrs. Minton, Hollins, & Co. The thorough ventilation of the wards is secured by windows on opposite sides, the upper parts of which are hinged on the bottom to fall inwards, forming a hopper, the top of the hopper being covered with perforated zinc to prevent any draught and to exclude insects. There is also one of Arnott's ventilators in each ward, and a bell to summon the nurses in cases of emergency.

The building has been erected by Messrs. W. Trow & Sons, from the designs, and under the superintendence of Mr. W. H. Spaul, architect, of Oswestry, the whole of the building arrangements having been conducted by Mr. Richard Westwood, as foreman.

The grounds surrounding the hospital have been laid out by Mr. Porter, nurseryman.

MOVE THEM BODILY.

THE great improvement of widening Shepherdess-row, at the City-road end, will shortly be completed, according to all appearance. It now forms a good wide street, with the exception of the part where the one-storied almshouses unpleasantly project too forward, whereby the pathway lessens the width of road in front some 6 ft. or 8 ft. Cannot the almshouses be bodily shifted back by means of excavating under the separate walls, and placing balks of timber under them upon rollers, each wall, when the building is moved far enough back, being under-pinned previously to removing the timbers? Such a process has been carried out before now in America, and with larger structures.

S. Y.

CONINGSBY'S HOSPITAL, HEREFORD.

SIR,—Not having perused any other report of the recent meeting of the Archaeological Association at Hereford but your own, I am unable to tell from whence you have derived the extraordinary description (given in your page 737) of "the coat of arms of the Coningsbys," placed over the entrance of Coningsby's Hospital, in that city. It is pronounced to be remarkable, as an example of "what is known as canting or punning heraldry;" and as representing "on the one side the lattice-fence, which kept the conies in their abode, and on the other side the conies enjoying themselves within it, according to their fashion." Were this actually a true description, it would be a remarkable example indeed, but more like an *improvisation* or allegorical device than a coat of arms.

The shield, in fact, represents the arms of Sir Thomas Coningsby, the founder of the hospital, and those of his wife, Philippa Fitz-Williams impaled. The conies are not "within" any "lattice-fence;" and what has been mistaken for lattice-fence is the well-known lozenge coat of Fitz-Williams. In the hall at Hampton Court, the seat of the family in Herefordshire, "Conisbie bears Gules, 3 conies *seant*, within a border engr. argt. impaling Fitz-Williams;" in the hospital, on a quarry of glass, was "Conisbie not bordered," also impaling Fitz-Williams, with the date 1614. (Dingley's "History from Marble," pp. cxxiii. and cxxviii.) It will be observed that the name was usually pronounced and written Conisbie: therefore the assumption of conies as the charge of the family arms was a very natural one. They do not, however, occur in any early roll, nor was the family of importance till the reign of Henry VIII.

JOHN GOUGH NICHOLS.

* * * The observations of our esteemed correspondent do not, after all, disprove the remark that the arms are noticeable as an example of canting or punning heraldry.

* It was the account given by Mr. Edmonds, who was the guide on the occasion.

CHURCH-BUILDING NEWS.

Bampton.—The parish church restorations have been completed, from plans prepared by Mr. E. Christian, of London, and the contractor for the larger portion, viz., the nave and aisles, was Mr. Bartlett, of Witney. Mr. Wakeford was clerk of the works during the execution of the restoration of the transepts, nave, &c. The pulpit, which is of Caen stone, has been elaborately carved by Mr. B. de Siemianowicz, of Westminster. It stands upon a stone base, and includes in the whole ten caps, four red and six green Irish marble columns, five panels of alabaster marble, besides all carvings necessary to show the work to the best advantage.

Leycester (Newcastle-under-Lyne).—A Mission Church has been opened at Leycester, and another will be opened in a few months at Onneley, on the Shropshire side of Madeley parish. The church and school building at Leycester is for the increasing population (principally colliers and their families) living near it. St. Saviour's Mission Church (as it is dedicated) is in the Gothic style of architecture of the Geometric period. In form it is a Latin cross, the transverse limb and the lower limb being devoted to school purposes; the other limb to the chancel, with organ chamber, vestry for clergy and choir, on the south side. The walls are brickwork externally and internally. The roof is open timbered, and in the chancel, is plastered between the rafters. The covering is of green slate, with red tile ridge, those in the chancel being of ornamental pattern. At the crux of the nave and transept is a bell cot, covered with lead, surmounted by a wrought-iron cross. The east gable is also in ornamental wrought iron. The chancel is fitted with altar-table, ledge, reredos, credence, and sedilia, clergy and choir stalls. Accommodation is provided for about 300. Adjoining is a teacher's residence. Mr. C. Lyman, of Sucko-upon-Trent, is the architect; and the contractor, Mr. John Stringer, of Sandbach. The bricks used were given by the Crewe Coal and Iron Company; the rest of the expense, including site, has been defrayed entirely by Lord Crewe, who is also paying the whole of the cost of rebuilding the chancel of Madeley parish church, and adding a new organ-chamber.

Middleton-one-Row.—The chief stone of a new church has been laid here. The rapid increase of the population of the village of Middleton-one-Row—the result of ironworks being established in its vicinity—has made it necessary that active exertions should be made with a view to meet their spiritual requirements. The site chosen is a slight declivity on the right-hand side at the entrance of the village, which overlooks the river Tees. The land has been presented by Mr. W. R. I. Hopkins, of Grey Towers, Cleveland, and 800L. of the 1,700L. required for the erection of the building, including the spire, have already been collected. The church is designed by Mr. J. Pritchett, of Darlington, in the Early Decorated style, and is to have,—nave, 50 ft. by 25 ft.; chancel, 23 ft. by 16 ft.; vestry, porch, tower, and spire. The east end, towards the village, is designed with a three-light window rising into the gable, which is surrounded by a floriated cross. At the south-east angle of the nave are a tower and spire, square at the lower part, and surmounted by an octagonal lantern and spire, rising to a height of about 100 ft. The south side of the church is designed with a porch in the westernmost bay; the other bays being occupied by two-light windows, between buttresses. The west end has two single-light windows, surmounted by a rose-window, set in a lofty gable. On the north side the western bay is occupied by the vestry, and the others have two-light windows corresponding with those on the south side. On the north side of the chancel is a small organ-chamber. The whole of the walls are to be faced with stone from Wakerley, with dressings of ashlar. Internally, the church will, for its size, have a spacious effect, owing to the height of the roofs, that over the nave being of the curved brace form, open to the apex, and that of the chancel being wagon-headed—all of pine, varnished. The chancel arch is to be moulded, with carved caps and marble shafts. The seats, which are all to be of low and open, with slanting backs, are to be of pine, varnished, and will afford accommodation for about 220 adults. The pulpit, font, reredos, prayer-desk, and lectern, are to be the gift of Mrs. Wooler, and to be designed by the architect in a style commensurate with the character of the church. The former will be of Caen stone, carved, and relieved with marble pil-

lars. The desk will be of oak, carved and French polished, and the lectern of iron and brass. The windows are all to be filled with cathedral-tinted glass, with coloured margins. The floors of the chancel and passages are to be paved with mosaic tiles. The works are to be carried out under the superintendence of Mr. Pritchett, and the contracts have been taken by the following tradesmen:—Masonry, Mr. Jas. Dodgson, Northallerton; slating, Messrs. Atkinson & Sons, Darlington; plastering, Mr. Ormerod, Darlington; joiners' work, Messrs. Gargett & Son, Darlington; painting, Mr. Dryden, Darlington. The contracts, including the spire, amount to about 1,500L.; and the total expense, including warming, lighting, professional charges, furnishing, &c., will probably amount to about 1,700L.

Stratford (near Ipswich).—The ancient church of Stratford St. Andrew, on the high road between Ipswich and Lowestoft, about three miles from Saxmundham, has been re-opened. The peal of bells has been restored by Messrs. Warner, of London. Two out of the three were cracked almost from time immemorial. The tower itself is as yet untouched for want of funds. A vestry has been erected at the north-east corner of the chancel, in place of an old building which was commonly called the bone-house, and a special entrance connects it with the church. It is well known how unwilling the farmers of a parish are to give up their right of entrance by the chancel door. In this case it has been met by the walling off of a part of the vestry, which gives a sufficient vestibule for the use of those whose seats are in that part of the building. In the interior are benches, the whole sitting-room being for 160. In the chancel, coloured tiles form the flooring: they are continued within the communion-rails, and form a part of the reredos. The text over the table is, "Ye do show the Lord's death till He come." The gallery at the west end is removed, and every window in the church except one is new. The architect employed was Mr. Peck, of London, who also erected Framlingham College. He made a present to the parish of all the plans, besides giving his own personal supervision. The builder was Mr. George Carter, of Saxmundham, who erected the Saxmundham Rectory, and restored Carlton Church.

Books Received.

Prometheus Vincit. Translated from the Greek of Æschylus into English verse. By ERNEST LANG. Smart & Allen, London, 1870. This little book adds one more to the list of well-meant attempts to reproduce as English poetry the beauties of the classical dramas and epics. Though all such works of course are undertaken "not so much for the benefit of the scholar as for those who have been prevented from closely pursuing a classical line of study," it becomes the scholar's duty to watch over the interests of his favourites, and see that they are not misrepresented by the translator. He requires that not merely the sentiments, but the character of the original should be presented to the public. We have here the sentiments of the "Prometheus" rendered into English as faithfully as can be expected in a poetical translation. But we cannot say quite so much for the character. The metre chosen by Mr. Lang has proved a difficulty. The heroic couplet, which has become the property less of the poet than of the rhymemaker, which has been discarded from any worthy place in English tragedy, might do for the comedies of Aristophanes, or possibly for Euripides in his weakest moments of philosophical platitudes, but is not adapted for the vigour of Æschylus's iambs. In many places we have a nicely-turned phrase, and the chorus beginning at the bottom of page 23, though not Æschylus, makes a pretty little poem of itself, giving promise of better things. Should the author try his hand at Æschylus again, he could not take a better example in respect of metre than the "Prometheus Unbound" of Shelley, where the vigour of the blank verse and the richness of the lyrical choruses recall to us some of the spirit of the father of tragedy himself. Mr. Lang is but beginning his career, and will doubtless be heard of again.

Workmen's International Exhibition.

The number of visitors, exclusive of season ticket holders, exhibitors, and others, for the week ending the 14th inst., was 42,296.

Miscellaneous.

The Meat Market and Proposed New Poultry Market.—At the last Court of Common Council, the court considered reports from the Markets Improvement Committee as to their proceedings in connexion with the new meat-market, and as to the best mode of utilising the vacant land on the west side of the market, and for authority to give directions for the preparation of a design, plans, estimates, &c., for the erection of a poultry-market on the south side of Charterhouse-street, and to lay the same before the court. Mr. Deputy Lowman Taylor, the chairman of the committee, said there had been expended for the purchase of land and premises, &c., required for the site of the market and the surrounding streets, 331,462*l.* 10*s.* 2*d.*; for making roads, including 7,850*l.*, the cost of the central roadway through the market, 31,079*l.* 1*s.*; interest on temporary loans, 38,316*l.* 11*s.* 8*d.*; raking a total of 400,858*l.* 15*s.* 10*d.* as the cost of the site and roadways. As to construction, the cost of the market, including sub-structure, fittings, and sundry other expenses, was 278,503*l.* These two amounts together were 684,361*l.* 15*s.* 10*d.*, or, in round figures, 700,000*l.* Taking 700,000*l.* at $\frac{1}{4}$ per cent., the interest amounted to 17,500*l.* On the other hand, the net income for the year was 38,101*l.* The market had been a great success. Western Approach-street was an entirely different question. The expense of it was 296,555*l.*, and nothing had been done at present with the land on either side of the street to meet that outlay; and, to utilise a portion of that land, the committee proposed erecting a new poultry-market, which it was calculated would bring in a net profit of about 5,000*l.* Mr. Fricker moved an amendment to the effect that it was not desirable to erect another poultry-market, and that it be referred to the Markets Committee to consider the desirability of enlarging the present poultry-market at Leadenhall. A discussion of some length ensued, in the course of which Mr. Bedford disputed the correctness of Mr. Deputy Taylor's figures. In the result, the amendment was lost, and the reports were adopted.

The Widening of Newgate-street.—At the last meeting of the Court of Common Council, Mr. Rudkin brought forward a resolution as to the desirability of completing the widening of Newgate-street on the north side as soon as possible, and with that view referring it for consideration and report. The leases had now fallen in, and the tenants were under six months' notices. The opening of the viaduct could not be considered complete until Newgate-street was widened. Mr. Lusher said Newgate-street did not require to be widened. He complained of the desolation caused by the Dobjorn-valley works in the ward of which he was a member. Land said to be worth a million and a half of money was lying waste, and although Paris were bombarded for a month, it could not be made worse than that part of the City. He thought the ground should be put up to public competition. Mr. Bedford agreed with Mr. Lusher, and objected to another course being pulled down until the unoccupied land was let. Mr. J. E. Saunders said that the Metropolitan Board of Works and the Commissioners of Sewers had tried public competition, and had failed. The fact was, that a wrong plan had been pursued. Instead of compensating tenants and driving them away to the suburbs, an arrangement ought to have been made with them to rebuild their houses on as nearly as possible the same spot, and thus the same population would have been retained. The proposition was adopted.

Nuisance from Gas Refuse.—The Canbury Gas Company have been heavily fined for contaminating several wells adjoining their works by allowing the escape of certain poisonous matter, which percolated the soil, and ultimately found its way into the water. In consequence it was urged that the grievance was but continuation of an ancient one, which had been condoned for by an arrangement that the parties aggrieved should be supplied with water from the company's services at a reduced rate or gratuitously. The evidence showed that the company had cut off their supply from their old works, and the complainants objected to taking the new water. The magistrates had but one course before them, and in this they fined the company 20*l.* penalty, with 10*s.* per day since the notice had been served upon them to remedy the evil.

The Architectural and Archæological Society of Durham and Northumberland. This society made its annual excursion and held its fourth annual meeting in North Yorkshire on the 15th and 16th instant. The meeting-place was Coxwold. The Rev. Canon Greenwell, of Durham, the president, was accompanied by the Rev. E. Grestorex, and Mr. J. Booth, jun., of Durham, honorary secretaries; Rev. J. F. Hodgson, vicar of Hutton; Rev. T. Rogers, Durham; Rev. J. F. Bigge, vicar of Stamfordham, Northumberland; Rev. J. Simpson, vicar of Kirby-Stephen; Rev. R. G. L. Blenkinsopp, rector of Shadforth; Rev. A. A. Philpotts, vicar of Harton; Rev. J. G. Pearson, vicar of Darlington; Rev. S. R. Cox, Hurworth; Mr. E. Mather, Newcastle; Mr. J. C. Langlands, Old Bewick; Mr. R. Bowser, Bishop Auckland; Mr. and Mrs. R. S. Carr, Farnley Grange; Mr. and Mrs. Booth, Shotley Bridge; Mr. and Mrs. R. N. Robson, Durham; Mr. Bagley, Durham; Mr. W. H. D. Longstaffe, Gateshead; Mr. H. Chaytor, Witton Castle; Mr. J. W. Kirk, Sunderland; Rev. H. H. Bishop, Sunderland; Mr. Pritchett, Darlington; Rev. Mr. Grey, vicar of Helmsley, and other ladies and gentlemen. Amongst the places visited were the old church of the Fanoconbergs at Coxwold; "Shandy Hall," once the residence of Lawrence Sterne; the Priory of Newburgh (Sir G. O. Wombwell's seat), Byland Abbey, Scawton Church, Rievaulx Abbey, and several places and objects of interest.

London Tramways.—The authorities of the northern metropolitan districts have received notices from the Metropolitan Street Tramways Company of the intention of the company to forthwith commence their works for the laying of their tramways. The first section, it is understood, will be from the Holloway-road, near the Nag's Head, through the parish of Islington, along the Camden-road to the Brecknock Arms, thence continuing through St. Pancras down the Camden-road, passing the Midland and Camden-road Station of the North London Railway to the Red Cap, turning into the High-street, Camden-town, and along the Hampstead-road to the Enston-road, which is to be the terminus to the first section. A number of excavators have commenced breaking up the main road and laying down metals for extending the South London Tramway from its present starting-point (near the police station) to the cross roads at Brixton Church. The tramway from Clapham to the junction at Kennington is now completed, and the line from this junction to the Horncles, at Westminster, is also about finished, and large tram-carriages will run from Brixton and Clapham to Westminster for public traffic. The omnibus fares are to be reduced to the low tariff charged on the tramway.

London and Middlesex Archæological Society.—The annual excursion of the above society took place as we mentioned it would, and was largely attended. The members and their friends took train at Moorgate-street and King's-cross, and proceeded to Barnet, where omnibuses were in waiting to take them to the various points for which visits were marked out in the programme. The first stage was Hadley, where, in the parochial school-room, the society held its annual meeting, under the presidency of Mr. J. R. Tyson, president of the society. Mr. W. H. Black addressed himself to the ancient topography of Barnet, and showed, by a great number of illustrative details, that in ancient times the township was the seat of a great Roman community and military station. Mr. Peacock followed with a paper on "Barnet and its Neighbourhood." The next stage of the excursion was the ancient parish church of Monkton Hadley, where the rector, the Rev. F. C. Cass, read a paper on the topography of the parish, and the antiquities and monumental brasses of the church. The latter, it appeared, had been torn from their places, and put away "in a cupboard," where they were discovered by Mr. Cass, the present incumbent, and after renovation replaced.

Paris and the War.—The *Official Journal* publishes the protest of the Institute of France against the eventual bombardment of the libraries, monuments, and museums.—M. Alphand, the well-known architect, in a letter to the editor of the *Figaro*, protests against a report that he showed to the King of Prussia the sewers and outcombs of Paris, and that he sent to him the plans of the same. He was never charged with the service in question, and never sent to King William plans of any description whatever.

Three Counties' Asylum Water-Supply, Hitchin.—The attempt to provide a good supply of water for the use of the Three Counties' Asylum, at Arley, near this town, has proved successful. The work of sinking a well was confided to Mr. Paten, of St. Alban's, formerly of Redbourn, who is known for his skill as a borer of artesian wells. It will be recollected by those who read the last two reports of the Lunatic Asylum Committee, that the ultimate success of finding water seemed very doubtful; the well having been sunk to a great depth, boring having been still deeper, and yet no water was found. But Mr. Paten was confident that all would come right at last. So the boring was continued, and at length, at a depth of nearly 500 ft., a splendid and never-failing supply of water was reached. The temporary pumps, worked by a 12-horse power steam-engine, have been throwing up 120,000 gallons of water daily; the estimated quantity required being 70,000 to 80,000 gallons. The borers went through the chalk formation, then through the gault, and the water was found in the old red sandstone.

Unveiling the Gladstone Statue.—The Mayor of Liverpool (Mr. Joseph Hubback) has performed the honorary ceremony of unveiling the statue of the Prime Minister of England, the Right Hon. William Ewart Gladstone, in presence of many members of the British Association, and others. It will be remembered that the statue was subscribed for some months ago by a number of Liverpool gentlemen of all classes and sects, who desired to pay a tribute of respect to their distinguished fellow-citizen. The statue was modelled and executed by Mr. Adams Acton. The artist has attired the figure in the robes of a Chancellor of the Exchequer. It is chiselled out of black-veined marble, and is a pure work of art. The statue is placed on the east side of the hall on the left of the central doorway, and in the niche next to the one that was recently filled up with the statue of the late Lord Derby. It therefore occupies a very prominent position in the hall. The grand hall was crowded in every part.

The Hungerford New Town Hall and Corn Exchange.—The corner-stone of a block of buildings, which will embrace a new Town Hall, and also a spacious Corn Exchange, has been laid in Hungerford. Mr. J. H. Money, of Spokenhamland, is the architect. The site is on the west side of the High-street, at the Crown Brewery. A large portion of the cost will be covered by subscription. Mr. Hoskins, of Hungerford, is the contractor, and Mr. Low has taken a sub-contract for the glazing, painting, &c. The design is in the Italian style, and the building will have every accommodation for the public business of the town, besides which the Corn Exchange, which is 66 ft. by 30 ft., and immediately adjoining, will give ample space and convenience for large meetings. A gallery for ladies, or an orchestra, is provided, with access from the principal staircase, and also retiring-rooms, lavatories, &c.

The Proposed Public Buildings for West Bromwich.—A meeting has been held to consider the situation of the proposed new market and townhall. The chairman and several gentlemen protested against the Lodge Estate site, as that was completely out of the way of business, and an opinion was expressed that the site of the present market was the most eligible for the new one. After a slight discussion it was ultimately resolved, "That the commissioners be requested to consider, if it is intended to build a townhall and market-place, it is most desirable that the same should be separated from each other." It was also resolved, "That the commissioners be requested to reconsider their decision as to the site for a market, and to consider whether the site of the present market is not the most eligible for the purpose. That a memorial to the same effect be forwarded to the commissioners."

Fall of Flooring at Stockport.—A portion of the third or top story of Messrs. Wheeler & Faulder's fruit-preserving manufactory, Stockport, has fallen through, and a man casually employed at the works was killed on the spot. Another man, named Samuel Mather, was rescued from the debris, and is expected to recover. The flooring gave way under the pressure of a number of barrels of preserves, each weighing about 15 cwt. The firm employs between 200 and 300 hands during the summer and autumn months, and a number of them had a miraculous escape.

Leeds School of Art.—An exhibition of students' drawings and paintings has been opened in the Mechanics' Institution, in connexion with the School of Art there, carried on under the superintendence of Dr. Packett, the head master. The various works are exhibited in the picture gallery, and they are 277 in number. At the school about 200 pupils attend, and as the works are all selected, and have been executed since August, 1869, a very fair amount of patient artistic labour is represented, chiefly of an elementary character. Of the pupils, nine have obtained third-grade prizes from the Science and Art Department, and twenty-six have had their works honourably mentioned or pronounced satisfactory; whilst twenty-five have been awarded local prizes. A large majority of the pupils attend the classes in the evening, many of them fresh from the workshop.

Excursion of the Worcester Architectural Society.—An excursion has been made by this society in a steamer down the Severn to Deerhurst and Tewkesbury. The weather was wet; but the deck was covered by an awning. About sixty persons were of the party. The seats of the Leechmeres, Coventrys, Beauchamps, Dowdeswells, and Martins, and many churches, were pointed out by the way; and scraps of family history, personal anecdote, and other interesting matter enlivened the party. At the notable old church of Deerhurst, the Rev. G. Butterworth, the incumbent, was the cicerone. The party partook of a cold collation at Tewkesbury, Sir Thomas Winnington in the chair; after which they visited the abbey, and the ladies were entertained at tea in the Abbey House, by Mr. and Mrs. Healing.

New Bridge at Malton.—The North-Eastern Railway Company have been sinking a cofferdam on the Malton side of the river Derwent, for the erection of a new iron girder bridge of two spans, the foundations of which, under the superintendence of Mr. John Baines, the engineer in charge, have been put in, the first iron pile in mid-stream having been driven under directions of Mr. Vester, the bridge superintendent. The excavation for the cofferdam was carried down to the gravel, 2 ft. 6 in. below the deepest part of the river. This excavation being situate about midway in the water-line of the supposed Roman town of Malton, the work was watched with care for relics. Singularly not a single article referable to Roman date has turned up.

Metropolitan Board of Education.—Efforts are being made for securing an efficient Board of Education for the metropolis under the new Education Act. Mr. George Moore has consented to become a candidate for the City of London, and Lord Sandon, M.P., and Mr. W. H. Smith, M.P., for Westminster. The names of Sir Francis Lyett, Mr. McCallagh Torrens, M.P., Mr. Hugh Owen, and Mr. William Rivington, are associated with Finsbury; Mr. C. Reed, M.P., with Hackney; and Mr. M. Arthur, M.P., with Lambeth. Mr. George Hanbury has promised his active assistance. An independent committee is being formed to secure the return of fitting representatives for all the divisions of the metropolis.

Pontofract.—In anticipation of increase in the population of this borough, in consequence of the opening out of a new coal-field, improvements are contemplated. It has already been arranged that Finkle-street, a very narrow thoroughfare and the principal road to the station, shall be widened at a cost of between 2,000l. and 3,000l. Another important project is also in hand, and that is the building of a new Corn Exchange, a building much needed.

Approaches to the Thames Embankment.—The Whitehall approach to the Victoria Embankment is now completed and opened for traffic. The works in connexion with the principal approach to the Embankment from Craven-street to Charing-cross are at a standstill, in consequence of a difficulty in obtaining possession of a small piece of land necessary to complete the approach.

The late Bishop of Carlisle.—An monument is about to be placed in Carlisle Cathedral, at a cost of 800l., to the memory of the late bishop of the diocese, Dr. Waldegrave, the joint design of Mr. Adams, the sculptor, and Mr. T. H. Watson, the architect. The figure, in statuary marble, will be recumbent, with canopied superstructure and foliated brass standards.

Surveyorship of St. John's Parish, Hampstead.—At their meeting, on Monday, the 19th inst., the Vestry elected as their surveyor Mr. Thomas W. Gardner, C.E., F.G.S., who, we learn, has had long experience on extensive hydraulic and sanitary works in England, Russia, and India. There were eighty-five candidates for the appointment.

TENDERS.

For Presbyterian schools, Kensington, Liverpool. Mr. W. J. Mason, architect. Quantities by Mr. G. Northcroft:—

Corbett	£1,416 0 0
Rome	1,370 0 0
Tomkinson	1,360 0 0
Reddie	1,337 0 0
Litt & Wilkinson	1,299 7 0
Urmson	1,271 0 0
Bateman	1,271 0 0
Nicholson & Ayre	1,248 0 0
Haigh & Co.	1,247 0 0
Potter, Brothers (accepted)	1,180 0 0

For Welsh Independent Chapel, Hermon, Anglesey. Mr. R. G. Thomas, architect:—

Roberts (accepted)	£599 0 0
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For Welsh Independent Chapel, Paradyra, Anglesey. Mr. R. G. Thomas, architect:—

Lloyd (accepted)	£798 0 0
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For Welsh Calvinistic Methodist Chapel, Bangor. Mr. R. G. Thomas, architect:—

Thomas & Sons (accepted)	£900 0 0
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For billiard-room, &c., for the Right Hon. Lord Clarence R. Paget, K.C.B., at Plas Llanfair, Anglesey. Mr. R. G. Thomas, architect:—

Salisbury (accepted)	£330 10 0
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For girls' and infants' schools, Bromley, E., for Mr. Arthur Currie. Mr. John W. Morris, architect:—

Heiser	£2,416 0 0
Eaton	2,389 0 0
Tanner	2,358 0 0
Kelly	2,343 0 0
Waite	2,340 0 0
Wicks & Bunge	2,331 0 0
Abraham	2,297 0 0
Shedfield	2,288 0 0
Mann	2,240 0 0
Hill, Reddel, & Waldram	2,230 0 0
Perry	2,230 0 0
Atherton & Latta (accepted)	2,006 0 0

For new buildings, at the Grange, Bermondsey, for Messrs. Barrow, Brothers. Mr. Geo. Elkington, architect:—

Tarrant	£933 0 0
Kent	890 0 0
Rhodes	798 0 0
Wells	700 0 0
Shepherd (accepted)	653 0 0

For alterations, &c., to the Admiral Cockington Arms, Green-street, Chelsea, exclusive of pewterer's work. Mr. J. Bradbury, architect:—

Rhodes	£173 0 0
Knight (accepted)	130 0 0
Nixon	123 10 0

For alterations to offices, 115, Leadenhall-street, for the Realm Building and Investment Company. Mr. John W. Morris, architect:—

J. Shedfield	£80 0 0
A. Sheffield	79 0 0
Harris & Wardrop	47 12 0

TO CORRESPONDENTS.

G. B. J. W. A. R. Q. P. C. S. A. J. K. C. C. H. E. A. G. H. W. M. H. B. (the "painting artist" has not come off). H. A. (send whole complete. No hurry). T. I. B. J. N. M. K. & O. D. J. B. W. R. J. W. G. H. & P. H. H. D. H. & E. X. Y. V. O. K. W. O. F. & S. O. T. O. L. M. F. J. D. H. (too late for this week). E. E. (ditto). M. & S. B.

We are compelled to decline pointing out books and giving addresses. All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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Advertisements cannot be received for the current week's issue later than THREE o'clock, p.m., on THURSDAY.

NOTICE.—All Communications respecting Advertisements, Subscriptions, &c., should be addressed to "The Publisher of the Builder," No. 1, York-street, Covent Garden. All other Communications should be addressed to the "Editor," and not to the "Publisher."

SPECIAL NOTICE.

In consequence of the Reduction in the Newspaper Postage, Subscribers will be supplied with THE BUILDER direct from the Office, at the rate of Nineteen Shillings per annum, PAYABLE IN ADVANCE. This arrangement will take effect from Friday, 7th October.

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POST CARDS.—Pursuant to an Act passed in the last Session of Parliament (33 and 34 Vic. cap. 79), POST CARDS have been prepared for circulation by post in Great Britain and Ireland.

These cards will be sold without any charge beyond the duty. A stamp, or any number of cards, may be purchased, but they will be sent out from the office in packets, containing 25 cards, price 1s.; and in parcels of 50 packets, price 1s. They may be obtained at all post offices and from licensed vendors of stamps.

The cards will also, when required, when required, in sheets, containing 4 cards, and measuring about 7½ by 2½. Although the cards may now be obtained in sheets, for the purpose of affixing stamps, it is not intended that each card should afterwards be separated from the sheet, as no calculation of cards can pass through the post-office.

Such sheets will be issued only in half-reams, containing 240 sheets (double duty), duty 2½d. and will be supplied to the public at the Public Revenue Office at London, Edinburgh, and Dublin, and at the offices of the authorized and authorized vendors of stamps in the country. A discount of 4s. per half-ream will be allowed to purchasers.

A sample of cards, in sheets, is required, elsewhere than in London, Edinburgh, or Dublin, application, in writing, must be made to the Water-keeper at this office; or, if the card is to be used in the country, in London, or Dublin, as the case may be, such application must specify the quantity required, and the terms, or price, to be paid, to which it is desired that the consideration should be made.

The public will have notice when they are to call at the stamp office, and pay the duty.

Post cards cannot be used before the 1st October. These cards will be supplied by this office on and after 25th instant, to enable the public to print on them, preparatory to their use next month.

It is desired that persons requiring cards in sheets should make early application for the same, by order of the Board.

WRAPPERS FOR NEWSPAPERS and other PRINTED MATTER.—The Board of Revenue desire to give notice that, for the purpose of the new Stamp Act, they have prepared a set of WRAPPERS for Newspapers, and for other printed matter, and have caused to be printed with the HALFPENNY POSTAGE STAMP, under the regulations.

1st.—The paper must be white, and must neither be folded nor creased.

2d.—The size of the sheets must be double crown, double demy, or double royal.

3d.—Each sheet must be prepared to receive eight, twelve, or sixteen stamps; no other numbers can be impressed, and the stamps can be impressed only in the position and at the distance apart indicated upon pattern sheets, which may be seen at the Head Offices at London, Edinburgh, and Dublin.

4th.—The stamp will be impressed immediately above the place for the address, and near the right-hand edge of the wrapper. To give space for the stamp, any printing upon the sheets should be kept 1½ inch clear of what is to be the right-hand edge of the wrapper.

5th.—Each lot sent in must be accompanied by a sheet marked, to show in accordance with which of the patterns it is desired that the stamps should be placed.

6th.—The paper must be delivered at the offices above mentioned, in reams of 480 sheets.

7th.—No less than two reams for one description of wrapper can be received for stamping.

8th.—Any sheets returned to this office, with an equal amount of fresh sheets, on the post, contain of similar sheets being sent, when the stamps will be transferred.

9th.—When the paper is brought for stamping, a person must attend at the Department of the Receiver-General, to fill up the necessary warrant, and to pay the amount of the stamps required. No discount is allowed.

10th.—Persons in the country must not send to the office through the post or by carriers, but must send through an agent.

By order of the Board, T. B. BURNER, Secretary. Inland Revenue, Somerset House, London, 9th September, 1870.

T. A. RICHARDSON, ARCHITECTURAL ARTIST, late of Symonds' Inn.—PERSPECTIVES in OIL, LINE or COLOUR. Highest references. Muralists terms. Established eighteen years. 362, Gray's Inn-road, W.C.

PARTNERSHIP.—HALF SHARE of an ARCHITECT and SURVEYOR'S PRACTICE TO BE DISPOSED OF.—Address, 415, Office of "The Builder."

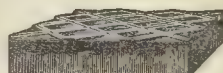
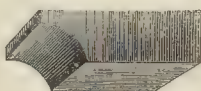
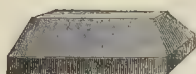
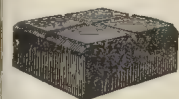
PARTNERSHIP.—An Architect and Surveyor, who has had considerable experience in two of the first offices in London, as well as for the last five years in his own office, would be disposed to share a SHARE in an established PRACTICE in London, capable of being enlarged by a small capital outlay. Communications will be considered confidential on the part of the owner. Address, A. B. Moore, Anderson & Son, Solicitors, 17, Ironmonger-lane, City.

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LAMBETH, the MIDLAND DISTRICT, and the NORTH, can ECONOMISE the Cost of Carriage,
And are thus able to Supply their various Manufactures at the Lowest possible Prices
In any Part of the Kingdom; and can also export from London, Liverpool, or Gloucester.

BLUE STAFFORDSHIRE WARE.



THESE GOODS MAY BE CONSIGNED

DIRECT to ANY PART of the COUNTRY, put into BOATS at the WORKS at Rowley, or into
TRUCKS at the RAILWAY STATIONS adjoining.

MAY BE HAD IN LONDON, at their WHARFS at

LAMBETH, OR CROWN WHARF, VICTORIA PARK, E.

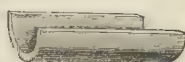
Or may be sent by Rail direct to ST. PANCRAS, CAMDEN, or PADDINGTON STATIONS; also at

GRANVILLE WHARF, BIRMINGHAM; and SOHO STREET, LIVERPOOL.

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PIPES FOR DRAINAGE,

From 2 in. to 30 in. in diameter.



CARRIERS FOR SEWAGE, &c.

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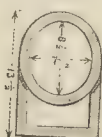
CHIMNEY PARTITION.

WALL COPINGS.

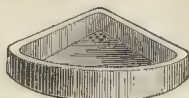
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The Builder.

VOL. XXVIII.—No. 1443.

The Social Science Association in Newcastle-on-Tyne.



VERY agreeable and useful week has been spent by the Social Science Association in Newcastle. Several excellent papers, two or three remarkable indeed, have been read, and a large amount of very valuable discussion has taken place. It is to

be regretted that much of this is necessarily unrecorded, and that what is fixed by the shorthand writer scarcely gets so wide a publicity as is desirable. The local press have done well in this respect, but the London papers find the amount of matter too much for them, especially in such days as these, when the mad doings of foreign nations demand so much space, and they are able to do little more than report the departmental addresses and to catalogue the headings of some of the papers. If the annual volume published by the Association could be quickly issued, and the subscriptions of the public would admit of its wide distribution free to public libraries, literary institutions, working men's clubs, and elsewhere, much good would be done. We cannot pretend to supply in any degree the deficiency of publication to which we refer. We can but touch a point here and there, and keep attention alive. We must add to what we have said as to the success of the Congress in respect of work done, that the word can scarcely be used as regards the numbers attending, when we consider the size and character of the town. About 900 tickets, we believe, were sold, a number much less than was anticipated. On the other hand, those inhabitants of the town who did take the matter up, were most active in their endeavours to render the week profitable, and co-operated with Mr. Edwin Pears, the able general secretary, in every practicable way. Hospitality was general. The Duke of Northumberland, president of the year, Sir William Armstrong, the Mayor of Newcastle, and others, entertained liberally, and many of the active members of the Association from London and elsewhere were received into the houses of the inhabitants. The banquet at Sir William Armstrong's residence, Jesmond (Jesus' Mount), was especially noticeable. The banqueting-hall, built a few years ago under the direction of the late Mr. Dobson, and the reception-room, quite recently completed from the designs of Mr. Norman Shaw, are of striking character, and of a size not often found in a private residence. The walls of the hall are of buff bricks, with red brick dressings; the roof of timber open. A wide arched opening, in the upper part of which is a music gallery, with organ, unites the hall to the reception-room. The circular arch, we may say, is used throughout; and the apartments, being

erected in a Dene, are approached by long flights of steps from the higher level above. About 230 visitors dined on the occasion in question; the dinner was admirably served, and amongst the speakers afterwards the host and Sir Stafford Northcote were more particularly happy.

The address in the Town-hall with which the Duke of Northumberland opened the Congress did not wholly escape criticism: it had a reactionary tone, seemed not quite certain as to the result of general education, and viewed timidly all innovation: still it included many excellent observations.

The first departmental address was given by Mr. G. W. Hastings, as Chairman of Council, and reviewed the work of the Association to secure an improved and extended system of national education. The question might have been settled years ago, he said, if the counsels of the Association had been followed, and thus the long period would have been saved which had been lost in sectarian jealousy and judicial apathy. Thanks, however, to Mr. Foster and to the moderation of the House of Commons, the country had at last obtained in the Act of this year the broad outline of a national system of primary education. The measure might not be all that the friends of education desired, but it was at least a practical measure, and a great improvement on that which had preceded it, and to which the country owed much. One thing was at once required to make the present system work efficiently, and that was the appointment of a Minister of Education. Until such a step was taken the work of the educational department would not be performed in an efficient manner or the educational machinery work harmoniously. Their vice-president, Earl Russell, had endeavoured to obtain the appointment of a Minister of Education, but his amendment to that effect had been defeated. It was clear, however, in his opinion, that the time was at hand when a central organisation should be formed such as that which had been advocated by the vice-president of the Association. We quote a few further sentences from Mr. Hastings's address. "Not only," said he, "have we much to learn, we have also much to give up. We must abandon that exclusiveness which, in education as in other things, is too prominent a characteristic of Englishmen. Access to our universities must be made more easy, and the benefits of our ancient endowments must be more impartially distributed. We must place within reach of all classes of the community the highest culture which the country can impart; we must take away all excuse for ignorance; we must, it may be, compel those who are unwilling to come in. Not until this has been done can we hope to become a cultured nation; and it is in the conviction that the Association, which by its discussions and publications and the action of its council has already done so much in the sacred cause, will not relax its efforts in the new fields now open to be won, that I have dwelt, perhaps, too long—though how much remains to be said!—on this great question of education." Mr. Hastings then adverted to the department of jurisprudence, which was treated at considerable length. He said:—"I have referred to a few of the legislative measures which the Association has originated, or has endeavoured to promote, but there is a function still more incumbent on it to fulfil, the promotion of a sound public opinion on questions of social and political science. It is matter of daily observation that even our educated classes are in lamentable ignorance on subjects the right understanding of which is essential to the national welfare. When we see public meetings held, and associations formed, to resist the spread of vaccination, and hear people, whose circumstances of light might have given them the opportunity of better information, urge their less in-

structed fellow-citizens to violate the laws framed to arrest the spread of small-pox and other terrible diseases, one is led to wonder whether there are not minds so framed as to be impervious even to the elementary teachings of science. There is naturally no limit to the fallacies entertained by people who despise investigation into cause and effect, and yet these seem to constitute no inconsiderable part of the whole community. A short time since, for instance, it was announced, truly or otherwise, that the average mortality in certain towns supplied with soft water was higher than in certain other towns supplied with hard; and immediately the conclusion is jumped at that hard water is more healthy than soft. I pronounce no opinion on the question, but it is obvious that the area of facts on which the conclusion is formed is far too narrow to justify such a sweeping induction; and that, moreover there are various other influences, such as soil, climate, occupation, which are just as likely to be answerable for the variations in mortality as the nature of the water supply. A similar logic arrives at the conclusion that if a child has been vaccinated, and has been subsequently ill, the illness is the result of vaccination, and overlooks the vast array of facts which prove the steady declension of small-pox wherever the great discovery of Jenner has been adequately applied; as in Ireland, for example, where at this moment a careful system of vaccination is stamping the disease out of the island. After the same fashion, economical principles of tried and incontestable verity are put aside on the flimsiest pretence. Not long since it was alleged, though never proved—proof being an inconvenience in these cases,—that the trade of the kingdom was falling off, and it was thereupon proclaimed that free trade was a failure, or at any rate that free trade on one side was a mistake, and that we ought to insist on its being reciprocal, or abandon it altogether. In other words, that if other countries are so foolish as to tax themselves with artificial prices on the articles they want, we ought to imitate their folly, and raise the market against ourselves."

Dr. Lyon Playfair's address, as president of the Education Section, was especially excellent, and we would gladly print the whole of it. We must confine ourselves, however, to a very brief quotation. He is speaking of—

Defects in our Educational System.

"The educational principle," he said, "of Continental nations is to link on primary schools to secondary improvement schools. The links are always composed of higher subjects, the three Rs being in all cases the mere basis of instruction. Elementary science, and even some of its applications, are uniformly encouraged and generally enforced. I shall not detain you with examples, as they are to be found in any work treating of Continental schools. But as we have no schools corresponding to the secondary improvement schools for the working classes, we suppose that we can do without the higher subjects used as links. With what result? Our primary schools, on the whole, do not teach higher instruction than a child of eight years of age may learn. In our class of life, our children acquire such knowledge as a beginning; with the working classes, they get it as an end. What an equipment for the battle of life! No armour-plate of knowledge is given to our future artisan, but a mere thin veneer of the three Rs, so thin as to rub off completely in three or four years' wear and tear of life. I am speaking on official record; for we are assured by inspectors that nothing under Standard IV. suffices for permanent use; and yet the Committees of Council tell us that four-fifths of the children, of ages at which they leave school, pass only in lower standards. Recently, under Mr. Corry's minute, inducements have been given for subjects higher than the three Rs, but, for some reason, it pro-

duces scarcely any result. So, under our present system of elementary teaching, no knowledge whatever bearing on the life-work of the people reaches them by our system of State education. The air they breathe, the water they drink, the tools they use, the plants they grow, the mines they excavate, might all be made subjects of surpassing interest and importance to them during their whole life; and yet of these they learn not one fact. Yet we are surprised at the consequences of their ignorance. A thousand men perish yearly in our coal-mines; but no schoolmaster tells the poor miner the nature of the explosive gas which scorches him, or of the after-damp which chokes him. Boilers of steam-engines blow up so continually that a committee of the House of Commons is now engaged in trying to diminish their alarming frequency; but the poor stokers who are scalded to death or blown to pieces are never instructed into the nature and properties of steam. In Great Britain alone more than 100,000 people perish annually, and at least five times as many sicken grievously, out of pure ignorance of the laws of health, which are never imparted to them at school. They have no chance of learning them afterwards, as they possess no secondary schools. The mere tools of education are put into the hands of children during their school time, without any effort being made to teach them how to use the tools for any profitable purpose whatever; so they get rusty or are thrown aside altogether. And we fancy that we have educated the people! Our pauperism, our crime, and the misery which hovers on the brink of both, increase terribly; and our paucity for their cure is teaching the three Rs up to Standard III. The age of miracles has passed by, and our large faith in our little doings will not remove mountains. It is best to be frank. Our low quality of education is impoverishing the land. It is disgracefully behind the age in which we live, and of the civilisation of which we boast; and until we are convinced of that we cannot be roused to the exertions required for its amendment. This is no new complaint, and has been long ago made by far higher authorities than myself. In imitation of our classical schools, Dr. Playfair maintained, verbalism and memory-cramming had grown up as tares and choked the growth of the wheat. Words had taken the place of conceptions. A child could tell you about the geography of the wanderings of the children of Israel, but had no conception whatever of the ordinary phenomena around it. It was hopeless to put to them the commonest scientific questions. Whence comes the water that fills the Thames? What is the origin of hail, snow, rain, or dew? Why does the sun rise in the east, or set in the west? What produces night and day, summer and winter? "In history they could rattle out to you the names and dates of kings and queens, perhaps even the names and ages of all Queen Anne's children as they died in childhood; but, as to a true historical conception, apart from memory-cramming of words and dry facts, to be vomited forth upon the examiner, it required a very good school under the old system to find it. Words, instead of ideas, were worshipped. Inspection, under the old system, did something to correct this tendency to verbalism and cram; under the new system they have no time, and, if they had, would find fewer of the higher subjects taught in any way. The teaching of science, if properly done, is the reverse of all this, and will go far to remedy its defects. Borne in this case ought only to be accessories, not principals. The pupil must be brought in face of the facts through experiment and demonstration. He should pull the plant to pieces and see how it is constructed. He must vex the electric cylinder till it yields him its sparks. He must apply with his own hand the magnet to the needle. He must see water broken up into its constituent parts, and witness the violence with which its elements unite. Unless he is brought into actual contact with the facts, and taught to observe and bring them into relation with the science evolved from them, it were better that instruction in science should be left alone. For one of the first lessons he must learn from science is not to trust in authority, but to demand proof for each asseveration. All this is true education, for it draws out faculties of observation, connects observed facts with the conceptions deduced from them in the course of ages, gives discipline and courage to thought, and teaches a knowledge of scientific method which will serve a lifetime." All the science which would be necessary to give

a boy a taste of the principles involved in his calling, and an incitement to pursue them in his future life, might be given in illustration of other subjects. Instead of mere descriptive geography drearily taught and drearily learned, you might make it illustrative of history, and illustrated by physical geography, which, in the hands of a real master, might be made to embrace most of what we desire to teach.

To the address of the President of the Health Department we will look hereafter: it well deserves attention. On another page reference to the Working Men's meeting and other parts of the proceedings will be seen, and in our next number we may find space to give some additional particulars, and to refer more especially to the progress and condition of Newcastle.

On the evening that the workmen met in the townhall, the ancient castle (Norman in date), was thrown open and lighted, and Dr. Collingwood Bruce, described some of the relics it contains, and exhibited views of

The Roman Wall,

to which he proposed leading a party on the following day. Dr. Bruce knows every stone of the wall and its history, and the excursion had been looked forward to by many in relief of the heavier work: but it turned out no child's play. It involved a considerable amount of walking, some eight miles, and no end of hurry. A correspondent, who was with the party, writes,—"Now eyes were strained to peer into some hole—now directed upward to some hill, and called upon to descry objects north and south at the same time. The indefatigable and enthusiastic antiquary never wearied or rested. The crowd rushed to see what he pointed out, and ran to overtake him. Ladies palpitated over hills, ditches, and stone walls; elderly philosophers perspired in futile endeavours to keep in sight of their ever-darting guide. Now and then he invited ladies to sit down on mounds of slipping stones, or on heaps of gliding planks left by a house-builder by the wayside; but long before they could find a spot of rest everybody had to be up and off again, so that attempts to rest were far more wearying than the unmitigated hurrying. At one moment the doctor was discovered adjusting himself upon uneasy and uncertain stones, from which he steadily discoursed, no one knew how. Next he was perched on a crumbling wall, balancing himself by his wand as Blondin does upon his rope. Had not the learned expounder's story been impartially delivered, he must have fallen over on that side to which his narrative leaned. Once he did fall headlong down a dyke, and was flatly distended on the earth. It was thought we should then have a moment's respite. But, alas! this was not to be. The elastic and resilient antiquary was up again before any one could get up to him, vowing that he could have saved himself but he must have broken his stick, and as he was quite unbreakable himself he preferred the fall." Until the party arrived, crazed and amazed, at the station of Borocovius, nobody really beheld anything; nevertheless all were satisfied in the long run, and got back to Newcastle safe and happy. They had much less trouble when they went, on Monday,

Messrs. J. Wigham Richardson & Co's Ship Yard,

at Low Walker, to see the launch of a fine iron screw steamer, the *Espresso*, and were entertained most handsomely. The yard of this firm is the oldest on the Tyne. Since the occupation by the new firm, the works have gradually extended, until now they give, on an average, employment to about 800 men, and the average tonnage launched by the firm is 10,000 tons. The vessel—the launch of which the members of the Social Science Congress witnessed—is the largest merchant vessel that has been built in this country for Italian owners. Her length is 308 ft. over all; breadth of beam, 35 ft.; extreme depth, 28 ft. 6 in. As she is intended for the emigrant and mail traffic between Genoa and the river La Platte, in which trade speed is the greatest desideratum, her lines have been designed by building firm, solely with a view to speed. The floor of the cabin is of solid work, and the sides of the saloon will be handsomely decorated with views of Italy and South America. An hospital every convenience for the crew and passengers is provided. As a means to secure greater

safety, while at sea, the hull is divided into six water-tight compartments by means of bulkheads, so that an accident in one portion of the vessel will not immediately affect the others.

Replying to the toast of his health, proposed by Mr. John Bowring,

Mr. Wigham Richardson, in the course of a particularly interesting speech, said that the ship being intended principally for passenger service in contradistinction to goods traffic, almost everything had, as in an express train, been subordinated to speed. Her owners were of opinion that by so doing they would always have the preference among intending passengers; and although there was nothing that cost more to attain in a steamer than speed, since, for example, they wished to gain 50 per cent. in speed, they must burn more than three times as much fuel; still, if they considered that the *Espresso* would have nearly one thousand souls on board of her, it was evident that if the passage could be accomplished in twenty days instead of thirty, the mere saving in provisions would be very considerable. He believed the extent of the emigration from Italy to South America was very little known in England. Probably from 500 to 1,000 emigrants left the port of Genoa alone every week, and one house there (and not by any means the largest emigration agency in that city) received remittances to pay the passage of their relatives of over 100,000 francs per annum. The Italian ships very often have mottoes either on the prow or the stern, or at the entrance to the cabins. This steamer has a line taken from one of the plays of Goldoni:—"Chi non cede al suo paese viene pieno di pregiudizii," which may be rendered:—"He who never leaves his native shore lives ever full of prejudices."

We could scarcely find a better line to end with.

HEALTH AND SOCIAL PROGRESS.

The working men's meeting, held in Newcastle, as in other towns, by the Social Science Association, passed off very successfully. The fine town-hall, where it took place on Friday evening in last week, was crowded. Mr. Alderman J. Lothian Ball presided, and addresses were delivered by Mr. Rupert Kettle, Mr. Godwin, Dr. Lyon Playfair, Mr. Newmarch, the Dean of Durham, Mr. Robt. Rawlinson, and Dr. Bowring, in the order we have placed their names, the chairman introducing each speaker with a few judicious sentences. We confine ourselves to two of the addresses which refer to matters with which we ordinarily deal.

Mr. Rawlinson, taking as his subject the

Habits of Workmen not long ago,

said:—"I suppose I am called upon to address this vast assembly of working men because I am claim the privilege of having sprung from the same stock as the men I see before me; and it was imagined that from my past knowledge and experience I might, in the limited time afforded to me, be enabled to say something of use,—something of advice,—probably something of warning, something of encouragement. I am old enough to remember working men for fifty years. It is fifty years since my acquaintance first began with the working men of this country. I do not know that I am competent at this moment to judge with accuracy of the feelings and the conditions of the vast mass of the working men I see before me, but it may probably both instruct you, and in some respects amuse you, if I tell you what was attempted to be inculcated in my mind when I was a youth of ten years of age. It was, as far as my experience went, the common conversation among working men that the cleverest man was a good drinker and a good 'fuddler.' All operatives connected with the building trade at that time were connected with drink and degradation. When the foundation-stone was laid, it was celebrated by drinking; when the first floor was put on it was celebrated by drinking; when the roof-tree was reared, there was another bout of drinking. If a workman removed from one place to another, he must pay his footing, and there was a celebration by drinking. Now, I sincerely hope that such customs are of the past, and not of the present. They were of the present in my day and generation, and if practice and precept could have made me a drunken man, I should have been dead long ago of drinking and sotchness. But something in my nature rebelled against it. I do not take credit to myself that I resisted, because I believe that I was constitu-

simply unfed to be a drunkard; for if I was
 tempted into any excess of an evening, I paid
 the fearful penalty of a sick-headache next
 morning. You have been told that it is necessary
 to the prosperity of the working man that he
 should be educated. I tell you so too. My
 friend, Professor Lyon Playfair, has described to
 you the process the State is about to adopt to
 give to all your children means of a better edu-
 cation, and let me appeal to you as fathers of
 families, and I am exceedingly sorry that when
 you came here to-night you did not bring your
 wives with you, because I think it is just as
 necessary that the wife should hear all these
 arguments as it is that the husband should hear
 them. If every man has to hold his position in
 the world, and especially to raise himself in the
 world, he must do it with the assistance of the
 helpmeet that God has given him. Of what
 avail will your schools be,—of what avail will all
 this teaching be, if it stops when the school-door
 is shut?—if you do not in your own homes follow
 that education given to you in the school,
 and perseveringly strive to make more of it,—
 if you do not take the talent entrusted to you,
 and so work it that the five talents shall be ten
 talents, and that at the end of life the Great
 Master may say to you,—“Well done, good
 and faithful servant, enter into thy reward.”
 Every working man’s home, as Mr. Godwin has
 told you, should be so improved that it should
 be his comfortable residence,—his castle, and in
 time of sickness his hospital. I do not think it a
 creditable state of things that charity should so
 supplement that condition of the working man
 that when sickness overtakes him he is neces-
 sarily put with an aggregation of human beings
 in the same state of misery. When civilisation
 has fulfilled its mission, and when statesmen
 have learned the full lesson of their duty, and
 when Governments so regulate and so order the
 laws, I hope that if we do not see it our children
 or children’s children will see it—that every
 man can have a roof over him; can have room-
 space about him and comforts within himself;
 he shall not need to go externally either to the
 drapshop or the beershop to get out of the
 court in which he has to dwell, or on washing
 days to get rid of the smell of the soap-suds, to
 spend his earnings selfishly and improperly in
 debasing himself, degrading his wife, and be-
 garing his children. The great Lord Brougham,
 whom I have had the pleasure on several oc-
 casions of seeing in the place of your chairman at
 this great meeting, and who, so long as life was
 spared him, never missed an opportunity in con-
 nection with this institution, which he founded,
 of presiding over such meetings as this—Lord
 Brougham compared society to the Egyptian
 pyramid, that emblem of stability. The lower
 courses, the great masses of the people; the
 intermediate course, rising up to the apex; the
 intermediate grades of society, crowned by the
 king or president, as the case may be. Now, it
 is quite clear that the stability of the pyramid, in
 spite of its form, would be nothing if the lower
 courses were not sound and stable; and so must
 certainly be the present time, and in this
 country, and, as far as I have studied the ques-
 tion, in these countries, is not in that stable
 position, because the welfare of the working man
 has not up to this time, from the first beginning of
 history, been grossly neglected. It must be that
 men will begin to wish for that stability, for
 there is no state in which society can be safe and
 stable if the foundation be not sound, good, pure,
 and true. In a remarkable speech made by that
 great statesman, philanthropist, and speaker,
 John Bright, at Birmingham, he used this
 faithful and remarkable simile: he said that when
 the Atlantic telegraph was lost in mid-ocean,
 and when it was thought to be hopelessly lost,
 the iron grapping hand of science was lowered
 more than 2,000 fathoms deep—where the pres-
 sure was 5,000 lb. to the square inch—that it
 successfully grappled the cable and brought up
 the line of communication which bound the two
 worlds in one; and he said he thought it was
 time to consider if the human hand of states-
 manship could not be lowered down to the
 depths of our civil degradation to grapple with
 the amount of misery and destitution that per-
 vaded society. I sincerely hope, he said, these
 meetings will enable us to come to right conclu-
 sions, and enable us to advise the Legislature to
 enact wise laws, and any little teachings laid
 before you will send you home so—for that is the
 bottom of it all—that you individually, each man
 for himself, shall study the question, and strive
 how much better he can make himself, how much
 more comfortable he can make his home, as

how much happier he can make his wife and children.

Mr. Godwin took for his subject,

Health and Home,

and at the starting begged his audience to receive any words that might drop from him, and which might be less agreeable probably than the words they had heard from Mr. Rupert Kettle, in the same kindly spirit as that which prompted them. He said*—"You know very well that one of the departments of the Association is devoted to the improvement of public health,—to such questions as properly constructed houses, good sanitary laws, recreation grounds, and other matters that conduce to the general welfare and the general happiness. On all similar occasions this subject has been entrusted to one of the speakers, and I feel it a compliment that I am here allowed to say half a dozen words to you upon it. I have given attention to sanitary matters in one way or another for many years, and if I should offer any objection to what I have seen in your town, it will be done without any intention whatever of giving offence. There still exists very great ignorance in the matter of public health—an ignorance, I might say, in all classes, though, for my own part, I can scarcely recognise classes,—in England, classes all run one into another,—I say there is great ignorance in the community upon this matter. They fancy, for example, that they know all about air. If you begin to talk on the subject to a body of men, such as I see here, they say, "Oh, we know all about that;" but, unhappily, the great majority of them act as if they knew nothing about it. The poet writes of "trifles light as air," but air itself is no trifle, that is quite certain. If you could but estimate the amount of mischief done by this ignorance of the air, it would be so stupendous that you could hardly understand it. Some persons have the notion that the only means of improving the air is to shut up every hole in a room, and prevent the access of air. It is God himself's arrangement to give an unlimited quantity of pure air, and it seems to be man's arrangement to endeavour to limit that supply, and to deteriorate its purity in every way in his power. I have often mentioned the observation of an old clergyman who used to complain greatly of his flock for shutting out the air; he said, "If I were to preach in a barrel, they would stop up the bung-hole." That is just what the majority of us do. I have been in houses—I have been in some to-day—where, for example, the top sash is nailed up—a suicidal act—doing such damage as one could scarcely tell of in the ten minutes that have been allotted to me. Now, people will not drink dirty water,—not willingly, though sometimes they are obliged, even in Newcastle,—but they have no objection whatever to take in dirty air. If they would but remember that from dirt comes death; if they would but realise the absurdity of the saying that "own dirt is no dirt;" if they would but see the absurdity, the dangerous absurdity of that saying,—I am sure they would act very differently. From our own breath may come our own death. It has been shown pretty conclusively that about 700 cubic feet,—say, 10 ft. by 10 ft., and 7 ft. high, and we can all imagine a room of that sort,—is about as small as a single individual should inhabit. I have been in houses in this town where six people were sleeping in that same space; and, therefore, having 120 cubic feet, or something of that sort each, instead of 700. Many of these evils come from want of thought, and they might be guarded against even by the people themselves, although I must confess that men are often placed in great difficulties. The increase of population in Newcastle, for example, has been much greater relatively than the increase of houses, and overcrowding, which means all sorts of dangers, all sorts of miseries, orphans and death, is still prevailing in many parts of Newcastle to a very great extent. I knew a bed in a hospital where seven patients died who was put into it; I knew a stable in which no horse would live beyond a certain number of months; I know houses in London where successive families are stricken down by fever as they go in, all of which might be prevented by a little knowledge. I ventured at a meeting yesterday to speak of the sewers of Newcastle (I am obliged to run from one question to another because of the short time allowed); and I am afraid that I a little annoyed some of the excellent authorities of your town. I do not venture to complain in the least of any

are doing; I simply say that a vast deal yet needs doing in Newcastle. I believe that for some time past a great deal has been done by your excellent town surveyor, Mr. Fulton, and by the corporation; but if any member of that corporation thinks that this town is well sewered, that it is well provided with water, that proper arrangements have been made for the education and recreation of the children, then he is labouring under a great mistake, and it appears to me that the corporation ought to be obliged to any stranger who, with a fresh eye, shall tell them what seems wanting. Now, if I were not afraid—I am almost afraid, but if I were not, I would tell of two or three things that I saw yesterday afternoon in this town. I have walked through some of the chares and some of the courts of Newcastle, and I must confess that in many of them there exist things which I thoroughly believe those who think I am too critical cannot be aware of. For example, I went into Rosemary-court, I believe it is called, and I found that there were seven or eight families dependent upon one miserable watered house, and present persons of a very respectable, well dressed, and of most respectable appearance for her position, and I must to me the condition under which they lived, and her description of it was truly painful. I might dilate upon it—I might speak of courts leading out of Market-street, and others quite close to the towball, and to the best parts of the town, all of which require supervision when it can be obtained. I do not say it can all be done at once. I know it cannot be; but let it be remembered that it is needed; let it be remembered especially that you do want a proper outlet for your sewage. But, if possible, the sewage should not be wasted but applied to the land, where it would be productive; we should put back to the earth that which we are plainly taking from it. The badness of parts of your town can be easily made quite evident. If you happen to live in St. Andrew's, for instance, you have a fourth chance more of life than you have if you live in All Saints,—that is to say, for every twenty-nine persons who die in All Saints, there are only about twenty-four persons who die in St. Andrew's. Now, say that five persons additional in a thousand die because of bad arrangements,—and I should say that a great many were dying even in St. Andrew's from bad arrangements; but take the worst as compared with the best, and what does the death of five persons in 1,000 in this town (a town of 130,000 inhabitants) mean? It means the unnecessary loss of five persons out of 650 persons. Points of this sort, if got into the mind, will show the necessity and value of sanitary movements and improvements, the provision of fresh air, good water, and pure food. And, touching food, if you were to hang two or three tradesmen who adulterate it, no wrong would be done. I would do it without scruple. There are a number of other things upon which I should be glad to touch if time permitted. There are those houses which are built back to back. I have been in a hundred of them to-day. This state of things cannot be helped at present, I know, but Heaven's name get rid of them as soon as you can. It is impossible to be lively, or healthy, or happy in a house without an opening at the back, without water, and with four times the number of people living in it that ought to be there; indeed, under such a state of things it is scarcely possible to be virtuous. I had a sore throat simply through passing for a couple of hours through these places, which produce on the inhabitants a depression of spirits, and a general degradation of health, which leave them no power of doing good, and no power of exertion. Just compare the condition of a man in a healthy house, with a happy wife, and that of a man living in a house of a different sort, having bad air, bad smells, and necessarily a grumbling and discontented wife, and you will see the difference. Positively there were many houses in Newcastle which could be called little more than chandler houses. I know the corporation go on gradually improving the courts, and they want and must have your co-operation, because, for effecting the objects desired, it is necessary to make laws, and in this way they must have great co-operation, and that not only in the aggregate, but individually. In your own houses, very much can be done if you get knowledge on these sanitary points. I saw an enormous number of courts unpaved to-day; get these places paved, for an immense deal of good may be done even by paving. It is a serious thing to have these courts unpaved; it does not merely mean unclean

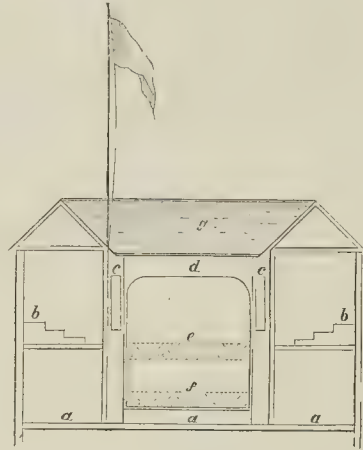
* We adopt the report given in the *Newcastle Chronicle*.

fortable walking, but bad air, decomposition, and, in fact, everything that is bad. Such matters may be considered small things in themselves, but they touch upon the happiness and prosperity of families, and these are by no means small things, and therefore perhaps you will pardon me for the ten minutes I have occupied in pressing upon you the great importance of sanitary knowledge and sanitary improvements.*

SHAKESPEARE'S GLOBE PLAYHOUSE AND OUR GAFFS.

CURIOUS enough how, says Mr. Carlyle, as it were by mere accident, this man, William Shakespeare, came to us. Curious, indeed, it was,—one might almost say miraculous,—considering from out of what a dingy, dismal place, and through what a narrow, dirty court, he did emerge into the light of day. Before we venture to describe the "Globe" Theatre, it will be necessary to say a word or two about the "Blackfriars,"—quite as curious a subject, by the way, as the Globe itself,—perhaps even more so, as it was to the Blackfriars that Shakespeare first made application for dramatic work. The Blackfriars Theatre was not a regularly built and designed theatre, but simply a common two-story house converted into a theatre by a little pulling down, and alteration, and tinkering. Mr. Knight cannot quite make it out; but the whole affair was simple enough. The partition between the front and back parlours was taken down, as also the partition above, the floor over the back room removed, and partially from over the front room as well, so that the whole space from the lower floor to the ceiling of the room above was clear. This floor, in part being raised 2 ft. or 3 ft., constituted the stage, the rest of the space being the pit, or space for the "groundlings," as the pit audience was termed in Shakespeare's time. The portion of the floor of the front upper room made the gallery. This was the famous Blackfriars Theatre. An ordinary private house with the floor between the two stories pulled down made a "playhouse." In the Lower Marsh, Lambeth, there was, and is, a small theatre constructed almost timber for timber in this temporary sort of way. It once gloried in being a gaff, but is now a chapel, and some of the scenery yet remains to remind those who visit it of its former vocation. A very considerable effort of the imagination, says Mr. Knight, and some knowledge of minute facts would be necessary to form an accurate notion of that building in the Blackfriars in which we may conclude the first plays of Shakespeare were exhibited. Not so; for the fact is that in this very ruin of a playhouse may be seen almost a *fac-simile* of the playhouse in the Blackfriars, in which Shakespeare acted and wrote. Few are likely to visit, or have ever visited, this place; but there is another, in a somewhat different quarter of the world, and filled with another audience, which will realise to a certain extent the Blackfriars to any who feel curious enough about it. We refer to the room or "dormitory" of the Westminster School in which is annually performed the Westminster Play at Christmas time. This is merely a long room fitted up with a temporary stage and gallery, the pit being the floor of it, and would doubtless have seemed to Shakespeare and his company quite a magnificent place; indeed, we may be quite sure that Shakespeare's imagination,

* Commenting on these observations, the *Newcastle Chronicle*, in an able leading article, says,—"*At the working men's meeting, held under the auspices of the Social Science Association, in the Town-hall, Mr. Godwin drew attention to the absolute want in many districts of Newcastle of good sewers, good water, good houses, and good recreation ground, or the ordinary conveniences of civilisation. In one spot, 'Rosemary Court,' Mr. Godwin found seventeen houses dependent upon one wretched hole for convenience. Facts like these sufficiently account not only for a high death-rate, but for aggravated immorality. Where decency, ordinary decency, cannot be maintained, the graces of virtue are impressed. It is the habit to assume this state of things is inevitable. There could not possibly be a grosser delusion. A good house is the ambition of even the humblest of our countrymen, and when Englishmen herd together in such hovels as Mr. Godwin so graphically described, it is only under the compulsion of supreme necessity. It is confessedly difficult to make small houses pay, and in that difficulty we have an explanation of the lack of comfort to which the least fortunate section of the community is compelled to submit. But this obstacle is not insurmountable. Where competent architectural skill is brought into play, it is perfectly possible to secure a fair percentage upon the erection of workmen's houses. With that fact demonstrated, we may expect that the dens of Newcastle, which Mr. Godwin denounced, will quickly disappear. While they exist we cannot hope for even comparative immunity from either disease, immorality, or crime.*"



vast as it was, could never have reached it. So much for the Blackfriars, on which a good deal more might be said, for there are two or three places in the outer parts of London which might bring it vividly before the mind's eye, but our present business is more especially with the famous "Globe."

The Blackfriars Theatre, as we have seen, was a common "private house" converted into a theatre in a temporary and somewhat rough way; but the Globe Playhouse was a regularly designed and constructed theatre,—a place in every way, as things then were, adapted to its purpose, and we may feel quite sure that the building, whatever we may now think of it, was fully equal to all that was required of it. Nothing, surely, was ever more singular; for how in such a place a full five-act play of Shakespeare's could have been performed, may remain a mystery, or the theme for a German theory. We have given a section of the Globe Theatre, drawn from a careful consideration of all we could collect bearing upon it. There is not much, truly, but still enough to make one pretty nearly certain of its general accuracy, and any professional reader can, from the section, readily realise to himself the general aspect of the building outside as well as inside. The Globe was built in 1594. It was, as will be seen, open to the weather; in architectural and classical language, this temple of the Muses was *hypothral*, the gallery (*b, b*) was covered, but not the pit (*c*), or space for the "groundlings." The stage could have been but partially covered. It was octagonal on plan, at least outside, as the old print of it shows; but inside we are inclined to think that it was circular. The pit seems to have been level, as it is to this hour in two of the gaffs, with probably low narrow benches without backs, for the accommodation of the "penny" audience. The stage was raised, as will be seen, about 2 ft. 6 in. or 3 ft. above the general level of the pit, and had in front of it a low railing, probably something similar to the footlight railing in an ordinary theatre. The gallery ran round the building, stopping at the private boxes (*d, d*), of which there were two next the stage, very small ones, and specially reserved for special visitors to the house. There is no evidence to show that there was any second gallery; so that there is but one gaff even now existing in London that can be instanced to afford an idea of the size and arrangements of this little, inconvenient, weather-beaten playhouse of Shakespeare's. The Alhambra, Shoreditch, a penny house, though not a pure gaff, shows, in a luxurious way, what the Globe was like, and may be nearly the size of it, but not quite fairly representative, inasmuch as it is covered in. In size it must have been from 25 ft. to 30 ft. across, from the one side of the gallery to the other. There were no scenes of any kind, or slips, or even a curtain, as some think, or, indeed, any of the appliances of a modern theatre, even of the smallest kind. The modern "gaff" would have electrified poor Shakespeare, and in the "Bower," a gaff, he would have

thought himself more than a manager. The only place in London nowadays in which one scene does the work of the whole play is in the Westminster Dormitory before named, where a pleasantly-painted view of the Athenian Acropolis, though the plays are always Roman ones, does duty for all times and circumstances; but in Shakespeare's day there was not even this, but at the back of the stage, at about 7 ft. from the ground, there was a small gallery (*d*), from which, as it would appear, the principal speeches were delivered. Any change of time and place was indicated on the stage by the bringing in of some piece of stage furniture or other indicative of it. Thus a bedroom scene was shown by the presence of a small couch, a living-room by a chair and table, a garden by a flower-pot or two, and so on. A little of this kind of realism yet lingers in the gaffs, the scenery not having quite banished it. It is well to mention that some of the audience sat on chairs placed on the stage, and that the musicians also sat or stood there, there being no space put aside for an orchestra. All the floor of the stage being thus occupied, but small space could have remained for the performers, and we can well imagine how inconvenient and crowded it must have been, and how few players could have been on the stage at one time; and this may, perhaps, in part account for the little gallery at the back of it, for sometimes it must have been most desirable to show the "whole strength of the company," small as it was, and some of them doubtless mounted into this gallery to show themselves.

In one of the most characteristic of the modern London gaffs, unfortunately burnt down but a year or so ago, a very small place in the dismal regions of the far East, a thought or two from before Shakespeare's day might be seen and recorded; for the "supers" were children, as they often were, for the children of the Chapel Royal, and St. Paul's, and Westminster, before the enlightenment vouchsafed to their modern successors, acted plays and interludes even before Majesty itself. These youthful performers in this place filed on to the stage, danced a few steps, then remained at the back, "all in a row," through the whole performance of the player or singer who might happen to be going through a character of his own, but without any reference to them, till, it being over, these supers danced a few more steps, and then filed off again. It was some such work as this that our immortal bard went through, whether on gallery or ground, when he first ventured on the perilous sea of London dramatic life; and he might have comforted himself, had he known it, by a recollection of the fact, that, as far back as the time of the old Normans, in the twelfth century, Abbot Geoffrey, of the abbey of Dunstable, had a play acted by children pretty much, as we may suppose, in this strange way. It may seem to many rather dull, on paper, but it is not so in reality,—indeed, it is a very pretty idea; and one cannot help wondering, as we get to know the place he had got to, whether our immortal poet repented or no of having "run

away from his master to London town as a servant."

It is obviously impossible to go at length into all the little almost unappreciable, though, put together, important matters connected with this most curious subject; but surely no time and painstaking could be thrown away in the attempt to bring home to the modern mind the surroundings of the man Shakespeare, who from a very mean rank, rose to the top of his performance, the *Ghost* in "Hamlet," not in Drury Lane, but the Globe—a place inferior to any modern gaff. There is, however, one thing connected with the building not to be passed over,—it is the curious indenture or agreement and part specification which has come down to us from the year of grace 1599, between Philip Henslowe and Edward Allen, and Peter Shreete, carpenter and carver, of London, for the building of the Fortune Playhouse, and it seems to throw light on the Globe, for the dimensions are given and a sort of general description of the work to be done in the building of it, and is, indeed, a rough description of a playhouse of the time, and has helped us to a better knowledge of the Globe than would have been possible without it. The contractors are required "to provide all manner of workmen, timber, joists, tile, lath, boards, doors, bolts, hinges, glass, workmanship, and other things whatsoever therein shall be needful." With documents such as this Shakespeare must have been well acquainted and perfectly familiar; for, though not a manager, there can be no doubt that he was a "property-man" and stage-manager, both from the very necessities of the case, as we see it when well acquainted with the Globe building, as from the recorded fact, which even Mr. Knight does not deny, that he bought and sold, and let out theatrical dresses, and really did quite a little briek trade in the providing and loaning out to—shall we say it?—needy actors and "supers" such necessary costume as they could not afford to buy. Thus wonderful as it seems at first sight, till you come to see into the ways of the Globe Theatre, its actors and its audience, to find this man William Shakespeare, the dramatic poet of nature, and of all time, mixed up with all these little trifling and trading matters, picking up a few pounds or shillings in any way he could, and through every source that presented itself; for no one ever seems to have felt the truth of the words, "if money go before, all ways do lie open," more keenly than he, and which, considering his drear and dark apprenticeship to the trade of getting it, it is no wonder he did feel.

It is important to remind the reader that the main idea for the arrangement of a playhouse came from the custom of using *inn yards* for the representation of plays, and which were, of course, open to the air, with a gallery or galleries round three sides of them. On the ground of such an inn the players and the audience alike stood; the better sort sat in the gallery above; so that a playhouse was simply as far as possible a copy of this very simple arrangement. In the yet remaining old-fashioned inn of the "Four Swans" Norton Folgate, Shoreditch; and one other, perhaps still better as having but one gallery, a small half-ruinous inn, opposite Christ Church, Mile-end, may be seen a possible theatre of this kind, though improvements are making havoc with it in more ways than one, the galleries having been all glazed. The Globe was little more than a copy of one of these inns; but octagonal on plan, with a raised stage, it did not even occur to the builder to cover it in. Lights were burnt by day during the performance, not foot-lights, but bracket lamps, one or more on each side of the stage. Time was when the pit of a theatre was the cheapest part of the house, as it must have been in the Globe, and is now in some of the gaffs which do not boast of a second gallery; for where this exists the "groundlings" are promoted to higher seats, and the gallery holds the audience. This is the arrangement in the "Bower" Theatre, the "sustained splendor" of the neighborhood occupying the middle or "dress-circle," on a level with the private boxes. The pit thus becomes more select and somewhat safer for those who feel a little timid. All these things are the material arrangements of the "gaffs," and were precisely those of the Globe gaff in which Shakespeare played and strutted his brief hour, and did all his magical and world-famous work. "He could have ruled empires," says Emerson, in a burst of hero-worshipping enthusiasm; "I feel that he could." He might

have done so; but it is quite sure and certain that he did not rule, much less create, a Penny Gaff; he did not even act in it, but he moved about in it, was helpful to every one in it, and, last of all, in an altogether unconscious and unnoticed sort of way, wrote for it, and lent to each one of his fellows brains as they could take them; but it was not for the world he wrote, but for the Globe Gaff!

ARCHITECTS AND THE BOARD OF WORKS.

An inestimable friend, who religiously reads every line of the *Builder* chiefly for the purpose of finding something misstated or forgotten, wants to know why we, like other journals, have not stated that Mr. James Pennethorne, late an attached architect of the Board of Works, is to be Knighted. Simply because the assertion is a little premature. The real state of the case is this. The Chief Commissioner informed Mr. Pennethorne that the Prime Minister would recommend that the honour of Knighthood should be conferred upon him, if agreeable to him; and Mr. Pennethorne, we believe, replied that, considering the circumstances under which he quitted office, he should like it: so probably at the end of the year, when the Queen returns to Windsor, the well-deserved honour will be conferred. Inasmuch as we ourselves suggested, on the completion of the London University Buildings, that such an evidence of Her Majesty's consideration would be highly esteemed by the profession, it must be unnecessary for us to say that no one will more heartily hail our esteemed colleague and friend Sir James Pennethorne, when the time comes, than we shall.

Mr. Pennethorne's business at the Office of Works will go into several hands, but the Office of Woods' business is now referred, and probably will so continue, to Mr. Arthur Cates; but without an appointment, which for him is just as good in a pecuniary point of view.

We have lately glanced hastily at a printed paper,—whether a draft and merely at present for consideration, we do not know,—containing a scheme as to the duties and remuneration of architects employed on public works, drawn up by the Government Board of Works. It is very precise and stringent, but on the whole did not seem unfair, except that it reserves to the Government the nomination of an arbitrator if differences arise. The percentage is left open; but one-third of the remuneration is to be paid when the builder's contract is decided; one-third at a second stage; and one-third when the builder is paid his balance. Would it not be well for the Government to submit it to the Institute of Architects before it finally adopts it? There ought to be two parties to such a document, to prevent chaffage and soreness, and in some, perhaps, a sense of unfairness. The profession as a body consists of fair and honourable men, and would feel disposed to consider such a document in a candid spirit. This would save future difficulties and misunderstandings.

COLOUR IN MODERN STAINED GLASS.

CONTINUING my observations, it is asserted that stained glass, which we have learnt "to make and use in the skillful manner which the old architects did," and which we now apply with "excellent effect," was only part of the ancient system of coloured decoration, and necessitates the application of colour to the entire structure.

Passing by the unproved assertion that the architects of those days were the designers of the stained glass of their time, as well as of the coloured decoration of their buildings—which was disposed of in my last letter—I would ask whether, even if they were, we are called upon, because their buildings and their mason's work deservedly rank amongst the highest efforts of architectural art, to accept with a slavish and indiscriminating admiration whatever else they did. We know well that, although their mouldings and conventional foliage were of the most effective and exquisite character, they were utterly unable, down to the middle of the thirteenth century, to draw or to carve correctly the human figure; and if we reject as utterly unworthy of our consideration the irrational demand which would require us to adopt these quaint but ignorant attempts of Mediæval artists to represent the human form as the models we are to follow in the sculpture of the present day,

surely we are equally at liberty to consider whether their use of colour in windows and on walls is, or is not, in accordance with the rules of good taste and high art, as we now understand it, and worthy or not of our adoption and imitation.

It may be said, it is true, that this matter may be supposed to have been settled for us long ago; that we have for many years past been designing and executing windows after the fashion of those of the Middle Ages; and that it is rather late at the present moment to raise this preliminary question. On the other hand, it is, perhaps, at the present moment, when we are called upon to extend this coloured decoration in our church restorations, from the windows to the walls, that it especially behoves us to consider well what we are about to do; to review dispassionately what we have already done; and to examine well whether the results of the exercises of this new art, if art it be, are really and undeniably as "excellent" as they have been declared to be.

Permit me to assist those who may desire to enter on such an examination, by describing a stained-glass window,—one out of five or six large windows in a church which I have lately seen,—which, recently issuing from the workshop of one of the most distinguished manufacturers of stained glass, may be taken to be a fair type of the more costly stained-glass windows of the present day. The subject is the Crucifixion. The central figure is, of course, that of our Saviour on the cross. His loins are girt with a sash of ultra-marine blue, having a rose-coloured lining. On the left stands the blessed Virgin, clad in what appears to be a green baize wrapper, lined with salmon-coloured taffeta, and an under-garment of bright vermillion, adorned with gold-embroidered collar, cuffs, and border. At the foot of the cross is St. Mary Magdalene, clad in a Prussian-blue upper garment and pea-green robe. She wears a collar of apparently silver flagree work round her neck. On the right stands St. John, in raiment of three colours,—scarlet, blue, and green. Next to him is seen St. Mark, in a diapered amber-coloured vesture, over which is thrown a green cloak or toga, lined with violet; and on the opposite side is St. Luke, in equally brilliant garments. To describe the whole of the other figures in the picture—in all sixteen—would be tedious; suffice it to say, that they share among them the whole of the six primary and secondary colours of the prismatic spectrum, contrasted and combined pretty much in the manner already described.*

It is impossible for a moment to be blind to the fact that the object of the designer of this window, in which the most portentous event in sacred history is unintentionally converted into a harlequinade, has been, not to present a truthful picture of the Crucifixion, but to seek, in the clothing of the divine and saintly personages that are introduced, a field for the lavish display of the gaudiest colours of the glass-stainers' workshop.

The toleration by a reverent and sober-minded community of so startling, so unnatural, and so untruthful a picture, in so prominent a position as the east window of a parish church, is at first sight almost incredible. And if this were the first window of the kind that had ever been seen, there can be no doubt what its fate would be. The facility, however, with which we become first habituated, then reconciled, and ultimately attached to what is at first sight startling and repugnant to our feelings, is, in matters of art, as well as in matters of religion, one of the most dangerous weaknesses of our nature. Use, ancient example, a certain supposed conventionalism in matters of this kind, and, above all, modern imitation, growing first into a habit, and then into an unreasoning and imperious fashion, have combined to blind us to the manifest vulgarity of this growing fondness for gaudy colour, the effect of which on ordinary minds is best conveyed by the expression of a small tradesman, who, on beholding the sacred scene portrayed in the picture I have above described, when the window was first erected, declared it to be "gorjus!"

It is true that there are numerous incidents of Bible history, in the representation of which this redundancy of strong colour would not be so glaringly offensive as in the instance I have

* This design, which as regards its colours resembles those of the other four or five windows by different artists of high repute in the same church, will be recognised as similar in its main features to hundreds of others representing the same subject in different parts of the country.

referred to; but in by far the greater number of the stained-glass windows of the present day, whatever be the subject treated, whether the personages introduced be Magi or Martyrs, Soldiers or Saints, Kings or Beggars, their dress is the same; the obvious aim of the design being to produce a dazzling effect on the mind of the beholder, by means of large patches of gaudily-coloured stained glass, not produced by the brush of the artist himself, but manufactured and sold to him by the ordinary glass-stainer, at so much per square foot.

It remains to be considered whether, renouncing such extravagance, we may yet be able, in the matter of stained glass, to extract from ancient precedent and modern practice a system of decoration which, without offending our common sense, or our good taste, may yet fitly represent at once the dignity and the purity of English worship, as well as the warmth of devotion inseparable from the true profession of the Christian faith.

There is no doubt that, as I have already remarked, the lavish display of deeply-stained glass in large patches is the most glaring defect of modern work. There is a preliminary objection to the use of these deep colours in large quantities, arising from the positive obstruction to the passage of light. There are portions of the clearstory windows of the noble work of Bishop Hugh in Lincoln Cathedral, the details of which have been thrown into such complete obscurity by the introduction of deeply-coloured glass in the windows of the opposite clearstory, that it is impossible, except at a certain hour of one of those bright summer days that are so rare in this climate, to detect their form and outline, still less to appreciate the grace and vigour of their treatment. In buildings containing lancet windows, nothing short of absolute prohibition of the use of these deep colours will be effectual. But even in buildings where, as is usually the case in the Rectilinear Period, the windows are large and numerous, the chief characteristic of glass,—transparency,—and the object of its use should never be overlooked, nor the material itself de-naturalised; and if the sums that are spent over the purchase of so many square feet of deeply-coloured and almost opaque stained glass for a single window or two were employed in the conversion of the whole of the plain windows of a church into stained-glass windows of more transparent character, of less cost, and of becoming and graceful design, the gain would be great, not only to the worshipper and the lover of architecture, but, in my opinion, also to the glass-stainer himself, whose business might thereby be largely and profitably increased.

It is not difficult to foresee, if the present fashion be maintained, and the whole of the windows of a church, in which one or two such memorial windows have been inserted, be filled with stained glass of similar depth of hue, that all traces of the architecture of the building will be lost in a Cimmerian gloom,—unless, indeed, the worship be conducted by gaslight,—and that sooner or later, when the inartistic nature of these gaudy pictures and grotesquely-dressed figures begin to be recognised, a wholesale removal of these opaque transparencies will take place. Nor can there, I think, be any doubt, as the fashion becomes old, and new and better ideas prevail, what the verdict of posterity will be on these art-works of the nineteenth century.

Before, however, we can hope for improvement, we must not only know what to avoid, but what to select and adopt,—a task compared to which the former is an easy one. Without having the presumption to offer myself as a guide in this search, I will venture to suggest a direction in which we may possibly seek with advantage for that assistance of which we are in need,—one, at all events, in which we may work with safety, if not, indeed, with good effect.

Before doing so, however, I will mention a circumstance which has often struck me, and which must have been noticed by others. The treatment of some of the most effective old windows that I know is, in their present state, the result of accident, and not of design. I refer to those which have been formed of fragments of stained glass, collected from many windows, and formed into one. The effect produced is that of mosaic, in which the ground-work, formed of the lighter portions of old glass, mixed with dulled white modern glass, gives a gem-like richness to the smaller portions of deep blue and ruby glass to which they form the setting. Such a window, the agreeable brilliancy

of which cannot fail to strike the observer, is to be seen in the clearstory of the apse of Peterborough Cathedral. Many others will, doubtless, occur to those who interest themselves in this question. To this may be added the fact that some of incomparably the finest windows that are left to us of early times are designed precisely on the same principle,—that, namely, of giving effect and apparent value to small portions of richly-coloured glass, occurring in coats of arms and similar devices, by the predominance, as a general ground, of larger portions of amber, grey, light brown, and light green glass. The Church of Etchingham, in Sussex, has remains of stained glass in all its beautiful curvilinear windows, designed, if my memory does not deceive me, on this principle, and coeval with the church.

EDMUND SHARPE.

THE UTILISATION OF SEWAGE.

FROM amongst the papers on this subject, read at the Newcastle Congress of the Social Science Association, we select for publication that by Mr. James Blackburn, of the Aldershot Camp Farm, as it sets forth the result of many years' actual experience there and in Scotland. Mr. Blackburn said the question is, "What is the best method of disposing of sewage and excreta?"—In considering this I will not detain you by dwelling on the old ash-pit system of collection, which necessitated the removal of the same by horse and cart. This plan has been condemned long since on sanitary grounds, and has been found practically to involve a great waste of manure. There are, however, a few plans based on the dry system of collection, of which Moule's earth-closet has attracted the most attention; that also known as Evax's is similar in principle, inasmuch as both use a dry material for absorbing the refuse which is afterwards used as manure; but these do not deal with other waste liquid matters, for which a system of sewers would have to be provided, and their contents treated some way or other at the outfall. I think it may be presumed that water has long been decided on by sanitarians as providing the best means of bearing away all the refuse of our towns, which will have to be taken on to the land in some form or other. Filtration, chemical treatment, and irrigation, have been tried with a view of accomplishing this. By filtration the solid and suspended matters are easily separated; the same is done more perfectly by chemical treatment, lime or alum forming the chief ingredients by which precipitation of the suspended matters is brought about. That known as the lime process has been used at Leicester, Tottenham, Aldershot Camp, &c., but has been abandoned. Compounds containing alum have been tried at Northampton, Stroud, and other places; also by the A B C Company at Leamington and Hastings; but it has been found, on careful investigation by the Rivers Commission, that they fail in removing the matters in solution, while the dry manure is of very inferior quality. Irrigation, which implies taking the sewage straight from the outfall to the land, holds out great hopes of success, both as regards utilising the manure and preventing the pollution of our rivers; to do this with the least waste and offensiveness, the sewage should be delivered on to, and absorbed by, the soil in a fresh state before decomposition has commenced. The waste of this manure has been enormous, and must have correspondingly lessened the food-producing power of the country, and it really appears if we could have gone on pouring everything into our rivers with impunity, we should have done so to all eternity; but this evil may now be said to be gradually working its own cure. There is only one outlet for the world's refuse, and that is vegetable production. No filter nor chemical or mechanical contrivance can compete with the soil as a medium for purification; it abstracts not only the suspended matters, but also those in solution, then retaining them until appropriated by the plant, and this cleansing power is ever being renewed by the plants, which are constantly withdrawing the deposited impurities and rebuilding them into vegetable structures. Water, besides having a value of its own, is an economical carrier, and efficient distributor of manure, which in sewage is in a very fine state of division; it insures such a complete admixture with the soil as cannot be arrived at by any other means, and the efficacy of all manure depends to a great extent on its uniform diffusion. The water-supply of

towns varies from 50 to 15 gallons per head per day, and in many instances the sewers receive a large addition of subsoil drainage: this is a serious drawback on heavy soils, and also in those cases where pumping has to be resorted to. My agricultural experience in the use of sewage leads me to prefer a supply of 25 gallons a head as the best measure of dilution, bearing in mind that it has to be applied through all seasons of the year; the less storm water that finds its way into the sewers the better, as the matters it may bring down are comparatively worthless. The amount of sewage that can be advantageously used on land depends a good deal on how near it approaches in texture to a sand or a clay, the former through the season requiring more than the latter, but taking an average medium soil, from 60 to 70 head of population per acre per annum may be necessary, so that a farm of from 100 to 120 acres will profitably consume the sewage of a town of 6,000 or 7,000 inhabitants, amounting to 700 or 800 tons a-day; but in sewage farming, more even than in ordinary agriculture, a maximum return from a given area is what should be aimed at, as the great means of reducing the heavy fixed charges, many of which remain constant, irrespective of the produce. The land, unless resting on a porous stratum, will have to be deeply drained, and all irregularities in the surface which may interfere with the conducting of the sewage removed. Deep ploughing and subsoiling are then necessary, moving and aerating the ground to a depth of from 1 ft. 6 in. to 2 ft. The better the quality of the land the less sewage it will require. The difference between good and bad land is never adequately represented by the difference in rent, especially in the case of sewage farming, where the quality of the soil tells not only on one crop in the year, but on four or five in the same time. The sewage at the delivery on the farm must be rid of its solid matter, and as much of that in suspension as possible, as the clearer it can be applied, especially to grass, the better. The solid matter thus separated I have found to be a very poor manure. In this state it may be conveyed over the farm by open or covered main carriers and further distributed on the land from small open channels, which, according to the configuration of the ground, will either be arranged on the catchwater system, or, when very flat, an artificial slope must be obtained by ploughing into ridge and furrow. The cost of levelling and laying out the land will vary from 10s. to 20s. an acre. Italian rye grass and green crops of all descriptions are the most successful to cultivate; the former is first-rate food for cows, and also for horses, at a later period of its growth when cut and consumed in the house. From fifty to seventy tons may be raised per acre through the season. Rhubarb, onions, French beans, and lettuces thrive luxuriantly under proper treatment. In winter the deeply-ploughed land and grass will take the sewage and retain its manurial matter until the season of growth commences. I think the addition of one or two mineral manures for certain crops will be found economical and productive of good results. Sewage cannot be used advantageously on old grass land, or for growing corn, and the scarcity of green crops in this country renders their cultivation the most remunerative, either as food for man or for conversion into milk, butter, or meat. On a farm of 100 or 120 acres, there would be sixty acres under Italian rye grass, which, with a small amount of extraneous food, will keep 300 cows through the growing season, but in many places it is found profitable to sell the grass on the ground. As to the money value of sewage, chemists have estimated it at 8s. 4d. per head per annum, but in practice we have not yet approached this; the gross return has not been more than 4s. to 5s. a head; but it must be remembered the whole system is completely in its infancy, and further experience will bring with it considerable amendment. As examples of what is being done in England, I may mention the farms at Barking, Croydon, Norwood, Bedford, as furnishing instances, out of some twenty or thirty, of what is being done; also Mr. Hope's farm, near Rufford, which from present appearances promises to be a most important example. My own farm on the Government land at Aldershot is an instance of reclaiming land by sewage, and which is about the most barren soil in Great Britain; fair crops of grass, potatoes, and cabbages are grown on part of it, but its natural poverty makes extraordinary demands on the sewage. Looking at these farms as means of purification, they may

be considered a success, as shown in the analysis of the effluent waters made by the Rivers Commission; their inquiry as to the effect of these farms on the health of a neighbourhood was equally satisfactory. The economic use of sewage is really a national question, bearing very materially on the food-producing power of the country, not merely from the utilising of the sewage itself, but also indirectly by manure produced from the consumption of so large an addition of green food, where its application to the land becomes general. Milk and butter will be produced at one-third less than their present price, and it will be found that when effectually fulfilling the agricultural conditions, it will of necessity accomplish the sanitary object also. Instead of compulsion being needed for its adoption, we shall have active competition.

CHESTER CATHEDRAL AND THE BRITISH ASSOCIATION.

On the 22nd ult., when, the scientific dissipation of the week being over, the members of the British Association were scattered over the places of interest within reach of Liverpool in various excursion parties, a short lecture on the ecclesiastical and architectural history of the cathedral was given by the Dean of Chester, to those who had chosen that city as their rendezvous. An audience, sufficiently large to throng the chapter-house, responded to the dean's invitation to meet him there at noon, when they listened to a discourse necessarily concise (owing to shortness of available time) in which, however, the main divisions of the history of Gothic architecture were broadly defined, and illustrated by reference to a plan of the cathedral, coloured so as to represent the approximate dates of each portion. Plans of Ely, Norwich, and Canterbury Cathedrals were exhibited also in illustration of principles of planning in Gothic cathedrals, especially with regard to the termination of the eastern end, and the various possible application of apsidal chapels in that situation. A good many facts relating to the history of the cathedral, communicated on the occasion, have already been fully noted in our report of Mr. Scott's recent lecture at Chester. The Dean drew special attention to the affinity between Chester and Bangor Cathedrals in many points, and also to the fact that Chester was one of the few cities possessing two cathedrals, or *co-cathedrals* (Rome, Dublin, and London being the only other instances known to him), as the Church of St. John was the original Cathedral of Chester, the present cathedral having only been so constituted, from its original condition of an abbey church, in the reign of Henry VIII. Attention was also requested to the remarkable design of the piers carrying the vault of the vestibule to the chapter-house, which have no impost of any kind, the mouldings of the pier branching straight out to form the vaulting-ribs; and also to the octagonal apse with high-pitched roof, which once formed the eastern termination of the south aisle of the choir, and is now being restored,* a model of the restoration of this portion was exhibited, and compared with a drawing of a similar feature now existing at Norrey, in France. The party subsequently accompanied the dean round some portions of the cathedral, pausing to hear some remarks from Canon Blomfield relative to the monument to Bishop Pearson placed in the cathedral some years back, and which it appears was first suggested (a prophet having "no honour in his own country") by the comment of some Transatlantic visitors, who were surprised to find no monument to so eminent an ecclesiastic in the cathedral where he had formerly held episcopal sway. The Lady Chapel and the "King's School," with its picturesque reading-pulpit, were visited; and on adjourning to the exterior the party congregated at a point under the city wall affording a good view of the south-east portion of the cathedral, where the dean pointed out the illustrations of the various periods of Gothic exhibited in different parts of the structure. Certain inquiries were

made by visitors of geological tendencies as to the nature and locality of the stone employed in the new work, and the possibility of its standing better than the original stone, on which latter point answers could be little more than conjectural; sandstone, from the same formation, being, of course, a *sine qua non* in harmonising the new work with the old. The stone now used, being from one of the hardest and closest beds in the district, we must hope for the best. Had the original builders thought of going to the expense of getting some harder stones from a more distant neighbourhood, the present Dean and Chapter would not now have the task of raising such large sums of money to revivify work which was nearly falling to pieces; the moral of which reflection is obvious. At this point the party had to leave the cathedral, to keep appointment with the Mayor, who had invited them to visit the new town-hall, and a premature stop was necessarily put to an inspection which might have been productive of much greater interest, had another hour or two been fortunately available.

The restoration at the cathedral is actively progressing, and the whole of the tower is now reared, and surmounted by new pinnacles, somewhat altering the old well-known outline. When the work in the nave and elsewhere is nearer completion, it may be a more fitting time to go further into detail as to what has been done and discovered, about which there is a good deal of interest to be said. At present we will only pause to rebut the criticism of a literary contemporary, which affirmed recently that "artists" would justly lament the loss of the old picturesque weather-tower. Now, we are certainly no advocates for undue or premature restoration; but we must be allowed to observe that when such a structure as a large centre tower has reached that condition in which it may best be likened, to use Dean Howson's own words, to "an old sea-beaten rock" when not only all the design is obliterated, but even the very masonry reduced to a conglomeration of rounded shapeless masses, mere prudence demands either removal or restoration; otherwise "the picturesque" might some day come down on the artists' heads, which even they would perhaps object to. While at Chester, we may say a word as to another piece of interesting restoration now on hand on a smaller scale, and which was also visited during the day by members of the "Association" party. Most visitors to Chester will remember the old red-brick house overlooking the Dee from St. John's churchyard, and noted as the residence, during part of his boyhood, of that erratic genius, Thomas de Quincy, of opium-eating celebrity; the very house, indeed, if we remember rightly, whence he made, one early morning, that strange desperate fight, so graphically described in the "Confessions," from dulness and respectability to Arab life in the London streets. This house is now pulled down, disclosing the old chapter-house of the once Cathedral of St. John, over which the house had been built, and which, in pre-restoration times, was used as a washhouse and laundry by the tenants. A very good late Norman window in the wall above, preserved from the weather for some time past by the modern house built over it, is also uncovered. The chapter-house, a small apartment, about 15 ft. square, has the centre pier so common in Gothic apartments of this class, with vaulting ribs springing from it; but the peculiar feature noticeable in the vestibule of the Cathedral chapter-house, the absence of impost, is repeated here in a still more curious form, for instead of the mouldings of the vaulting ribs running straight through to the ground, the pier here is octagonal, and the vaulting-ribs rise straight from the top of this octagonal pier, their sections butting perpendicularly upon it, without the slightest horizontal moulding of any kind to mask this abrupt transition. At the foot of the pier a well-preserved and delicate base, of Lancet, or perhaps late Transitional period, marks the approximate date of the work. This restoration is being carried out at the cost of the present Marquis of Westminster, under the direction of Mr. Douglas, architect, of Chester.

The late Mr. Braithwaite.—The death is announced of Mr. John Braithwaite, civil engineer. From the earliest formation of railways he has been engaged in their construction, both in England and on the Continent. He was seventy-three years of age.

A NOTE IN SOMERSETSHIRE.

Yeovil.—With the foot and mouth disease raging over Somersetshire and most of the western counties, the sanitary state of Yeovil (one of the principal towns) is anything but encouraging. Bad sewerage and drainage, and an insufficiency of good water-supply are not the least of the wants of this town. Take an outline picture of Yeovil at this moment: foul open drains; unremoved nuisances; a fine old Gothic church, i.e., "The Lantern of the West," one of the finest in the county, with mean and filthy surroundings; a dead inspector of nuisances, and a living one voted as not wanted; a local board or town council, in want of money, and yet voting it away; new waterworks hanging fire for several years; civil and ecclesiastical improvement ditto; a town clock, with a dirty face, which it has at last been resolved upon to wash; and (tell it not in Gath) several of the town council with not over-clean tongues. It is to be hoped that a change will be soon discernible, and that it will not be shelved for a twelvemonth, like the recommendation of the improvement committee sent the churchyard-wall buttresses.

Castle Carey.—Some sewerage works have been commenced here, which for many years were badly needed. The estimated cost of the present effort is set down at 1,000*l.*, a sum we should think insufficient to assure anything like a thorough system of sewerage for the town. If the work be done well, the money will be well spent, but half measures do not even establish an equilibrium between disease and health.

A GLIMPSE OF GLASTONBURY.

The readers of the *Builder* have been often told something of saintly Glastonbury and its historic structures and memories,—the old Abbey, St. Michael's Tower, the Abbot's Kitchen, St. Joseph of Arimathea's Chapel, the old Market Cross, and the old Inn. But it is not with these we would deal just now. Glastonbury of to-day has had drainage and a defective water supply; and these wants are producing obvious results. Scarletina, diphtheria, and other dirt-produced diseases are breaking out, and are about to keep pace with the cattle plague, now prevalent in the country. Added to this, another no less frightful evil is common in the town—drunkenness and consequent disorder. The public-house system of the town is loose, and on Sundays more than on other days, even during service-time, the "swilling" goes on, and the week's hard earnings of working men are foolishly wasted amid greetings that generally end with growlings and kickings. The inhabitants are partly to blame, as well as the authorities, that such a state of things should exist. If either or both have no respect for themselves, they ought, at least, to have some for the town which they call theirs. This is hardly to be expected, however, on the part of inhabitants who have for years plundered the old piles of their sculptured wealth to deck their own miserable edifices. Let any one walk through Glastonbury to-day, and if he possesses the eyes of either a workman or an artist he will perceive pieces of doors, mullions, columns, and other carved and finely-chiselled work stuck here and there in the mean buildings through the town for support or ornament. Cleanliness, it is said, is next to godliness, but it would appear that not a minority of the folk of Glastonbury seem to be leaving it farther and farther every day. It is doubtful whether the apparition of the good St. Michael or St. Joseph of Arimathea would be sufficient to scare it back into a sense of public propriety or common duty.

ABOUT CONWAY CASTLE.

SUCH of the members of the British Association as visited Conway Castle were guided over it by Mr. H. Yale, the present president of the Liverpool Architectural and Archaeological Society. In the banqueting-hall of the castle, he said:—We may consider the reign of King Edward I. the epoch of the grand style of accommodation and magnificence combined in castle architecture. When engaged in the crusades "he surveyed" with satisfaction, as Dallaway observes, "the superior form and strength of the castles in the Levant, in the Holy Land." The introduction of parti-coloured stone in the quoins and dressings of Conway

* It will be remembered that in a former article on the restorations at Chester we raised a question as to the advisability of restoring this portion of the aisle in this form; at all events, so far as the high roof is concerned. The apse is all very well; but the roof having long since disappeared, we cannot but regard it as a mistake to restore what can only be called a freak in design, which to have no archaeological interest when merely reproduced by the modern restorer, and which architecturally will certainly appear an excrescence, out of keeping with the general expression of the building, which is emphatically that of repose.

Castle, as also in Carnarvon, serves to strengthen the idea that we owe these castles to such an Eastern origin. This stronghold is one of those called Edwardian Castles by the archaeologists, of which kind there were five in North Wales—namely, Beaumaris, Carnarvon, Caerphilly, Harlech, and Conway. The chief characteristics which distinguish these Edwardian castles from the earlier Norman ones, are the Great Hall of Audience or Ceremony, and the introduction of inferior towers, and overhanging turrets, bartizans or bretises, projecting from towers or angles, and the more frequent use of portcullises. The earlier Norman castles were without these portcullises, or only protected by one; but at Beaumaris, Carnarvon, and Harlech, three exist under every gateway, and at Caerphilly they form obstructions at the end of every passage or mural gallery. Conway was protected by one or more portcullises. The audience-hall at Conway was unusually splendid; the ribs of the stone arches of its roof may still be seen. This apartment was 130 ft. long, 30 ft. wide, and 20 ft. high. The ground-plan of this hall conformed to the bend of the outer wall adapting it to the nature of the site. Beneath the hall was extensive cellars for ammunition and provisions. The other characteristic of the Edwardian castle, namely, the turrets rising above the larger towers, are well accentuated at Conway, and served as staircases leading to the summits of the larger towers, the latter being 40 ft. in diameter. Another special feature at Conway is the beautiful little groined oratory, or private chapel, in the Queen's Tower, the absence of a fireplace in which apartment has pointed to its appropriation as a chapel. Conway Castle was completed by Edward I., in the year 1284; and H. d'Earlton, who designed Carnarvon Castle, is supposed to have been its architect, although the characteristic features to which I have referred are said to have been copied by Edward from some of the fortresses in the East, whither he had gone in the year 1270 as the leader of the British crusade. In 1282 he subjugated the Welsh under Llewellyn, and proceeded to construct his castles in Wales, the leading features of which generally may be summed up thus:—To render the entrance or gate at once magnificent and impenetrable; to secure the garrison, and to enable them to annoy the besiegers; to delude the besiegers to attack the strongest parts, by giving them the appearance of weakness; to put their prisoners, provisions, and implements of war out of the reach of danger; to convey the engines of war to any part of the castle with ease and expedition; to communicate intelligence to any part of the building; to supply the garrison with water; to convey away the smoke and sewage; to provide a commodious and safe habitation for the king and his household; all which conditions will be found to have been met with in the Castle of Conway and the other Edwardian fortresses. . . . When Richard II. came to Conway, in 1399, the castle was kept by fifteen men-at-arms and six archers. In the Civil Wars it was held by Archbishop Williams for the king, but who, it is said, changed his party, and assisted General Milton to reduce the place. At the Restoration it was given to the Earl of Conway, who stripped it of its more valuable materials, sending them to Ireland in vessels which are said to have been wrecked, and the whole of the property lost. The mortar of the walls is very hard. Some of the inner surfaces appear to have been plastered with a very tenacious material. The overhanging of the tower near the railway is a good evidence of the cohesive nature of its ingredients. The walls which enclose the military station protected by the castle are a mile and a quarter in circuit, with four gateways and twenty-one small towers, built, as some have said, a bowshot range apart, the whole being encircled by a ditch or fosse. When we take into consideration the skill shown in adapting the ground-plan of the castle to the peculiarity of its site, combined with its gracefulness of outline, we may conclude that the designer was not only a good engineer, but also an architect of no mean ability.

Dispersion of a Museum at Keswick.—Crossthwaite's Museum, which for the last ninety years has afforded much edification and gratification to its numerous visitors of all classes, especially antiquarians and naturalists, has been distributed by Mr. C. P. Hardy, of Carlisle, in upwards of 1,500 lots. There were in it extensive collections of Roman and Saxon antiquities, minerals, skeletons, shells, &c.

NEW SCHOOLS AT COLLYHURST.

The foundation-stone of branch schools, in connexion with the Albert Memorial Church, Collyhurst, was laid on Saturday, by Mr. Robert Gladstone. The site of the new schools, which will be in the Gothic style of architecture, is at the junction of Sanderson-street and Rowbotham-street, and contains 1,200 square yards. The plan of the building comprises mixed school, adjoining class-room, and infants' schoolroom, the former and the latter being merely separated by a framed partition. The buildings externally will be faced with selected brick, white headers, relieved with different colours, and the roof of high pitch, with open framed principals. The mixed school will be surmounted with a lofty belfry. In addition to playgrounds attached to each school, a teacher's residence will be provided, the whole of the plans having been prepared in accordance with the requirements of the Privy Council. Each of the schools and class-rooms will be fitted with the necessary seating, desks, and galleries, affording accommodation for 231 children. The cost, including the inclosure walls and fittings, will be 1,250l. Messrs. Wade, Brothers, Miles Platting, are the contractors; and Mr. J. Low, Manchester, is architect for the works.

NEW CORN EXCHANGE, DONCASTER.

On the 22nd ult., the Mayor laid the first stone of the New Corn Exchange and the south-east wing of the Market-house. The market improvements of Doncaster are amongst the most important works which the Corporation have undertaken. Mr. William Watkins, of Lincoln, is the architect. The exchange is 91 ft. 6 in., by 84 ft., inside measurement, and although chiefly intended for a corn exchange, is also designed with a view to large public assemblies. The interior is divided into what may be called nave and aisles, the centre portion or nave being 58 ft. wide, spanned by six semicircular wrought-iron lattice ribs, without cross ties of any description, so that there will be a clear and uninterrupted space from the floor to the apex of the roof inside of about 63 ft. The ribs are connected laterally by ten wrought-iron longitudinal T pieces, placed between two pieces of wood, upon which are fixed the rafters of the roof, which are cut segmental on the underside to follow the lines of the main ribs. Along the entire length of the Exchange is a lantern light, and lower down the roof on each side, also the entire length of the Exchange, are additional skylights, measuring, together with the lantern light, over 50 ft. by the entire length of the room, thus giving a lighting surface of over 4,500 superficial feet for the nave portion alone. The main ribs of the roof are supported by coupled cast-iron columns on each side, having ornamental caps, bases, and bands. These columns are connected laterally again by semicircular cast-iron double ribs, with ornamental soffit plates to connect the ribs. Galleries are provided on three sides of the Exchange, viz.—Over the settling offices and principal entrance, and over what has been here called the aisles, for the purpose of giving increased accommodation to meet the exigencies of large public assemblies. The gallery fronts are supported by the coupled columns of the nave, and are attached thereto about midway between the caps and bases. Transverse wrought-iron girders connect these columns at the gallery fronts with the side walls; and there are also similar girders connecting the columns longitudinally, by which means great stiffness to the columns is secured. The gallery roofs are formed with semicircular cast-iron ribs spanning the gallery, and supported by the coupled column of the nave at one end, and the side walls at the other. In addition to the top lights, there are windows in every position where they can conveniently be arranged.

The principal entrance to the Exchange is in the centre of the front, the external opening being 15 ft. high by 9 ft. wide, leading into a recessed porch 18 ft. by 8 ft., from which are two large doorways, exactly opposite to the front entrance leading into the Exchange. Right and left of the recessed porch are entrances into small settling offices, from which again are doorways leading into, and both may be used as entrances to, the Exchange, at large public meetings, instead of the front doorways proper, which would entirely prevent a cold draught of air. They may also be used as well as the front doors proper, thus giving additional means of exit. There are side entrances to the Exchange, also

through recessed porches or lobbies beneath the side galleries. The front of the Exchange is flanked by angle staircases, having separate external doors leading to the galleries. Thus, there are five separate and distinct external entrances and exits; but there are four doors leading from the large central entrance to the Exchange, so that there will be practically eight doorways which may at any time be used as exits.

The external elevation of the Corn Exchange is in the Classic style, to accord with the present buildings; the Tuscan order being employed for the ground story, surmounted by that of the Doric, the columns and pilasters being properly spaced. The cost of the new works is estimated at about 15,000l. Mr. Athron, of Doncaster, is the builder.

RETURNS OF METROPOLITAN DISTRICT SURVEYORS.

The superintending architect, Mr. G. Valliama, has published the Fourteenth Report on the Monthly Returns of District Surveyors, under the Metropolitan Building Act.

The total of the gross fees received for the year is 33,246l. 19s. 6d., in respect of 19,947 works, of which more than two-thirds were done within the year.

The gross fees received in 31 districts vary from 48l. to 479l., six being under 200l. each, eight under 300l., nine under 400l., and eight under 500l. In 27 districts the incomes vary from 511l. to 1,869l.

The expenses of district offices are 7,535l. The fees remaining due for all arrears are 28,924l., but probably mostly of little value. The sums abated or lost are 4,683l. Compared with the results of some former years, the present abstract shows a considerable decrease.

In 1856	Works.	Fees received.
1857	14,854	£19,911 11 11
1858	15,330	21,069 11 4
1859	16,300	21,732 11 2
1860	16,558	22,365 9 2
1861	16,030	22,791 2 3
1862	14,008	21,588 2 8
1863	16,707	25,315 2 3
1864	17,854	29,447 9 9
1865	18,994	31,503 5 2
1866	19,261	32,572 7 9
1867	20,138	31,950 11 4
1868	21,3	36,674 6 0
1869	21,816	37,780 13 5
1870	19,947	33,246 19 6

STANMORE.

This house, of which we give an illustration, has recently been erected on the estate of Mr. John Pritchard, near to the picturesque town of Bridgnorth, Shropshire, under the direction of Mr. J. W. Hugall, of Oxford.

The site selected is very high, and the grounds are beautifully varied with an extensive view across the Severn valley, along which the river is seen to flow at various points.

The house is built of pressed red brick from Broseley, with Bath stone dressings, and is covered with red and blue tiles, arranged in lines. The flats are covered with Vieille Montagne zinc, by Fox; and the cresting and finials, of wrought iron, surmounting the roofs, together with the gas-fittings, balustrading, and coil cases, are from the works of Messrs. Thomason & Co., of Birmingham; Messrs. Edwards, of Great Marlborough-street, fitted up the hot-water apparatus, the culinary arrangements, and the laundry; Mr. Coulman, of St. Mary Church, near Torquay, supplied the marble mantel-pieces, slabs, inlays, and columns; Mr. Steinitz laid down the parkery in the entrance-hall; Messrs. Jackson executed the very elaborate ceilings in their fibrous plaster; and the general contractors, Messrs. Wall & Hook, of Brimscombe, have carried out their various works with care. Water and gas have been laid on from the town of Bridgnorth, a distance of two miles.

The principal and some subsidiary rooms have a line of hot-water pipes passing through them, and coils are placed in the halls, covered by wrought iron and brass cases with marble slabs. A lift for luggage reaches from the basement to the attics. The principal staircase is of oak, and enclosed beneath, to form a serving passage to the dining-room.

The house being erected on a slope of the ground to the north, advantage has been taken of it to form a basement for laundry, larders, cellarage, and so on.

A considerable quantity of stone carving is executed both externally and internally.



JEWISH SYNAGOGUE, EDGWARE-ROAD.

THERE is a movement amongst the Jews. A few months ago we chronicled the opening of a synagogue, to hold 1,000 people, in Great Portland-street, then one in Chatham, and we now have to mention the consecration of another building of similar size. This last is to be occupied by what we may term a body of Jewish Dissenters.

The new building is erected on leasehold land belonging to the Portman Estate, and held by the trustees for a term of ninety-nine years only.

It is Byzantine in character, and a square on plan, measuring 70 ft. each way, and with a wide gallery along two sides and the western end; the ceiling consisting of a large central dome and four small domes in the angles, and four great arches covering the side spaces. This ceiling is carried by four piers of clustered columns of Devonshire marble, with carved capitals. At the east end of the building is a domed semi-circular recess, or apse, in which is placed the organ and choir; and in the centre of this apse is placed the ark or shrine, the receptacle for the scrolls, constructed of marble. The placing of the choir at the east end of the building, and facing the congregation, is a peculiarity.

A gangway is reserved all along the side walls of the building, so that persons coming in after service has begun may reach their seats without disturbing the mass of the congregation. The occupants of the ground floor, 500 in number, pass out through two 6 ft. wide doorways into a corridor 10 ft. wide, and similar means of egress are given to the 600 occupants of the galleries. Where the occupants of the galleries and ground floor meet, the hall or atrium is 20 ft. wide, and the opening of the great arch and gates in Upper Berkeley-street is of this width.

In this building the decoration of the flat surfaces depends entirely on combinations of simple Geometrical forms, picked out with colour, and on the leaves and flowers introduced in the carving; and here the lily, the pomegranate, olive, fig, and palm, are the types which are conventionalized.

The building has been erected from the designs of Messrs. Davis & Emanuel, by Messrs. George Myers & Sons. The marble work of the ark and choir-screen, reading-desk, and pulpit, is by Messrs. Poole & Sons. The pitch-pipe seating is by Mr. W. H. Lascelles; the gas-fittings are by Messrs. D. Halett & Co.; the main portion of the stone carving is by Mr. Williamson; the system of hot-water-pipe heating and ventilation has been carried out by Mr. W. W. Phipson, C.E.; and the stained-glass windows are the production of Mr. A. F. Usher. The organ has been built by Messrs. Gray & Davidson, at a cost of 1,200*l.*; and the total cost of the building will be about 20,000*l.*

THE CONINGSBY ARMS.

SIR,—I trust to your kindness to allow me space for a few words in reply to the letter of your esteemed correspondent, Mr. Gough Nichols, in your last number.

Commenting on my brief description of the Coningsby Arms, as sculptured on the front of the Coningsby Hospital, Mr. Nichols considers that I am wrong in describing the bearings, and pronounces them to be,—not a lattice-fence inclosing "conies," but the arms of Coningsby impaling Fitz-Williams, which latter he describes as "lozenzy." As he gives no authority but Dingley's "History from Marble," a mere collection of pen-and-ink sketches, which may or may not be accurate in the details of the drawing, I should like to suggest some reasons why I do not regard that work as conclusive evidence.

1. The bearings seem to me to be *fretty*, and not "lozenzy," resembling rather the bearings on the shields of Irby, St. Leger, and others, than the solid-looking lozenzy of Fitz-Williams.

2. There is no perceptible line down the centre of the shield, as in all other modern impalements that I remember. I quite agree with Mr. Nichols that the Coningsby coat is not an old one; if it were, I should expect to see the two coats on separate shields side by side, as in the case of the arms of Derby and De Watts, in Chesterfield Church, Derbyshire.

3. I regret to be obliged to dissent from Mr. Nichols's remark that the bearings, as I described them, would be "remarkable indeed." Similar bits of nature, with and without "fences," occur in a number of coats, e.g., those

of Lord Liamore, Lambert of London, and the boroughs of Saffron Walden, Andover, Beccles, Berwick, Camelford, Chester, Derby, Hartlepool, Hertford, Huntingdon, and Launceston.

4. The corruption of the name Coningsby into Conisbie is not old, and did not last long. Sir Thomas Coningsby, who built the hospital, spelt his name "Conyngsby" (Townsend's History of Leominster). The present spelling was in use in the time of Pope:—

"The House impeach him, Coningsby harangues;
The Court forsakes him, and Sir Balaam hangs."

As to my principal remark, that the coat is an example of canting and punning heraldry, you have sufficiently vindicated me, leaving me nothing to add but that I am, &c.,

FLAVELL EDMUNDS.

WESTERN SYNAGOGUE, ST. JAMES'S, LONDON.

THE Western Synagogue, in St. Alban's-place, Charles-street, was re-opened on the 18th ult. for service. It has been repaired and decorated in quiet good taste, under the direction of Mr. J. D. Hayton, architect.

This synagogue was built in the year 1828. The congregation, which was established A.M. 5531 (1774), worshipped previously in premises situated in Denmark-court, Strand.

The whole of the flooring, as well as that to the gallery, is covered with kamptulicon of extra thickness by Messrs. Gough & Son.

Messrs. Buchan & Son, of Southampton, were the contractors for the repairs, painting, and decorations, and they have very creditably and satisfactorily carried out their contract. Messrs. Halett & Co. have executed the sunlights and gasworks.

The expense of the whole of the works has been defrayed by Mr. Moss Isaacs.

THE INFLUENCE OF BAD FOREMEN.

SIR,—I have read your recent articles upon the technical education of the artisan with attention; but, while concurring in your remarks, it has struck me that in numbers of instances, many of which have come under my notice, a technical education is of very little use to the operative. This is owing to the working system now in use in the building trade. In nine out of every ten establishments, one man—the foreman—has supreme control, and can employ or discharge whomsoever he thinks fit. In not a few instances have I seen the educated workman dismissed for simply knowing too much; which is quoting a favourite saying. The moment it is noticed by interested officials that this or that man can strike out his own work from a rough sketch or regular drawing, that moment he is looked upon as one to be guarded against, and at the first opportunity, if circumstances permit, gets his "back day." Much has been said from time to time about the "proper understanding" which ought to exist between masters and men, but this will never be until the masters trust their men as a body more than they do at present. They always seem to have a proper understanding with their respective foremen, twenty per cent. of whom add to their income by a system of trafficking, which demoralises the men while it takes considerably from the employers' profits. By the present working system, a foreman who has supreme control over fifty or sixty men can add to his salary by receiving weekly pay from inferior hands, who are always to be found ready to tender the bribe in return for being kept in constant work. Under such a system the educated artisan, who is generally a spirited man who would not stoop to such a practice, is sure to be the sufferer.

Besides the weekly pay, which is a common practice, there is another method by which the foreman, or deputy foreman, in charge of a job, and who generally keeps the time-book, can augment his pay. There are in a firm, say twenty *old hands*, favourites, who can be consequently trusted by officials inclined to do a bit of "jobbing." If these constant men happen to lose any time, suppose two hours a week, on an average, their full time is returned by the jobbers to the pay-clerk, and the two hours' pay, which was never worked for, handed to the foreman or deputy, as the price of his favour.

What leaves so many married men always in a struggling position? Bribing the foreman, or "boozing" his deputy. Why are so many

operatives drunkards? Because the deputy or confidential man likes his beer, and looks to the men under him for a treat or treats as the price of his favour. Between bribing the foreman, and supplying beer to his deputy, the man who has a wife and family can save nothing for the rainy day. If one of these men knew an operative to be technically educated, he would stand a bad chance of keeping his place, for reasons which are very obvious.

The writer who calls for the technical education of workmen for our workshops also suggests that masters should be taught in like manner. If they were, and showed a more friendly feeling and inquiring spirit amongst their men, there would be better results from the money earned. A master once said to me, "You are one of the firm, and ought to take as great an interest in it as I do myself." I felt this was a good saying, if there were no too-much-trusted officials between us.

A JOURNEYMAN JOINER.

MAN THE BOATS.

SIR,—The following remarks will perhaps render my last letter more fully understood.

In the system proposed it would be necessary to hoist the boat from the deck, and when hoisted to remove the falls into the boat ready for lowering, and in order to do this there must be some means to suspend the boat for the time independently of the falls.

To do this it will be necessary to have an additional sheave on the axle, that the sheaves of the upper block (being, as before stated, part of the davit) turn.

Then to hoist the boat, heave on the falls, and when high enough, the man in the boat will make fast to rings to receive these two ropes, each running over the additional sheaves in the davit at its end of the boat; these ropes will then be made fast on board, and the boat will be suspended for the time without the falls, and which can be coiled into the boat ready for lowering; but in order to prevent the chance of accident through the ropes suspending the boat not being properly made fast, or cast off too soon, it would be well to have an overhanded, or Turk's head knot made on it, to prevent it from running out through the sheave-hole, and thus letting the boat down.

Then, in lowering the boat, it will be necessary for the man in it to cast off the ropes it is suspended by, the falls having been previously placed in the tube described in my last (and which must be strong enough to prevent its being torn apart or broken), and if necessary temporarily lashed together beneath the tube. If so, he will then cast off such lashings and pay out the falls, and lastly, cast off the tackling when the boat has taken the water. The boat will then of course have a painter to prevent her from being carried away by the current before her crew can jump into her. When the falls shall have been cast off, it will be necessary to take the end of each one on board preparatory to rehoisting. The lower blocks will, in the mean time, if rough weather, be likely to dash with great violence against the hull, and should therefore be of suitable material and of the best possible shape to prevent shivering; for this purpose it would be well to have attached small fenders so placed as not to impede the working.

Concerning the tube for paying out the falls when in the boat the following method (if not already invented, and which I am not aware that it is) would perhaps be an improvement.

Suppose a piece of, say 2-in. elm plank, 2 ft. long and 1 ft. wide, to have four sheaves, each $\frac{1}{2}$ in. thicker than the diameter of the fall, and two of these to be placed on axles running through the elm plank, and near one end, and so that these sheaves shall have the grooves in their circumference rather more distant apart than twice the diameter of the falls, so that they can both be rove through on these sheaves without chafing each other; then, if the other two sheaves be similarly placed at the other end of the elm plank, the falls can be continued and rove out at this last-named end of the elm plank, and if the sheave axles were left long enough, we could put on this side a corresponding piece of elm plank, and we should now have a block with the falls rove through.

The writer goes further into description, but it needs diagrams to make it of any value.

If, underneath, a thwart, at the middle of the boat's length and on one side of the keel (under-

neath the boat), were to be formed of, say 1 ft. 6 in. by 1 ft., and rising in the bottom of the boat about 8 in., a box, and this to have, to rise from its centre, a pipe having a water-tight piston (with a collar at top to prevent its dropping through), and to the bottom of the piston to be secured a water-tight box of wood or leather (or perhaps of cork), to be very light and strong, and to rise up into and fill the hollow box previously formed in the boat to receive it (and which would be better made with a draught of 1 in. in 8 in., to allow the water to pass); then, this being very buoyant, its lifting power in the water would be 50 lb. or 60 lb.

Now, suppose to the end of the piston there be fixed a small chain on either side to lift a very light but strong lever running along the bottom of the boat at each end, and its end to be turned up at right angles (and to work on a pivot where it turns), and the part turned up to be connected with the rule joint of the bolt. This lever would, perhaps, be best made of exceedingly light iron, and it would consist, its long arm of (say) 6 ft., and its return arm (which should have an angle brace) of, perhaps, 1 ft. 6 in.; then the power of the short arm would be four times the power of the long arm.

Now, if we were to balance the long arm by continuing its end, and putting a weight thereto (like the minute-hand of a church clock), we should have available half the lifting power of the piston for each long arm, say that to be 28 lb.; then that would give four times that, or a power of 1 cwt., to force against the bolt at the rule joint (against the 7 lb. spring), and bend it so as to liberate the iron eye or ring of the strap of lower block.

By this plan both the falls must be cast off the instant the boat takes the water at its middle, and it would thus be almost, if not utterly impossible for it to capsize through any fault in the falls, and the lower block could not twist while the bolt passed through its iron eye in its strap; but it would turn on the bolt as a pivot, and accommodate itself to the varying inclinations of the falls in lowering, and it would have the guide-rope (mentioned in my last letter) attached to it, sliding by its ring at its other end, up and down the wire ropes, and which would, of course, be cast off with it.

To rehoist the boat, a man must, by his weight, force down the piston, and there must be a bolt or chain or something to keep it down while he attaches the tackle, and till the boat is quite clear of the water.* HENRY AMBROSE.

ARCHÆOLOGICAL SOCIETIES.

Wiltshire.—The annual three days' meeting of the Wiltshire Archæological and Natural History Society has been held; with Wilton, an ancient and interesting town which once ranked first in the county,—as the head-quarters, and Salisbury and some of the most attractive parts of South Wilt as points for excursions. Mr. Charles Penruddocke, of Compton Park, presided. As usual, the society was received with great hospitality; and the programme was unanimously voted a good mixture of business and pleasure. One noteworthy feature was the number of ladies who honoured the society with their presence. General regret was expressed at the affliction cast upon Lady Herbert and the Pembroke family by the news of the loss of H.M.S. *Captain*, in which a son of the house was serving as midshipman; and the intended visit to Wilton House was of course put off in consequence. Other than that there was no drawback to the satisfaction and enjoyment of the numerous visitors. The inhabitants of Wilton were represented in the welcome by the mayor, as well as by two of the hon. local secretaries, Mr. H. J. F. Swayne and Mr. J. E. Nightingale. The scientific and social congress, with its round of addresses, papers, *conversations*, excursions, luncheons, dinners, &c., was attended by a large and influential company; although the presence of two or three of the expected *savants* was unobtainable, through the meeting of the British Association being in progress. Among the papers read were:—The Rev. D. Oliver, on Wilton Church; Mr. J. E. Nightingale, on Objects of Interest in the Fonthill Excursion; Rev. G. S. Masters, on Roman Remains recently found at Holbury, near Dean; Rev. J. Heale, on the History of Poynton; Mr. E. T. Stevens, on the Stone Period; Rev. D. Oliver, on the Stone Avenues of Carnac. The annual dinner was held at the Pembroke Arms

Hotel, the mayor of Wilton in the chair. The second day of the meeting was the grand excursion-day, when a distance of upwards of forty miles was traversed along the interesting valley of the Nadder. Starting from Salisbury at nine o'clock, and Wilton at half-past nine, the excursionists numbered not far short of 200 persons, and occupied about thirty carriages of various descriptions, some of which had been hired from Southampton for the purpose. With Mr. E. T. Stevens as pioneer and manager of the excursion, the lengthy and somewhat novel procession was kept together in excellent order. Next day the excursionists, about 100, went to Longford Castle.

An Archæological Society for Dorset.—Under this title the editor of the *Dorset Chronicle* proposes the establishment of a new society.

AID TO THE ARTS IN FRANCE.

In a number of the *Revue Générale de l'Architecture*, conducted by M. Daly, just received, it appears that Madame la Comtesse Decaen has left to the Academy of Fine Arts, in Paris, the munificent legacy of 120,000*l.* for the formation of a museum, to be named the Decaen Museum; as also to provide recompenses to the students of the Academy, and to give for three years to those students who have returned from Rome a pension of 160*l.* per annum to the painters and sculptors, and to architects 120*l.* The cause of this difference does not appear; but possibly it may be to cover the expense of models, &c., so essential to the former, but not required by architects. When France gets out of her present unfortunate position, which will, we most sincerely hope, soon be the case, this noble bequest will doubtless produce good results.

THE CHAIRMANSHIP OF THE METROPOLITAN BOARD OF WORKS.

At the first court of the Metropolitan Board of Works since the recess there was a very large attendance of members. Mr. Alderman Gibbons was called to the chair.

Mr. Pollard, the clerk, read a notice referring to the death of Sir John Thwaites, and Mr. Runtz adverted to the sad loss the Board had sustained: the condolences of the Board were agreed to be conveyed to Lady Thwaites.

The letter of the Home Secretary, suggesting that the appointment of a chairman should be deferred or made conditionally, having been read, Mr. Newton moved that the whole matter connected with the salary, duties, and so on, of the chairman, together with the letter of the Home Secretary, should be referred to a committee. The letter, he considered, was an interference with the duties of the Board, and he thought that a conference with Mr. Bruce on the subject should be sought.

The motion was carried unanimously, the committee to consist of all the members of the Board.

ARCHITECTURAL VAGARIES IN EDINBURGH.

Sir.—While the romantic site of Edinburgh and the towering irregular outline of our lofty buildings require so little effort to give the pleasing effect so much admired, we still continue to waste many thousands of pounds, displaying false taste in obscure localities, where plain buildings with more light and more air are only wanted. The tenants are saddled with costly stone and lime excrescences, copies of some baronial reminiscences which have no historic worth, far less present or future utility, to any one, except where sentiment prevails over principle. Allan Ramsay, addressing civic authority here a century ago, gives a hint as to a feeling of principle now wanted in our city improvements, when he says:—

"Our reason and advantage call
Us to preserve what we esteem,
And each should contribute, tho' small,
Like silver rivulets that fall.
In one, and make a spreading stream,
So should a city all her care unite,
To engage with entertainment of delight."

Now, here we are, sober, sentimental Scotchmen of the period, striving with the imitative ability of the Chinese tailor (who so tastefully copied the patches on the old pattern into the new breeches), reproducing the stuck-to devices of the old builders into new tenements, with damaging effect to the comfort and means of

the workmen's families and shopmen who require accommodation.

Such is the distorted taste of the period that even an effort has been made to mar the present perfect symmetry of Charlotte-square, requiring the strong arm of the law to preserve the true Classic taste of our fathers. This noble square is well worthy of being chosen as the site of the grand Scottish Memorial to the late Prince Consort, but, such is the questionable state of public taste, it is more than likely to share the fate of the Ross Fountain,—this, the finest work of art we have of the kind, having been placed in the worst possible position under the cold shadow of the Castle rock,—on the lowest ground of Princes-street-gardens,—where in the same bleak locality a winter garden is planned out to be placed, the design for which being exhibited as art.

Many visitors to Edinburgh think from the costly construction of buildings here, that too many fantastic notions in stone and lime are built for posterity to alter. We experience trouble now by the cost and dust of daily alterations on the massive works of past generations. The Caledonian Railway Company have spent many thousands of pounds in clearing away substantial palatial buildings, which after all are only replaced by a wooden station, which a Yankee visitor said has a useful homely feeling about it. Near the same timber erection, a further clearance of some few thousand pounds' worth of princely dwellings has been lately proposed as a suitable site, at the west end of Princes-street, for the Prince Consort memorial; while alongside that street there are at least two good sites in the garden walk opposite Frederick-street and Castle-street, and best of all a most appropriate site having the vista of Princes-street towards the east, if placed upon the rocks below the Nelson tower. We have in the same view that most symbolic of Scotland's memorials, the unfinished national monument to her brave sons who fought and fell during the wars of the first Napoleon striving to obtain the now waste-paper treaties of the last generation. The new and finished national memorial to "the silent father of our kings to be," would tend, if placed near those solemn columns, to illustrate the triumphs of peace over war? *Sic transit gloria mundi.*

It is proposed to have a statue of Chalmers in marble. As we do not keep such memorials very clean, it would be better that it should be of bronze, and made to match the statues of George IV. and Pitt by Chantrey, as there is yet another site in our noble George-street requiring such a statue. The Chalmers memorial should be placed at the intersection of Castle-street, and we should then have a statue of the regal, lay, and clerical representative men of last generation adorning our finest thoroughfare. As yet in the city of Knox there is no monument to our great reformer, statesman, and divine.

Whatever sentiment or principle guides us in the erection of memorials to our worthies, we cannot boast of being Israelites indeed. We do not garnish the memorials of the past, but, neglecting historic worth, the sectional and sectarian Scotchman of the period needs the genial heart and gentle hand of an "Old Mortality" to remove the weather-stains from freestone and marble memorials of our lay and clerical worthies. J. K.

MORTUARY CHAPEL, LIVERPOOL.

ABOUT five years ago Dr. Trench, the Liverpool medical officer of health, commenced a subscription for the purpose of raising a fund for the erection of a mortuary chapel, to which, with the co-operation of the Roman Catholic clergy and by the attraction of a religious ordinance, the poor Irish inhabitants might be induced to remove their dead between the periods of disease and burial, so putting an end to "wakes" of the dead in their own dwellings. The work, however, was undertaken by a single individual, and the site fixed upon was on the north side of Collingwood-street. The architect chosen was Mr. Henry Sumners, of the firm of Culshaw & Sumners, of Liverpool, who was the designer of the structure; and the builder, Mr. William Tomkinson. The foundation-stone was laid on December 11th, 1866, by Dr. Goss, Roman Catholic bishop. After a considerable portion of the building had been erected, adverse circumstances affecting the fortunes of the donor arrested the progress of the work, and the building remained at a stand until some two years ago, when, funds having been obtained for that

* *Erratum.*—In my last, for "double tape" read "double tube."

purpose, it was re-proceeded with, and it is now near completion. It forms an architectural feature of the neighbourhood. The style is Gothic of the Decorative period; and the exterior of the entire edifice is executed in Yorkshire stone ashlar, with Grimsill and Longridge stone as dressings. The object in the construction of the building was to assimilate the edifice as much as possible to an ordinary church, and to remove, in an equal degree, the appearance of a mere morgue or dead-house.

The mortuary consists of a nave, 37 ft. by 28 ft., and it is capable of containing, without crowding, twenty-one coffins; it has a distinct entrance from the street, the opposite end of the building to which is semi-octagonal. The sides and end of the mortuary are divided into seven equal bays, the arches of which are supported by eight polished granite shafts, resting upon a Yorkshire stone plinth or basement, the bays being again subdivided by smaller granite shafts supporting intervening arches and tracery. Between the shafts is plate glass, completely filling up the openings of arches and tracery, forming a completely sealed division from the aisles; and thus, whilst a view of the interior of the mortuary is afforded, there is a perfect absence in the building without of any taint or smell. The aisles, which are 19 ft. wide, entirely surround the mortuary, and form the chapel portion of the building, which, to correspond with the mortuary, is also semi-octagonal, except the centre, which is projected outwards to form the chancel, which, together with the aisles, is lighted by three traceried windows, filled with stained glass. The seats are so planned that the whole of the audience faces the altar. To the chapel portion of the building there are separate entrances at the side. Above the arches of the mortuary there is ashlar work, and the roof is formed of moulded and curved principals springing from stone corbels, filled in between by boarding, as also is the roof of the aisles. The walls of the aisles are in brick-work, in coloured bands, no plaster being used throughout. The floor of the mortuary is 2 ft. 6 in. lower than that of the aisles, and for the convenience of access, nearly level with the street. The ventilation is by one very large Watson siphon ventilator on the roof; and the chapel is also ventilated and warmed. A sacristy and other conveniences are provided for, being approached from the chancel.

The building, says our authority, the local *Journal*, will be ready for the ceremony of opening in a few weeks. It is in a sufficiently advanced state to indicate all that was intended by its projector and architect.

THE ROYAL ALBERT ASYLUM FOR IDIOTS.

The centre and south wing of the Idiot Asylum for the Northern Counties of Lancaster are now so far completed as to be nearly ready for the reception of patients. The building, which stands on a commanding site about three-quarters of a mile south of the town, near the Lancaster and Preston Railway, is in a modified Gothic style of architecture. It is to consist of a centre, with lofty entrance tower, and two wings. The tower and south wing are already completed. The asylum stands in the midst of sixty-seven acres of land, which are in process of being suitably laid out. The exterior walls are of a light-coloured freestone. The general arrangement of the plan is very simple, and something in the form of the letter E, the main front facing westward being represented by the thick upright stroke, with two wings at the north and south extremities projecting 60 ft. from the front of the main building, and running back 185 ft. and a central projection of 40 ft. extending in an easterly direction to a distance of 250 ft. The greatest length from north to south is 472 ft., and from east to west 340 ft., the total area covered being 5,160 square yards. The principal entrance is in the centre of the main front, and opens into the large entrance-hall and staircase leading to the board-room and the secretary's office. To the right is the residence of the superintendent; to the left the matron's room, waiting-room, &c. Facing the entrance is the large dining-hall, 73 ft. by 35 ft., capable of accommodating 300 inmates. Immediately behind the dining-hall is the kitchen wing, containing a large kitchen, 43 ft. by 35 ft., scullery, pantries, servants' hall, &c. Beneath are the bakeries, store-rooms, &c., communicating with the kitchen by a hoist. To the east

of the kitchen wing, at a distance of 40 ft., and connected by a corridor, is the workshop block, 140 ft. by 65 ft., containing workshops for the carpenters, painters, shoemakers, &c., engine-house and smithy, over which are the wash-house, laundry, &c. Immediately adjoining the entrance hall, and branching off to the right and left, are the principal corridors, 9 ft. wide and 130 ft. long, communicating with the various apartments and with the corridors of the wings. The rooms on the west side of the corridor, both on the right and left, are reserved as day-rooms for the first-class patients. Those on the east side are to be occupied by the schoolmaster, schoolmistress, and attendants. In the north and south wings are the school-rooms, day-rooms, baths, and lavatories. The basement floor is mostly above ground, owing to the natural slope of the ground, and is chiefly appropriated for general storage of provisions, ironmongery, coals, drapery and linen, larders and dairies, tailors' and upholsterers' shops, &c. The principal entrance to the basement story is at the east end of the central block, where goods and stores are delivered and deposited for use. In the south wing are work-rooms and large play-rooms for the use of the inmates in wet weather. The first floor is generally appropriated as dormitories, with the board-room and offices over the principal entrance. The second floor is similarly appropriated. The work, now nearly completed, comprises about two-thirds of the whole contract, and includes all the various offices and apartments described, with the exception of the north wing and the range of buildings connecting it with the central block. The south wing is intended to appropriate for boys, and the north wing (now in course of erection) for girls. The building, when finished, will accommodate 500 inmates, exclusive of the staff of officers, and the total cost will not be less than 350,000*l.*

STEAM BOILER EXPLOSIONS.

SIR,—By the programme of the British Association in Liverpool, Mechanical Section, only one paper was, I believe, to be read, viz., "Steam Boiler Explosions." Is it indifference, or are all our wants supplied? Are there no railway accidents to see to? no preventive required for ships turning top-sy-turvy? Are explosions in gunpowder mills and coal-mines of no moment? Are, sir,—but your space in *The Builder* is valuable. I will at once explain my self-acting valve of a large bore, the present safety-valve to remain, though off the reverse of safe, through instantation or tampering.

I think I can best illustrate my improvement by relating a scene in the engine-room of H.M.S. *Wasp*. The boilers were old and much worn, full power seldom attempted. On one occasion the engineer drew attention to the upheaving of the top plates. A little more steam would have sent us all to Davy Jones's locker. One daring fireman danced on the plates.

The lever of my self-acting valve being secured down by a wire drawn across the edge of a steel clip or shears: undue expansion would instantly sever the wire, all the steam would then escape up the chimney. An iron plate on the top, made on purpose to bulge, would make assurance doubly sure.

R. T.
P.S. Many mechanics would gladly attend an all-night discussion. If the British Association would permit them to take part, explain, read, papers, show models: they would esteem it an event for a lifetime.

SASHES AND FRAMES.

SIR,—Having noticed the correspondence in your journal of this and last week headed "Sashes," in which objections are urged against them as being continually subject to the breakage of cords, detaching of weights, &c., which renders them comparatively useless, we beg to call your attention to the patent arrangement of which we are the sole manufacturers, which dispenses with the use of lines, pulleys, and weights, and which allows the sashes to revolve, so that the outside of the sash can be turned towards the inside of the room, for the purposes of glazing and cleaning, without removal from the frames or disconcerting, bending, &c., which obviates the very objectionable practice of using external stages. This latter qualification cannot be too highly rated.

ARCHIBALD SMITH & CO.

AYLESBURY SURVEY, AND SURVEYS GENERALLY.

SIR,—In asking you to allow us through your columns to give expression to our astonishment at the acceptance of a tender of 187*l.* 10*s.* we do so on directly opposite grounds to those of your other correspondents, viz., not because a lower tender was not accepted, but that one so low should be.

The work to be done, as per memorandum of instructions sent to the competitors by the Town Clerk, is as follows:—

1. Survey and map of the town, comprising about 200 acres and 1,400 houses, scale one chain to the inch: to be completed by the 1st of November.
2. Survey and map of the district (including a reduction of the town portion), in all about 3,200 acres; scale, three chains to the inch: to be completed by the 1st of February.
3. Separate plot of 200 acres of the country portion (required for irrigation purposes) by 1st of November.
4. Complete schedule of the owners, lessees, and occu-

piers throughout, with reference numbers on the maps (including, of course, the fair copy of same).

5. Superficial quantity of every field and property throughout, except in the town, where small inclosures may be combined in groups not exceeding 10 poles (inclosures copying same in schedule or on the maps).

To this add, unless the surveyor reside in Aylesbury, travelling expenses for the staff employed, extra expenses attending their residence, office, &c., with paper for the three maps, and incidental expenses.

We are unable to understand how this can be done with any degree of accuracy for any of those sums quoted in the letters which have appeared, and, knowing nothing whatever of the fortunate (?) competitor, we can only hope that he has not been misled in taking the work at such a figure, and that he will complete it accurately by the times named, so as to obtain a fair profit for 6 or 8 months' work for the necessary staff; but we cannot conceive the possibility of his doing this unless he succeeds in obtaining the assistance of properly-qualified surveyors at about the rate of ordinary artisans, and we are led to doubt the satisfactory issue so far as the Board are concerned, not, however, unfortunately, so much from the apparent absurdity of such an expectation, as from the opportunities we have had of seeing the result of other surveys made at low prices for local Boards, &c.

A short time since a map of a county town was put into our hands, and on taking actual measurements in the streets, we found that they differed generally 8 or 10 per cent. from those appearing on the map. A main road, shown for at least 10 chains, was about 15 degrees out of its true direction, while one of the principal churches had skew angles at all the corners, as apparently the only way of fitting it into the strange shape which the churchyard had (erroneously) assumed.

We could mention the names of other places, some of considerable importance, where the town maps are, for purposes of accuracy and precision, not worth the paper on which they are drawn.

We desire to call attention to this fact, because it is one which does not get generally known. A variation which, from motives of parsimony, has made a bad bargain in this respect, does not proclaim it, even if aware of it; but a map, perhaps nicely coloured and mounted, hangs in the Town-hall or Board-room, looking, to ordinary spectators, very satisfactory, while a few members of the Board, the town surveyor, and any unfortunate professional men who would be glad, if they could, to make use of it, are alone aware of its worthlessness for nearly every purpose for which it was made.

Hence, if the ratepayers of Aylesbury have cause (as suggested by your correspondent "Fair Play") to regret the acceptance of the present tender, we should base such an anticipation on different grounds from those suggested in his letter; and though the well-known experience of the firm of Messrs. B. Danton would not lead to a belief that they would accept a tender impossible to meet to a satisfactory conclusion in strict accordance with the instructions given the competitors, we cannot but think that they are mistaken in the contrary idea.

We repeat that we know nothing of the gentleman who has taken the contract, but fear he will either find he has undervalued the work, or will have to "cut his coat according to his cloth," in which case either he or the ratepayers must suffer.

We should state, in opposition to the letter of "A Surveyor," that we were distinctly told the lowest tender would not necessarily be accepted, but one according with an estimate prepared by Mr. Danton.

TWO OF THE COMPETITORS.

LAYING PAVEMENTS.

SIR,—Will one of your numerous readers kindly inform me what is the most approved and cheapest method for laying tar paving or asphalt on public thoroughfares?

L. M. F.

THE SEWERS IN REGENT-STREET.

SIR,—Surely something ought to be done to the Regent-street sewers. I have noticed for the last three weeks a most horrible stench rising from the gullies, more especially from those at the corner of Vigo-street.

I think your able sanitary correspondent "Pro" is in more regulation here than in the provinces; for it is a shame that one of our finest streets should become intolerable from faulty drainage.

W. H. A.

CASES UNDER THE METROPOLITAN BUILDING ACT.

FEE FOR ARCHES.

At Guildhall, Mr. Wigmore, of Bradfield House, Waltham-green, builder, was summoned before Sir Robert W. Carden for 25*l.* 10*s.* for surveyors' fees for the building of certain arches under the public highway in Newgate Market. Mr. Clarke appeared for the district surveyor, and another solicitor for the defendant.

Mr. Edwin Power said that he was the surveyor for the district which included old Newgate Market. On the 8th of June he received a notice from the defendant that he intended to build fifty-two arches under a public highway in old Newgate Market. He went there on the 12th of June, and measured and surveyed them. About ten or twelve days afterwards he found one or two arches were complete. By the 20th of July fifty-one arches were complete, and in the interim he went fifteen or sixteen times to survey them as they were in progress, and had to measure them from time to time to see that the walls were of the proper thickness, the arches of the proper width, and the span constructed according to Act of Parliament. The arches varied in size, and he had to examine every one of them, and measure them. They were not arches attached to houses, but were built on a vacant piece of ground under what was intended to be a public way, and adjoining which houses were intended to be built. Each arch had a separate entrance and separate party-wall.

Cross-examined.—Each vault or arch was a separate structure, and one arch was turned at a time. He had claimed his fees (25*l.* 10*s.*), and the defendant had refused to pay them.

For the plaintiff it was contended that each arch was a

separate structure, and entitled him to a fee of 10s. on each; while, for the defence, it was argued that they were one continuous structure, requiring only a fee of 10s. for the whole. After hearing the arguments on both sides, Sir Robert W. Curden said that while 25/ 10s. was too much to pay for the surveyor's fees for the 51 arches, he thought 10s. was too small; but taking the Act of Parliament as it stood he could only order one fee to be paid for the whole of the arches.

Mr. Clarke then asked for a case to go to a superior court, and it was agreed that as the question was one of much importance to builders and district surveyors, a case should be agreed upon to get the decision of a superior court up to it.

THE ALBERT EMBANKMENT.

Sir,—Seldom a complaint has to be repeated in the *Builder*, but really the neglected and dirt-clogged steps from Westminster Bridge to the Albert Embankment are in such a state as to call aloud for a shovel and broom. Provincials will say we are magnificently dirty.

R. T.

MONUMENT IN MEMORY OF DEFOE.

Sir,—I long to suggest an improvement, by way of addition to the above memorial stone. Bald and dry as the bare record is, the by-standers' interest therein would, I think, be greatly increased by the addition of a portrait: an oval medallion likeness, in profile, of the prolific writer, to whom periodical literature in especial, and all successive "rising generations," have been so much indebted.

A. H. GENT.

THE WATER-GATE.

Sir,—In your impression of the 17th ult. I notice a justly indignant letter as to the disgraceful condition of the fine old relic, Inigo Jones's "York Stairs." I entirely sympathise with the remarks of your correspondent, "E. P. W.," and may inform him and the public that when the estimates were made for the new Embankment, it was included to rebuild the Water-gate in an appropriate position. Why this is not executed we can only surmise. Some information from the Metropolitan Board should be forthcoming.

FATHER THAMES.

DISCOVERY IN WORCESTER CATHEDRAL.

As the workmen engaged in laying a new pavement in the Lady Chapel of Worcester Cathedral were removing one of the three stone coffin slabs lying on the floor beneath the great east window, they discovered a stone coffin containing the skeleton of a man, partly enveloped in fragments of the dress in which he had been buried. When Mr. Bloxam, the well-known ecclesiologist, visited the cathedral some years ago, among other things he described to the Archaeological Association the three slabs before named, with the effigies upon them. Two of the slabs have apparently no coffins or burials under them. But with regard to the third, which lies north of the other two, and is the one now to be described, Mr. Bloxam believed it to be the earliest episcopal effigy in the cathedral, and it was assigned by him to Bishop William de Blois, who died in 1236, and who laid the foundation of the Lady Chapel and its aisles. The effigy on the slab is sculptured in low relief, and the slab forms the top of the stone coffin in which the remains have been found. On the head of the effigy is the low mitre.

On lifting the slab from the pavement the open coffin appeared, containing the perfect skeleton of a tall man. The coffin had evidently at some former period been rifled of any jewelry or other valuable contents which might have been buried with the deceased. Underneath the head, and forming the cushion on which it lay, was part of a Norman shaft and capital, turned upside down, and hollowed out for the reception of the skull, as was usual in coffins of that period. The coffin had been cut both head and foot, to admit the dead body in its mitre. The coffin is 6 ft. 10½ in. long externally, and 6 ft. 5 in. inside. The skeleton was of a man an inch or two more than 6 ft. high when alive. The sutures of the head were obliterated or ossified, denoting the apparent age from sixty to seventy years.

Mr. Bontell has examined the remains, and given a particular account of them, for which see the *Worcester Herald* of 24th September.

A Public Hall, Camden-road.—It is intended to erect a public hall and reading-rooms in the Camden-road, at a cost of from 3,000l. to 4,000l. The hall is to accommodate upwards of 500 persons. The architect is Mr. Frederick R. Meeson.

OWEN'S COLLEGE, MANCHESTER.

The foundation-stone of the new building for Owen's College, Manchester of which we gave full details on the 9th of April last (page 281), has been laid on the site which has been purchased in Oxford-street, extending from Compland-street to Burlington-street. The ceremony was performed by the Duke of Devonshire, in the presence of a large and fashionable gathering, including Professors Huxley and Tyndall, and many other members of the British Association for the Promotion of Science, who had been specially invited. The building was designed by Mr. Waterhouse, the architect of the Manchester Assize Courts and of the new Town-hall, now in course of erection in Albert-square. The style is Gothic. It will have accommodation for 600 day students, and for a much larger number of evening students. A sum of 102,000l. has been placed at the disposal of the Building Committee, 67,000l. of which are at present available for the erection of the college. The cost of the building now under contract is 90,000l.; so that a sum of from 25,000l. to 30,000l. is still required for building purposes. When completed, the building will form a quadrangle, of which that part of the college which is now in course of erection will form the western side. The principal front of the building will face Oxford-street.

In laying the stone, the Duke of Devonshire remarked that Owen's College owed its foundation to an act of remarkable liberality on the part of one of the successful merchants of Manchester, and its permanent and continued success was, no doubt, largely attributable to the efforts of the citizens of Manchester. Mr. Owen's bequest ought not to be measured by a pecuniary standard, but as an example which had been more fruitful of good than his money. It is understood that the projected buildings will provide ample accommodation for threefold the number of students who are at present receiving instruction in the college.

"SARCOPHAGUS."

Sir,—Will you kindly inform me the proper use of the word "sarcophagus," as applied to tombs?

N.

* * * A sarcophagus is the actual receptacle in which the body is placed, as its derivation from the Greek (*sars*, flesh, and *phago*, I eat), shows.

ARCHITECTS IN RESPECT OF SCIENCE.

At the last meeting of the Northern Architectural Association, Mr. T. Oliver, the president, read an address on the position of architects in regard to science. His object, he said, was to call the attention of the association to a prominent omission and a prominent fact in connexion with the architectural profession, and the development and progress of what was called social science. Not only as a body, but as individuals, architects had hitherto, in his opinion, held themselves aloof from discussing scientific matters, not only to the detriment of science itself, but to their position as scientific men. Architecture, while essentially an art, was also a science. Its practical application incited a knowledge of the science of construction in its ramifications, details, and materials, and in its varied adaptations to the material wants of mankind. He maintained that the architect must be a man of science if he aspired to eminence and public appreciation. Called to lay out towns, plan streets and dwellings, it became absolutely necessary that his scientific qualifications should be brought into requisition, as well as that artistic power which enabled him to clothe a building with the greatest beauty. Architects as a body, he must confess, were both scientifically and practically competent to grapple with all such difficulties, and indeed, in their ordinary practice, really did so. It was, however, a singular circumstance that architects did not take that active part, and apparently that active interest, in purely scientific matters as the members of the medical profession, both collectively and individually, took. On the one hand, the architect was practically conversant with the improvement of unhealthy dwellings, the removal of impure excreta, the improvement of drainage, and the general application of the principles of ventilation, as well as the designing of new streets and dwelling-houses; while, on the other hand, the medical practitioner knew and dealt with practical results

rather than with practical scientific remedies. He referred, of course, to the bricks and mortar, and not to the medicinal question, but did not for a moment detract from the influence of the medical man. He pointed out that architects, inasmuch as they had so much to do with the dwellings of the people, were the best persons to assist in remedying the causes of disease in regard to drainage, ventilation, &c.; and he was persuaded that no religion, education, politics, laws, or penalties would so greatly benefit mankind as a healthy and happy home; and how to make this no one knew so well as an architect.

CHURCH-BUILDING NEWS.

Kington (near Hereford).—The new church at Evancord has been consecrated. It is from the designs of Mr. T. H. Wyatt, of London, and is in the Gothic style of architecture of the Early Decorated period. The vestry abuts upon the north wall of the chancel, and the general entrance to the church is by a porch on the north side, from which large folding doors open directly into the nave, and a smaller one at the side leads into the aisle. The interior of the church is uniform, the seats, &c., being all of dark stained wood. At each end of the church are large stained-glass windows, the one being erected as a memorial of the late Mr. Higgins Myrns.

Folkestone.—St. Peter's Church, at East Cliff, which has lately been undergoing considerable alterations, has been re-opened. By the extension, seats have been provided for 350 people, in addition to the choir, this being about 150 more than the original building accommodated, and the increase has been effected by the addition of an aisle on the north side. An improvement has been effected in the appearance of the building by increasing the elevation of the roof, and an extension of the chancel and north transept; but the ornamental work is not yet complete. The chancel rises above the level of the floor of the nave, while seats for the choir are ranged on each side, and the vista is terminated by an altar rising some 2 ft. or 3 ft. above the choir, and approached by steps. The stained glass windows, representing various Scriptural subjects, surmount this, and the altar is flanked by two candelabra.

Pittlevell.—The Rev. S. R. Wigram, vicar of Pittlevell, has received subscriptions already amounting to more than 2,000l. to enable him to carry out a restoration of the parish church. The church is one of the largest in Essex; but as it has been left in a state of decay, it will require 6,000l. for its complete restoration.

Ore (near Hastings).—St. Helen's Church has been consecrated by the Bishop of Chichester. It was found necessary to erect the church on a new site in a more central position, the chief reasons being that on account of the height to which the churchyard had risen round the old walls, and the number of graves against these walls, no enlargement could have taken place. The old tower stands and all the ancient parts, and in the tower are collected all the monuments of the past affixed to its walls. The new church has been erected with a lofty tower and spire on a commanding site,—on the top of the hill on St. Helen's estate. The spire is a landmark from the sea, and all the inland country for many miles around. The new church is of the Decorative period of English Gothic architecture. It consists of a nave, side aisles, chancel, tower and spire, and vestry. The accommodation is for about 400. The roof timbers are exposed to view. The building is heated with hot water throughout. There are inner porches to each door to prevent draughts. The church has been erected solely at the expense of the Rev. T. W. Turner, the rector of Ore, who previously built another church at the other end of his parish, also at his own cost. The land on which it is erected was given by Mr. E. Habershon, of Beaulieu, Hastings. The stained-glass east window was given by Bishop Harding, of St. Helen's Lodge, Ore. The architects were Messrs. E. Habershon & Brook, of London; and the builders, Messrs. Hughes, of St. Leonards-on-Sea.

Bristol.—The contract for the first portion of the works connected with the building of the new church of St. Mary's, Tyndall's Park, has been taken by Mr. Diment, of this city, builder, and excavations for the foundation are commenced.

Silloth.—A new church, called Christ Church, has been opened at Silloth. The edifice has

been built by subscription. It is simple in its conformation, consisting of a nave and north and south aisles, with two small transepts or chancel aisles, built in the earlier form of Gothic architecture, freely treated. The north transept forms an organ chamber and vestry, with a cellar underneath for the heating apparatus. The exterior elevations are of Irish granite, which had been brought over to Sillith as ballast to vessels, and the interior is lined with white and red fire-bricks. The nave is surmounted by an open roof of Memel timber, the chancel being closed boarded in oak. The nave seats are simple open benches. The chancel fittings are all of oak, with rosewood introduced in portions of the designs. The total length of the church is 94 ft. 6 in., the nave being 63 ft. long, and the apsidal chancel 31 ft. long, both 21 ft. wide. The accommodation provided is for about 500 persons. The church stands in a square by itself, being placed so that one of its longest sides faces the Solway, and on this side inclosing the main entrance door, and forming a porch to it, it is intended to build the tower, a subscription for which purpose has just been opened. The design of the church was selected from a series sent in for competition in April of 1865. The author of the design was Mr. Charles J. Ferguson, then a pupil of Mr. George Gilbert Scott, now of the firm of Cory & Ferguson, of Carlisle, architects. The mason and bricklayer's work was carried out by Mr. Graves, of Aspataria; the carpenter and joiner's work by Mr. Thompson, of Sillith; the plumber's work by Messrs. Thompson; and the painter and glazier's work by Mr. Westray, of Carlisle. The amount expended on the present contracts has been a little under 3,000l.

Northampton.—St. James's Church, St. James's-end, Northampton, has been consecrated. The church is in the Early English style, and consists of a nave, south aisle, chancel, south chapel, and vestry. Arches have been thrown in under the clearstory of north wall, to facilitate future extension. The south clearstory is supported by an arcade of four arches, the columns being of polished red granite, with carved caps of Bath stone. The nave clearstory is pierced on each side with twelve lancet-headed windows, formed in groups of three, placed over the crown of each arch. The clearstory is continued along the north and south wall of the chancel. A series of six lights on each side the internal arches, to the chancel windows, are supported by red Mansfield stone shafts, the caps and bases being of Bath stone. The east window is formed of three lights, surmounted by a rose-window, containing nine circles. The south chapel is divided from the chancel by two arches, the central column being of red polished granite, with foliated caps and moulded bases. The chancel walls are ornamented with bands of mosaic tiles. The arch dividing nave from chancel takes the whole span of the central aisle, and is 24 ft. wide. The arch is supported by marble shafts, and terminated with stone and brick corbels. The principal entrance is through a western doorway, above which are two lancet-windows, and the gable is pierced with a quatrefoil opening. The bell-turret, at north-west angle of nave, takes an octagonal form, and is terminated with a spire of Bath stone. The roofs are constructed of deal, stained and varnished. The chancel roof is formed in panels, which are ornamented by means of stencil patterns, applied with a dark stain upon a ground-work of boarding left its natural colour. The mouldings of panel are also stained dark. The nave roof is constructed with beams and king-posts, each rafter being framed alike. The nave and aisles are seated with open benches, of a plain nature. The chancel is furnished with stalls and sub-seller, and the altar is approached by five steps, including the foot-pave. The sacristan floor, as well as the other parts of the chancel, are laid with Minton's tiles. In the south wall, a double sedilia is constructed, divided by a marble shaft. All the walls are built with red brick, both externally and internally, the outside face being varied by the use of bands of local stone, from the Daston quarries. The arches of all doors and windows are also alternated in blocks of local stone and brick. The works have been designed by Mr. R. Wheeler, of Tanbridge Wells, architect; Mr. Ayton acting as clerk of works. The builder was Mr. Kightlye, of Northampton, and the carving was executed by Mr. Earp, of Lambeth. The cost of the structure and boundary fences is about 2,700l., and the accommodation is for nearly 500.

Upton.—The Church of the Good Shepherd,

near Upton, has been consecrated. The site was given by Major Martin. The expenditure has been upwards of 1,300l. The design was furnished by Mr. G. Row Clarke; and Mr. Griffiths, of Eldersfield, was the builder. The new edifice contains about 120 sittings. The style is of the Transitional period, from the Early English to the Decorated; length from east to west, 72 ft.; width, 22 ft. 6 in., both inclusive of walls. There are a chancel and nave, but no aisles; a bell gable over the chancel arch; a vestry on the north side of the building, and a porch at the south-west angle; a steep-pitched open wood roof, tiled; trefoil-headed lancet lights in the side walls, and other windows, two and three lights, with Decorated tracery. The chancel arch is pointed, has a roll moulding at the angles, and rests on square chamfered piers, the caps of which are carved with conventional foliage. Similar carving enriches the various corbels and dripstone terminations throughout the building.

Miscellaneous.

Lifting Houses.—As the city spreads it is often found desirable to remove buildings in order to raise others more suited to the site. But the old buildings must not be wasted or injured. How can the difficulty be met? It is almost the case of the Irish magistrates who, it is said, passed a resolution to build a new gaol from the materials of the old one; and another resolution that the old gaol should not be pulled down till the new one was ready. Almost, but not quite. The people of Chicago put the old gaol on rollers and take it off elsewhere prisoners and all; so that the new one can be erected on the site of the old, and yet the old gaol not be taken down. I was told of a church, steeple included, which was thus taken from one end of the city to the other. I saw a specimen of house-removal in the town of Buffalo. A wooden dwelling, three stories high, was slowly passing along a street, entirely filling it, the trees of the avenue being injured by the house tearing off many branches on its way. A woman was nursing a baby at an upper window, calmly surveying the scene as she passed along. The method was as follows. A strong rope was fastened to the bottom of the house, and was wound, by a single horse, round a windlass which was planted in the middle of the street. A number of men were at work conveying the rollers from the rear to the front. From time to time the windlass was planted farther up the street as the house advanced. Of course, for the time all other traffic was stopped in the street thus occupied. I was glad to witness for myself what might have seemed an exaggeration. This is a frequent occurrence in Chicago.—*Newman Hall's Journeys in America.*

Milner's Safes and the British Association.—We have received particulars of some experiments made with Messrs. Thomas Milner & Son's fire and thief resisting safes, at the Phoenix Safe Works, Liverpool. The results of the tests appear satisfactory in every way. In the first instance an ordinary cast-iron safe, without any fire-resisting chambers, and one of Messrs. Milner's ordinary fire-resisting safes, of the weakest quality, were tested in a large fire composed of coal and wood, the result being, after two hours and a half, that the former was entirely destroyed, while the latter remained intact, a 100l. note and a large number of circulars which were placed in its interior being wholly untouched. In a second test, one of Messrs. Milner's safes, containing a 100l. note, several gold watches, and a number of circulars, was consigned to a terrific fire, in which it remained for five hours and a quarter without any effect of the flames—save a dulness in the colour of the iron—being visible, while the contents were perfectly unharmed.

Birkbeck Literary and Scientific Institution, Southampton Buildings.—This institution has just issued its prospectus for the winter session. The alterations in the classrooms, which were rendered necessary by the large increase in the number of members, have been completed, and the list of classes has been much extended. Arrangements have also been made by which a course of technical instruction can be obtained. A special course of lectures on the history of art, by Dr. G. G. Zerff, is announced. These will be illustrated by about 3,000 diagrams, plans, maps, and photographs.

The Metropolitan Asylum at Leavesden.

The ceremony of consecration of the chapel and burial-ground, combined with what may be termed the official opening of the new Metropolitan District Asylum for the Imbecile Poor of London, at Leavesden, Woodside, near Watford, has been held. The Leavesden Asylum, of which we have given illustrations, is situated on rising ground about four miles from Watford, and lying between that town and King's Langley. The works have been carried out, and the entire building and fittings, furniture, &c., completed at a cost of 135,570l. The buildings are designed to accommodate 1,620 patients—730 males and 890 females. There are on the female side five general blocks, each for 160 patients, 105 ft. by 38 ft., and an infirmary block for sixty patients. On the male side are four blocks for 160 each, and an infirmary block, the whole being connected with covered corridors. The extreme length of the corridors, from the kitchen to the most distant blocks, is 180 yards on the female, and 138 yards on the male, side. The chapel, which will accommodate a congregation of 600 persons, is placed on the left of the administrative block in the frontage. The kitchen, which is fitted with every kind of gas and other apparatus for cooking, is 50 ft. by 45 ft., and 25 ft. high, with thorough ventilation, and large enough to cook for fully 2,000 persons. The day-rooms are each 105 ft. long by 38 ft. wide.

The Moabite Stone.—At the Liverpool meeting of the British Association, the Rev. Dr. Ginsburg read a paper on the "Relation of the Ancient Moabites to Neighbouring Nations, as disclosed in the newly-discovered Moabite Stone." He said that the inscription on the stone read almost like a chapter of the Bible, and when it was borne in mind that this curious relic dated back 900 years before Christ, it would be seen that the inscription was older than two-thirds of the Old Testament. Out of twelve or fifteen Moabite cities mentioned in the Old Testament, eleven were enumerated in that inscription. He had come to the conclusion that at the period indicated an organised temple service existed amongst Jews out of Palestine, and that that service must have been very much akin to the service of the Moabites; that 900 years before Christ the word Jehovah, which was afterwards so much avoided by the Jews, was so much upon the lips of every Jew that it passed over to a neighbouring nation; that the language of the inscription, which was far more simple than two-thirds of the Old Testament, showed that the Moabites had attained to a high state of cultivation; that in military prowess they were superior to the Jews; and that the ancient Greeks and Romans, and we ourselves, had derived what had become our alphabet from them. A discussion followed.

An American Hotel.—On the 25th of August, the doors of the Grand Central Hotel, situate on Broadway and facing Bond-street, New York, were thrown open for the first time. This hotel will accommodate 1,500 guests in its 650 rooms. The superficial area of each floor is over 35,000 square feet, and the top-floor surface dimensions of the interior amount to 350,000 square feet. There are two courts in the centre, 20 ft. wide by 160 ft., affording light and ventilation. These courts are bridged by the main hall on each floor. Fire-hose is conveniently located on each floor, while two large tanks, each holding 10,000 gallons of water, are situate on the top of the hotel. There are five staircases, two elevators, and scuttles to the roof. The building is heated by thirty miles of steam coil. In the statistics of the hotel we find the number of bricks, 4,000,000; cost of building and ground, 1,500,000 dol.; cost of furnishing, 500,000 dol.; water supply in tanks (in gallons), 20,000 dol.; number of doors, 2,000; depth between Broadway and Mercer, 200 ft.; height to top of flagstaff, 197 ft.; length on Broadway, 275 ft.; number of halls, 50; ceilings, average height, 12 ft.; number of stories, 10; acres of carpeting, 7; steam-engines, 3; elevators, 2; acre of marble tiling, 1.

National Association for the Equalisation of Poor-rates.—This association, the president of which is the Lord Mayor, held a committee meeting on Tuesday last at the Westminster Palace Hotel. A letter was read from Lord Alfred Churchill, stating his consent to become one of the vice-presidents; also letters from gentlemen in various parts of the country, approving the objects of the association. The meeting resolved to take vigorous action.

New Railway Stations.—The new stations at present being built in the Midland Counties are rather numerous, and find a fair share of work for the builder, and those more or less interested in the trade. Amongst the largest and most important is the erection of a new Great Western station at Snow-hill, Birmingham. The old structure has been taken down, and in its stead a new brick erection is beginning to make its appearance. The building is to be erected on a scale suitable to the traffic. The London and North-Western are erecting a large goods station at Derby, where a considerable amount of business is done. The building is of brick, and is being erected by a Rugby firm. It is almost ready for roofing. The vast colliery population of Clay Cross and the district has induced the Midland Company to erect a new station. The building is fast approaching completion. A population capable of producing 400,000 tons of coal for London yearly has gathered round the place. A new station is also nearly finished at Chesterfield. The building is composed of pressed fire-bricks, with wooden platforms, the covering being iron and glass. At Unstone a new station has been built, with two platforms, 100 yards in length and 13 ft. broad.

Whitworth Scholarships for 1870.—The award of the ten Whitworth Scholarships of 100l. each for the year 1870 has just been made to the undermentioned candidates:—To those examined as students:—W. Garnett, 19 years of age, student, London; Jas. Taylor, 21 years of age, mechanic, Oldham; J. A. Griffiths, 22 years of age, engineer student, Middleton; H. W. M'Gann, 17 years of age, student, Liverpool; J. Perry, 20 years of age, engineer, Belfast. To those examined as workmen:—Edw. Tomkins, 24 years of age, engineer and draughtsman, Manchester; Wm. Dodgson, 25 years of age, mechanic, Manchester; Frank Salter, 21 years of age, mechanical engineer, Leamington; W. S. Hall, 25 years of age, engineering draughtsman, Nottingham; Hy. Dyer, 21 years of age, mechanical engineer, Glasgow.

Exhibition of Works of Art for Relief of Widows and Orphans of Germans Killed in the War.—A collection of over 250 works of art, comprising oil and water-colour paintings, prints, photographs, and sculpture, is at present being exhibited at the gallery of the New British Institution, 39, Old Bond-street. All the works contributed are for sale, and many of them will be disposed of by a prize drawing, to take place at the German Academic Society, on the 30th and 31st of December. The committee of this exhibition has made a fatal mistake, which may prevent its being a great success. There should not have been even a suspicion of partisanship in the matter. It should have been organised for the benefit of the widows and orphans of the French as well as the Germans.

Memorial Chapel to Whitefield.—A memorial chapel to the Rev. George Whitefield, the St. Paul of the eighteenth century, as he has been called, is about to be erected in Gloucester, his native city, and within a few yards of the spot whereon tradition says he preached his last sermon in Gloucester. A site at the south-west corner of Barley Close, near the Park, has been selected; the chapel is to be in the Gothic style of architecture, with spire and illuminated clock; provision is to be made for 600 worshippers; the estimated cost is 2,500l. Messrs. Medland are the architects. Over the chief entrance is to be a carved representation of Whitefield preaching to a multitude.

TENDERS.

For new maw wing to the Hull Borough Lunatic Asylum. Mr. W. Botterill, architect. Quantities supplied:—

Fewster	£1,389 0 0
Brown	1,385 0 0
Goodwin	1,385 12 93
Habbershaw	1,365 0 0
Hochney & Liggins	1,365 0 0
Walls	1,344 13 0
Halls	1,325 0 0
Lison & Wilkinson	1,322 6 5
Walker	1,291 0 0
Jackson	1,247 14 0
Evington & Wharum	1,215 10 0
Musgrave	1,212 0 0
Marshall	1,240 0 0
Skinner	1,168 0 0
Simmons & Frow	1,167 13 0
Stanley (accepted)	1,162 0 0

For alterations and additions to premises in Crutched Friars. Mr. Joseph Gibson, architect. Quantities supplied:—

Turner (accepted)	£1,134 0 0
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For Epsom Cemetery, Buildings, and Mortuary Chapels.

Messrs. Shaw & Young, architects:—	
Nightingale	£3,393 0 0
Mansfield, Price, & Co.	3,394 0 0
Holland & Hannen	3,288 0 0
Todd & Sanders	3,287 0 0
Hitchcock	3,285 0 0
Peckett & Taylor	3,244 0 0
Batchelor	3,200 0 0
Pritchard	3,179 0 0
Jackson & Shaw	3,160 0 0
Pollard	3,138 0 0
Wright	3,135 0 0
Blackmore & Morley	3,112 0 0
Nye (accepted)	3,078 0 0
Chappell	3,000 0 0
Gibson, Brothers	2,977 0 0
Hemming & Son	2,975 0 0

For building the nave and aisles of the Church of All Souls, Grosvenor Park, Camberwell. Messrs. Henry Jarvis & Son, architects:—

Gammon & Sons	£6,481 0 0
Thompson	5,930 0 0
Dove	5,885 0 0
Myers & Sons	5,748 0 0
Longmire & Burge	5,723 0 0
Henshaw	5,703 0 0

For finishing two houses, with shops, Birkenhead-road, Holloway. Mr. N. E. Jennings, architect:—

Mann	£705 0 0
Nightingale	686 0 0
Faulkner	680 0 0

For national school, Regency-square, Kensington. Mr. C. A. Gould, architect:—

Jackson & Shaw	£749 0 0
Nightingale	733 0 0
Ebrow	728 0 0
Nixon & Son	693 0 0

For St. Simon's Schools, Upper Chelsea:—

Ford	£1,269 0 0
Lacey	1,160 0 0
Nightingale	1,142 0 0
Williamson & Brunt	1,135 0 0
Cowland	1,111 0 0
Steel	1,111 0 0
Goff	1,050 0 0
Parsons & Telling	1,025 0 0
Puttick	1,019 0 0
Whittaker	1,010 0 0
Shillito	955 0 0
Barber & Groom	889 0 0
T. & A. Pearce	987 0 0

For works, 19, James-street, Buckingham-gate. Messrs. Middleton & Goodman, architects:—

Mansley & Rogers	£1,377 0 0
Carter & Son	1,357 0 0
Nightingale	1,350 0 0
Scriveners & White	1,309 0 0

For sundry alterations and additions to Sharon Villa, East Sheen, for Mr. Louis Blaise. Mr. John Thomas Wimpey, architect:—

Fish	£1,394 0 0
Adamson & Sons	1,187 0 0
Perkins (accepted)	1,055 0 0

For lining a portion of the Hertford sewers to prevent the ingress of subsoil water. Mr. Thomas W. Grindale, Engineer to the Hertford Corporation:—

Hulbard	£689 0 0
Anderson & Dunmore	638 0 0
Turner & Cole	459 8 0
Dynes	450 10 0
Keabill	450 0 0
R. & W. Andrews	431 5 0
Carter	430 0 0
Burgbird	425 9 0
Strickson (accepted)	424 0 0
Porter	395 0 0

For the erection of boys' and girls' schools, &c., for the district of St. Philip the Evangelist, Arlington-square, Islington. Mr. Alexander D. Gough, architect:—

Cohen	£3,359 0 0
Jackson & Shaw	2,916 0 0
Markwick & Thurgood	2,886 0 0
Crabb & Vaughan	2,842 0 0
Chappel	2,790 0 0
Snowball	2,774 0 0
Potter	2,767 0 0
Wood	2,750 0 0
Colls & Sons	2,723 0 0
Bishop	2,645 0 0
Crockett	2,620 0 0
J. & A. Wright	2,625 15 0
Merrion	2,618 0 0
Hill, Keddell, & Waldram	2,615 0 0
Winship	2,590 0 0
Myers & Sons	2,598 0 0
Newman & Mann	2,586 0 0
Cole	2,575 0 0
Nightingale	2,535 0 0
Houghton	2,495 0 0
Henshaw	2,443 0 0
Blease	2,378 0 0
Gibbs & Son	2,339 0 0
Parsons & Telling	2,235 0 0

For house and two shops, at Wandsworth, for Mr. Diplock. Mr. C. Foulsham, architect. Quantities furnished by Mr. Thomas Nixon:—

Nixon & Son	£1,690 0 0
Colls & Co.	1,075 0 0
Thompson	1,060 0 0
Marsland	1,053 0 0
Taylor & Pitts	1,022 0 0
Taylor	970 0 0
Shillito (too late)	930 0 0

For making alterations and additions to Torrington Lodge, Cleygate, Esher, the property of Mr. H. T. Edwards. Mr. F. Allen Edwards, architect:—

Williams & Son	£1,683 0 0
Stephens	978 10 0
Cheesum	950 0 0
Whitlock	895 0 0

For new Foresters' Hall, Wilderness-row. Quantities by Messrs. Lansdown & Pollard:—

	Extra if
Nightingale	Malm Facing.
King & Son	£7,629
Higgs	7,700
Crabbe & Vaughan	7,653
London Building Companies	7,500
Eaton & Chapman	7,370
Capps & Risco	7,320
Winship	7,176
Wicks, Bangs, & Co.	7,131
Henshaw	6,989
Wigmore	6,865
Crockett	6,830
Hoare & Cleland	6,208

For infirmary, &c., Stookwell Orphanage:—

Colls & Sons	£1,688 0 0
Thompson	1,575 0 0
Croker	1,571 0 0
Gibbs & Son	1,546 0 0
Tarrant	1,539 0 0
Nightingale	1,467 0 0
Cullum	1,390 0 0

TO CORRESPONDENTS.

J. N. B. (the "Sash").—W. M. M. (if we received the communications named, an answer was given at the time)—Raffia (there are two: the new one from near Tower Hill)—Messrs. K.—M. & Son.—T. O.—J. K.—W. T.—R. W.—R. B.—G. J.—D. O.—T. O.—W. O. J.—J. R.—H. R.—W. R.—J. W. R.—G. W. B.—W. R.—R. & G.—T. R.—T. N. R.—R. & Son.—F. R.—F. M.—G. C. R.—J. F.—J. D. F.—T. L. D.—J. M. N.—T. H.—M. V. & M.—H. C.—H. L.—R.—W. R.—W. H. A.—J. L.—W. J. C.—R. R.—N. J.—T. W.—C. R.—Z.—A.—R.—F. L.

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Seagolia Manufacturers
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Screw Jack Makers
Sculptors
Shop Front Builders
Shop Front Letter Makers
Shop Front, Stair, and Door Plate Manufacturers
Slate Manufacturers
Slate Enamellers
Slate Merchants and Agents
Slaters
Sooty Chimneys—Manufacturers of Preventive Appliances
Spiral Manufacturers
Speaking Tube Makers and Fitters
Spring Blind Roller Makers
Staircase Fittings and Furniture Manufacturers
Stained Glass Window Manufacturers
Steam Traveller Makers
Steel Safe Makers
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Stone and Marble Masons
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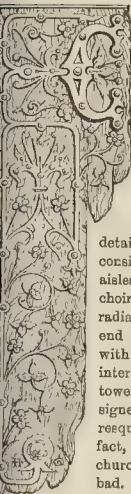
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The Builder.

VOL. XXVIII.—No. 1444.

The Revival in Holland.



CONTINUING our notice of the revival of architecture in Holland,* we would point to a very large new church at Velemen, about five miles from Bois-le-Duc, and which, from a distance, presents an imposing appearance. Upon a nearer approach, however, one is disappointed, as some of the detail is very poor. The building consists of a lofty nave and aisles, deep transepts, and a choir, with chevet, and five radiating chapels. At the west end is a lofty tower, crowned with a slate spire; and at the intersection is a *flèche*. The tower and spire are well designed, and the spire is picturesque and well arranged; in fact, the whole exterior of the church is striking, and far from bad. Upon entering the building, however, everything good disappears; for arches, triforium, and vaulting are all composed of plaster; and, to make the matter worse, the mouldings, columns, and so on, are most elaborate and intricate, and all the capitals are adorned with foliage, also executed in plaster. The design really would not be so very bad, were it not carried out in plaster; but nothing can excuse or palliate such a detestable sham. The radiating chapels of the apse, which present a good appearance from the exterior, are built off from the choir, and are, we suppose, used as sacristies. The architect of this most disappointing church is Mr. Van Tolde, of Tilburg, who has also built a large church at Elburg, where all the faults of the one at Velemen are repeated, without any of its merits. At Helmond, near Eindhoven, is a large new church, very similar in general outline to that at Velemen, only larger, and far better in detail. We were unable to see the interior of this church, so to learn who was its architect. Between Helmond and Bois-le-Duc is Eindhoven, where Mr. Cuypers has built a really magnificent church; and perhaps it is not too much to say that this is the finest modern church in the Netherlands. When seen from a distance, the two lofty spires and the *flèche* of this church present a most dignified appearance, and make this small town look quite like a cathedral city. This fine church consists of a nave of five bays, two lofty western towers, which become octagonal half-way up, and are crowned with slate spires of dissimilar design. The west front, which is simple and grand, is pierced by a large rose-window and three very bold doorways, the centre one of which is double, and has pierced acroery in the head, and a finely-executed statue of the Madonna and Child against the dividing column. The western gable is formed of a combination of niches and open windows. Each side of the nave has five well-proportioned flying buttresses. The transepts are each two bays deep, and the ends have well-designed rose

windows, with a single row of lancets below. The choir has three bays and a chevet, from which project three large hexagonal radiating chapels. The whole church is built of brick both within and without, with all the dressings of dark yellow stone. Over the intersection of the nave and transepts is a lofty and very graceful *flèche* of wood covered with lead. The interior of this church is quite as fine, if not finer than the exterior. It is vaulted throughout in different coloured brick, with stone ribs. The clearstory windows consist each of two simple lancets under a sexfoil rose. The triforium is very original and pretty; it consists of three arched openings over each main arch, the upper portions of which are filled with simple perforated tracery, and the lower portions are filled in with a very conventional imitation of drapery similar to that on the exterior of the west front of Rheims Cathedral. The effect of this portion of the church is singularly happy. The main arches of the nave and choir are well proportioned, and the capitals of the columns are everything that can be desired in the way of carving. The internal effect of the chevet, with its three hexagonal chapels, is very fine, as are also the transepts, each of which contains a chapel and altar. The choir fittings are not yet completed, as there are no stalls, though space has been left for them. The high altar is small, but charmingly designed, as are also the metal candlesticks and other furniture attached to it. The side-screens are of stone and marble. At the back of the high altar is a brass plate, stating the date of the commencement of the church (we think it was 1860 or 1862), and its completion in 1868; also giving the name of the architect, Mr. Cuypers, and his able assistant, Mr. Bolsius (to whom we are indebted for much valuable information with regard to the works of Mr. Cuypers, for which we wish to offer him our thanks). This church, as we are informed by the inscription above referred to, "was erected under the personal superintendence of Mr. Bolsius," who resided on the spot during the whole time the works were in progress. Not the least beautiful part of this church is the decoration; and here, as at St. James's, Bois-le-Duc, Mr. Cuypers has made large use of positive white; for, although the interior of the church is lined with brick of a warmish buff colour, lines of positive white (which is simply whitewash) mark all the more important divisions of the architecture, and are introduced with great effect between the red and yellow bricks of the vaulting and main arches. Along the sides of the church, and over the altars, are sacred subjects painted upon a white ground in a very severe style. Colour is amply used even upon the stonework, and the decorative painting on the high altar and side screens is harmonious. The stained glass is remarkably good; and here we again see the great brilliancy given by the use of a large quantity of white. In the transept windows the figures of the apostles and prophets are all draped in white, the colour, which is rich and deep, being confined to the borders and backgrounds of the windows, the effect is remarkably good. We regret that our space will not allow us to dwell longer on this remarkable and beautiful church, so with a list of the chief dimensions we will close this description of it. The entire length is 237 ft.; width over transepts, 114 ft.; width of nave and aisles, 71½ ft.; height to vaulting of nave, 71½ ft.;—side aisles, 33 ft.; height of spires, 244 ft.

Not far from Eindhoven is another very large and remarkable church, by Mr. Cuypers, at a place called Veehel. In general arrangement it is somewhat similar to Eindhoven, except that it has only one western tower, and at the east end the chevet has two semi-octagonal radiating

chapels, and two triangular ones, and a Lady Chapel of two bays, terminating in an apse projecting from the east end. The nave here, also, has one bay more than at Eindhoven. The church is of even larger dimensions than Eindhoven: they are as follow:—Entire length, 245 ft.; width of nave and aisles, 72 ft. (inside); width of nave, 32 ft.; height to vaulting, 72 ft.; height of tower, 268 ft. The whole of this magnificent church is vaulted in stone, and the columns are of granite. The church contains eight altars, and has in addition a baptismal and a mortuary chapel. The lower portion of the western tower forms a finely-vaulted porch.

Mr. Cuypers's church at Breda has already been described and illustrated in this paper. We now give the dimensions of this church, which we were obliged to omit on the former occasion; they are as follow:—Entire length, 216 ft.; width of nave, 27 ft.; height to vaulting, 66 ft.; height of lantern tower, 235 ft.

We cannot consider this church such a satisfactory building as either of the former ones we have described: though the effect of the double aisles to the nave is undoubtedly good, yet the great open triforium (which is to be used as a gallery) has a bald and weak appearance, and the clearstory wants dignity; in fact, we cannot help thinking it a pity that Mr. Cuypers has sacrificed his design to the idea of utilising the triforium, which can at best make but an unsatisfactory kind of gallery. Some of the details of this church, and the carving of the capitals, are admirable; and there is some very clever decoration and furniture, as well as one or two interesting old pictures. In the sacristy is a fine fourteenth-century remonstrance, which, together with the pictures, originally belonged to the cathedral (now Protestant).

The superb monument in the cathedral to the memory of John of Nassau (fifteenth century) has been carefully restored. The rest of the church is in a most disgraceful condition. The nave alone is used by the Calvinists; and the magnificent choir and transepts are allowed to go to ruin, except for the thick coats of whitewash with which they are bedaubed from time to time.

At Oudenbosch a very large new Roman Catholic Church is being built, from the designs of the same architect. It is in the Romanesque style, built entirely of brick. It consists of a nave and aisles, transepts, and a choir, terminating in a semicircular apse.

The following are the principal dimensions:—Length, 260 ft.; height of nave to ceiling, 65 ft.; height of octagonal lantern over crossing, 220 ft.; width of nave, 40 ft.; nave and aisles, 73 ft.

This church is only carried up as high as the walls of the side aisles; but it promises to be a very solid and striking building, though very plain.

At Rotterdam six new churches are building, or have been recently completed; four of these are Roman Catholic and two Protestant (Calvinist).

The Catholic Church of St. Mary, which is being built, or rather rebuilt, by Mr. Cuypers, will be a fine building when finished. The transept alone, however, is at present completed, and, although good, it is not quite equal to other works we have seen by this architect. When completed, this church will be about 180 ft. long, and will have double aisles, a centre lantern, and two western towers.

The Roman Catholic Church of St. Anthony, recently erected from the designs of Mr. J. Margerij, is, on the whole, a good building. It consists of a nave and aisles, transepts, and an apsidal choir, with a sacristy underneath. Over the crossing is a graceful *flèche*. The church is built of brick, and vaulted throughout in the same material. We suppose that Mr. Margerij is a pupil of Mr. Cuypers, or we should be inclined to accuse him of plagiarism, as this

* See p. 757, ante.

* A portrait of Mr. Cuypers is given in our present Number, p. 806.

church bears such a strong family likeness to portions of Eindhoven and Vechel. Its chief faults are, firstly, the thinness of the columns supporting the triforium arcade; secondly, the arrangement of the chancel over the sacristy; thirdly, the chamfering of the piers at the crossing, which would be too thin without such a treatment, and with it presents a terribly weak appearance; and, lastly, the horrible stained glass with which the windows are disfigured. However, on the whole, it is a good church, and if, as we suppose, the architect is a young man, it gives hope of better things in future.

Near to this is a small new Protestant church, of which it is perhaps enough to say that it is impossible to conceive anything more mean, or less suited to the purposes of religious worship.

Not far from this another Roman Catholic church is being built, in a street called "Endragts-laan." It is a Romanesque building, of small size, but great pretensions. It is only about 80 ft. long by 40 ft. wide, and yet it has two western towers, a nave, aisles, with triforium gallery over, supported upon columns of black granite; transepts and apsidal chancel. Were there anything like scale to the building, it would not be bad, but as it stands, it is a mere toy or model. The architect is Mr. Laurens. The other Roman Catholic church is attached to the cemetery; it is also Romanesque, and has the same faults, though in a lesser degree, that exist in the former church.

The other Protestant church to which we referred, is situated near the terminus of the Rotterdam and Amsterdam railway, and is far from being a bad building. In plan it is nearly square. Each side shows a gable, with two wings. At one angle is a tower crowned by a slate spire of very fair design. Each side of the building is pierced with a rose-window, and five long semicircular-headed lights. The style chosen is a kind of modified Romanesque.

The Hague has not distinguished itself in architecture within the last few years. A horrible cast-iron spire, of open tracery work, has been added to the tower of the old church, and an equally bad new church has been erected in a street called Blyenberg. The fine fourteenth-century hall belonging to the Parliament House at the Hague has been badly restored. This is much to be regretted, as this Dutch counterpart of our Westminster Hall is a most valuable example of civil architecture of the Middle Ages, and its great hammer-beam roof is quite unique on the Continent.

If, however, the Hague has been behind hand in the revival of Gothic architecture, the same blame cannot be attached to Amsterdam, where several very fair Gothic churches have been erected. In addition to the Redemptionist Church already described, we must notice that of the Immaculate Conception from the designs of Mr. Cuypers. It is a cruciform building. The west front and western bay of the nave are not yet built, but when completed the church will be about 160 ft. long. There is a singular arrangement in the nave, which has a double triforium one above the other, each one being used as a gallery. The effect here is better than at Breda, but we cannot quite reconcile ourselves to these practical triforia. Here, however, there is great excuse for such an arrangement, as ground is excessively valuable, and it is necessary to accommodate as large a congregation as possible on the smallest possible space. The whole church, including the lower triforium, is vaulted in brick.

Another Roman Catholic church has just been commenced, from the designs of the same architect. When completed, this will be the most important modern church in Holland: it is of grand dimensions, the length being upwards of 300 ft., and the width across the transepts over 150 ft. The choir and transepts will be completed at once, and the nave and aisles, towers, &c., carried on as funds are forthcoming.

At Alkmaar, in North Holland, the same architect (Mr. Cuypers) has erected two important Roman Catholic churches. That dedicated to St. Lawrence is a fine cruciform church, 178 ft. long by 92 ft. 6 in. over the transepts. The tower is only as high as the apex of the nave roof at present, but will eventually be carried up another story and crowned with a spire. The roof of the nave here is a wooden barrel-vault. The choir and aisles are vaulted in brick and stone. There is a good deal of very capital decoration.

The church of St. Dominic is a clever, but rather singular building. It is in plan an irregular square, 117 ft. each way. It is cruciform and

has double aisles on either side of the nave, and two small supplementary aisles as well. At the intersection is an octagonal lantern.

Very large and important churches are in course of erection by the same architect at Sneek and Klosterburen, in Friesland, and have been recently completed at Volder, Jabeek (the latter has an open timber hammer-beam roof), Vlaardingen, Offelt, Dookum, Bodegraven, and Blaauwhuis. The last-named is a very remarkable church, with transepts both at the junction of the choir and at the west end. The length is 150 ft., and the whole church is vaulted.

There are very many more works by Mr. Cuypers which are well worthy of notice, but our space will not allow of our describing them, and a mere list would only be tedious and uninteresting.

We think that our readers will agree, after reading this paper, that the revival of Gothic architecture in Holland is really extraordinary. And when it is taken into consideration that all these large and important churches which we have mentioned or described have been erected within the last twenty years, and are spread over a country less than a third the size of England, and with a whole population not much greater than that of London, we have a good idea of the enthusiasm with which this movement has been taken up by our Dutch neighbours. Nor must we forget the large size of many of these churches, six of those we have described are over 200 ft. long, viz., Amsterdam (building) nearly 300 ft.; Oudenbosch (building), 260 ft.; Vechel (completed), 245 ft.; Eindhoven (completed), 237 ft.; Breda (completed), 216 ft.; and Sneek (building), 210 ft.

We are not aware that any country in Europe (except, perhaps, France) can show such a list of large churches now building, or recently completed.

Of course, these important churches cannot be erected without a large outlay, and that is an additional proof of the great prosperity of the Dutch people, and also of their generosity and liberality. We are informed, upon good authority, that when a church is proposed to be built in Holland, nearly every person in the parish puts on one side a certain portion of his income for so many years, which he regularly subscribes to the building fund of the church. Thus, when a church is commenced, those who undertake the work know within a little what sum of money they can safely depend upon getting for its completion.

We wish we could find some words of praise for the way in which most of the old churches in Holland are kept, but unfortunately we cannot. The condition of the ancient churches at Breda, Scheideid, Bergen-op-Zoom, and many others we could name, is a national disgrace. The naves of these buildings alone are used by their present possessors, and the choirs and transepts seem, as far as we can make out, to be devoted to the purposes of drying the linen of the clergyman and his family. At Breda we saw a clothes-line suspended across the transepts, with several articles exposed to view which one is not accustomed to see in a place of worship. We observed the same phenomenon at Bergen-op-Zoom and other places.

The churches of Dordrecht and Gouda form an agreeable exception to this general neglect, and the portions of them not used are kept in a decent condition, and not employed for unworthy purposes.

The Dutch Calvinists might profit by the example of their co-religionists of Scotland or Switzerland, who are beginning to restore and take care of the old churches in their possession (vide the cathedrals of Glasgow and Basel). We would suggest to them the propriety of keeping the structural portions of the buildings in good substantial repair, and protecting the sacred edifices from unnecessary and wanton desecration.

TIMBER AND CONSTRUCTION.

ONE architectural characteristic of the present day is the substitution of iron for various materials used in construction down to the earlier portion of the nineteenth century. The origin of the change was not of an architectural nature. It was neither the destruction of forests, the loss of skill, the sudden discovery of any new material, or property of a material, or any of those changes to which we are accustomed to attribute the previous modifications in the form of Christian architecture. But the seed and principle of the new style is referable to the

fact that, some sixty years after Watt has first learned how to derive motive power from the expansion of water by heat, a colliery labourer succeeded in applying that same power to the propulsion of carriages by land.

With the construction of the Liverpool and Manchester Railway, in 1825 and 1829, an entirely new era was inaugurated. Structural requirements were altered, and the effect of the alteration very soon became evident in monumental form. With an increased facility for the transmission of heavy weights over lines of iron rail, a demand for an improved mode of bridging over rivers, roads, or other openings sprang up. The supply and the manufacture of iron thus received a stimulus, and the iron trade, in its turn, reacted upon the designs of the architect and of the naval constructor, by giving him a material which was virtually a new one. Men of practical mechanical genius first laboured to produce structures of wrought iron of which the expense should be reduced to a minimum. Thus Sir Charles Fox, then a subaltern of Robert Stephenson, designed that simple, inexpensive shed roof, for the Euston-square passenger station, which for some time was the normal type of similar structures. The taste and lavish expenditure of Isambard Kingdom Brunel next produced the Great Western Station at Paddington. The need of bridging the Menai Straits led to the construction of the hollow box girder, and the piercing of London with railways induced the execution of those effective, but hideous bridges the aspect of which so afflicts the man of taste. Soon the displacement of architectural requisites by structural combinations that took no heed of any laws but those of strength spread from the floor to the roof,—from the bridge to the station; and men vied with one another in the erection of the largest, the most unnecessarily costly, and the most hideously unarchitectural forms that the world has yet seen.

The use of iron for railway purposes has crept in, to an extent constantly increasing, in civil buildings. Vast shop and warehouse fronts of iron are filled with plate glass. Permanent exhibition buildings are erected, of that perishable combination of iron, glass, and wood, which may answer, on a small scale, for conservatory, but which is the most costly style of structure, as far as maintenance goes, of which we have any experience. Connected with the same increased energy in our workshops are the increase in the power of artillery, the improvements in the manufacture of shot, the launching of iron and of steel armoured vessels, and the construction of shields for fortresses, as to which, at the present moment, the art of defence is somewhat ahead of the art of attack.

Concurrently with this substitution of iron for wood, and for other materials, there has been, with very few exceptions, a wanton waste of the forest resources, not only of our own country, but of the entire world. Man has come to regard his early cradle, the forest, as an enemy, instead of as a benefactor. In England the prudent care of our forefathers to watch the growth of our forest trees—to secure a perennial supply of oak for our ships, as well as of yew for our bows, is altogether forgotten. The forest rights of the crown over a district that has been wooded since the time of Julius Cæsar—the forest of Epping,—have been so purposefully neglected, that it has needed the very unmistakable expression of public feeling to elicit from the Solicitor-General anything more than a joke upon wolves and bears. The 100,000 acres of forest, under the administration of the Woods and Forests, has been so admirably managed, as to arrive at the result of a rental, at the rate of 3s. 6d. (three shillings and sixpence) per acre. The wooden walls of old England are now so much an affair of the past, that it may be said that we only regard timber as necessary to ornamental landscape, or as a material for lucifer matches.

It is in this country and its dependencies, and in those of our American descendants, that the laws of Nature as to the clothing of the earth with timber have been the most persistently broken. But we are far from being alone in our folly. To whatever part of the world we turn we see indications that waste and destruction bring their own vengeance in their train. Of the effects produced upon climate by the denudation of the soil there is no room for doubt. To a certain extent the influence of human labour in the thinning of forests is beneficial. But the limits between culture and destruction are rarely maintained. In the year 1816 the

forest came up close to the city of Philadelphia. The Delaware, a mile wide, was then often frozen in a single night. The edge of the forest was reckoned to a distance of more than thirty miles. The thermometer is now rarely down to zero; the river is hardly ever frozen; nor does snow lie long on the ground. In the forest it lies very long. The increased aridity of Palestine, of Spain, and of the South of France, is well known. In the former case it has been partly caused by the cutting down of the olive, a barbarous incident of warfare, merely forbidden by ancient law. In the last-named country it has been the need of fuel that has led to the denudation of so many districts, and the double evil has ensued, first, that the humidity of the climate has been reduced to a formidable extent; and, secondly, that when rain does fall, in any unusual proportions, the absence of the great natural absorbing power of forest districts allows the entire product of the rainfall to be discharged at once by the natural drainage, thus causing those floods which have proved so formidable in their ravages within the last few years.

The denudation of the forests of England is by no means a new grief. More than 200 years ago Mr. Evelyn complained of the rapid extirpation, "root and branch, of all those goodly forests, and woods which our more prudent ancestors left standing for the ornament and service of their country." On the confiscation of the Church lands, in 1536, immense forests were cut down; and during the civil war that commenced a century later, many royal forests, as well as private woods, were entirely swept away. In France there yet exist 2,700,000 acres of State forest, earning a gross revenue of 1,740,000, and a net revenue of 1,240,000, per annum. Bavaria contains nearly 2,000,000 acres of forest; Prussia, upwards of 5,000,000; Austria, no less than 13,000,000 acres, realising an annual export value of 3,000,000, sterling.

In France and in Germany exist schools of forestry in connexion with the service of the State, and men of a superior class of intelligence are carefully trained in these establishments for the scientific management of this important part of the national property.

In Bavaria there is a school of forestry at Aschaffenberg on the Maine. The candidates for admission must have passed good examinations in the higher public schools. The time of training extends over five years, half of which time is devoted to acquiring a practical acquaintance with the condition and the care of the forests of the State. The special scientific course comprises lectures on forestry, management of forests, planting, division of forests into blocks, valuation surveys, rotation of classes of timber, and the due rotation between the maximum yield of a forest and its maintenance in an unimpaired condition. Preparation, transport, and sale of forest produce forms another special branch of study. Botany, chemistry, zoology, physiology of plants, climate, and geographical distribution of plants form the natural science division of the course; and mathematics, forest and applied, engineering, surveying, and pure legislation complete the curriculum. On passing the final examination, the students are qualified for appointments in the Bavarian forest service.

In France a similar college exists at Nancy, where from thirty to forty students are trained for the service of the State. The service is directed by the "Bureau Central de l'Administration générale des Forêts," and 849 *conservateurs* and *inspecteurs*, having under their orders 3,600 *gardes généraux*, have charge of the public forests of France.

Forest schools are also established at Hanover, Newstadt, Eberswald, near Berlin, Thuring, in Saxony, Eisenach, and other places in countries possessing State forests.

The threatened and very proximate exhaustion of the enormous forests and timber-growing jungles under the British rule in India has led to a tardy attention being paid to this important subject by the Indian Government.

From the report of Dr. Brandis, Inspector General of Forests in India, it appears that the normal average of first-class teak trees in a virgin forest is fourteen per acre. A teak forest at Maulmain, in the hands of the Government, extending over 550 square miles, has been found to contain only three full-grown trees in two acres, while damaged trees and stumps abound.

Forests of the Sal, or Saul, tree replace those of teak in Central India to the north of the Nerubudda river. A belt of forest, from five to twenty miles wide, extends for a length of 1,500

miles along the foot of the sub-Himalayan range, and up to an elevation of 3,000 ft. The Saul tree grows socially, and by its dark green foliage excludes the growth of other trees; being unlike the teak in this habit of growth. In Oude and Nepal the jungles contain as many as seventy first-class trees per acre, together with from 200 to 300 of all sizes, springing up from seed. The system of letting these forests by contract in annual leases to the highest bidder, while bringing in a positively insignificant return, has had the effect of stripping all the accessible parts of this large district of full-grown trees. Such is the size attained by this noble tree, which, with a specific gravity less than that of oak, possesses from one and a half times to twice the strength of that wood, that the Nepal ferry-boats, used to contain from ten to fifteen men, with horses and cattle, are hollowed out of single logs. The tree takes about 100 years to arrive at this size. The British Sal forests are computed to cover more than 3,500 square miles, and a rest of forty or fifty years will be requisite to replace this waste of first-class trees which has been so blindly permitted to go on.

From the state of the Sal forests it may be concluded what is the condition of the supply of teak, a tree which grows so much more sparingly in its natural home. In 1822 the forests which the native princes had studiously preserved were thrown open to the public. Within eight years it was discovered that, owing to indiscriminate cutting, teak timber fit for Government purposes was growing scarce, both in Madras and in Bombay. In 1839 Mr. Williams, the dookyard manager, reported, that within twenty-one months 40,000 teak-trees, between 12 in. and 6 in. in diameter, had been floated down by the contractors, whose indiscriminate waste was thus destroying the resources of the future. So great had been the destruction, that in 1842 the Government actually purchased 260 square miles of forest land, for replanting with young teak, for the use of the dookyards. It was found that the expense of thus preparing a single acre of forest nursery was greater than the value of the timber which could be grown on a square mile in 100 years! During the thirty years preceeding this futile attempt to repair irreparable waste, the forests of Malabar, Canara, Goojerat, Bombay, Madras, Rajamundry, Coimbatore, and Cochin, stocked with first-class trees fit to cut, and with an ample supply of young trees in all stages of growth, had been given over to destruction. The contractors took no heed of those who might come after them, and cut everything that came to hand.

During this time the forests of the Rajah of Travancore, under the charge of an English conservator, had yielded a regular revenue, while still containing a full supply of first-class trees. For every ten trees fit to cut, two were left for seed; and for every tree actually felled, ten were planted.

The teak-growing districts of Burmah extend over more than 7,000 square miles of forest. A system of well-devised management has been introduced into this district, in 1860, by the conservator, Dr. Brandis. The forests are divided into six divisions, of upwards of 1,000 square miles each, containing an estimated number of 100,000 trees in each district. The trees are divided into five classes, each individual being allowed a period of twenty-four years in each class, thus making the total life of the tree, from the germination of the seed to the felling of the timber, 120 years. The ordinary average of the forest gave 100 trees of the first, second, and third classes, and 200 of the fourth class, per mile. By cutting, therefore, only eighty of the first class in twenty-four years the forest is unimpaired, and in the course of 120 years its stock of timber is entirely replenished.

The specific gravity of green teak is greater than that of water. The dry timber, on the other hand, will float. It is therefore the practice to mark and girdle the trees three years before felling. The tree is killed by the destruction of its bark, and dies *in situ*. When felled it is dragged to the rivers by elephants, and floated down to Rangoon, the Government paying so much a log on its arrival. Under these arrangements the Burmese forests have kept up a good supply of timber without exhaustion, and have ensured an annual profit to the Government of 80,000, besides providing for the expenses of their own conservation, amounting to more than 30,000, a-year.

No less important than the conservation of our extensive forests, inexhaustible as they may prove under proper management, although

readily destructible by the waste which we have been accustomed to allow, or rather to practise, is the introduction to the knowledge of the English builder and manufacturer of those noble and beautiful species of wood of which we command so great a variety. It is incredible to what an extent this part of the subject has been neglected. At the Paris Exhibition of 1867, timber from no less than 3,769 distinct species of trees was collected from forty-five different countries. Of this large number Europe contributed 395 species. Africa yielded only 252, showing that the resources of that large continent were almost virgin. Asia produced 853 species, Oceania 966, and America no less than 1,298.

Among the most notable of these materials for the builder may be mentioned the *Eucalyptus Amygdalina* from Victoria, which attains in the valleys of Dandemonny and on the Yarra river the height of 420 ft. Dr. Mueller says that this amazing height is by no means exceptional, and that it is due rather to great rapidity of growth than to extreme age. The "white gum" (*Eucalyptus Stuartiana*) and the "stringy bark" (*Eucalyptus obliqua*), are said to exceed 300 ft. in height, and to cover the plains and more barren mountains of Victoria. From the same vicinity come beautiful ornamental woods. The *Senecio Bedfordii*, a curious striped wood, and the *Banksia serrata*, marked with a pattern like network. Gipps Land produces the *Eucalyptus longifolia*, said to last in the ground for twenty years, and the *Acacia suppreosa*, an elastic wood resembling hickory, and yielding straight spars from 50 ft. to 100 ft. long.

British Guiana produces the "Greenheart" (*Nectandra Rodiei*), called the natives Sipico, a timber which is remarkable both for its great durability and for its extraordinary strength, which is three times that of oak. Balts of this timber, squaring from 18 in. to 24 in., may be had from 60 ft. to 70 ft. long without a knot. In the same locality, the mora (*Mora excelsa*) attains a majestic height of from 100 ft. to 150 ft. It is so tough that it is rare not to splinter when struck by cannon-shot. Its strength is more than double that of oak, and it is said to be exempt from dry-rot. Of the seven species of timber which form the first class in Lloyd's classification for shipbuilding, oak, which heads the list, seems to be far inferior to the East Indian, the Australian, and the African timber, to which we have referred. The list includes seven species of timber, the ordinary European oak (*Quercus robur*), the live oak of North America (*Quercus virens*), African oak (*Quercus Africana*), teak (*Tectona grandis*), and sal (*Shorea robusta*), from East India; mora (*Mora excelsa*) and greenheart (*Nectandra Rodiei*) from British Guiana, and iron-bark (*Eucalyptus*, species not named) from Australia.

It is beyond the limits of our space to describe the varied, mottled, striped, and coloured woods which offer such admirable materials for the artist, whether for furniture, for doors, skirtings and wainscotings, or for inlay work. The use of dyed or stained wood for the latter is rendered unnecessary by the bounty of Nature. From the pure white of satin wood, and of numerous other species, to the full lustrous black of ebony, we can simulate almost any that form the resources of the vegetable world. French Guiana produces a violet wood of extreme beauty, the "Bois violet" (*Copaifera bracteata*), and the *Caryocar glabrum*, a splendid yellow timber. Brazil has a red wood fit for any kind of furniture, the "Echrospermum Eukasarii," and the *Dalbergia nigra*, a beautiful rosewood. Venezuela has a zebra wood (*Cordia zebra*); Natal produces sneezewood (*Pterocylon utile*), equal in beauty of grain to the best bird's-eye maple; Canada its white and pencil cedars (*Thuja* and *Juniperus Virginiana*).

It is needless to refer to the economic products of the forests, apart from the actual timber: turpentine, resin, Burgandy pitch from the pine forest of the Lander; cork from the South of France, Corsica, Algeria, Italy, and Spain; gum *antmi* from Zanzibar; gum *copal* from Angola and Sierra Leone; gum *acacia* from Senegal and Mogador; gum arabic from different sources; palm, cocoanut, and other vegetable oils; cord and fibre; bark for tanning; osier and bamboo; corozo, or vegetable ivory, and nuts for turners' work (*Phytolophus macrocarpa*) from Ecuador; the vegetable wax of the Carouba palm (*Corypha cerifera*) from Brazil; caoutchouc, the milky sap of the *Siphonia elastica*, and other elastic gums, as well as logwood (*Hæmatoxylon campechianum*), and other dye woods, from the same rich vege-

table district; bark mat from the bark of the lime, the Russian source of supply for cordage, bags, mats, sandals, horse-collars, packing-cloths, and other purposes; black and grey moss from Louisiana, used by upholsterers for stuffing; "forest wood" for the same purpose, formed from the needle-like leaves of the pine, essential oil from the same tree, balsam and spice. Such are but a few of what may be called the incidental products of the forest.

Our purpose will have been accomplished if we have succeeded in awakening attention, first to the fact of the invaluable stimulus to art, in all its branches, no less than to civil and naval architecture, that must result from the attainment of a competent knowledge of the vegetable kingdom; and, secondly, of the absolute importance, as a branch of the great profession of which the architect, the engineer, the shipwright, and the surveyor, are alike essential members, of the intelligent study of forestry.

WESTGATE BAY, ISLE OF THANET.

A NEW WATERING-PLACE.

LATELY, when speaking of Margate, we mentioned some intended building operations on the west side of the town, and prognosticated a good future for this popular watering-place, if the authorities acted wisely. Still further west, though not far, an entirely new location has been made, which bids fair to become in a very short time a favourite resort. About a mile and a half from Margate there are two fine bays, one of which, marked on the maps WESTGATE BAY, gives the new place its name. The control of the land, some 500 acres in extent, has come into the hands of Mr. Corbett, of the firm of Corbett & McClymont, of the Redcliffe Estate, Brompton, and with the same energy and clear-headedness which have in a marvellously short space of time covered the latter with good houses, and brought to it a population, this gentleman, with several supporters and friends, has set to work to make Westgate a fine watering-place. About four miles of roads have been completely formed and named, as Cuthbert-road, St. Mildred's-road, Sea-road, Westgate-road, Wilson-road, and Domneva-road; a sea-wall and esplanade are being constructed around the two bays, a certain number of houses have been erected, an hotel is about to be commenced, and the site for a church is marked out. The London, Chatham, and Dover Railway Company, whose line passes through the estate, are naturally greatly interested in its progress, and are, we believe, about to form a station there at once. When we add that arrangements are nearly complete for the erection of gas and water works on the estate, it will be seen that the right steps have been taken, and that the style of the beginning promises well for the end. At present good water is obtained from deep wells in the chalk. Mr. Wignore, who was the contractor for the roads, is building himself steam saw-mills and other workshops, and will probably aid in covering the land.

On a plot of ground within the estate some houses have been erected with the materials patented by Mr. J. Taylor, his facing bricks with concrete-backing, roof-tiles, and so forth, and within these much ingenuity is exhibited in turning space to account.

The houses built by Mr. Corbett are good sound structures designed by Mr. Beazley: they are detached, and, wisely, a good area of garden ground is allotted to each. Professor Erasmus Wilson, Mr. Spencer Lewis, and others who are known have already located themselves at Westgate, and are interested in its welfare.

The sea-wall and esplanade in progress, to which we have already alluded, are a considerable work. The walk is being formed by cutting down and shelving back the cliff, the wall by blocks of Portland-cement concrete, with granite facing, the top of which will be paved or asphalted with the esplanade. To make the work complete, it should be continued round the headland which occurs between the two bays; and it would then present an unrivalled sea-walk more than a mile in extent. Mr. Birch is the engineer, and Mr. Oakes the resident superintendent.

The views embrace Reculvers on the left, Margate on the right, with Daundelyon, Street (the residence of Mr. Mertens), and Birkington Island. Minster and Canterbury, rich in associations, are handy for drives. While we were on the spot, we were reminded of its connexion with early times by the turning up of part of an oddly-shaped vessel in flint ware, Medieval

if not Roman. Westgate has certainly many natural advantages, and we shall be surprised if it do not prove attractive first to builders and buyers, and then to the general public. It has the fine air and open sea of this part of the coast, with great quiet, and rural surroundings; and yet a ten minutes' ride, or a twenty minutes' walk, will take those who seek a little life and variety to the gaieties of the Jetty, or to Halls by the Sea. We very cordially wish the pioneers success. There is no time to lose on the part of those who would get ready for next season.

RESTORATION AT THE BRITISH MUSEUM.

ALL kinds of objects of art are in these days restored,—buildings, statues, paintings, furniture, things large and small, useful and useless, valuable and worthless,—and they are restored or attempted to be restored in all sorts of ways, both by adding to them and taking from them, by cutting away the surface and by painting over it, or covering it up. It is difficult sometimes to discover how most effectually to destroy the artistic value of the original work, and to blot out the impress of the original artist and the marks of his mind and hands. There are not a few things so completely coated over with layers of oil-paint that it is impossible to say what the real substance is of which the object itself, whether building or statue, or chair or table, is made of. This is one method, and we are just now led to think about it from the very singular fact of two of our most notable possessions in London city undergoing a process of restoration in a directly opposite way. We ask our readers' attention to them, for they are well worth a little thoughtful consideration, and show how much there is yet to be examined into and studied. St. Paul's Cathedral is, by way of restoration, covered over and hidden away under four or more thick coats of oil colour or paint, so that it is impossible to say what the building is made of; while the Greek marbles from the world-renowned Parthenon or Temple of Minerva, Athens, are as industriously in rapid course of restoration, not by covering them over after the model of St. Paul's, but by the directly opposite system of removing, through the aid of powerful chemical agents,—some chlorine mixture, we suppose, for there is nothing else powerful enough,—all the weather marks and evidences of age which time had impressed on the surface of the marble! The simple-minded reader who is new to these profound subjects will therefore at once see that there is more than one way of "restoring" a work of art, and that it depends on the fancy of the restorer how it is best to do the work, and how the restored object shall look when the tremendous feat is accomplished. It would perhaps be a difficult thing to say which is the most precious to Englishmen, St. Paul's Cathedral or the Parthenon marbles, and in presence of which two things of beauty he may be said to feel most at home; but of one thing we are certain, that they both of them cost him a vast sum of money, and so he is not a little interested in their preservation and careful keeping, and thus that his successors may see them as well as himself. Leaving St. Paul's for the present, let us glance for a moment at the work now going on at the British Museum.

Every reader of the *Builder* knows that pure Carrara marble, when fresh from the quarry, is of the most beautiful snow white; indeed, perhaps among natural substances there is no substance more beautiful and refreshing to eyesight than this pure and spotless marble. When the surface of this marble is cut by the successive and minute cuttings of a fine chisel, the surface of it, without being polished,—and the reader is requested to bear this in mind,—acquires a wonderful transparency and depth, which makes this substance so fit for the purposes of the sculptor, and so capable of expressing the form and texture of flesh and muscle. But Carrara marble cannot be kept long in this state, or in its state of pure snow whiteness: after a little time, a few weeks or months, it changes colour, and if left to itself becomes of a fine stone-colour. Now, charming as the pure white of the fresh quarried substance may be, it is for the purpose of sculpture a more appropriate colour, and better for its purpose, when it has passed into pale cream-colour, and thence into pure stone-colour, and we may presume no sculptor would hesitate which to prefer of the two, the pure stone-coloured tint being so much more expressive of the nature and colour of the

flesh which it is the aim of the artist to imitate. All this applies to the Carrara marble only. But the Greek marbles in the British Museum are made of the equally celebrated Pentelic marble, which is not, even when fresh from the quarry, pure snow white, as is the Carrara marble, but a fine pale cream or stone colour; and it would seem under a clear sky to have the property of retaining that colour for a great length of time, though growing by slow degrees somewhat darker in hue. Of all the marbles it is the best fitted for the purposes of the sculptor, and acquires under the action of the chisel that fine polish which approximates it to the texture and colour of the living flesh. Phidias certainly could not have had a better substance to go to work on. Thus circumstances seem to have all united together to make up the perfection of Greek sculpture,—the man, the substance used, in texture and colour, and the glorious forms by which he was surrounded,—and in the British Museum we may see, or might have seen, the result of it. But what has been the sad fate of these famous and fortunate works? Why, they must have remained for centuries up in their safe niches in the Temple itself without harm or injury of any kind, until the unfortunate siege of Athens, and the blowing up of a powder magazine destroyed so many of them, and injured so many more. It was reserved for Lord Elgin to lay hands on them, and to cause their removal to England, and their sale to the then Government, and their final deposit in the British Museum, where they now are. Let it be recollected that when first brought to the Museum their colour had, perhaps, suffered but little: breakages and flaws there were in all directions, but they were all fairly in the same state as when taken down from the building for which they were cut. Of course they were not totally free from weather and time marks. During the time they have been in the Museum no change has taken place in them, with the solitary exception of their becoming—in this climate unavoidable—slightly darker in colour, no attempt happily having been made to restore them, or make up the deficient and broken parts. But, in an evil hour, it seems to have occurred to some one connected with the Museum that some process of restoration or revival might be advantageously applied to them,—not by the tampering with the *form*, but with the *colour* of them, and the unhappy consequence has been, that now nearly the whole of the slabs from the frieze have been subjected to some process of "cleaning," as it is termed,—in other words, by aid of some powerful chemical, chlorine, or alkali, or acid, these marble slabs, and not a few other things, have been thoroughly soaked, so to speak, in this powerful substance, and subjected to its dissolving powers, or powers of eating away the substance of the marble. By this process the polish produced by the chisel is almost totally effaced, and the close grain of the marble eaten into and made coarser. It is very difficult to make this marble-cleaning process clear to the mind's eye on paper, but it may be seen clearly enough—nay, but too clearly—in the "Roman Room" of the Museum, in the bust of Marcus Antoninus, where the fact of its having been washed is but too painfully evident. It may be also seen in the figure of a Satyr in the next room, close to the doorway. We mention these two objects especially, because the result of washing and cleaning is so strikingly evident, and because, when thus viewed, probably no one is likely to see anything in it but destruction,—total destruction, if repeated. The slabs from the Parthenon frieze have been treated in the same way, and the object has evidently been to remove the weather stains, the marks of age, the deepening tint which time always gives, and to make the marble look as if but just newly quarried. But to do this you must go deep into the substance of the marble block, and must remove something in the process, and that something is the fine marble polish and close grain of it, and something, too, and that not a little, of the subtle impress of the hand of the executive artist, and what is more than all, the peculiar and living flesh-like look of the marble surface always to be found in the genuine and untouched work of all the great artists who have made sculpture the means through which their artistic power has manifested itself. It is very difficult to see how destruction could be more complete of exquisitely fine and subtle work. All is not yet gone, though so much is: would it not be advisable to let what remains alone, and to be contented with simple washing with sponge and water? And be it observed that even this operation, simple as it seems, should

be done by a skilful and careful hand, and not by a mere "labourer" or ordinary "attendant." It is truly sad to see how things are going on at the British Museum. It is worth attending to; for the guns of the German army, if fired into the very centre of the great Louvre, will scarcely destroy more effectually than the British Museum system of "cleaning" statues and figures destroys!

But one thing more there yet is which is not only painful to see, but truly absurd, and one would like to know who suggested it. We refer to the system of putting works of marble and sculpture under glass, so that you cannot see them except through the medium of the reflections of skylights, your own face, the passing crowd, and the opposite wall. When we come to think that these sculptured slabs of marble have battled so well some 2,600 years of time and weather, and the hand of man, on the top of a high hill, in the middle of a great and famous city, and have yet come down to us with the impress still on them under glass to preserve them from dirt, and an enlightened English crowd in this nineteenth century of education and progress? What harm can come to them if left fairly visible and uncovered, and so that any may see the marble surface and the tool marks of the workman, and the evidences of the marble-cutting powers of the executive artist, of Phidias himself? What a change will take place in art when our influential art societies come to notice such ignorant ways as these, and to so far interfere as to at least protest against them. We are an art-educated and enlightened people, and the result of it is, in a great public institution like the British Museum, to first destroy as far as may be the splendid works of the past, and then to put them under a glass case, so that it is impossible to see them except through the medium of the reflections of an opposite wall or a passing crowd!

HEALTH AND HOUSE-BUILDING.

RETURNING to our reference to the proceedings at the Newcastle Congress of the Social Science Association, we give a portion of Mr. Rawlinson's address, as president of the Health Department. We will return hereafter to what was said by others with more special reference to Newcastle itself:—

So far as history illustrates or explains anything connected with the past condition of the masses of mankind, the story is one of utter State neglect in securing decent home accommodation. In ancient times the masses were slaves or worse than slaves, as ownership imposed some responsibility, but the free peasant has been for the most part utterly neglected, and was left to house himself as he could. This has been true of the past, and is also true of the present, over the entire surface of the inhabited portion of the world. It is true of country districts, it is also true of towns and cities, however magnificent they may be in their outward appearances. To describe the mud and bog cabins of Ireland, the huts of Scotland, and the cottages of England, would be to depict nests of foul air, of scrofula, of physical debility, and of moral impurity. The sanitary defects which exist in the lower class dwellings of Great Britain, exist in the lower class dwellings of every nation and people on the face of the earth. There are reports in abundance on English, Scottish, and Irish villages and towns, setting forth the facts in all their hideous details. Single rooms occupied by all the members of a large family, males and females; father, mother, brothers, sisters, and male and female lodgers (sometimes pigs and dogs), mixed in one nest of impurity. Poverty is not always the cause, and, if it were so, should this continue to be a satisfactory excuse? Will sanitary reports, describing the wretched abodes of the teeming populations, or sanitary rules and recommendations left to chance enforcement, avail in enabling the country peasant, or the town artisan, to follow the advice given? If the work of the State stops with reporting and recommending, may it of its action be termed "a delusion and a snare?" Poverty is recognised by the Poor Law, and property is made to bear the pecuniary burden. Sickness is recognised by private charity; hence the building and support of public hospitals, and charity is thereby made fashionable. Crime is provided for in the erection of gaols; and the maintenance of legal tribunals, and of punishment, becomes the work

and cost of the State. These arrangements are, at this moment, the outcome of civilisation in England. Sanitary legislation, it is true, commenced in 1848, and Act upon Act has since been piled up, one to mend the other, until confusion is the result. Men, "learned in the law," cannot even understand, and of course cannot interpret, these Acts. A Royal Commission, under the chairmanship of Sir Charles B. Adderley, M.P., has been taking evidence relative to sanitary law, and is expected to make a report, with recommendations, in time for the Legislature, in 1871. Whether Parliament will provide any practical remedy for improving human dwellings remains to be seen. Poverty of the occupant is a plea which may be put forth by the peasant in the country, and also by the labourer in the town, and which cannot be gainsaid. The unaided poor cannot provide their places of residence, but must exist in such as they find; the poverty of the individual is, therefore, an effectual bar to improvement by him,—he must take his health and his morals as provided for him by others. If born with an unsound constitution, poor-law taxation will, however, keep him. If example inculcates crime, he will oscillate in and out of gaol. The worst of the males learn crime, and live by it. The most tempted of the female portion of such families drift into prostitution. The wealth of the State is not saved by this mal-arrangement, a fact which has been explained over and over again. Defective house accommodation produces disease, immorality, pauperism, and crime from generation to generation, until vice has become a second nature, and morality, virtue, truth, and honesty are to human beings so debased, mere names. The money expended in relieving pauperism, in detecting and in punishing crime, and in supporting the sick, if properly expended, would provide sufficient funds to furnish improved house accommodation. Taking floor areas and cubic space into account, and the money expended within such spaces, it will be found that wretched dens of misery and vice are more costly to the community than any equal area and cubic space in a palace. There are tenements by hundreds of thousands which generate sickness, pauperism, and crime, the cost of which is paid for out of rates, and yet such property is not worth more than from three to five years' purchase; but the round of degradation is allowed to go on. Zymotic diseases cut down the head of a family. Typhus removes a father in the prime of life, and the family is then left to the care of the parish. "Once a pauper always a pauper" has become a proverb. Statesmen have, therefore, this lesson to learn,—namely, that that which is necessary to the well-being of society, and which individuals cannot provide, but which States can provide, must be the bounden duty of the State to furnish. No excuse can be valid. It does not follow, as an inference from these arguments, that States must build and own cottage tenements; but it may be inferred that States ought to frame laws, and provide means and machinery for enforcing such laws and regulations as are necessary to bring about the required improvements. State aid has been and is afforded in many forms, but upon no defined or settled principles. There are Exchequer Loan Commissioners, who, however, are only State hybrids—they are not a Government department, neither are they independent, but, being in connexion with the Chancellor of the Exchequer, they can advance State money on loan for various purposes. Parliament also by fits and starts votes money for public purposes outside strict Government requirements—as to relieve the Irish Famine, 1846-7; to drain agricultural land; to promote special occupations, as fisheries; to construct roads, canals, harbours, and river improvements; and to provide for the execution of sanitary works, as in Lancashire during the cotton famine. Corporations and local boards can also borrow money from Government for main sewerage, waterworks, and general improvements; but not on any simple, easy, and equal principle, and the rates of interest charged vary from 3 per cent. to 5 per cent.; also Exchequer loans are, as a rule, discouraged. The question may be asked, Should the State halt and stop on the threshold of so wise an arrangement as lending money to aid sanitary improvements? The money (1,750,000*l.*) lent to the distressed cotton district (1863-69) has been expended on works of a permanent and sanitary character; such as main sewers, house drains, forming streets and roads, constructing waterworks, and other works of local improvement, thereby securing to the inhabitants means to

enjoy health, comfort, and greater facilities for locomotion and trade. The advance of this money relieved local distress, at no cost to the State, because the local rates are mortgaged as security, and both the principal and interest (at 3*½* per cent.) will be repaid to the uttermost farthing, "within a period not exceeding thirty years." If Government would lend money at this rate of interest to enable parish authorities, town councils, local boards, improvement commissioners, and other similar public bodies, to improve dwelling-houses, to sewer, drain, construct waterworks, markets, &c., and to effect street, road, and other town improvements, the progress of the whole country in sanitary improvements would be rapid, and the Registrar-General would soon be enabled to record the beneficial results in his returns; pauperism would cease its alarming growth, and crime would be lessened. The first steps in sanitary progress are, as previously indicated, special examinations and faithful reports; and then remedial measures ought to follow. The inspections and reports in England have (to some extent) been followed by works, and, at the present time, the Local Government Act (1858) has been adopted in some 700 places, and the number is being added to. A sum of about 8,000,000*l.* sterling (exclusive of the metropolis) has been expended on the various works provided for by the powers of the Act, such as sewerage, draining, water supply, road and street improvements, &c. To put the whole of England in a similar sanitary state will cost about 50,000,000*l.* in addition. In round numbers, the sum of 2*l.* to 3*l.* sterling per head of the population under the Act may have been expended. Large as these figures appear when thus stated, the expenditure is (and will be) a relief and not a burden. House property is (and will be) increased in value, and in so far as causes producing zymotic diseases are removed, the ratepayers enjoy better health, earn fuller wages, and are, consequently, better enabled to pay the rents demanded. There are many persons, however, who do not appear to value health, if providing the means to obtain it touch their pockets. These persons in towns and villages are, small shopkeepers (in business or retired), small speculative builders, and owners of cottage property, generally owners of those of the worst class, which, on account of their badness, are relieved from paying rates, but in which fever and pauperism are manufactured with singular regularity, the parish relieving officer indirectly, but nevertheless regularly, paying the rents. Since the Crimean war, and the effective work of the Army Sanitary Commission, there have been commissions, inquiries, and reports, as to barracks and hospitals on home stations, and works have been carried out of sewerage, drainage, water supply, and of ventilation, the results being a great reduction in the sick rate, and a reduced annual army death-rate of about 8 in each 1,000.

In the cities of the Republican States of North America, the worst sanitary defects of the worst cities of Europe are being repeated. The sanitary engineer of the future will know nothing of "refuse matter" other than as a useful product, which, properly applied to the soil, will add to the wealth of the community. The aim and end of statesmanship ought to be to insure to every individual born in the State means of health and of morality. Each Englishman's home should not only be his castle, but his hospital. Charity will not then degrade, but will elevate; and that alone will be true charity which assists the poor to assist themselves, and so to live, independent of almsbegging and almsiving. We are now proud of our charities, of our public hospitals, which cost 1,000*l.* per bed, plus the additional expenses of administration, in which hospital-beds sick men are treated at a money rate three times greater than the wages they could ever earn when in health. "Our charitable institutions are the glory of our land," but happy will that State be which neither possesses nor needs such form of glory. We repeat at our great musical festival the angelic chant, "Peace on earth, good will to men," but we read in our daily papers of carnage such as the world never before knew; we cannot explain the terrible phenomenon, but stand aghast in dread, fear, and wonder. The war epidemic is upon the nations, and must run its course. Sanitary science under such conditions as are now in existence appears to have laboured in vain. But it is our duty to work in hope and wait. War and carnage are not the end of Christian teaching: we must strive to look beyond the present, and hope for

better times. The poet, using his divine faculty, states,—

"For I dight into the future, far as human eye could see,
Saw the vision of the world, and all the wonder that
would be."

And in another verse the same poet embodies the hopes of men, who believe in revelation and do not despair, in words with which I conclude this address:

"Yet I doubt not thro' the ages one increasing purpose runs,
And the thoughts of men are widen'd with the process
of the runs."

SOCIAL SCIENCE IN NEWCASTLE.

AMONGST the subjects discussed at the recent congress of the Social Science Association,

The Employment of Children in Brick and Tile Making,

was treated of by Mr. George Smith, of Leicester, who stated his own experience when a child, and continued:—

A sub-inspector of factories informed me the other day that he had visited several brick-yards in the Midlands, and found the children were of various ages, from nine to twelve, but mostly nine to ten. They were of both sexes, and in a half-naked state. Their employment consisted in carrying the damp clay on their heads to the brickmakers, and carrying the made bricks to the "floors" on which they are placed to dry. Their employment lasts thirteen hours daily, during which they traverse a distance of about twenty miles. It may be asked why the inspector did not interfere. He could not, the Act not applying to establishments in which less than fifty persons are employed. Any person visiting these brick-yards will soon discover the need for something being done for the poor little ones. Imagine a child of nine or ten, with features prematurely old, toiling from six in the morning until seven in the evening, and receiving nothing but curses and blows from the men because he is not quick enough in his movements. What is it but actual slavery of the worst description? No wonder many of these children find life a burden to them. Of course, the natural results ensue. Ignorance and immorality prevail to a fearful extent among the workmen and children so employed. How could it be otherwise? All goodness and purity seem to become stamped out of these people; and were I to relate what could be related, the whole country would become sickened and horrified. The employment of girls under the age of eighteen in brick-yards ought to be rendered illegal. The present system is a prolific source of immorality and vicious habits of the worst kind, even more so than the agricultural gang system once prevalent in some of the Midland Counties. Out of the many hundreds of brick-yard girls whose career I have personally marked not more than half a dozen have become decent and respectable wives. If we wish to remedy the evils to which I have,—very slightly, I fear,—alluded, a change must be made in the present system of Government inspection. At present brick-yards, employing less than fifty hands, are exempt from Government supervision. The absurdity of such an arrangement is obvious. In my own neighbourhood there are several brick-yards, one of which, having more than fifty hands, is under Government inspection; the others are not. In the larger yard, a lad of about twelve years of age was prohibited working by the inspecting surgeon: the very next day that lad was to be found employed in one of the smaller brick-yards, and working eighty-four hours in each week. Now, this is the kind of thing we ought to prevent. But a practical solution of the difficulty is to be found. All establishments, no matter how many hands are employed, should be placed under the Factory or Workshop Acts. The former Act should be made to apply to all light trades, in which the half-time system can be adopted; the Workshop Act being applied to those trades in which heavy manual labour is required, and in which the half-time system cannot easily be introduced. Under the present arrangement, it is difficult to tell under which Act an industrial establishment is to be placed.

On the subject of

National Prosperity and Social Security,

Mr. Francis Fuller read a paper. He stated, as a mischievous anomaly, that whilst, by the adequate application of labour to the cultivation of the waste lands in the United Kingdom, such

lands could be made to produce, with commercial profit, an annual value of at least 100,000,000L. sterling in ordinary articles of food, we pay foreigners in some years nearly 50,000,000L. sterling for the very things which could be profitably produced at home. At the same time, hundreds of thousands of people were in distress from want of work, hovering precariously about the narrow lines which separate indigence, pauperism, and crime; and notwithstanding our large imports from abroad, the greater portion even of the employed population were under-fed, and suffering from an insufficiency of the nutritive food which, if the measures advocated by the "Industrial Employment Association" were adopted, would be superabundantly supplied from our own soil. In this plan, Mr. Fuller maintained, would be found a satisfactory solution of the ominously increasing difficulties of the labour question. As connected with that question, he dwelt upon the urgent and imperious necessity of rescuing from ruin of soul and body the multitudes of the young of both sexes who are now growing up in the ways of all evil, to become hereafter the curses and cankers of the body politic. In agricultural pursuits, and the numerous branches of industry which come into operation collaterally with them, and an improved cultivation of the land, existed the only practically inexhaustible field of employment. By this policy the young would be trained to independence, and be enabled to gain a good livelihood at home, or become healthy, vigorous, and prosperous colonists.

The necessity for—

Legislation to prevent Adulteration of Food and Drink,

was urged by Mr. Philip Beavan.

After giving some valuable information as to legislation abroad to prevent adulteration, Mr. Bevan said, any fresh legislation on this subject should be compulsory in its character, and not permissive. All articles of consumption which are manufactured should have their ingredients declared, for there is a feeling prevalent amongst manufacturers, as for instance, cocoa-makers, so that as long as their articles contain nothing hurtful, they are at liberty to call them by the general name of cocoa. Still, a sophistication is, to a certain extent, a fraud, and every purchaser has a right to know what he is purchasing; and although we might be safe in the hands of the largest and most respectable manufacturers, there is a considerable class of unprincipled makers who are not above taking advantage. Differences of opinion sometimes occur as to the relative hurtfulness of certain common adulterants; and an eminent authority has assured me that he had grave doubts as to whether alum was not a good thing instead of a bad one. I would suggest that there should be a Food Sub-department formed, which should take cognisance of all food legislation and supplies. To it a Board of two or three of the most eminent analytical chemists should be attached, who should examine and pronounce upon all disputed chemical questions, and whose opinion should be law. The sub-department should have the election of, and a certain amount of control over, the county and borough analysts, whose appointment should be compulsory and not permissive; neither should it rest with vestries or corporations, many of the members of which are often largely concerned in adulteration. Inspectors should have power to visit and take samples from all dealers in articles of food, subject to certain checks, so as to prevent any risk of tyrannical domiciliary visits. They should also have the power of testing the supplies furnished to public bodies, such as union contracts; for guardians have frequently a habit of accepting tenders for food at a price at which the real article cannot possibly be supplied; as a London Union Board did the other day in the case of butter. In cases where a petty dealer declares his ignorance that the goods which he sells are adulterated, I should make the onus of proving this fall upon him, and then it would be for the Food Sub-department to take the matter up, and prosecute the manufacturer. When adulteration takes place before importation, as in the case of the Malo tea mixture, the department might well provide the machinery for setting consular and other influence to work to prevent it; and might also step in as the proper arbiter between conflicting interests. In this very case, a great fraud on the public was allowed to go unpunished, because the Customs could not legally forego the duty.

As to offences, when proved, I am no believer in either a very small or a very large fine; but I would have no sliding-scale at the option of the magistrate. For the first offence the penalty should be sufficient to make the offender smart in his pocket; for the second, I would double it, and have an *affiche* detailing the offence put outside his door, as also outside the door of the church, police-station, and townhall, for a month. The case should also be advertised in the local papers at the offender's expense. For the third offence there should be imprisonment for one month, with hard labour. Adulteration is either a fraud, or it is not, and it should be punished like any other cheating.

Sewage and Sanitary Works.

Mr. J. Brierley, C.E., of Blackburn, read a paper on "Sewage and Sanitary Works," setting forth the result of his observations, and making a series of suggestions which that experience had given birth to. In laying out a sewerage scheme, he remarked that a close inspection in detail of the whole district was necessary, taking into consideration the population and probable increase, the death-rate, the rateable value past and present, prevalent trades, existing works, amount of rainfall and water-supply, and the geological features of the district. He laid down the following doctrines:—The whole scheme should be laid out, although executed only in sections; main outfalls should be as few as possible; each drainage area should be treated as a separate district; a careful study of the size of sewers would save expense; circular sewers are better than oval up to 2 ft. diameter; to save cost storm outlets should be provided with self-acting overflow; subsoil waters should enter sewers by junctions; the separate system is not generally practical or desirable, because subsoil water and rainfall help to flush the sewers, though excess would reduce irrigation power. Legislation to prevent steam pollution is imperative; transferring solid matter into streams ought at once to be prohibited, but reasonable time should be allowed to intercept all sewage. Sewers should be constructed of earthenware pipes up to 21 inches, above that size of bricks; should be laid down in straight lines, and freely ventilated, to render the gases innocuous. Scavenging and night soil removal should be done by corporations, and not farmed; ash-pits should be covered, and kept dry; excreta and other rubbish should be kept separate, and cleansing must be frequent; water-closets must be provided with an ample flush of water, good ventilation, and efficient drainage. Public water-closets and conveniences might be placed underground in large cities. Each community of 30,000 and upwards should have a medical officer of health; inspectors of nuisances should be intelligent, and large communities should be divided into districts, and furnished with an inspector for every 10,000 inhabitants; the death-rate statistics should be localised, so that disease manufactories might be fixed on, and improved off the face of the earth. Mr. Brierley illustrated his paper by excellent drawings of works carried out in accordance with his theories.

The Labour Market Question.

Mr. E. W. Holland read a paper on the question, "By what means may the labour market throughout England be more equally supplied, with special reference to local and temporary distress?" After describing the difficulties at present experienced both by the employer and employed in meeting with each other, and laying stress upon the helplessness of ordinary labourers in the matter of finding where work was to be obtained, Mr. Holland went on to recommend the establishment of a national system of labour registration upon a self-supporting basis. He could not advocate, as some persons had done, that the machinery for this purpose should be supplied by the Poor Law, because that would tend to make labourers fall upon the rates for support, and, finding no Governmental agency exactly suited to the work, they came to the conclusion that the Post Office was the best agency that could be at present fixed upon. He looked forward to the day when the Government provident institutions would be extended and erected into a separate department, which would then most suitably undertake the registration of labour. Till that time arrived, the Post-office must keep the labour registers. The registers kept in the various districts should be sent up to the central office, and there compiled into a labour gazette, which would supply the most valuable information as to the state of

the labour market all over the country. A provident travelling fund for workmen should be established in connection with the registration scheme; and it might be advisable to bring pressure to bear on the railway companies to pass such workmen to their destination at reduced fares. Proceeding to discuss the question how under existing circumstances the workmen's usual difficulty in supplying his means of transport to any given field of labour might be overcome, the writer affirmed that employers in want of hands would usually willingly advance money for their support, provided they were certain of the ability and good character of the men, and could rely upon their remaining at their employment sufficiently long to remunerate their employers for the trouble and expense incurred. He further recommended such a legislative change as would enable boards of guardians, under certain conditions, to migrate labourers who were dependent on the rates for support. One of these conditions was that notice should in all cases be sent to the Union into which the labourers were to be migrated.

FIRE-WARNINGS AND FOREWARNINGS.

LONDON has narrowly escaped what might have been a terrible calamity; and thoughtfully and deliberately, after a careful inspection of the scene of the fire in Shoreditch, we assert this conclusion. Coincident almost, a series of fires has taken place east and west of the City; but amongst the number none present more remarkable features than does the one at Shoreditch. The locality of the calamity is rather low and thickly populated. The streets leading to it and adjoining are narrow, and very many of the houses in the vicinity date back a century and a half. Newcastle street, as appears from a tablet inserted on one of the houses, dates from 1765; and Old Castle-street—the street where the fire broke out—presents at one end a series of gable-fronted houses, having all the appearance of being raised two hundred years ago. In the immediate vicinity of the timber-yard where the fire broke out, and ranging along Mount-street, the houses are modern, and wretchedly constructed.

The timber-yard was well stocked, as may be inferred even now from the charred *débris*, which rises several feet high. We have often noticed through the City a system pursued by timber-merchants and dealers in sawn timber, which we consider an evil. Many of these timber-yards are very narrow and confined, some of them hardly the breadth of an ordinary house. To compensate for frontage, the plan is resorted to of raising a framework of naked flooring and joisting. The timber is piled, and often it may be seen projecting several feet over the street, as well as rising several feet above the roofs of the houses. This is a common sight, and it may be seen in many back streets and low neighbourhoods. The facilities given to ignition by sparks from chimneys, where thinly sawn wood, almost veneers, are exposed, are apparent. In Shoreditch between twenty and thirty houses have suffered by the fire, the majority of which have been completely gutted of their doors, windows, floors, and roofs. We passed through most of the houses affected by the fire, and, were we drawing up an ordinary newspaper account, we might conjure up many a saddening picture of loss and destruction, of hair-breadth escapes from burning, of household gods, animals and manimats, reduced to cinder. Birds, rabbits, poultry, and, in one instance, a sterner nature than Sterne's could be furnished with the sight of a poor man's dead donkey to moralise or weep over. The poor tenants of the six houses destroyed in New-street escaped with the exception of two, but lost their all,—their household effects, and their little stock-in-trade. It was lucky, indeed, that the fire did not take place some hours later. Had there been a strong wind the engines that were brought to play upon the fire would have been totally insufficient to stay the destruction. Another timber-yard was just the breadth of the street away from the one where the fire broke out. It narrowly escaped the conflagration; as it stood, it was slightly affected, but happily it was saved. Mild as the night was, portions of the burning mass were drifted a quarter of a mile distant, to High-street, Shoreditch, where the roof of a tavern was set on fire, and to which some of the engines engaged in putting out the first fire had to be draughted. House property, occupying a space of about 200 ft. square, has been injured, and the escape of more

appears to us truly wonderful. The poor have lost their all; but it has been lucky indeed, considering the nature of the fire, and the remarkable manner in which it has worked destruction. The old half- and almost whole-timbered houses that line Bishopsgate-street, and intersect a large portion of Shoreditch and that quarter, are little better than so many powder-magazines or huge boxes of lucifers. Any one can prove the truth of our assertion if he will but visit the scene of the removals that are now going on in Bishopsgate and Shoreditch, to make room for the Great Eastern Railway Extension.

A more complete organisation of the Fire Brigade is wanted. If the City is left depending on a non-effective daytime service, we shall charitably add, May God help the City! There is no reason at all, except that of false economy, to prevent the City from having a complete and active embodiment of force for the daytime as well as the night. The loss of life and property in Liverpool-street is more or less owing to the want of men at the Fire Brigade Station. The help of the public, though acceptable at times, more often proves an incumbrance to disciplined men, who are so prevented from doing their duty. Let us impress it upon the minds of the citizens of London that the fire that was extinguished in the last days of September in Shoreditch, under more adverse circumstances might have swept, with an uncontrollable fury, over a large extent of the east of the City. Let us be warned in time.

THE LAST NEW THEATRE IN THE STRAND.

OBSERVANT passengers in the Strand will notice a frontage near the corner of Newcastle-street, marked as the "Opéra Comique," and, knowing the narrowness of the area between the Strand and Holywell-street, will find it difficult to imagine how, even in London, where now-a-days theatres are wedged in among the houses anyhow, an "Opéra Comique" can have been formed there. In truth, however, this doorway is but an approach to an underground way leading across Holywell-street, to a theatre which has been built between that and Wyck-street, on a site still so small as to prevent anything like proper stage accommodation, but at any rate larger than was obtainable in the Strand. It backs on "The Globe," and is to a considerable extent underground, as will be understood when we mention that a long flight of stairs in Wyck-street leads down to the stage level, and that the pit, of course, is lower than that.

The auditorium promises to be pretty enough, the painted decorations include a considerable amount of figure-painting, Apollo and the Muses, of course, figuring over the proscenium; but we must wait to see it further advanced before we offer any opinion upon its merits. The floor of the house, so to speak, looks as if it were intended wholly for stalls, and has a tier of boxes round it, with a slightly-raised level.

The name is altogether a mistake, unless the building is really intended for French comic operas. Even if it were put into English, it would be too restrictive, or would become absurd.

SETTLED CLAUSES OF CONTRACT.

DURING the last two years the council of the Institute of British Architects have been in communication with a committee of London builders on two subjects of great importance, 1st. As to "General conditions of contracts," which might be fair to builders as well as to employers. 2nd. As to the habit that some members of the profession had fallen into of having quantities taken out in their own offices, or by a surveyor nominated by themselves, and yet declining any responsibility as to the sufficiency of such quantities. After several meetings an agreement has been come to, which will be found in the following paper:—

"General Heading for Clauses of Contract, as settled between the Council of the Royal Institute of British Architects and the Committee of the London Builders' Society.

1. Contractor to provide everything necessary for works as per drawings and specification, or to the true intent and meaning thereof; and if drawings and specification differ, architect to decide which to be followed.

2. Contractor to conform to general acts, re-

gulations, and bye-laws, relating to buildings; to give notices thereby required to be given to local authorities, and pay fees payable thereunder.

3. Contractor to set out works, to rectify errors, provide appliances, and to produce vouchers proving materials to be as described, and genuine, when required. The contractor to provide plant, labour, materials, &c., required. All materials and workmanship to be the best of their several kinds. To leave all perfect and clean.

4. Contractor to keep on ground a competent foreman; and to be supplied with a complete copy of drawings and specification, by the architect or measuring surveyor. Not to sublet without consent.

5. Architect to have at all times access to the works, which are to be entirely under his control. He may require contractor to dismiss any workmen incompetent or misconducting himself, and thereupon the contractor is to do so.

6. Contractor not to deviate from drawings or specification, or execute extra works, unless required to comply with the aforesaid acts and regulations or bye-laws, or unless upon authority of architect, to be shown by written order, or by plan or drawing expressly given and signed, or initialled, as extra or variation, or by subsequent written approval, signed or initialled. Vouchers for all such extras to be delivered to the architect or clerk of works weekly, in case of day-work. No day-work to be admissible unless so ordered, or for work impossible to be measured.

7. Alterations in or additions to works not to vitiate contract, and if no price be agreed, the value thereof to be added to or deducted from contract, according to schedule of prices or fair measure and value.

8. Work and materials brought on ground to be considered property of employer, when included in any paid certificate, and not to be removed without architect's consent; but employer not to be liable for loss or damage thereto.

9. Architect may require such materials to be removed as in his opinion are not according to specification, and others to be substituted; and, in case of delay, the employer may remove same, and substitute others at contractor's cost.

10. Architect may require work in his opinion executed with improper materials or defective workmanship to be re-executed; and, in case of delay, may cause same to be done at contractor's cost.

11. Faults arising from improper or defective workmanship or material within — months after completion, to be made good by contractor; and, in case of default, employer may recover costs thereof from contractor.

12. Contractor to insure, in office to be approved, in joint names, in half amount of contract, until works covered in, and thenceforth in three-fourths until completion, and to produce policies and receipts for premium. Moneys received to be applied in rebuilding or reparation. In case of neglect, employer may insure, at contractor's cost.

13. Building to be under contractor's sole charge, who is to make good damage by fire, or from causes under his own control; and to hold employer harmless as to injuries to persons and structural damage to property.

14. Employer to have access to building, and may execute other works, for which contractor is to give reasonable facilities, so that his work be not impeded; contractor not to be responsible for damages to or occasioned by such other works.

15. Works (except painting and papering), to be completed in — months after commencement, unless in case of inclement weather, causes not under the control of contractor, combination of workmen, strike, or lock-out affecting any building trade, in which case architect to extend time, and contractor to complete within such time as the architect shall consider reasonable and in writing appoint. In case of delay, employer to be entitled to £ — per week as damages, if architect shall in writing certify that works could have been reasonably completed in the time appointed.

16. If contractor becomes bankrupt, compound with or make assignment for benefit of creditors, or suspend or delay the works (except on account of causes mentioned in Clause 15, or on account of proceedings by parties interested in adjoining properties, or for want of proper instructions duly applied for), employer may require works to be proceeded with; and if requisitions be not complied with for — days, may enter and com-

plete works,—the cost incurred to be repaid by the contractor.

17. Contractor to be paid, on certificate of architect, and at architect's discretion, during the progress of the works, as previously agreed, 80 per cent. of value of works executed, until balance of per centage equal 10 per cent. on contract sum, and thenceforth to be paid full value. When works completed or possession given up, contractor to be paid moiety of balance of moneys payable to him (except £—, for papering and painting), and the remainder — months from completion of works or giving up possession.

Provided always that no final or other certificate shall cover or relieve the contractor from liability as defined in Clause 11, whether the same be noted at the time or subsequently to granting such certificate or order.

18. Certificate of architect or award of referee showing amount payable to contractor, to be evidence of completion, without prejudice to liability of contractor to make good defects as aforesaid. The sum reserved for painting and papering to be paid to contractor on completion thereof.

19. If employer make default for — days in payment of any moneys due to contractor, or if works be delayed for — months by proceedings of adjoining owners, contractor to be at liberty to suspend works, and require payment for works executed, materials wrought up, and loss on goods or materials purchased for the works, and not to be bound to complete contract.

20. Arbitration Clause. — with regard to quantity or value of extras and omissions, or variations on the contract, and questions of delay, or the withholding of certificates, or the true intent and meaning of the drawings and specification as to cost,—the arbitrator being an architect and a Fellow of the Royal Institute of British Architects, agreed to by the parties, or appointed by the president (for the time being) of the Royal Institute of British Architects. The arbitrator to award costs between employer and contractor.

Memorandum.—In cases where the quantities are provided, it is recommended that, unless a surveyor be mutually agreed upon by the architect and builder, two surveyors be employed to take off the quantities, one appointed by the architect, and the other by the builder, at a meeting convened for the purpose."

THE NEW MECHANICS' INSTITUTE AND SCHOOL OF SCIENCE AND ART, KEIGHLEY.

THIS new institute and school, of the design of which, by the architects, Messrs. Lockwood & Mawson, we gave an engraved view and full details in our last volume, pp. 527-9, was formally opened last Friday with a distinguished gathering, and various musical and other ceremonies, followed on Saturday by a *soirée*, and on Monday by a concert.

The edifice is Gothic in style, built entirely of stone, with ashlar quoins and dressings. It stands at the angle formed by the Skipton-road and Cavendish-street, and is a conspicuous addition to the public buildings of the town. The estimated cost was 12,000*l*. The institution is designed as an industrial college for the Keighley district. The building is a very complete one for its purpose, and the educational scheme of the promoters has developed into a still more practical shape since we described its details. The Endowed Schools Commission, on making their inquiry at Keighley in reference to the reorganisation of the grammar-school, were so impressed with the arrangements and general scheme that they decided to turn the grammar-school into a girls' school; hand over the teaching of boys to the new trade-school; and hand over also one-half of the grammar-school income, to be appropriated in the form of scholarships and in other ways that will increase the efficiency of the trade-school. The grammar-school income is but small, and for some time from 100*l*. to 150*l*. a year is as much as can be expected from it; but the arrangement seems a good one.

Of the edifice as built we may give some description. The architectural arrangement has been made subservient to the requirements necessary to unite the large public lecture-hall and the smaller rooms of the Mechanics' Institute. In the grouping of the elevations, advantage has been taken of the different heights and forms of the rooms to produce externally a

picturesque effect. The principal front, towards Skipton-road has seven large pointed windows opening into the great lecture-hall. The main entrance is under the tower, which rises to a height of nearly 100 ft., and serves to unite and yet to distinguish the double block of buildings. The Cavendish-street front has gables at each end, with traceried windows and a range of pointed windows between. The centre of this front is relieved by an octagon window terminated by a projecting roof. On the ground or principal floor the institute has the more important rooms, consisting of a reading-room, 28 ft. by 18 ft.; conversation-room 18 ft. by 17 ft.; library, 33 ft. by 18 ft.; news-room from the south-west angle of the building, 33 ft. by 20 ft.; also bank-room, secretary's office, and committee-room. The lecture-hall is 87 ft. by 44 ft. and with a wagon-headed and panelled and boarded ceiling, and will be common both to the institute and school of art. It will seat about 700 persons. On the upper floor the school of art has an exhibition-room, 46 ft. by 23 ft.; mechanical-room, 32 ft. by 22 ft.; painting-room, 30 ft. by 18 ft.; elementary drawing-room, 40 ft. by 18 ft.; also masters' room, ladies' room, and retiring-rooms and lavatories for each sex. The lighting of the painting-room is from the north, and of the exhibition-room from the top. A gallery opens out into the lecture-hall from the landing of the principal staircase, giving accommodation for about 100 persons. The whole of the basement story (which, from the nature of the ground, is clear on all sides) is occupied by a range of class-rooms, eight in number, including one 50 ft. and 18 ft.; a lecture-theatre, 28 ft. by 18 ft.; and a residence for the hall-keeper. Separate entrances from this story are provided. The building is so arranged that the mechanics' institute, the school of art, and the lecture-hall may be in operation at the same time, and yet not interfere with each other. All the rooms are lofty and well ventilated, and are warmed with open fires or hot-water apparatus. The works have been executed by the following tradesmen:—Mr. John Smith, the masonry; Mr. R. Sugden, the joiner's work; Mr. John Schofield, the plumbing and glazing; Mr. B. Dixon, the plastering; Messrs. Clapham, Bros., the ironwork; Mr. T. Wilson, the slating; and Mr. H. Briggs, the painting. The original amount of the contracts was 9,434*l*. 3*s*. 6*d*., and including the price of land, the architects' commission, &c., the total cost will be about 13,000*l*.

ARCHES UNDER PUBLIC WAYS.

SIR,—Admitting the dubious language of the "Act of Parliament,"—*lapsus calami*,—I think there can be no doubt as to the intention of the Legislature that this was a special fee of 10*s*. per arch; in fact, it involves a manifest absurdity to assume any other intention, as each arch is a complete structure or building in itself, and I fancy it really cannot be argued that an indefinite number of arches may be erected for 10*s*., and at the same time that the fee for one is 10*s*.—a distinct *non sequitur*. Again, it can hardly be deemed an excessive fee. The lowest fee under the Act for any building or structure, descending to a W.C., is 15*s*.. If built as an office-building at the back of a house, as a coal-house, this is the fee to which it would be liable.

A DISTRICT SURVEYOR.

THE NEW YORKSHIRE CLUB, YORK.

FOR two years past a new house has been in course of erection for the Yorkshire Club, near Lendal Bridge, in York. The new structure, which was opened for the accommodation of the members of the club on Tuesday in last week, is a large one. The edifice has been erected in accordance with the drawings and designs of Mr. C. J. Parnell, of London, architect. The architecture is Elizabethan. The portal is supported by polished Aberdeen granite columns, and the building is approached by a flight of steps. The ceiling is lighted by glass domes. The principal hall is of large dimensions, and contains the cloak-room, porter's screen, and the principal staircase, the landings of which are supported by arches and columns. On the ground floor are the dining-room, morning-room, smoking-room, and billiard-room, with lavatories. The staircase leads to the private dining-room, drawing-room, library, and writing-room, with a suitable number of dressing and bath rooms. The serving-room on each floor is supplied with a lift from the cooking kitchen. The

superintendence of the building devolved upon Mr. W. Lewis, the clerk of the works during the erection of the club-house, but who is now following the profession of an architect. The contractors were Messrs. Weatherley & Rymer, builders, of this city; and the painting and decorations were executed by Mr. Perfect. Mr. Prudames supplied the gasfittings; the globe ventilating light was by Hammond, of London. The carving was executed by Mr. Ruddock, of London. The plumbers were Messrs. Hodgson the plasterer, Mr. Rawling; and the bellhanger, Mr. Tryer. Mr. Sanderson supplied the ironmongery furnishing. The kitchen was fitted up by Mr. W. Walker, iron-founder, Walmgate. The principal rooms, which are of large size, have been furnished by Messrs. Howard & Son, of London.

THE DESTROYED CRYPT, LEADENHALL-STREET.

PREVIOUS volumes of this journal contain views of the few ancient crypts that are to be found, or were to be found, not long ago, in London, and we have thought it desirable to add to them an illustration of the crypt recently destroyed in the City, from a rough sketch made not long before this occurred. This interesting relic of Old London was situated at the south-east corner of Leadenhall-street, near to the well-known Aldgate pump, and, as some of our readers will remember, was periodically "discovered" by writers in the newspapers and described. The shop, to which it formed the basement, has been removed to increase the width of the approaches here, and the desired level of the new pathway and road was thought to render necessary the destruction of the vaulting. It seems to us regrettable that some other course was not adopted, so that it might have been preserved,—at any rate, in part.

Little is known of its history. In plan the crypt was a parallelogram, being 46 ft. from north to south, by 17 ft. east and west. It was divided into two aisles, as shown in the view, by clustered columns, from the caps of which sprang the vaulting. At the intersections of the groins were bosses, cleverly executed. The arched vaulting was received against the walls on semi-clusters, corresponding with the centre groups. The bases of the columns were about 10 ft. below the surface seen in the view. The opening with the steps led from the street, but the archway on the right communicated with the upper floor by means of a circular staircase. There were large cellars near, but not of the same period.

PROPOSED MONUMENT IN ATHENS TO COMMEMORATE GREEK INDEPENDENCE.

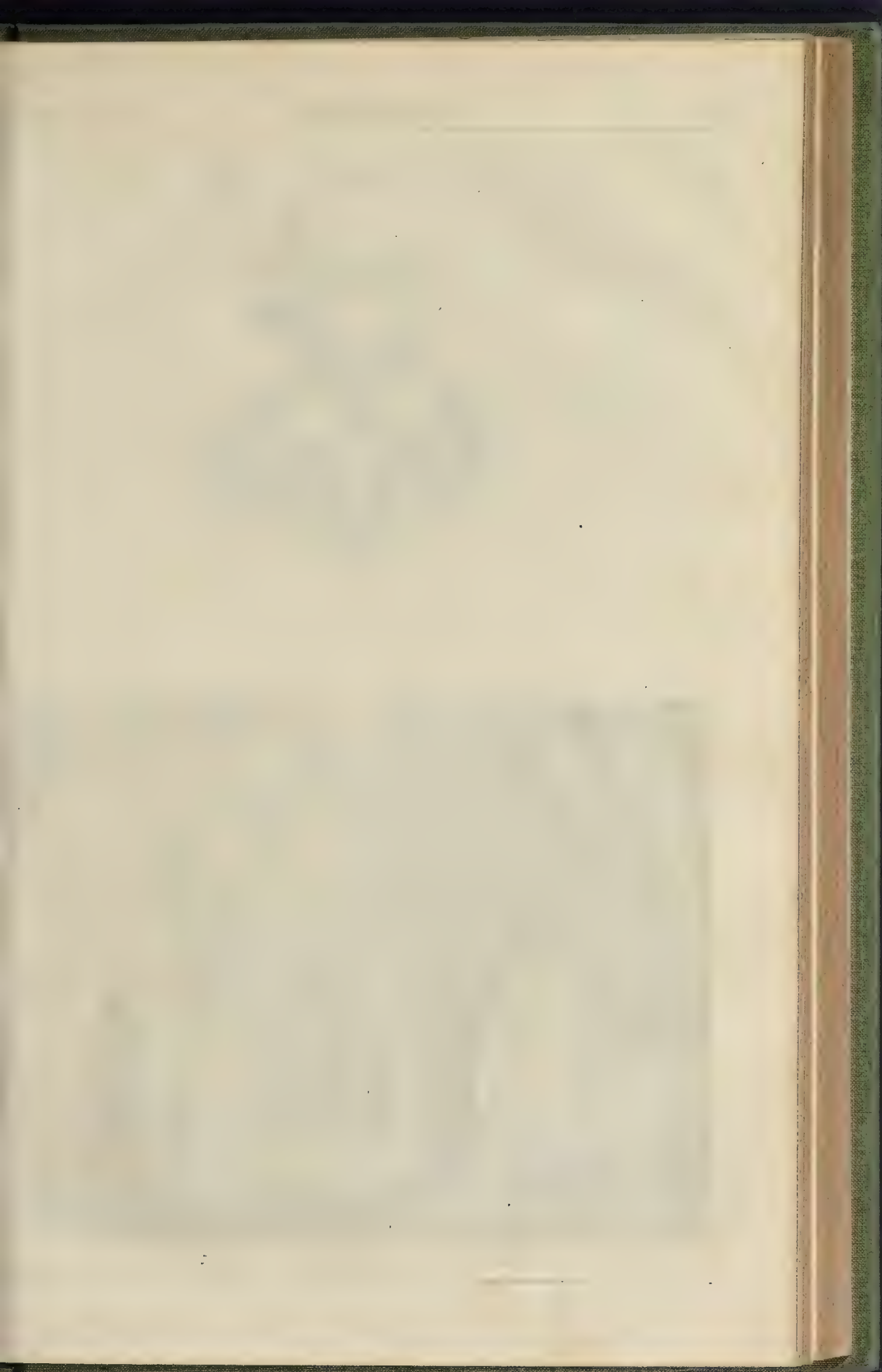
ON the anniversary of the declaration of the independence of Greece this year, King George announced his intention to erect a monument to commemorate the event in the Square of Concord, at Athens. And he charged Mr. Ziller, the architect of the Academy, to prepare a design for carrying into effect the project of a monument which his Majesty had formed. This design we now publish.

The principal figure on the summit of the monument represents Hellas. The four seated figures on the base represent the four territorial divisions of the Hellenic kingdom,—Northern Greece, Peloponessus, the Archipelago, and the Ionian Islands. The circular frieze round the base is composed of the most memorable scenes of the history of Greek independence. Among these representations are,—Germanos, the archbishop of Patras, raising and blessing the standard of independence on the 25th of March (6th of April), 1821; the siege of Mesolonghi, the battle of Navarino, the arrival of Capodistrias, and the landing of King Otto.

Two inscriptions are placed on the column. "The Nation to its Liberators." "Union gives Strength." The monument will be of pure Pentelic marble, 60 ft. high, occupying a commanding position, visible from the six principal streets of Athens, and at the termination of that which runs in a straight line from the Piræus.

The foundation-stone will be laid next year on the fiftieth anniversary of Greek independence. Invitations will be sent to the Greeks in every part of the world to attend the ceremony, which, it is hoped, will inaugurate a period of future progress as well as commemorate past glory.

The monument is to be raised by subscription, and subscriptions will be received by all the Greek consuls.





MR. CUYPERS, *Architect of many Churches in Holland.*



THE DESTROYED CRYPT, LEADENHALL STREET, LONDON.



PROPOSED MONUMENT IN ATHENS TO COMMEMORATE GREEK INDEPENDENCE.
MR. ZILLER, ARCHITECT.

STRASBOURG.

HONNEUR AUX SUISSES!

THE horrors of the assault are over. To those only who have experienced the existence in a besieged city can the realisation of the miseries endured be possible. We have listened long to the painful repeatedly-told account from the lips of those who escaped when once escape became practicable, after the commencement of the bombardment that inaugurated the *fête* of Napoleon, of the first sound of missiles whizzing over their heads, like the ascent of rockets,—a whisper compared with the sound that followed of the monster bombshells bursting on roofs, shivering the slates and timbers for 4 ft. in circumference into splinters no larger than lucifer-matches, tearing away in their descent one side of the wall of an apartment, and igniting all around on their landing on the ground. Then came the resorting to the cellars of their houses, carrying their all that was valuable or transportable, barricading every window with beds to dull the din without and protect themselves from the chance balls that might reach them, the staircase forming the only means of ventilation and egress of smoke. Here they awaited some means of rescue or escape from the doomed city. Then, when the increasing fire began at midnight, made doubly awful by the darkness, and the poor sufferers felt as if translated to the infernal regions, escape, at all risks, alone occupied their thoughts. Some few French families accomplished this, with the Germans leaving the town. Their proximity to the German frontier, and the hitherto amicable intercourse between the two people, in this city had almost necessitated the free use of the German language. Hence their escape as Prussians. But the helpless, the aged, the women, and children, these were still left, their lives momentarily endangered, and the prospect of famine before them.

It has been to the Swiss that their deliverance has been due. All honour to the kind-hearted little Republic! A deputation from Zurich, Basle, and Bern petitioned the Prussian and French Governments for permission to enter the city and offer gratuitous hospitality to all who would accept it. And convoys of Strasbourgeois were brought into the principal towns of Switzerland, there to receive unbounded care and kindness. The contributions from every canton have been very large, more than 100,000 francs already subscribed, independent of offers of every kind of hospitality. Not more than 2,000 profited by this generous offer. Many of the most needy remained, preferring at all hazards to cling to their little all, in hopes of saving it at the end, rather than leave it to the invaders; others in hopes of gain when chance of pillage came. The Jews also appear to have remained in their quarter. The accounts of the ruined and battered state of the houses as given by one of the Swiss committee, who entered to escort the refugees, is very heartrending. The sympathy of the Swiss nation for the Strasbourgeois has existed for many a long year. In 1256, they were both Imperial cities, members of the Rhenish League. Their old friendship was renewed in 1456, at a somewhat original trial of skill of archery performed from boats, on the rivers Limmat, Aar, and Rhine. On this occasion the Zurichers, to express the promptitude with which they would come to the help of their friends the Strasbourgeois should they ever need their aid, presented the latter with an iron pot of soup, still hot, that had been cooked at Zurich. The "Marmite" was placed with great ceremony in the Bibliothèque of the town; and, may be, it may still be found intact among the precious embers, a type of indestructible friendship.

In 1530 the towns of Zurich, Bern, and Basle again joined with Strasbourg to protect their Protestantism, in alliance with the Elector of Hesse. In the religious wars of Switzerland in 1529, Strasbourg mediated between the belligerent Catholics and Protestants, and one of the conditions of peace enforced in 1531 was the renunciation of the friendship of the Zurichers and Strasbourgeois.

The good understanding was renewed between the two cities in 1576, by a repetition of the presentation of the "Marmite." In 1584 Zurich and Bern made an alliance, offensive and defensive, with Strasbourg against its bishop. In return, the latter citizens fought bravely with the Swiss in the Burgundian wars, and in the battles of Nancy and Morat. In 1681, when Louis XIV. surprised and annexed the city to France, the Swiss, powerless to aid their friends by arming, strove to aid her by mediation. The

custom of international *fêtes* has continued, and happily been substituted for manifesting the friendly feeling between the two people. But two years since, a miniature copy of the "Marmite" in enamel and gold was presented by the Zurichers to the Museum of Strasbourg. Basle also had received aid in her hour of need from the now distressed city. In 1356 the former had been almost entirely destroyed by an earthquake. The latter not only offered hospitality to the houseless, but gave them still more tangible help by calling on their neighbours of Fribourg, Colmar, and Mulhouse, to aid them in rebuilding the fallen city.

Amid the accumulated horrors of war, this little sketch of enduring kindly feeling and practical tangible friendship between two peoples,—the one reduced by the treachery and incapacity of their rulers to the depths of misery, left alone to struggle through hopeless abasement; the other, peaceful, simple, kindly, coming to their aid, vying with each other in proffers of open-hearted hospitality and sympathy,—may tend further to exhibit the merits and sterling worth of the Swiss.

Lausanne.

OPENING OF THE NEW REREDOS AT HORNCASTLE.

ANOTHER of the works lately done in the parish church of Horncastle has been completed, and was unveiled at the Harvest Thanksgiving services. The screen is in Caen stone. It was designed by Mr. C. Giles, of London; and sculptured by Mr. J. Forsyth, also of London. It is in the Perpendicular style of architecture, but of so free a character as to harmonise with the decorated east window. There are five niches; the centre one filled with a representation of Our Lord's Agony in the Garden, the Saviour being accompanied by two angels in *mezzo relievo*, one bearing the symbolic cup, the other ready to place a crown on Our Lord's head; over this niche is a canopy ornamented, the whole being surmounted with a cross. The other niches are filled with effigies of the four Evangelists, and between the canopies over them rise enriched pinnacles. Pillars of polished marble of various colours uphold the canopies, and beneath are panels filled with diaper work consisting of escutcheons. We believe it is intended to have the sculpture tinted at some future time.

WEAKNESSES IN THE SEMI-DETACHED VILLA.

SIR,—Is the improvement in the arrangements of the semi-detached villa beyond the resources of architecture? The question arose during a stay in one of the villas near London: villa and suburb both typical. I visited numbers of these erections, and, with the exception of a few details, the arrangements were identical. Judging from the class who live in these villas, and from the frequent adverse criticism on them in current literature, one would conclude that better plans would be appreciated, and, what is of more account to the builders, would pay. An infinity of ingenuity has been bestowed on labourers' cottages, while none appears to have been bestowed on small villas, notwithstanding there has been so much demand for it. The villa that has caused these remarks, and which appears to be a type of its class, has a frontage of 25 ft. What is called the ground-floor is more nearly the first floor, being generally about 6 ft. above the ground line; the front and garden steps causing much work, and being dangerous for children. There are generally eight rooms, two on each floor. For this sized house, two reception-rooms, of about 260 ft. superficial, ought to be sufficient accommodation, but we have instead two rooms on this floor of about 12 ft. square. It is true there is generally a small room in the basement called a breakfast-room, but the proportion of three reception-rooms and four bedrooms appears absurd, resulting in there not being one reception-room of convenient size. The reason for this is evident, the designers having too much room in the basement for the kitchen and its offices, evade difficulty by calling the spare space they do not know what to do with in the basement "a breakfast-room." In practice I find that plans, that show places where "nice cupboards" can be put, are deficient in compactness. The back garden, usually already small enough, is further filled up at the back with coal-cellars, dust-bin, &c. There ought to be no such depressing objects visible from the

back windows, but the garden should come quite up to the back wall of the house. The W.C. is generally placed prominently in the thoroughfare from the living-rooms to the kitchen, and the servants' W.C. is sure to be a nuisance. The pantry is placed anywhere, and without thought as to convenience. The sanitary arrangements are generally of the obscurest.

These are a few of the defects of these dwellings; perhaps if you gave prominence to them in your journal, it might be the means of eliciting some valuable suggestions for their improvement.

INQUIRER.

SASHES.

SIR,—I am glad to see that this subject is attracting a little attention. The idea of Mr. Ambrose seems to me to be too complicated, and too expensive for general use; and the inconveniences of the present system suggested by "M. H." are similar to what I pointed out in my letter of the 3rd ult. He needs not wonder why we do not adopt French casements. I have used a good number of them, and I consider them to be equally as troublesome as the ordinary sashes, and quite as liable to let in the wet and draught. The most useful place for them is for ingress and egress from a back parlour to a conservatory or garden of a villa residence. As "G. L." seemed anxious to know the system I would adopt to obviate the inconveniences of the present mode, I will now put it in this form. Supposing a good practical carpenter and joiner should be out of work, or have spare time on his hands (which many have had of late), and who may have saved a few pounds when the trade was brisk, a few years ago, by being a very steady and careful man: he does not like that his time should be utterly lost; so he determines within himself to make a few doors, and sashes, and frames for sale; or he may have the idea at some future time of building a house for himself. He starts making his sashes and frames on the system now in general use,—double-hung sashes, with balance-weights,—and having a pride in making his own, being bound to no order or specification, and knowing the difficulties he has had, or has seen others have, in hanging sashes (in some cases in having to take out the parting slips, to make room for the weights; in others door-brads or 2½-in. nails frequently driven into the middle of the linings right in the way of the weights by labourers, in nailing up sacks or hair-bags, to keep out the wind, rain, or frost). These little difficulties he will try and prevent as much as possible. He will take care to give sufficient room to allow his weights free play. It may enter his mind, if he is making them for his own use, "Why need I have any weights?" Various plans may revolve in his mind how they may be hung without them; but all are more or less complicated; and then he thinks there is no necessity for any of these complications. "My sashes," he says to himself, "are of equal size and weight, with the trifling exception of the extra depth of the bottom rail, and as for that, the slight friction will prevent that from being any obstacle. I will make my sashes *suspend each other*; there is no occasion to alter them, and I can also make my frames do; so that I shall get rid of all the little difficulties, without any complications; and as I have observed, when I have been out looking at the various styles of buildings, in about nine cases out of ten the bottom sashes only are opened, the top ones being closed even in bedrooms, so that the foul air is retained in the room, and as I wish to preserve my own health, and also that of my wife and family,—I will hang my sashes on this principle; so that the top sash must be opened the same time as the lower one, so as to get as good ventilation as possible."

I have worked out this idea, and hung my sashes with chains, so that the inconvenience of the weights and broken lines, and of the lines being detached from the weights, is at once disposed of, and it is an excellent system where the top sash is out of reach. The sashes are prepared in the usual way, with holes bored for the lines and knots, in which I insert small bolts with nuts, which screw at the bottom, and hooks to the chain so that they can be regulated to a nicety, and are easily unhooked and removed when required; but although I can hang them almost to a shaving, I prefer a head on the sill and a groove in the bottom rail to fit on it, to prevent heavy driving rain from drifting in, as I have seen it bubbling up between the bottom rail and the inner bead, and running down the wall.

place them all on an improved footing, and to make their emoluments, &c., in every way equal to those of the military employes. It did not, it is true, endeavour to explain how the former elaborate proofs that the civilians were so much better off had been found wanting. The scheme consisted in raising the pay 60l. a year, and making this increased pay the salary of all engineers alike, civil and military, always excepting, of course, the engineer officers, who having the making of the rules, and being liable to be called out for military duty (when, if I am rightly informed, they are allowed to retain their appointments), are to receive an extra allowance as a "retaining fee." The *Pioneer* newspaper, well known to be the Government organ in Upper India, definitely announced that the next *Gazette* was to contain this panacea for all civil grievances: this was in May last, but up to this date not another word has been said about it. To make matters worse, and probably with a view of rendering civil members of the Department still more discontented, some of those who were since last October posted to railways (the new State ones) were granted the increased rate of pay, while it is in contemplation only to apply it to the others from the 1st of April last, and it is now apparently being postponed to save the extra salaries under the pretext of financial pressure. The real probable cause is (and I have heard it from more than one source) that the old colonels and majors in the staff corps, who, after some twenty years' service, find themselves still relatively low down among the executive engineers, have been exercising pressure upon the Indian Government to delay the promulgation of the new rules, as directly they come into force these gentlemen (who draw nearly double the pay of civilians doing the same work) will be practically debarred from all pecuniary promotion.

Vox in Sicco.

Allahabad.

MONUMENTAL.

Trovebridge Cemetery.—This cemetery contains two new funeral monuments, now near upon completion. One is a mausoleum containing the remains of the late rector and the members of the Kingston family. This building, which is of a semicircular shape, is composed of Box ground stone, and is in the Norman style. The walls are 5 ft. 6 in. in thickness. The exterior is ornamented by zig-zag moulding, supported by polished granite columns with carved caps, with recesses on either side between the columns for mural tablets. The interior is arranged for the reception of eight coffins. The marble slabs in the several chambers at present contain four, that of the late rector and three of the Kingston family. The whole is enclosed by iron rods, supported by pillars of Hanham stone, the interior being approached by steps of the same material. The raised mound is planted with evergreen shrubs. A little distance from this stands another mausoleum, of rectangular shape, in the Early English style, erected by Mr. Bowland Rodway, in which the remains of his son are placed. The exterior is embellished with statues emblematic of Faith and Hope, placed over the entrance, the spandrel being reserved for a figure of the Saviour holding a globe in his hand, with the inscription, "I am the resurrection and the life." Over the doors, which are of oak, ornamented by wrought-iron hinges, run the words, "Hid with Christ in God," carved in stone. Zig-zag moulding runs round the front and sides of the building, the front being supported by pillars of polished Aberdeen granite, with carved caps. The interior is arranged for six coffins, on tables of monastic tiles. The floors are of the same material, polished. Right and left are sedilia or seats for the mourners, supported by columns of Devonshire marble. The roof is ribbed with stone-work. Shrubs are planted on the outside of the building, and iron rods fixed into pillars of Hanham stone, inclose the whole. These structures were designed, and have been carried out in all their details, by Mr. W. Smith, builder; the ironwork being done by Mr. S. Hobbs. Messrs. Palmer & Sheppard, of Bristol, executed the carving.

Leicester Cemetery.—A monument has been placed in the Church of England portion of this cemetery, to the memory of a young lady of the name of Jessop. It consists of a massive block of polished Peterhead Scotch granite, supporting a carved pedestal, shaft, and capital, in the hard grit stone from the Gaseby quarries, near Shipley, Yorkshire,

terminating at an elevation of about 18 ft., with a sculptured statue of "Hope," in Sicilian marble, forming in the whole an attractive *ensemble*. The design is by Mr. Joseph Goddard, architect, of Leicester, and the work has been executed by Mr. John Barratt, also of Leicester.

BRICKMAKING BY MACHINERY.

EXTENSIVE works for the manufacture of bricks have just been completed by Major Stapylton, of Myton Hall, Helperry. The estate, under the management of Mr. Calder, is undergoing great improvement, especially in the erection of model farm-buildings and improved dwellings, requiring large quantities of bricks. To insure making more solid bricks than by hand, and doing away with skilled labour, he has introduced machinery driven by steam-power, which enables him to produce bricks with smooth surfaces like the "patent bricks." This is all done in one operation. After the clay is cast in the ordinary way it is put into wagons, and by means of a rope connected with the machine it is hauled up a tramway and tipped on to the rollers, which crush all foreign matter, such as stones, and thence enters the pug-mill, where it is thoroughly incorporated and made ready to enter the dies, from which it passes to the two cutting-tables, on each of which are cut at once six bricks. The average production of this machine is 20,000 per day. They are not, as with the ordinary hand-made bricks, put upon "the flats," but walled up at once as they come from the machine six or eight bricks high, thereby saving much expense in drying. Those bricks which are wanted for very particular purposes, such as facing, are passed through a special machine,—"the rotary press,"—which performs its work of pressing, and thereby consolidating the bricks. A brick is simply placed in front of the piston, which then forces it into the mould or die (of which there are four on a revolving shaft) of the desired size, and any superfluous clay is cut off, thus making all the bricks true and of uniform dimensions. During the return of the piston the box of dies or moulds revolves one-fourth of the way round, thus presenting another empty mould, which has already been oiled and cleaned by a self-acting lubricator, directly opposite the piston, to receive the next brick. In the meantime a self-acting push-plate forces the brick already pressed out of the die, upon a self-acting table, which carries them away, each brick being impressed with the initials of the proprietor.

Both of the machines described are driven by a horizontal engine, and are the productions of Mr. John Whitehead, of Preston, Lancashire, whose name is well known in connexion with brick-making plant.

FROM WALES.

Llanfelloch Church, Anglesey.—This parish church, which is dedicated to St. Mechell, has been re-opened. The additions and alterations that have been made consist of a new north transept; the adaptation of the lower story of the tower as a robing-room; the removal of plaster ceiling, old pews, and other fittings; and replacing open sittings, modern pulpit, and prayer-desk; repainting and re-decorating the screen, which has now, with the wrought-iron cresting and central cross, a pleasing outline; the re-setting of the font, which is of peculiar design, and is an object of interest to antiquaries; the introduction of standards, altars, and other ironwork from the establishment of Messrs. Brown & Dowling, of Birmingham; the re-lating roof, re-cooping gables, and the insertion of some new double-lighted windows of the same style as the lancet in the south side of the chancel. A stained-glass window, by Clutterbuck, of London, has been set up in the east window. It is the gift of Mr. W. B. Hughes, M.P., Plas Coch, as a memorial of his ancestors buried in Llanfelloch Church.

Llanllechid National Schools.—These schools have lately been enlarged for the Ven. the Archdeacon of Merioneth.

A new church at *Llanfaglan*, near Carnarvon, is now in course of erection, in addition to the present parish church, which is remotely situated. The new church is intended to accommodate a large and more populous part of the parish.

The church at *Bodorgan* is now in the course of restoration and enlargement. The Ven. Archdeacon of Bangor has used energetic efforts to procure funds for this purpose.

The parish church of *Llangynyfan*, being severed from the main land by the encroachment of the sea, it has been found necessary to build another edifice in a distinct part of the parish, and by the liberality of Mr. O. A. Fuller Meyrick, of Bodorgan (who has gratuitously presented a site), and the rector and his curate, this is to be done. The architects in this and the preceding cases are Messrs. Kennedy & O'Donoghue.

CHURCH-BUILDING NEWS.

Sherington.—The parish church of Sherington, near Newport Pagnell, has been re-opened for public worship, after having undergone a restoration. The church is a cross church, the tower being in the centre of the building. It has north and south aisles. The old church had the high-backed pews, abundant whitewashing, and a platform at the west end, which marred the beauty of the west window. The whitewash has been removed, the high-backed pews have been replaced by chairs, the floor of the church presenting an open area, and the disfiguring of the platform has been removed. The church has a lofty, open roof. The chancel shows the most marked feature of restoration. It has a new open roof of oak, and has also been newly tiled. The reredos is of alabaster, inlaid with black marble, and is adorned by a cross of polished granite. The chancel floor is inlaid with Godwin's tiles, the choir stalls are of oak, there is a new iron altar-rail, and the chancel is divided from the nave by a pair of new wrought-iron gates, the work of Messrs. King & Sons, of Stoke Goldington. A recess has also been built for the organ, and adjoining it is the vestry. A painted east window represents in its three lights the circumstances surrounding the birth of Christ, His baptism by John, and His crucifixion. During the work of restoration the builders came upon a small single-light window looking upon the chancel. This has been restored, and a painted glass window placed there. Formerly the bells were rung from the ground-floor, so that the ringers inconveniently intervened between the nave and the chancel. This has been remedied by the erection of a new ringing-floor, so that the communication between the nave and the chancel is uninterrupted. The church is heated with hot air, the principle applied being in use in various churches in the neighbourhood. A memorial window, looking upon the south aisle, has been erected by Mrs. Umney, in memory of her late husband. The south porch has been restored, and a north doorway, disfigured by the mutilations of former years, has been discovered and restored. The restoration has not been carried as far as absolute necessity demands. The work has cost something like 1,000l., mainly defrayed by the rector. The architect was Mr. G. B. Street; and the builders were Messrs. Shakeshaft & King, Newport Pagnell.

Manchester.—The new Church of St. James-the-Less, Newton-street, Great Ancoats, has been consecrated by the Bishop of Manchester. The building is of brick, constructed in the Early English style of architecture, with stone and coloured brick dressings, and coloured brick decorations in the interior. The church will seat 654 persons, and about 400 of the sittings will be free. The cost amounts to 2,500l., all of which has been paid, except the sum of 300l.

Minsterworth.—The rebuilt parish church has been opened for divine service. It stands on the site of the old edifice, and is built of the grey stone of the neighbourhood, with Bath stone dressings. It has been erected upon a higher level, and has a tile-covered roof. The old tumble-down lath-and-plaster tower at the west end of the north aisle has been replaced by a new structure with a stone turret, and provided with six bells. On the south side of the nave is an oak porch with open-timber work; and, seeing that the floods and high tides have made it needful to have the floors considerably above the churchyard level, all the entrances are approached by flights of steps. Instead of the two naves formerly existing, the church has now one nave and a lean-to aisle, separated by a new arcade, and an ample chancel and chancel-aisle or chantry. An arcade of three pillars separates the chancel from the chantry. The nave has an open-timbered ceiling. The chancel and sanctuary are paved with Milton's plain and encaustic tiles, and the aisles with Pease's; and there is Porrett's heating apparatus beneath the floors. The chancel arch is plain, and the corbels of the new pillar arcades are waiting to be

carved. An oaken screen divides the chancel from the nave, and when completed will be surmounted by a cross. The sanctuary rails are of plain oak. The doors are of sound oak, with ornamental hinges; there are new stalls in the chancel; and the old open seats in the nave, with their linen-pattern ends, have been simply repaired and restored. All the windows, save three, are of plain glass, with green-tinted border, and several of them are restorations from the old church. The large east window and the two smaller ones on the south side of the chancel are of painted glass, by Messrs. Clayton & Bell, and have been placed as memorials to the Hawkins family. In the east window the old tracery, with its Plantagenet lions, is preserved; and there are two sets of scenes in the three lights, each apparently representing events in the Saviour's life,—the Transfiguration, the Lord's Supper, the visit of the Wise Men, and so forth; and several Scriptural scenes are also graphically portrayed in the side windows. Mr. H. Woodyer was the architect. The contract was for 2,640*l.*, but did not include all items.

Ormskirk.—The foundation stone of Christ Church, Douglas, near Ormskirk, has been laid by Miss Morris, of Fairhurst Hall. The cost of the church will be over 5,000*l.*, and it will be built at the expense of Miss Morris, as a memorial of her mother. The site for the church and school is the gift of Sir Thomas George Fermor Hesketh, bart., M.P., of Rufford Hall. The plan of the church consists of a nave, 57 ft. by 28 ft., and 42 ft. high; north aisles separated from the nave by four pointed arches; chancel, 29 ft. by 20 ft.; organ-chamber and vestry on the north side of chancel; and a tower and spire, the lower portion of which is intended as a children's gallery. The tower is on the south side. Accommodation is provided for 409 adults. The whole of the benches and stalls will be of pitch pine. The inside will be lined with ashlar work, and the exterior will be built of Parbold stone, in courses and quarry face, and the dressings of Longridge stone. The tower and spire form a prominent feature on the plan, and will be about 115 ft. high. The architects are Messrs. Myres, Veevers, & Myres, of Preston; Mr. J. Pownall, of Preston, is clerk of the works; and Mr. John Preston, of Wigan, the builder.

Castle Hedingham.—The ancient parish church of Castle Hedingham has been re-opened after restorations. The lord of the manor and patron of the living, Mr. Lewis Majendie, has commenced the restoration by taking in hand the chancel, which he has restored at his own expense, and in accordance with the style of the period when it was erected,—late Norman. The work has been carried out by Mr. Z. Rogers, of Earle Colne, under the directions of the architect, Mr. Henry Woodyer, of Grafham. The roof has been restored,—it is high-pitched, with open rafters; the apex had been taken off and covered with a lead flat. The lancet windows in the walls have also been restored externally and internally, and fresh stonework inserted where necessary. The walls have been underpinned and refaced; all the old plaster being scraped off, and the stone flat buttresses and other work shown. On the north side an organ-chamber has been erected, opening into the north aisle by means of a screened arch and by a Norman arch, with its characteristic mouldings, into the chancel. The walls inside have all been re-plastered and the arched ceiling restored, together with the chancel arch. A new corbel table runs under the eaves of the roof outside. The carved fifteenth-century rood-screen, dividing the nave from the chancel, has also been restored, and gates added; a tall floriated cross, in the same crocketed style, being placed above in the centre. The ancient stalling, with curious and ludicrous carvings under the *misereres*, have also been restored, and additional stalls and "priests' seats" erected. The floor has been paved with Minton's tiles. A new floor has been laid in the vestry, the walls re-plastered, and the windows re-glazed. The three eastern lancets are filled with stained glass, manufactured by Messrs. Hardman & Co., Birmingham.

Acton Trussell.—St. James's Church, which has been closed nearly eight months, during its restoration by Mr. G. E. Street, has been re-opened for divine service. Two arches, one in the north wall, and another between the nave and tower, have been re-opened; as also a lychnoscope at the south-west end of the chancel. The screen between the nave and the new aisle is worked out of the sound portion of the old roof. The quaint-looking steeple, and parts of the north and south walls, have been re-

built; a new roof has taken the place of the plastered ceiling, and the substitution of benches for pews, and the addition of a small aisle on the north-east side, give accommodation for 150 in the place of ninety-four. A small memorial window on the south-west side, by Clayton & Bell, has been given. The entire cost of the restoration is between 1,100*l.* and 1,200*l.* Mr. Easpley, of Eccleshall, builder, has carried out the work.

Tansley.—The church of Tansley has been restored. Instructions were given to Messrs. Stevens & Robinson, of Derby, architects, to prepare plans for an extension of the north aisle, and for re-pewing the church. A contract was subsequently entered into with Messrs. Buxton & Son, of an adjoining parish, for the execution of the work; but within two months after the stone was laid both father and son died, and were buried in Tansley churchyard. A younger son, however, agreed to carry on the contract. The addition of one wing only to the church produces somewhat of an oddity; but it is intended to add a corresponding wing should further accommodation be required. These alterations will render necessary an enlargement of the chancel, which even now is too small. The whole of the ceiling has been replaced by new rafters, and the church is almost entirely re-pewed with open benches. The total cost of the alterations is 511*l.* 10*s.*

DISSENTING CHURCH BUILDING NEWS.

Doncaster.—The memorial stones of a new Wesleyan chapel and schools, in Oxford-place, have been laid. The new buildings are situated to the south of St. James-street, and occupy the rising part of the ground lately known as Crowther's gardens. The front of the chapel faces the new street called Oxford-place, the schools being placed on either side, at a distance from the chapel of 46 ft., those to the right being for boys, and those on the left for girls and infants. The three front entrances of the chapel are reached by a broad flight of eight steps, terminating with a landing 3 ft. wide. The central doorway, leading to a central lobby, communicates to the body of the chapel right and left. The side doorways lead directly to the gallery staircase, and terminate on broad landings to each gallery. At the sides and rear of the chapel there are also provided three entrances, which will afford extra means for ingress or egress, as required. On the ground-floor, at the rear of the chapel, is a band-room, 33 ft. by 16 ft.; ministers' vestry, 16 ft. by 10 ft. 6 in.; two W.C.s, and lavatories. Also, from this part of the building, a staircase communicates to an upper floor, which contains two class-rooms, 15 ft. by 9 ft.; two, 16 ft. by 11 ft.; and one, 21 ft. by 12 ft. The outside dimensions of the building are 57 ft. 6 in. by 107 ft. The design is Italian, and the front and the rear staircases wings execute in stone, the sides and rear being faced with white bricks. The chapel is divided into nave and aisles, the clearstory walls and nave roof being carried on cast-iron columns and wrought-iron box girders; the columns also support the side galleries. Under the galleries at each side are six semicircular-headed windows; a similar number are placed on each side for the galleries, and on the clearstory, on each side, are seven semicircular windows, 6 ft. diameter. The centre part of the front elevation rises to a height of 53 ft., this being the height of the nave roof; the wings, being lower, have a parapet, which continues round the sides, so that only a little of the aisle roofs will be seen. The roofs will be covered with the best Bangor slates. The interior ceilings of nave, aisles, and galleries will be divided into panels, and embellished with ornamental plaster-work. An organ-gallery is formed behind the pulpit or platform, and the opening is finished with an arch ornamented and moulded. The whole of the interior fittings will be of red deal, and wrought, stained, and varnished; the iron-work flatted and picked out in tints. The chapel will seat 1,000 persons. The school buildings on the left comprise girls' school, 54 ft. by 20 ft.; infants' school, 70 ft. by 20 ft.; and class-room, 15 ft. by 20 ft.; with lavatory and cloak-rooms. Those on the right are boys' school, 81 ft. by 20 ft., and a class-room, 16 ft. square, these also having entrance-lobby, lavatory, &c. Attached are large play-grounds and out-offices. These buildings are also of Classic character, and are faced with white bricks, red brick plinths, bands, strings, arches, cornices,

and stone dressings. The interior woodwork of the roofs will be exposed to view, which, with all the other interior wood, will be wrought, stained, and varnished. The boundary walls will be coped and faced with stone, and surmounted with wrought-iron railings, having also two pairs of entrance carriage-gates, inclosing the front of the chapel in a semicircular form; also, running across right and left of the chapel to each school, will be walls and railings, entrance-gates for the schools, &c., but of more simple design. The contract for the whole has been undertaken by Mr. H. Arnold for 5,262*l.*, and is being rapidly pushed forward by him, under the supervision of Mr. W. Watson, of Wakefield, the architect.

Fenton.—A Methodist New Connexion new chapel has been opened here for public worship. The new edifice occupies the site of the old chapel, with the addition of ground at the rear, from which some old buildings have been removed. It is in the Gothic style of architecture, according to examples in France and Germany in the thirteenth and fourteenth centuries. The total length, exclusive of the entrance, is 55 ft. 6 in.; the width, 40 ft. 3 in.; the height from ground line to ridge, 51 ft. The front gable, facing Market-street, contains the principal entrance, and has three wide doorways with moulded arches, and stone labels with carved terminals, supported by circular stone shafts, with circular moulded bases, bands, and carved caps, the whole surmounted by a large five-light stone window with tracery in the head. To the right and left of the entrance are staircases leading to the galleries and orchestra, the right staircase being surmounted with a tall, slated, spirelet roof, and the left staircase surmounted by a tower with buttressed angles and spire, the total height of which is 110 ft. to the top of the metal finial with which it is to be crowned. There is a gallery around two sides and one end, with a circular enriched and moulded front. The school, which is at the further end of the chapel, is two stories high, entrances to which are from Park-street. The total length is 56 ft. 6 in., and the width 35 ft. 6 in. The rooms are divided into departments for boys and girls, with separate entrances, in which are a number of class-rooms. Portable partitions are fixed in the upper room, so as to be readily taken down in order to admit of the room being used as a lecture-hall, or for public meetings. The chapel will accommodate about 700, and the schools are sufficiently large for nearly that number of children. The total cost, including the purchase of old buildings to enlarge the site, has reached nearly 4,000*l.*, of which sum there have been about 2,000*l.* raised. The architect is Mr. Pinchbeck; and the contractors are Messrs. Wade, Brothers, all of Manchester. The interior, although sufficiently advanced to admit of the opening service, is not quite completed. The exterior is not quite finished either.

Stockport.—The foundation-stone of a new Wesleyan Chapel has been laid at the Moore. The building is to have a school attached, and the cost will be 1,000*l.* The size of the chapel will be 38 ft. by 23 ft.; the school, 29 ft. by 16 ft. The latter, being only separated by folding doors, can be opened to the chapel during divine service. The frontage will be 81 ft. in length. The rear will extend to the embankment of the London and North-Western Railway. Accommodation for seating 160 persons will be provided. The architects are Messrs. Pierpoint, Hughes, & Pierpoint, of Warrington. The style will be Gothic.

Lincoln.—The memorial corner-stones of the new chapel for the Baptist congregation worshipping in Mint-lane have been laid. The building now being erected by Messrs. Barnes & Wright, builders, from the designs of Messrs. Drury & Mortimer, architects, is situated upon the old site in Mint-lane, and has a superficial area of 2,040 ft., with 600 sittings. The old chapel was 1,600 ft. in area, with 360 sittings. The additional sittings have been gained by making every spare inch of the ground available, and to this end the front of the building is close to the foot pavement, and arranged without any breaks. The front is designed in the modern development of the Romanesque style, and is arranged in three stages—the lower, containing the two entrance doorways and the triplet window, lighting the centre body of the chapel; the second stage is occupied by a window lighting the gallery floor; and the upper stage consists of an arched opening, combined with an arched coping to the gable. A slight depression of the north side roof gives more distinction to the centre composition, and a tower, with angle turrets and

low slated spire—total height, about 70 ft. at the south angle—marks the purpose of the building. The interior is proposed to be fitted with open seats. The pulpit will accommodate several ministers. The baptistery, which is placed in front of the pulpit, will be lined with white glazed tiles. The entrance passages on the ground-floor will be paved with Maw & Co.'s geometrical ornamental tiles. The building will be heated by hot water, and lighted with star burners suspended from the roof. Attention has been given to insure ventilation. The building is to be covered in with an open timber roof, and a sufficiency of light is secured by the aid of a long range of clearstory windows on each side of the roof. There will be large windows towards the south, overlooking the garden premises of Messrs. Smith & Ellison's bank. These windows, together with three others on the north side, will insure abundant light, which, for the present, is to be subdued by the adoption of cathedral tinted glass, with the intention, ere long, when funds may permit, of replacing it with stained glass. The probable total cost of the edifice will be about 1,400*l.*, exclusive of the value of the old materials.

Ripon.—The foundation-stone of a Congregational church has been laid here. Mr. J. P. Pritchett, of Darlington, is the architect. The contractors for the church are the following:—Messrs. Wright & Son, Thirsk, masons and plasterers; Messrs. M'Adam & Co., joiners and iron-founders, Alton; Mr. G. W. Wilson, plumber, Leeds; Mr. Briggs, painter, Lowmoor. Mr. W. Dougill, of Ripley, is clerk of the works. The cost of the church, including fencing and out-buildings, will be about 3,000*l.* There will be a tower and spire at the south-west corner 100 ft. high. The gable end next the main road will contain a door under a projecting gable in the floor level, with a four-light window over it rising into the main gable, which is surmounted by a floriated cross or finial. The tower at one corner is in four stages, brushing a somewhat narrower door in the lower stage, a two-light window in the second stage, and belfry-windows in the upper stage; the whole surmounted by a spire, finished by a vane. A staircase will occupy the opposite corner, having a similar door in the lower stage, and a rose-window above, the roof being hipped to the octagonal shape of the choir. The side of the church faces the new road, which the trustees of the ground are making. The side is relieved by the transept gable end, which has two windows on the ground, and a rose window above. The rest of the side is divided into four bays, the corner one being occupied by the tower and spire, the others having long two-light windows between buttresses. The choir is somewhat lower than the nave, and has a rose-window in the gable. Behind the church is the school, with the gable end to the side road. At the east side of the church is the minister's house, which is simple, but characteristic in design. It has a bay-window of two stories in the front; and the house being irregular in plan, the hipped roofs break up the outline. Internally, the church is divided into nave and aisles by light iron pillars supporting a narrower gallery running round three sides of the church; and these pillars rise above the gallery, to support wooden arches, from which rises the roof, which is wagon-headed, divided into panels by carved braces and moulded parlines. The choir arch is of moulded stone, with marble pillars, carved capitals, and moulded bases. The seats, which provide accommodation for about 600 adults, are to be all open stalls, with slanting backs, all of pine, varnished. The windows will be glazed with cathedral-tinted glass, and the passages paved with mosaic tiles. The school is designed to have a simple open roof, and will accommodate about 300 children. The whole of the site is to be surrounded by an ornamental railing on a low wall.

Books Received.

Report to the Tottenham Local Board of Health, on the Disposal of the Sewage of their District. May, 1870. London: Spott.

This Committee report enters at some length into the details of various systems of treating sewages, by deodorisation, irrigation, &c., as practised in different parts of the country; and the reporters come to the conclusion that irrigation, upon the whole, is decidedly the best. The report is signed Edward Clarke and James Brickwall, two

of the members of the Sewage Committee, and P. P. Marshall, C.E., surveyor to the Board. A dissentient report is appended, signed William Hall, Member of the Committee, who advocates precipitation and filtration with deodorisation "by the best means known." The dissentient member, however, according to the committee's report, agrees with them so far "that irrigation is on the whole the best method of dealing with the sewage" although he "would recommend precipitation and filtration for Tottenham." The committee recommend that some of the marsh-land in the parish should be selected as a sewage farm for the greater part of the sewage, in the disposal of which, in any way, pumping will be requisite; and, for the remainder, they find that land is obtainable at a reasonable price in a favourable position for irrigation.

Patronymica Cornu-Britannica; or, the Etymology of Cornish Surnames. By RICHARD STEPHEN CHARNOCK, Ph. Dr., &c. London: Longmans & Co.

Now that the Cornish dialect of the Celtic language is literally extinct as a spoken tongue, a list of Cornish proper names, with their etymology and meaning, is both curious and valuable. The present collection is made from various quarters, including the Post-office Directory for Cornwall; from private lists, and from the works of Pryce and Polwhele. The volume contains from 1,200 to 1,400 surnames. Many of the Cornish surnames, however, are more or less identical with the Welsh, but there are many Cornish and few Welsh in existence.

VARIORUM.

"Les Promenades de Paris: Bois de Boulogne, &c. Par A. Alphonse and G. Daviond." We have already spoken of the earlier parts of this superb work. Since then, many more have been issued, and we shall take an opportunity to speak of them fully. The publisher is at this moment in London (11, Portland-terrace, St. John's Wood), and we go out of our way, in view of the present exceptional and distressing position of Paris, to mention this circumstance, in case any of our readers should feel inclined to examine the work for themselves.—The current number of the *Art Journal* includes an engraving after W. Hensley's "Left in Charge." Wilton House is the subject treated of by the editor under his heading, "The Stately Homes of England."—A photograph of a Portrait by Vandyck, name unknown, in the new number of *Art Pictorial and Industrial*, is itself worth the cost of the number.—*London Society*, from its new quarters (Burlington-street) keeps its old aspect.—From Cassell's *Household Guide* we quote a few lines anent "The House":—"The rapidly-increasing value of land in every district easy of approach by rail has brought about a degree of discomfort in domestic architecture undreamt of in former times. Good housewives, accustomed to roomy stair-landings, long passages, large cupboards, and separate offices for various kinds of household labour, reconcile themselves with difficulty to the circumscribed dimensions usually afforded for domestic purposes in modern villa residences. Nor is the complaint confined to the immediate neighbourhood of large towns. Even remote rural districts are becoming a prey to the inconveniences of house-building and its attendant annoyances. One of the first acts of denial imposed upon most housewives, in order to meet existing circumstances, consists in giving up the keeping of any kind of stores. The nearest grocer's shop has become in most establishments the substitute for the storeroom; and a poor substitute, at the best of times, that warehouse proves, entailing endless vexations and disappointments, which were unknown when it was the custom for all well-to-do families to provide for their daily wants in advance. Fitted with every requisite to meet the numberless emergencies that arise in domestic life, the compact little apartment was at once the general resort in moments of need, and a pleasing and healthful source of occupation to the female members of a household. Intent upon laying in stores, at convenient seasons, in preserving, pickling, herb-drying, sauce-making, sorting and arranging goods, much time was profitably employed, which now hangs heavily on the hands of many women. If with the cessation of the above duties a corresponding amount of gain were secured, regrets on the subject need be but few. It is not so, however."—The *Quarterly*

Journal of Science for October has much good matter on the Surveys of India, the Eclipse of August 7th, and other subjects.—Hardwicke's *Science Gossip* continues its pleasant way amongst flowers and rocks, spotted with birds and insects. The number for October is quite equal to those that have preceded it.—The *Arena* is the title of a new illustrated monthly magazine (75, Great Queen-street), which seems to desire to open a way for new and hitherto untried men. Some promising stories are commenced in it.—Messrs. Longman have issued "A Graduated Course of Elementary Problems in practical Plane Geometry. By John Lowres, Science Teacher." It is designed chiefly for the use of students in science classes in connexion with the Science and Art Department.

Miscellaneous.

The Fall of the House in Glasgow: Cause of the Occurrence.—Mr. James Lamb, Inspector of Buildings, and Mr. Robert Taylor, builder, the skilled person to whom the Sheriff made a remit to inspect Messrs. Law's buildings at Belmont-crescent, which fell, have made a report describing what, in their opinion, caused the accident. In substance the conclusions to which they have arrived are as follow:—"That the occurrence resulted partly from too hurried construction, not permitting time for the consolidation of the lime and stone in the building, partly from the joisting lying wholly in one direction, instead of alternate cross tiers, which would have given a certain support to the walls that fell; but chiefly from the stones being of inferior quality, badly dressed, and carelessly put together, without a sufficient proportion of headers or band stones. The reporters further consider that the mortar was wanting in a sufficient proportion of lime, and was consequently deficient in cohesive power; that the packing of the walls between the exterior and interior facing stones was of bad quality, being mere shivers; and that, generally, the mortar, such as it was, was too sparingly used. It appears that nothing was discovered in the foundation to account for the fall of the building.

Mortuary Buildings for City of London.—At the last meeting of the Commissioners of Sewers, a report of the Sanitary Committee with reference to the erection of mortuary buildings for the City, was considered. The chairman stated that some time ago the Court authorised the committee to spend 13,000*l.* in the purchase of a site, and the erection thereon of a mortuary. A site had been purchased for 5,000*l.*, and 8,000*l.* remained for the buildings. Since then another piece of land adjoining the site had been offered to them for 750*l.*, and the question was whether they should purchase it. Mr. Haywood's estimate for the buildings was 9,400*l.*, so that, including the additional piece of ground, the total cost would be 15,000*l.*, being an increase of 2,000*l.* upon the amount authorised to be spent, namely, 13,000*l.* Some discussion took place upon the subject, in the course of which it was stated that one of the metropolitan parishes had provided a mortuary for 1,000*l.*, and an opinion was expressed that 15,000*l.*, or even 13,000*l.*, was too large a sum to be spent on a mortuary for the City, in which there would be only a few bodies. Eventually a vote was taken adverse to purchasing the additional piece of land, and the whole subject was referred back to the committee for further consideration.

The New Town Clock, Hoddesdon.—This clock was manufactured by Messrs. Gillett & Bland, of Croydon (who were also the makers of the great clock for the International Exhibition of 1862, exhibited by Benson, and of the Grog and Magog clock at Bennett's, in Chapsald). It goes eight days, and strikes the hours upon the old bell, and the quarters upon the two new bells, and shows the time upon three dials, each 4 ft. in diameter, one of which, facing the High-street, is illuminated upon an improved principle by gas; the other two dials are copper, with gilt figures and minutes. Amongst the many improvements introduced in the clock is the gravity escapement, the invention of Mr. E. B. Denison, Q.C.; and instead of the ordinary wood rod pendulum, which is subject to considerable variations, it has a compensated zinc and iron pendulum. There is an engraved and silvered dial on the clock, for the purpose of regulating the outer hands from the inside.

War Appliances.—Advices from Paris, by balloon mail, announce that an immense iron reservoir, supported upon bricks, has been placed in front of the Gallery of Apollo in the Louvre, and will be kept filled from the Seine by two steam pumps, as a precautionary measure in case of the Louvre or Tuilleries taking fire. The Paris Government have taken possession of all the carriages of the Chemin de Fer du Nord for special ambulance service upon the ramparts.

—The present war is likely to give a great impulse to man's rule over the air. Experiments are being made with balloons by the Government authorities at Woolwich. They find that captive balloons can be fitted with telegraph wires, and messages sent to headquarters instantaneously, pointing out the progress of an action as regards the state and procedure of both armies. Panoramic photographs of a whole field of war, whether previous to, during, or after the battle, can be taken and studied at leisure. War balloons in store will, no doubt, be a new item in war supplies. —A French paper says that the difference of gauge between the French and German railways has proved a hindrance to the Germans in using their own engines and carriages on the former. The bridges and viaducts in France are so low that it has been necessary to shorten the chimneys of the German locomotives very considerably, and this takes up a good deal of time.

Foundation-stone of Old Blackfriars Bridge.—The foundation-stone of old Blackfriars Bridge was last week discovered. Beneath the stone was found a guinea, a half-guinea, a crown, a half-crown, a shilling, two pence, 31 halfpence, and a farthing, and upon it was the following inscription:—

"On the last day of October, in the year 1783, and in the beginning of the most auspicious reign of George the 3d,

Sir Thomas Chitty, Knight, Lord Mayor, Laid the first stone of this Bridge,

undertaken by the Common Council of London in the height of an extensive War,

for the Public accommodation and ornament of the City,

Robert Mylne being the Architect,

and that there may remain to posterity a monument of the City's affection for the man

who, by the strength of his genius,

the steadiness of his mind,

and a kind of happy contagion of his probity and spirit, under the Divine favour

and fortunate auspices of George the Second, recovered, augmented, and secured

the British Empire

in Asia, Africa, and America,

and restored the ancient reputation and influence of his Country

amongst the Nations of Europe,

the Citizens of London have unanimously voted this Bridge to be inscribed with the name of

William Pitt."

"Colours and Dyes in Early Times."—Commenting on the article on this subject, reprinted from our pages, the editor of the *Mayo Constitution* says,—"Through the length and breadth of our island the traveller will not light on any portion of it more pregnant of associations of old times than West Connanght. This is particularly the case with regard to the subject matter of the above paper. The Claddagh clock of every description is very remarkable. The other day, a Galway tradesman had the distinguished honour of receiving an order for one each (crimson pattern) for her Royal Highness the Princess of Wales, Princess Beatrice, and Princess Christian. That there was no indigenous plant in this country to dye blue in Dr. Nicholson's day (1725) can only be true so far as the extent of his inquiry went, for the blue dye has been known to the peasantry of Mayo for generations.* The colour predominates in Partry. If a peasant is seen wearing a pair of blue stockings, he is at once put down as a Partryman. In the parish of Turlough, near Castlebar, there is an excellent blue frieze made, containing a very small admixture of white. The purple dye is peculiar to the clothing of the people of the baronies of Tyrarwy and Costello. Before the famine, a comfortable-looking dark brown dress was worn by the country girls. Now-a-days they wear muslins and light frippery, to be à la mode if they can.

The Hulme Town-hall.—The interior of this building has just been decorated by Messrs. Edmondson & Pollitt, of Bridge-street, Manchester, at a cost of nearly 600l. The walls of the hall have been painted a dark colour, and the ornamental parts gilded and figured. The ceiling has been painted in several striking colours. The large refreshment-room and the committee-room have also been decorated.

* Exactly what we stated.

Proposed New Naval College.—Admiral Kelly, who died about three years ago, left by his will a sum of money, supposed now to amount to upwards of 100,000l., to found a college in Devonshire for the primary education of naval officers' sons. The will has been the subject of litigation, but arrangements have just been come to by which all further opposition ceased, and it is stated to be almost certain that the college trustees will accept the offer of the Duke of Bedford to give a fine site for a college at Tavistock, and 5,000l. towards the cost of its erection. It is also said that the Tavistock Grammar School will be merged into the new college. The matter has excited great interest and competition among various towns in South-West Devon.

Re-opening of Gingerbread Hall Bridge. This new bridge at Great Baddow, which has been erected by the Chelmsford Highway Board, has been opened for traffic. It is 17 ft. wide between the iron railings, or 6 ft. wider than the old tumble-down structure which it has superseded. It is built of brick and iron, the work having been carried out under the superintendence of Mr. Whitmore, the surveyor to the Board, by the following contractors:—For brickwork, Mr. James Patten, Great Baddow; ironwork, Messrs. Coleman & Morton, Chelmsford; stonework, Mr. Wray, Springfield.

Keeping Bronze Statues Clean.—It was observed in Berlin that those parts of a bronze statue which were much handled by the public retained a good surface, and this led to the conclusion that fat had something to do with it. An experiment was therefore tried for some years with four bronzes: one, says our authority, *Chambers's Journal*, was coated every day with oil, and wiped with a cloth; another was washed every day with water; the third was similarly washed, but was oiled twice a year; and the fourth was left untouched. The first looked beautiful; the third, which had been oiled twice a year, was passable; the second looked dead; and the fourth was dull and black. Perhaps public authorities in this country who have charge of statues and other adornments will profit by the experiment here described.

Laying the Top Stone of Chester Cathedral Tower.—The top stone of Chester Cathedral Tower has been laid, as marking an important stage in the completion of the restorations. The stone was laid by a little girl, the daughter of Dean Howson, in presence of some American and other friends. Before the party descended from the tower, which was not done until Dr. Howson's young daughter had been lifted to a seat on the top of the pinnacle, the Dean expressed a hope that arrangements would soon be made, in co-operation with Mr. Thompson, the contractor, for some celebration of the event by all the workmen under his superintendence. This will probably take place when the external roof of the nave has been completed.

New Masonic Hall in Bristol.—It is said that the erection of the new Masonic Hall, to be built in Park-row, on a portion of the Tyndall estate, exactly opposite Park-street avenue, will be very shortly commenced. The entire plan, according to the local *Times*, embraces a banqueting-hall, with its necessary appendages, including kitchens, and will cost 5,000l.; but the promoters will at first only proceed with the portion necessary for the meetings of the several lodges, the cost of which will be between 3,000l. and 4,000l. The structure is to be worthy of the city.

"Stamford, Salop."—We would add to the account of this residence, given in the *Builder* of last week, that all the painting and coloured decorations were executed by Messrs. J. G. Crace & Son, of London. It is desirable, also, we should point out that a doorway to the dining-room from the hall is accidentally omitted to be shown on plan.

Straightening a Chimney.—It is stated that the furnace-chimney at the Goolle Alum Company's works having subsided to the extent of 4ft. out of perpendicular, was thus set right:—A layer of bricks, about two-thirds of the way round, and about 20 ft. from the base, was cut out. When this layer of bricks had been taken out, strong iron wedges were introduced, and a thin layer of brick put in the place of the course of bricks extracted. When this had been accomplished, the wedges were then drawn out, and the stupendous structure came over on to the new-made bed, assuming its original position. This was a dangerous process, and needed clear heads.

TENDERS.

For building two pairs of villas in Hornsey-lane. Mr. J. W. Reed, architect:—

Williams & Son	£3,157 0 0
Sale	2,542 0 0
Wishup	2,295 0 0
Hawkes	2,665 0 0

For alterations and additions to stables at Tewkesbury Lodge, Forest-hill. Messrs. Tress & Innes, architects. Quantities supplied:—

Coleman	6895 0 0
Thompson	680 0 0
King & Son	680 0 0
Burchell	681 0 0
Waterson	685 0 0
Heard	684 0 0
Jerrard	619 0 0
Mitchell	550 0 0

For the erection of a new tan-room for Messrs. Taylor, Walker, & Co., Limehouse. Mr. Charles Dunch, architect.

Macey	£1,320 0 0
Conder	1,295 0 0
Johnstone	1,279 0 0
Ennor	1,241 0 0
Newman & Mann	1,136 0 0
Kibby	1,135 0 0
Hill, Keddel, & Waldram	1,053 0 0

* Accepted.

For the erection of schools, Bermondsey. Mr. Joseph Gale, architect:—

Colls	£4,678 0 0
Asby & Sons	4,460 0 0
Sewell & Son	4,305 0 0
King & Son	4,305 0 0
Henshaw	4,363 0 0
Sheppard	4,275 0 0
Brown & Robinson	4,261 0 0

For new sewers, Catford Bridge, Anerley and Forest-hill, for the Lewisham Board of Works:—

Coker	£204 17 0
Crockett	892 0 0
Pearson	742 0 0
Bellamy	703 0 0
Cole	691 17 0
Woolnough	663 0 0
Blackwood	587 0 0
Hayes	589 0 0
Harris	535 0 0
Young	522 0 0
Carter (accepted)	521 0 0
Hayes	347 2 0

For new infirmary for St. Mary Abbot's, Kensington. Mr. A. Williams and Mr. H. Saxon Snell, architects. Quantities by Messrs. Landown & Pollard and Messrs. Mann Saunders. Net amounts after deducting the value of the old buildings on site:—

J. & A. Wright	£13,093 0 0
Hockley	3,291 0 0
Covland	29,940 0 0
Scriven & White	37,943 0 0
Lacey	37,693 0 0
Crockett	37,105 0 0
J. & S. Williams	37,000 0 0
Capps & Rizzo	36,600 0 0
Crabb & Vaughan	36,525 0 0
Higgs	36,273 0 0
Blackmore & May	36,191 0 0
Manley & Rogers	35,668 0 0
Markwick & Thurgood	35,183 0 0
Wignome	34,555 0 0
J. & A. Wilson	34,550 0 0
Henshaw	33,467 0 0
Hill, Keddel, & Waldram	33,270 0 0
Crappell (accepted)	33,233 0 0

For new sewers for the parish of Lambeth. Mr. Hugh McIntosh, surveyor:—

Crockett	£12,600 0 0
Dickinson & Oliver	12,290 0 0
Brown	11,966 0 0
Jackan	11,600 0 0
Morris	10,600 0 0
Blackmore	10,073 0 0
Pearson	9,710 0 0
Hubbard	9,704 0 0
Goudale	9,350 0 0
Wignome	8,999 10 0
Ritson	8,900 0 0
Mayo (accepted)	8,190 0 0
Carter	7,993 0 0

For the erection of granary and flour-mills, Waterloo Wharf, Lambeth, for Mr. South Taylor. Mr. George J. Loe, architect:—

Brass	£11,720 0 0
Lawrence	11,332 0 0
Holland & Hannen	9,706 0 0
Woodward	9,685 0 0
Perry	9,411 0 0
Hill, Keddel, & Waldram	9,391 0 0
Conder	9,300 0 0
Hart	8,840 0 0
Crabb & Vaughan (accepted)	8,690 0 0

For proposed new factory and dwelling-house in Far rington-road, for Mr. F. G. Lloyd. Mr. R. A. Gruning architect. Quantities supplied by Messrs. Gardner & Bell:—

Kipps	£8,950 0 0
Dickinson & Oliver	8,600 0 0
Holland & Hannen	8,245 0 0
Trollops	8,143 0 0
Mansfield, Frier, & Co.	8,175 0 0
Henshaw	7,937 0 0
Newman & Mann	7,856 0 0
Hill, Keddel, & Waldram	7,895 0 0

* Accepted.

For repairs to Nelson Inn, Nelson-street, Woolwich, for Messrs. H. & V. Nicholl. Mr. E. H. Badger, architect. Quantities not supplied:—
Payne & Bolding 2850 0 0
Penny 558 0 0
Jerrard 540 0 0
Bush 517 0 0

For house and stabling at Lordship-lane, Dulwich, for Mr. W. Hewett. Mr. T. R. Smith, architect. Quantities not supplied:—

	House.	Stable.
Roberts	£1,339 0 0	£185 0 0
Burchell	1,315 0 0	119 0 0
Ashwell	1,268 0 0	189 0 0
Jerrard	1,278 0 0	165 0 0

For new carriage-shed at Bow, for the North London Railway Company:—

Brutey	£13,550 0 0
Marion	12,727 0 0
Seal	10,900 0 0
Perry & Co.	10,700 0 0
Crockett	10,270 0 0
Mason	10,133 0 0
Ward	9,500 0 0
Henshaw	9,983 0 0
Blackmore & Morley ..	9,875 0 0
Mansfield, Price, & Co.	9,800 0 0
Ward	9,770 0 0
Snowball	9,477 0 0
Abrahams	9,414 0 0
Hill, Keddell, & Waldram ..	9,410 0 0
Cardus	9,391 0 0
Wicks, Bangs, & Co.	8,950 0 0
Myers & Sons	8,730 0 0
Watts	8,533 0 0

TO CORRESPONDENTS.

F.C.—B.B.—R.W.—O.S.—W.F.—W.C.—J.T.—T.F.—D.W.—C.—Dr.—W.—H.—B.—W.M.—R.—M.—T.—S.—T.—D.—W.—C.—D.—C.—H.—F.—J.—R.—O.—H.—W.—D.—R.—A.—A.—G.—J.—K.—W.—H.—W.—J.—D.—H.—B.—W.—O.—L.—P.—J.—D.—P.—H.—H.—P.—O.—A.—W.—(insertion)—A.—B. (it will require great power)—T.—I. (shall have attention)—M.—T. (ditto)—K.—L.—M. (next week)—K.—S. (next week)—Inquirer (next week).
We are compelled to decline pointing out books and giving addresses.
All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.
Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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[ADVERTISEMENT.]

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A true Copy.—A. M. BELL.

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K. & T. R. SPON, 45, Finsbury-street, London.

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	Maximum of Marks.
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Experimental Science, including Inorganic Chemistry, Heat, Electricity, and Magnetism	100
Geology and Mineralogy	40
No Candidate will be eligible who does not show some proficiency under one at least of the heads included in Part I.	
Part II.	Maximum of Marks.
Strength and other Properties of Materials, and the Calculation of Strains	100
(A.) Railway and Canal Engineering	140
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(C.) Hydraulic Engineering, including Water or Steam Power, and Irrigation	140
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* * * Each of the groups lettered A, B, C, D, to include design, estimation, specification, and the mechanical construction connected with it; and candidates will be required to show that they have been engaged in the practice of their profession on adequate works for a sufficient time, or have had of some other way satisfactory proof that on becoming so engaged they will be able to perform the duties of the position in the branches indicated. Persons wishing to compete must forward, on or before the 10th OCTOBER inst., a statement of their age (which must be below 35 and without professional training), of the Secretary, Civil Service Commission, Cannon Row, London, E.C. Such further information as may be necessary will be made by the Civil Service Commissioners with regard to the age of candidates, and also as to their health and character.
Dublin Castle, 4th October, 1870.

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The Builder.

VOL. XXVIII.—No. 1445.

"Canny Newcastle:"
Social Science.

NEWCASTLE UPON TYNE is about nine miles from the sea, and the river Tyne is navigable to Blaydon, four miles above Newcastle, for vessels of 30 tons burthen. Large steamers and sailing vessels, drawing 15 ft. of water, can now discharge at Newcastle Quay, owing to the recent deepening and improvement of the river by the Tyne Commissioners. From the Registrar's Customs Return it may be stated that the tonnage of the port of Tyne is nearly as large as any in England, the tonnage being as follows, viz., London, 4,136,000; Liverpool, 4,676,000; and Newcastle, 4,141,000.

The population, as estimated by the Registrar-General, is 133,000. The Parliamentary boundary includes an area of 5,325 acres, the circumference being sixteen miles. This comprises an open space of ground belonging to the Corporation, to which the public has access, called the Town Moor, and which measures about 1,200 acres. With this it is to be hoped something effective will be done.

The town has greatly increased of late, as is indicated by the census, the return for 1851 showing a population of 87,000 only. Owing to the very rapid growth of the town, it was found necessary, in the year 1853, to extend the boundaries of the borough so as to include a number of outlying townships, which up to that period were beyond the jurisdiction of the Corporation as far as regards sanitary measures, many of the streets being undrained and unpaved, as is the case with other towns beyond the original boundaries. Since that date some progress has been made in providing what was necessary in this respect, but very much still requires to be done to render the borough as salubrious as it might be, such as the reconstruction and proper arrangement of sewers, the repaving of old thoroughfares, and the utilisation of the town sewage, so as to prevent its discharge into the river. We are informed that within the past three years about 150 new streets have been drained and paved, and that thirty old streets have had their drainage reconstructed. The newer-built portion of the town is partly furnished with water-closets; but in other parts there are only filthy open pits, or no provisions at all.

Leaving this part of the subject for a time, we may mention with reference to street improvements that Grainger-street, one of the most central streets in the town, is in course of extension southward to the railway station. This street is 60 ft. wide, and its additional length will be 260 yards. A new street is now being laid out from Pilgrim-street to Carlisle-square, a length of about 170 yards. In the formation of these streets a great deal of closely-built property has been removed, which should admit of arrangements tending to the health of the localities surrounding them. The great fire in 1854, which consumed a large amount of old property on the quay side, has cleared the way for the erection of ranges of offices, and places of business, and open streets in place of the narrow "chares" formerly existing there. Closely adjoining the above is the Sandhill, which has also been improved by the removal of ancient timber buildings, the widening of the street, and the erection of substantial houses. At the Quayside a mass of old and ruinous property, near Sandgate, has been pulled down, and the Corporation has recently obtained powers for other street improvements in various parts of the town, the effect of which, if properly effected, will be to remove much old and closely-packed property, in addition to facilitating street traffic. The formation of two parks on the town moor, to be laid out ornamentally for the public recreation, is also talked of, and should be pressed on as a measure of great importance.

Our readers have been kept informed from time to time of architectural and artistic works in the town, and recapitulation is unnecessary. The neighbourhood of the railway station, one of the noblest, by the way, in external appearance in the kingdom, is becoming the finest quarter of the town, the monument to George Stephenson and the Roman Catholic Cathedral helping the ensemble. The latter has lately received an addition and an improvement in the shape of a little tower, with spire, for a staircase, connecting with the church the residences of the clergy. The effect of it is particularly agreeable. Close to the station a large and costly building is in course of erection for the Institute of Mining and Mechanical Engineers, from the designs of Mr. Dunn, of Newcastle. It will include a fine hall, lined with stone, and with an open roof. The style of the exterior is Italian Gothic. A want of agreement between the side and end of the building struck us, but it would be unfair to offer upon it any conclusive opinion in its present incomplete state. It is obviously a work to which considerable attention is being paid: stone is the material used externally, and a little variety of colour, not too violent, as is sometimes disagreeably the case, is being introduced. A handsome building is in course of erection at the corner of Mosley-street for the National and Provincial Bank of England. Our readers have heard of the restoration, under Mr. G. G. Scott, of the well-known Church of St. Nicholas, prototype of Wren's Church of St. Dunstan-in-the-East, and which was for some time in a ruinous and threatening state. It is now apparently sound and substantial, though the use of iron ties in stonework always seems to include a certain amount of risk in futuro. Local admirers of the church complain of an altered effect, caused by a change in the character of the new ashlar facing introduced; but without complete knowledge of the circumstances than is possessed by those merely looking on outside, comment would probably be unjust. In restorations of old buildings, difficulties scarcely known to any but the architect have often to be weighed and overcome.

The stonework of the ancient Norman castle which gave the place its name, is greatly decayed at the joints, in some parts to the extent of several inches. This produces a picturesque effect, and, the walls being very thick, does not

at present interfere with the stability of the structure. It necessarily, however, admits a great quantity of water, and decay goes on with increasing rapidity. Judicious pointing with black mortar, so as not to destroy the appearance of antiquity, would add a hundred years to the possible duration of this interesting pile.

Near the county-court, where the Health Department of the Social Science Association held its sittings, two old houses, occupying a prominent position at the junction of roads, have been faced with terra-cotta, somewhat elaborately, including gables, strings, and window-dressings; and, the old flank walls remaining, the front suggests what used to be vulgarly called a "dickey," or sham front. The material, manufactured by Harriman & Co., of Blaydon-on-Tyne, seems good, and has capabilities; but the architectural and chromatic combinations are not particularly successful. The main cornice, while all the rest is light, is of a dark chocolate colour, which seems to cut off all above it from the part below.

Let us now, however, look in, with the mind's eye, where the Department is sitting, and record something of what was written and said there touching the progress, condition, and requirements of the town.

After the reading of Mr. J. Blackburne's paper on the Utilisation of Sewage, which we have already printed,* observations being invited as to the drainage of Newcastle,

Mr. Godwin, as a stranger, said the aspect of the river Tyne was something terrible, and showed a want of attention on the part of the corporation on this very question of sewage. It seemed to him that the system of drainage pursued in Newcastle was much the same as had been followed for many years, and was quite unworthy of the town, either in respect of its wealth or intelligence. He had reason to believe that the surveyor of this town was very likely to place some scheme before the ratepayers, and he respectfully hoped that the people would in the fullest and most candid manner, irrespective quite of the money question—the health question being of much greater importance—examine carefully any proper scheme that might be laid before them. They must not look to obtain a large sum for the use of the sewage at first. They should rather be content to get rid of it at the smallest possible cost.

Mr. Alderman Bell, who had presided over the deliberations of the section during the greater portion of the discussion, at the close of the debate, reverting to these remarks on Newcastle, said he did not quite understand the speaker when he said they were going on just as usual. If he meant the town had formerly been going on well, he was glad to hear a stranger say it was continuing in the same desirable course; but if Mr. Godwin meant that the governing body was neglecting its duty, he must take exception to his remarks. Without having the figures at hand he would not quote statistics in refutation of the suggestion, but he would see that information was submitted to the congress to show that Newcastle had not been idle in sanitary matters during the last twelve years. Newcastle was an extremely difficult town to deal with. Although it would be easy to collect the sewage at one point, it could not be disposed beyond the town to the land except by first raising it some 300 feet.

At a subsequent meeting Mr. Sheriff Gregson objected to what had been said, and maintained that Newcastle could favourably compare with any town in the kingdom. The sewerage was not defective; 90,000l. a year was expended on a perfect system of scavenging of nightsoil which never went into the sewers; and steps were being taken to intercept all the sewers on

* See p. 781, ante. For other notices of proceedings of Social Science Association in Newcastle, see pp. 777, 778, 801, &c.

one side of the town, instead of allowing the refuse to be discharged into the river. Under these circumstances, it was too bad to raise such objections. Mr. Godwin, in reply, said he had no desire to prove the Town Council was in the wrong; but only to impress upon the inhabitants that some further steps were absolutely necessary in regard to the sewage of the town. He found that large outlets in existence a dozen years ago were nearly in the same condition now as they were then, and others had been added of the same character, all below low-water mark. There were some fifty on the Newcastle side of the river in a terrible state; and it was of the utmost consequence that attention should be given to the matter, instead of rebutting statements of this kind by the assertion that the town was as well sewered as any town in the kingdom; because it was not so. He denied the necessity of raising the sewage 300 ft. before it could be transferred to the land; that evidently was a mistake. On another occasion the speaker went further into the subject, and referring to a report made chiefly by Dr. Rutherford in 1866, asserted that if it had been attended to more promptly and more completely, there would have been many more living in Newcastle than there were at present, and a much better state of things existing. He was forced to repeat that there was a great deal yet to do in Newcastle. He had already taken the liberty of alluding to one or two places in this town where he had found the want of closet accommodation to be quite dreadful, and until they got provision of this sort nothing could be done, the want of it was a great difficulty in the road of progress, both moral and physical. Modesty was destroyed, habits of carelessness were encouraged, and the stories he heard on Friday afternoon from poor inhabitants of courts, if they were repeated, would carry conviction to the minds of the authorities of the necessity of a proper system of sewerage for the town of Newcastle. The town surveyor, he believed a very able man, had not yet begun to touch it, but had paved many of the streets, and had no doubt done a great deal of good in that way above ground, but had not gone down to the sewers. These latter must be attended to at once, if Newcastle was to be placed in a satisfactory condition. The condition of the children was also very bad. In the examination he had made, he spoke to not less than twenty children, of eight, ten, or twelve years of age, who knew nothing whatever of reading or writing, or had had the slightest instruction. They appeared to be simply brought up to damage the community, for their own speedy death, or to fall into what was called the dangerous classes. Overcrowding had also had a most injurious effect upon the health of the people. Much undoubtedly had been done in Newcastle, but there were many parts of it which were still greatly overcrowded. In conclusion, he strongly urged the Town Council to appoint a medical officer of health for Newcastle; he was perfectly astounded to find that the town, with its many admirable buildings, had not such an officer.*

Mr. Michael remarked that it required no amount of observation from a stranger to notice on his entrance into the town its imperfect sanitary state, and in calling attention to the fact he and others would be pardoned, because they only desired to make the best return to the people of the neighbourhood for their hospitality. Now, opposite the principal hotel, where he was staying, the streets before the main door were a disgrace to civilisation. Three or four inches thick of dirt had been accumulated for some days, and during the driest portion of the year in some of the streets there were pestiferous stenches. He quite agreed with what had been said as to the appointment of a properly qualified medical officer of health for the town, whose duty it should be to point out necessary im-

provements, and see that they were carried out.

Dr. Holland observed that with the existing sewage arrangements of Newcastle there were two very serious faults, which it might be desirable to point out. It ought to be remembered that the great object of sewers was the taking away of the filth from the town as rapidly as possible,—a defect in the Newcastle system,—and they knew that the sewers were also untrapped. So long as a large proportion of the population were allowed to live in single rooms, it was impossible for that population to be healthy. We were always giving off that which might at any time become the seeds of disease. Organic matter must be cast off; and unless, therefore, people could change their rooms—and the more they changed them the better for safety—they could not keep those rooms sweet. Unless a family could afford a house of certainly not less than two rooms, in order that one might be occupied at a time, then that family, living all together perhaps in one small apartment, could not possibly be in the enjoyment of really good health. He was, from careful consideration of the question, persuaded that in the end a working man would find it more economical to provide more rooms than one for his family.

Mr. Councilor T. P. Barkas, replying, observed that reference had been made to the ignorance of the children, but he thought if the children of Newcastle were examined with those of other towns, they would find that they were not more ignorant than the children of Manchester and other places. They were not, he strongly maintained, in this matter worse than their neighbours. Every endeavour had and was being made by the Town Council upon sanitary matters.

Mr. Rawlinson, the president, said they had not desired to unduly censure the Newcastle authorities in bringing before the meeting the special evils alluded to, but rather in order that by their being pointed out they might be speedily remedied. The last speaker had said that certain things in Newcastle were not worse than similar ones in other towns, but he did not think that that was the right style of reply to be given. It was satisfactory to learn that the town was now feeling the benefit of the work of progress which had been carried on during the last few years. When they saw that in this population of Newcastle 15,800 families, and he supposed that each family on an average would be composed of five individuals, when that vast mass of the population was crowded into tenements of one or two rooms they could readily imagine the result. From eleven to twelve o'clock at midnight was the proper time for investigation, and between those hours he would recommend members of the town council to visit the overcrowded parts in company with a police officer, and if they did not learn a lesson that would last them for their lifetime, he was afraid they were bad to teach.

A valuable paper was read by the Rev. Dr. Rutherford, on the

Public Health in Newcastle in 1866 and 1869, the object of which was to show what excellent results had followed such sanitary improvements as had really been made. In the course of it he said,—“The vitiation of the atmosphere of dwellings, by over-crowding, is one of the most powerful causes of a permanently high death-rate; and a considerable increase of over-crowding seems to have been the great predisposing cause of the excessive mortality in Newcastle during 1866. Between 1851 and 1861 there was an increase of 21,812 in the population of Newcastle, and of 3,658 in the number of inhabited houses, being a house for every six persons added to the population. During that period the people of England increased 2,193,615, and the number of inhabited houses 461,466, or a house for every 4.6 of those added. Since 1861 the augmented accommodation for the estimated increase of population in Newcastle had, up to 1866, scarcely averaged a new house for every ten persons. In 1861 there were in the borough 15,979 inhabited houses, 588 uninhabited, and 330 building. The population was 109,108 persons, or rather less than eight persons to each inhabited house, being a larger number than in any of the large towns in England. From 1861 to 1866 only one house had been provided for every ten persons of increase in population. The number of houses built, or being built, in 1862, was 337; in 1863, 220; in 1864, 187; in 1865, only 108. This marked

diminution in house accommodation for the rapidly-increasing population was followed by a great increase in the over-crowding of tenements, and by a death-rate only exceeded during cholera epidemics. The evil was increased by the removal of property occupied by the labouring population, for purposes of public improvement. Towards the close of 1866 a considerable impetus was given to house-building. Between August, 1866, and August, 1867, 232 houses were built; in 1867-68, 505; in 1868-69, 443; and from August, 1869, to August, 1870, 552. During the last three years, it must be stated, 1,500 houses had been built, a number considerably greater than had been built during the preceding seven years. This great increase in building operations has tended greatly to relieve the overcrowding which invariably expresses itself in a higher general and zymotic death-rate. The active, intelligent, and competent builder is thus one of our most efficient sanitary reformers. Nor has it been left to private enterprise alone to provide for the pressing necessities for the labouring poor. The comfortable and healthy homes provided by our local Industrial Dwellings Company form an immense contrast to the wretched abodes in their immediate neighbourhood, where death holds a perpetual carnival; and, for the sake of the moral and social results, it is to be hoped that the public spirit which has inaugurated the movement will not fail of its financial reward. In London, where attention has been paid to the wants of a locality, such dwellings have proved in every respect a success, and, as an investment, are justly regarded by many as one of the safest in the market. Nor is there any reason why it should be otherwise in Newcastle.”

And again,—

“Poisonous emanations from decaying animal and vegetable substances are favourable to the production of diarrhoea; and it is impossible to resist the conviction that the wretched and filthy condition of the miles of unpaved streets then to be found in that sub-district were likely to be conducive to that excess. Leaving out of consideration the mortality from phthisis in the sub-district of St. Nicholas and St. John, which includes the deaths in the Infirmary, a comparison of the other sub-districts shows a death-rate from phthisis in Westgate and Elswick, during 1865, of 327; St. Andrew, 310; Byker, 278; and All Saints', 257, in 100,000 persons living. The principal conditions somewhat under municipal control, conducive to the development of tubercle in the lungs, are want of pure air, want of sunlight, and damp; and while each of these causes in varying degrees operates in every registration sub-district, it can scarcely be doubted that the high mortality from consumption, during 1866, in a sub-district like Westgate and Elswick, upon the whole the healthiest of the borough, was largely dependent upon its 155 unpaved and unsewered streets. The vapours of marshy lands are known to favour the deposit of tubercle, while it is often arrested by living on a dry soil and in a uniform and temperate climate. The mere removal of subsoil water by complete drainage, to some extent accomplishing both objects, was found, in our experience of 1866, in a considerable degree to diminish the mortality from consumption; and the enlarged and enlightened observations of Dr. Buchanan had established it as a sanitary law that the drying of the subsoil reduces the death-rate from consumption, and the experience of the west end of Newcastle since 1866 is not the least striking illustration of the truth of that law. The great reform in the street condition of that sub-district during the last three years can only be truly estimated by those who lived in its midst before. Justice cannot be done to it in any description. The melancholy mud ocean that enveloped so many hundreds of work-people's dwellings has given place to well-paved and sewered streets. The death-rate from diarrhoea and consumption has been steadily lessened; and when the street and sewer works are finished, the west end of Newcastle will bear favourable comparison with some of the healthiest districts in our large towns.”

Mr. W. Crozier, C.E., gave the town excellent encouragement to proceed, by an account of

What has been done in Sunderland,

and the satisfactory results that have followed. Mr. Crozier said:—“There has been expended from the year 1851, up to the present date, in the borough of Sunderland, as follows:—

* *The Irish Builder* in a recent number says:—“Referring to Mr. Godwin's remarks about the sanitary condition of the town of Newcastle-on-Tyne, we can hear him out in every particular. He has largely spoken strong enough of the deplorable state of the low quarters of that commercially prosperous but sanitary misgoverned northern capital. We speak from personal knowledge ourselves and of repeated visits made to ‘Canny Newcastle.’ It is to be hoped that the action of the Sanitary Congress held during the last few days in the town, will wake up the civic authorities (if Newcastle is to look closer after the courts or ‘charies’ as they are called in that town. Round about the Quayside quarter, along the quay side, and through the heart of the Sand Gate, there is at present and always has been, a plentiful supply of dirt, disease, and, of course, absence of pure air. We make those remarks in justice, and in confirmation of the speakers whose remarks we append.”

On Sanitary Works (current).....	£288,000
Ditto (permanent), including Sewerage, Baths and Wash-houses, Public Flaggings, Private Flaggings, Public Park, and pulling down old property under the Act of 1867	230,000
Private Sewerage Works.....	150,000
	£668,000

And upon works which can hardly be classed as sanitary works, such as markets, bridge, police stations, fire-brigade, &c., 79,270*l*. It is also proposed to expend 40,000*l*. more in pulling down old property, 5,000*l*. in public flagging, and 10,000*l*. in extension of the sewerage works. The only liabilities which remain to meet, out of this great expenditure, is a mortgage debt of 195,000*l*. As to the beneficial results obtained in the health of the town, these are clearly shown by the registered rate of mortality from the year 1841 to the present time, which is as follows:—In 1841, the rate of mortality was 28.89 per 1,000; in 1851 to 1858 (inclusive), 26.00 (before sanitary works were completed); in 1858 to 1868 (inclusive), 24.00 (after sewerage works were completed, but no dwellings dealt with); in 1869, 22.80 (ditto); in 1870 (half of year), 19.6. Since the paving and sewerage works have been carried out, there has also been a marked improvement in the cleanliness of the interior of the dwellings of the poor. The Public Lodging-houses have been closely and strictly attended, the necessary cubic space and all necessary rules rigidly adhered to, and the mortality in the lodging-houses is actually less than in the ordinary dwellings of the working classes. One matter which I am bound to admit is greatly in favour of the borough of Sunderland, is its abundant, constant, and splendid supply of water, which never fails: every house and tenement in the borough has an ample supply, and yet, by a constant supervision exercised by the water company over the fittings used, and the detection of waste, the consumption for private purposes is only 13 gallons per head of the population, exclusive of water for manufacturing purposes, and rather under 20 gallons, including the same. In laying before you these few facts, I have referred, for the sake of showing what can be done, and what is often either left undone or too long delayed, to the boards and works of two of our largest local boroughs. But, as in all matters that are to be inquired into, it is only by such references that we can arrive at conclusions which may be useful hereafter for our future guidance, I trust that any remarks I have made will be received in the spirit in which they were intended,—that is, with no intention on my part either to condemn or approve the proceedings of any public body, who, I am sure, always do what they consider proper for the interest and welfare of their different boroughs, but to endeavour to arrive, as far as possible, at facts, which may be of use in further carrying out sanitary reform, the yet great question of the day, but which, I am sorry to say, has, for the last twenty years, been more treated by words than works. After the works above enumerated have been carried out in a town, including the removal of uninhabitable, and the substitution of an improved class of dwellings, paving and flagging, baths and washhouse, public parks, an abundant and constant supply of pure water, and a proper system of sewerage, which, I am of opinion, is the best means of bearing away the soluble refuse of our towns, there is still left, before our sanitary works can be said to be complete, a great and important work to be done, viz., the disposal of our sewage matter, so as not to pollute our rivers and harbours, and to endeavour, if possible, to turn the matter so disposed to some profitable account."

We may not, however, devote to this subject more space at the present moment, further than to urge the authorities to give their serious attention to the suggestions that were made, and to offer them assurances which we hope they do not need that we have ourselves, in pressing upon them the necessity for further improvements, but one object in view,—the general welfare.

Flies.—A little attention on the part of the proprietors of dining-rooms would get rid of the evil of flies. In Belgium the butchers use laurel oil on their door-posts and window-frames, to such good effect, that the flies will not enter the shops. Is not this hint really worth taking?—*Food Journal*.

HOW WE BUILT A SHIP TO SINK.

THE grave, pointed, and well-considered censure which the Court of Inquiry into the circumstances attending the loss of H.M.S. *Captain*, with 500 of her officers and crew, off Cape Finisterre, on the morning of the 7th of September, has had the courage to embody in the judgment read by the Judge-Advocate on the 8th current, deserves the very serious attention of educated men. That two admirals and seven captains of the Royal Navy should have so conscientiously discharged the judicial function to which they were summoned, unbiassed by any of those considerations of personal favour, or hopes of employment or promotion, that are thought to be forfeited by uncourtly remarks as to the conduct of administrative superiors, is in itself a circumstance that does them honour. The Court, after finding, as the public were fully prepared to anticipate, that no blame is attributable to Mr. James May and the other survivors of the *Captain* (the *pro* *primo* prisoners before them) for the loss; and having put on record the somewhat bald statement that the vessel "was capsized by a pressure of sail, assisted by a heave of the sea," and that the "sail carried at the time of her loss (regard being had to the force of the wind and the state of the sea), was insufficient to have endangered a ship endowed with a proper degree of stability," emphatically state their conviction, which resulted in their minds from the careful consideration of the evidence. They remark that the *Captain* was built in deference to public opinion, expressed in Parliament and through other channels, and in opposition to the views and opinions of the Controller and his department; and that the evidence all tends to show that these officers generally disapproved of her construction. They state that while in the hands of the contractors who built the *Captain*, a grave departure from her original design was committed, by which the draught of water was increased, and her freeboard was diminished, by about 2 ft. And they add that her stability proved to be dangerously small, combined with an area of sail (under the circumstances) excessive. Thus far, indeed, the facts brought out in evidence admit of but little difference of opinion; nor would the late Controller, or any administrative officer of the navy, have hesitated to sign such a judgment. But the thing is to follow. The Court deeply regret that, if these facts were known and duly appreciated, they were not communicated to the officer in command of the ship; or, if otherwise, that she was allowed to be employed in the ordinary service of the fleet before they had been sufficiently ascertained by calculation and experiment. If this is not something like a verdict of manslaughter against the Admiralty, we fail to read the meaning of very plain English.

We are not of the number of those who will rejoice to make use of this grave and serious impeachment as a political weapon against the present Commissioners of the Admiralty, or the Government of which they form a part. For us, as for the majority of our readers, the interest lies far deeper than any party question. Neither would such an application of the blame be altogether just. The "yielding to the pressure of public opinion expressed in Parliament, and through other channels," can hardly be considered as a crime in itself. It is in the mode of such yielding that the gravamen consists. To introduce, experimentally, a pattern of floating battery which had very strong recommendations in its favour, while (whether truly or otherwise), it was generally believed to be opposed, rather to the private interest, or private hobbies, of Government officials, than to any structural law, was a departure from the rules of red tape that would find more to applaud than to condemn. But the sore point lies here. In so disregarding the opinion of the responsible officers, the Board of Admiralty was bound to guarantee their own action by the independent advice of some engineer of sufficient eminence to justify them in case of failure. Had this been done, the Admiralty would have been placed in a very different position. For, in the first place, the loss would not then have occurred. No such civil engineer as were those great men whom, a quarter of a century back, the Admiralty would have consulted in a similar case, would have allowed the *Captain*, as she was actually built and rigged, to go to sea. Secondly, if any disaster, even of a less unmistakable character, had occurred after such a step, My Lords would have been held blameless.

They might have said with justice that the great importance of the subject, the military advantage to be gained in the event of success, and the favourable opinion of many skillful men, had convinced them that the experiment should be made. That, having so decided, against the wishes of their own constructors, they had taken the independent advice of a competent professional man, and that, on his assurance of the safety of the plan, they had ordered the experiment to be carried out. Further that, during the progress of the construction, this *ad hoc* consulting engineer had, from time to time, given the requisite attention, to see that the design was faithfully adhered to. Had this been done, no complaint would have been urged against the Admiralty in case of non-success.

It is very clear that it is not the present Board of Admiralty that is to blame for omitting, in the first instance, this obviously necessary precaution. That they should have allowed the *Captain* to put to sea, under all the circumstances that have since been made public, was, no doubt, a grave fault. Still the present administration did no more than allow the matter to run on in the groove in which they found it actually in motion; and it may be even urged that it is to expect too high a grade of education for merely political men to imagine that a First Lord would even entertain the idea that a vessel would be so designed and so built as to be liable to capsize. Such, no doubt, is the case. While, therefore, the absence of a proper consultative officer shows a want of proper precaution, which is in itself inexcusable, it is not so easy to say that Mr. A. or Lord B. is personally responsible for the omission. The evil, to a great extent, is chargeable to the system of our political administration. While we are content to commit military, naval, and technical matters to civilians and non-technical men for political reasons, we shall be likely to pay the price of the *Captain* at least once a year. Happy would it be for us if it were the material cost of the vessel alone that was in question, and not the loss of the very flower of the navy, the noble youths and stalwart sailors that were caught, in a moment, in that deadly trap.

In giving minute attention to the evidence brought before the Court, it is impossible to doubt that the main question was, whether purposely or not, kept in the background. Whether the cloud of words in which it was obscured arose from the fact that the witnesses purposely shunned the light, or from the circumstance that they had not that definite mechanical knowledge which would have enabled them to make the matter clear, we can offer no opinion. But the two separate (though intimately related) questions of height of freeboard and position of centre of gravity were so confused that as yet we have no hesitation in saying the public in general are quite unaware of the real cause of the loss of the *Captain*, and, consequently, of the fact that that loss was not what can properly be called accidental.

In all sea-going craft it is a primary necessity to provide that the vessel shall be able to right herself, in the case of being laid on her beam-ends in a sudden squall. The precaution against permanent overthrow is twofold. First, the centre of gravity of the vessel must be kept so far below the centre of gravity of the bulk of water displaced as to insure the vessel's floating, in normal circumstances, with the keel down and with the deck up. Secondly, the cross section of the vessel should be such as to make the resistance to overthrow the greater the more the vessel is inclined to her side,—greater, for instance, at an angle of 15° than at an angle of 10°, greater at 20° than at 15°. This requisite involves a certain height of freeboard.

It must, however, be borne in mind, that in calculations of this kind we have been in the habit of regarding floating bodies of homogeneous nature. In the case of a ship built altogether of timber, or altogether of iron, the height of the freeboard may be regarded as the primary element of stability. If the line of the hull be so designed that the displacement continually increases,—that is to say, that more and more water has to be lifted, the more the vessel heels,—we have a force ever acting in the right direction, and one which, under almost all conceivable circumstances, will get the better of the fitful fury of the wind. But if the vessel be constructed of different materials,—if the upper part, for instance, be of iron and the lower part of wood,—this righting process vanishes. The difference of the specific gravity of the upper part of the vessel, compared with that of the

water, is so great, that the effect of the increased displacement is disproportionately less than that of the leverage of the ponderous side-wall of the vessel. And as, under these conditions, the centre of gravity of the vessel approaches the level of the centre of gravity of the water displaced, stability becomes questionable, or altogether disappears.

Thus, in the height of the freeboard of the *Captain* we have but one of the elements of her floating qualities. She drew, we are told, 2 ft. more water than was designed. If the effect of this deeper draught had been to keep the centre of gravity well below the indicated line of safety, the greater draught would have been in her favour. The mere presence of a higher freeboard of heavy plates would not have compensated for the disadvantage of a centre of gravity varied to an equal extent. This matter must be obvious to any one who has swum a pail in a pond, but it has been kept out of sight in the evidence.

Nor has any light been thrown on the subject of the cause of the excessive weight. It was given, we are told, to strengthen the vessel; but the calculations were throughout so much in arrear of the construction that all this part of the affair is most unsatisfactory. We should like to know how the vessel was paid for, and what was the character of the specification. Eight hundred tons additional ironwork is no trifle. We know nothing of the schedule of prices of the *Captain*; but, according to Admiralty schedules with which we are acquainted, it would represent an extra cost of 36,000l. Are we to suppose that extras of this kind, amounting to more than 25 per cent. on the entire weight, were to be sprinkled in at the pleasure of the constructors, and paid for by the public, after the design had been approved, and the vessel ordered? In any case, the need of that independent and competent supervision, to the absence of which the disaster is directly attributable, is only the more glaringly shown by such admissions as these.

The object of the construction of the *Captain* was one of the highest military importance. As a floating battery, it is probable that the lost vessel was unrivalled. That for purposes of harbour and coast defence the freeboard might, with advantage, have been yet further reduced, had all idea of ocean navigation been abandoned, is more than probable. The idea of raising and lowering the vessel bodily in the water, by the admission or the removal of water ballast, is one that has much to recommend it. The convenience of carrying guns of the great power of 600-pounds, in revolving turrets, framed of 10-inch iron, protecting the gunners with something approaching absolute security, while at the same time a line of some 6½ ft. deep was alone presented as a target for the enemy, is extreme. So admirable a design for a battery may well be coveted for a sea-going ship. We cannot hold that the loss of a vessel of the kind, built without calculation and without supervision, should be deemed conclusive, as against the seaworthiness of every possible form of turret-ship. In the turrets, themselves structures of such enormous weight, and placed necessarily so much above the centre of gravity of the vessel, lies, no doubt, a great element of instability. It is possible that this element can only be mechanically compensated in a vessel of a larger size than any we have yet discovered the possibility of constructing for war purposes. But we deprecate the abandonment of the attempt to build a sea-going turret-vessel, as strongly as we deprecate the construction of turret-vessels which are not sea-going,—that is to say, with any purpose of sending them to sea.

The questions of tripod or jury-masts, and of the greater or less spread of sail borne by the *Captain*, important as they are, are of less moment than the question of the position of the centre of gravity. As to the fatal error committed on this score, the evidence does not leave the shadow of a doubt. Mr. Barnaby, the president of the council of construction of the controller's department of the Admiralty, furnishes some figures on this head. On the 26th of February, the Lords of the Admiralty ordered that "steps should be taken to ascertain the vertical height of the *Captain's* centre of gravity." It was, however, somewhat anomalously resolved that the trials of the steaming properties of the vessel should be made before this precise element of stability was ascertained. That this had not been previously attempted, however roughly, by calculation, is one of those facts for which we fail to find any

excuse. It was not until the 29th of July that the *Captain* was actually inclined, by placing weights on her deck, in order to ascertain the position of her centre of gravity by calculations based on the experiment. The calculations were not complete, and the position of the centre of gravity was unknown to the constructors, until the 23rd of August,—the vessel having been allowed to proceed on her cruise, in the absence of this knowledge, on the 4th of August. From this trial it was ascertained that the centre of gravity of the dip was situated at a depth of 29 ft. (two feet and nine-tenths) below water. The distance between this point and the meta-centre, if Mr. Laird is correctly reported, is given at 2.6 ft.; but, as no information is given as to the amount of displacement, either when the vessel was vertical or at any angle of heel, we are not furnished with the means of applying the formula of stability of equilibrium to the case. Still, if the evidence be correctly reported, it would seem as if, but for the unexpectedly deeper draught of the vessel, the centre of gravity would have approached within 9 in. of the water-line, instead of being one-third below the line of flotation and two-thirds above the keelson. As the ship was actually built, it appears (assuming both calculation and report to be correct) that her maximum stability was attained at an angle of heel of 21°, when it was represented by 7,100 foot tons. From this very moderate inclination, which is more than three times that arrived at by actual experiment, the righting force diminished. The edge of the deck would have been immersed at an angle of 14°, when the righting force was stated to be 5,700 foot tons. How far the deck would have been immersed at the angle of maximum resistance is not stated. At 31½° the righting force had sunk again to 5,700 foot tons, and at 54½° it vanished altogether. The opinion appended to the statement of these facts that the reporter "did not think the *Captain* was unsafe," has been subjected to a grim and terrible rebuke. But even for these calculations, completed nineteen days after the *Captain* sailed, and just six months after they were ordered by the Admiralty, it seems that the only data obtained were those derived from placing 80 tons of ballast on the deck, causing an inclination of 6°. On this we are told that Captain Burgoyne said, "This ship is not difficult to get over 6°, but beyond that she will not go." The Assistant Constructor replied that an additional 80 tons of ballast on the upper deck would cause her to go over to "about double that inclination." It would hardly seem as if the latter statement was much less of a shot in the dark than the former.

The subject is one which eminently concerns the profession of civil engineers. The high position which was held by some of the leading men of what we can hardly call the last generation is vacant. Men seem never to think of guiding themselves by such advice as was given by James Walker, by Robert Stephenson, by Isambard Kingdom Brunel. The collapse of the artificial system of contractor-built railways has involved a noble profession in a downfall, which, if in individual instances it may have been merited, is, nevertheless, a great loss to the public. In the whole of the proceedings as to the calculations and the construction of the *Captain*; the increase of the ironwork of her hull from 3,000 tons to 3,800 tons; the absence of correct theoretic calculations as to the flotation of the vessel; the actual and dangerous position of the meta-centre; the limping of experiment, calculation, and report, after the actual ocean path of the great battery; the declining of responsibility from Admiralty officers to contractors, and from contractors to My Lords; and, worse than all, in the final catastrophe, may be traced one clear and important lesson,—the *Captain* has been lost from the neglect to employ a competent consulting engineer.

Nor is the lesson less signal for the public and for the leaders of the public. Vehement advocates, in Parliament and in the press, reasons the propriety of which must absolutely depend on scientific taste, may learn—if they can learn—a little modesty from the catastrophe of the *Captain*. Without admitting that the Admiralty have any excuse for failing to take proper advice, we may yet do well to remember, in the words of the Judgment rendered by the Court of Inquiry, that the construction of a vessel disapproved of by the permanent scientific officers of the navy was forced on the Board by popular clamour. At a time when it is becoming a prevalent doctrine, notably in some parts of the

Continent, and increasingly even in England, that the less highly a class of men is endowed with the advantages of a liberal education, or, at least, the further it is below the position which can command these advantages, the more potential should be its voice in political questions, it is of extreme importance to observe what overwhelming calamity may, and we believe must, result from the application of the theory. From want of thorough knowledge, in more quarters than one, of the first requisite of a sea-going vessel, our finest floating battery has been sent to the bottom like a shot. We may not have paid, even in this sad and sorrowful event, too heavy a tax for our national safety, if we learn in time the danger of applying the same system, or rather the same no-system, to the erection of our public buildings, the direction of our army, and to the general defence of the country.

BUILDING IN A HURRY.

ONE of the most distinguished of the architects who aided in stimulating the Gothic revival in England, when asked, by a committee sitting on the plans of a proposed cathedral, for an estimate of the cost of the building, "for all reply" (as the French would phrase it), rolled up his drawings, and carried them off; and when

"With the morning cool reflection came,"

explained his behaviour by protesting that he could not deal with people who were silly enough to ask the "cost" of a cathedral, the building of which would, or ought to, extend over more than a life-time, and through all kinds of possible fluctuations in the labour market. This was, perhaps, carrying matters a little too far; and, moreover, it is not unlikely that the sentiment was based, not so much on a consideration of what modern builders could possibly accomplish, as on an illogical idea that since the building of a Medieval cathedral generally extended over at least two or three generations, a modern one had no business to get itself built any quicker. More recent architects, Gothic and Classic, have at all events got out of this little superstition, or the public have worried them out of it. We are a business-like people, and whether the order is for a pair of shoes under one's feet or a roof over one's head, the purchaser always wants to know "how soon he can have it." And it must be conceded that, in a business point of view, the demand is well met. Architects are ready to turn out plans for a town-hall or a monster hotel, by the aid of an efficient staff, in a wonderfully short space of time; and contractors, with an army of workmen and an imposing array of "plant," are prepared definitely to "name the glad day" when the work can be handed over complete and in good order, for the use and occupation of those who require it. In some respects, and in some cases, this rapidity and certainty in carrying out work, the result of modern improvements in communication, transit of materials, machinery, and in the organisation of labour, is an incalculable advantage. Where a building is wanted mainly for certain pressing practical needs,—where it is necessary, for instance, to build a hotel to meet the rapidly-increasing popularity of some special neighbourhood,—in such cases it is almost essential to be able to state an early date when the work shall be in readiness, more especially when there are anxious shareholders who wish "to see something for their money." And in any case it would be absurd to ignore the necessary result in the building trade, as in other trades, of improved mechanism, material and social; or to suppose that because a great architectural style was developed under a slow and uncertain régime of building operations, the two facts were therefore to be regarded as in the relation of cause and consequence. But whilst all saving of labour is, in the main, so much to the common weal, there are, in regard to the practice of modern architecture, certain drawbacks attendant upon the greater facility with which large building operations are carried on, which it is as well not to lose sight of. Practical drawbacks there are, for instance, which, as they affect chiefly the comfort and health of the future inhabitants of a building, we may ask non-professional as well as professional readers to take into account. These nowhere show themselves more than in the erection of dwelling-houses, as frequently carried out, especially houses for the middle-class in point of wealth, who do not support more than one residence, and who, if they build a house, do it as one of the great events of their

lives, not to be approached or even entertained without due caution and deliberation. But, once decided on, the feeling is that of Jacobeth, "if 'twere welldone, 'twere well it were done quickly."

In many cases, our client is a recently married or an about-to-marry man, bent on making a domestic homestead for himself and his descendants; and he must have the house ready by a certain date, because he is coming home from his travels at that time, or because of some interesting domestic prospects, or because he is constitutionally impatient; and so the house is planned in a hurry, and subsequent modifications have to be made for which no thought had been taken at first; and the bricks or stone are chosen in a hurry, and the former turn out to be friable and efflorescent, and the latter green and pervious to damp,—*n'importe*, the house must be ready, and so the joiners and plasterers are turned in upon the hardly-finished carcass, and the consequences are seen before long in "sweating" wall surfaces, and mottled ceilings, and decaying painter paper. It is seldom that an ordinary middle-class dwelling-house is built as deliberately as it ought to be, in order to ensure good and permanent work. To do strict justice to a house, the shell should be built and left to stand for some months, till thoroughly air-dried, and till all the superfluous moisture has found its way out of the walls before its exit is obstructed by plaster and skirtings. But this would in general involve far too great a delay for an anxious and impatient client. Artistically, too, the house must suffer, since there is no adequate opportunity for considering the design of the fittings and furniture, which ought to correspond with the style of the building; but these are points so seldom actually considered by a house architect, and to which his client is in general so totally indifferent, that they may be practically left out of account in regard to English dwelling-houses. It is probable that were double the time and trouble expended over the actual building of the house, the owner would still fill it, as usual at present, with carpets and furniture bought from upholsterers' stocks, and of no style of design in the world.

In buildings on a larger scale than ordinary dwelling-houses, there is of course in hurried building the additional practical danger from insecure foundations and unequal settlement of work hurried up at an undue speed. In the matter of foundations, however, so much can be effected now with concrete, that where expense is no object, and time is, there may be less occasion for deliberating and experimenting on the nature of the site. But the most important prejudicial effect of hurried building, though one to which the public generally are quite indifferent, is seen in the architectural design. There are, unhappily, a large number of architects who are as careless in this matter as their clients, or who have no idea of its being necessary to study carefully the design of a large building; if they can turn out showy drawings in the prevailing fashion of the day, and set clever carvers to work upon the building, they have satisfied equally both themselves and their clients. And these are the class of architects who are most in favour with hotel companies and other speculators in large buildings; they are regarded as good men of business, and praised for their readiness and despatch. In the meantime those architects who wish to produce buildings that will be both durable and permanently satisfactory in effect are somewhat unfairly treated; the pace is set by the rapid and ready school of men, and the more careful and conscientious must either keep up to it, or be content to lose commissions which they can ill afford, either for their gain or reputation, to see go into other hands. So it comes to pass that a man who would be very glad, if he could, to give careful consideration to every detail of a building, finds himself with several large works on his hands, all required to be completed as soon as possible, and the result is a scramble in which details and all those subtleties of style and treatment which go to make up the charm of a really artistic building are left to chance and the clerk of works or draughtsman. There are very few large buildings to be seen which do not show in their treatment of detail evidences of disproportionate haste and consequent want of attention on the part of the architect, who is really not in general to blame in the matter, since he is hurried on by the demands of his clients. The architect of such buildings as the Law Courts and the Manchester Town-hall (for example) ought to be so remunerated and so considered with regard to demands on

his time that he could afford to give study to all the detail in its relation to the whole. Instead of this, too many buildings bearing the name of unquestionably talented architects bear also on their face the testimony that their ostensible author could have had but a very limited share in producing them, and that the details are just the current office stock of features (and we know how different offices run into mannerisms of their own), applied in a mechanical manner by a staff of draughtsmen, to the design which their chief has broadly sketched out, but had no time to work out in detail. No really satisfactory building ever was or will be produced in this manner; and we could point to several large buildings at this minute which convey to the spectator the idea that they are the conglomeration of the work of several designers thrown together at hap-hazard. Between the slow growth of a Mediæval cathedral and such a flinging together of materials as in Beckford's attempted tower at Fonthill, which was carried up day and night by the aid of torchlight and relays of workmen, and fell down the moment it was completed, there are many gradations of haste or deliberation; and there may be occasions when speed really is of the first consequence. But, in a general way, the public and the Government ought to understand that neither stable construction nor good architecture is to be had in a hurry; and that if they want really good work for their money, they must give their architect time to think and their building time to settle.

COLOUR IN STAINED GLASS.

ONE of the most remarkable movements ever recorded in Church history, but one that has scarcely received the notice which it deserves from modern writers, was that which was commenced by a few Benedictine monks in the east of France, at the close of the eleventh century. Disgusted with the laxity of manners which had overgrown monastic institutions, and scandalised with the ostentatiousness and extravagance displayed in the buildings, decoration, misdirection, and services of the Church, three monks of the Abbey of Molesme, desirous of following a stricter mode of life, and of adopting a simpler and purer form of worship, separated themselves from the community to which they belonged, and founded, in a desert place in Burgundy, a new convent and a new Order of Monks.

Such was the commencement of the great Cistercian Reformation, which, rapidly over-spreading the whole of Christendom, in a wonderfully short space of time covered the face of Europe with its results, no less than 350 abbeys of this order having been founded, erected, and abundantly endowed within the first century of its existence. In no country did this reformation, and the simple earnestness of its promoters, meet with greater favour and readier acceptance than in England. Landowners and nobles vied with one another in offering sites for their convents, in aiding them to raise their Abbey church and their domestic buildings, and in amply endowing them when completed: witness the numerous noble remains of this Order in Great Britain, which still survive the disastrous effects of a subsequent Reformation, due to similar causes, the destructive ruthlessness of which swept away much that was noble and admirable, as well as much that was corrupt and degenerate.*

Again and again has the same thing happened. We see it in the outbreak of the Iconoclasts, in the early ages of the Church, and in their wholesale destruction of images and pictures; as well as in the subsequent separation of the Greek and Latin Churches due to the same causes. We have it again in the protests and secession of the Cistercians in the eleventh century, and in the action of Wycliffe and his followers in the fourteenth. We see it later still in the German Reformation of the fifteenth century; in the suppression and destruction of monasteries under Henry VIII., and in the puritanical havoc of the Great Rebellion.

In this frequent recurrence of the same causes and the same effects, from time to time, in the history of the Church, we recognise, in the first, the natural proneness of human nature to that which captivates the eye and pleases the senses, and the constantly increasing tendency to ornate services, to church decoration, to a

sensuous ritual, to pictures and images, and ultimately to superstitious observances, and saint-worship; and we see, in the second, the sure result of that revulsion of feeling which suddenly arises when the lowest point in this downward progress of mental subversion is arrived at.

Of these different movements in the latter direction, not one was commenced and carried out with so much humility and gentleness of spirit as that of the Cistercians. Content to protest and to dissent, they proved the sincerity of their professions by the sanctity of their lives, and by the reality of their self-denial, rather than by aggressive attacks on the system which they condemned. In no document, however, either of ancient or modern times, is the use of colour and gliding on walls and windows, of gold and silver in ornaments and utensils, of pictures and images, of superstitious practices, and saint-worship, so emphatically denounced as it is in the *Charta Caritatis* of the Cistercians, the code of laws which, adopted in the earliest days of the foundation of the Order, and subsequently enlarged and confirmed under the auspices of St. Bernard himself, remained the rule of life of all the monasteries of the Order.

The many independence which characterises this early protest or charter is sufficiently remarkable, when we consider the circumstances and the times in which its authors lived. Without throwing off their allegiance to the Church, they acknowledged no authority in the administration of their affairs, or the government of their own monasteries, but that of the head of their Order. They forbade, indeed, their members to go to Rome, unless accompanied by a bishop of the Cistercian Order.^a They prohibited prostration in their churches, and any object position of the body whilst praying.^b They abolished saint-worship, and permitted their churches to be dedicated only to the Blessed Virgin.^c They tolerated no images, or pictures even, of saints; nor, indeed, the representation of the human form on their walls, or in their windows; nor even the crucifix itself; permitting only a painted wooden cross.^d This order is further supplemented, and their opposition to all approach to sensuousness, either in their service or ritual, is further illustrated by a comprehensive order passed at the General Chapter of 1213;^e and again by two remarkable injunctions relating to bell-ringing and singing, occurring, the first, in the same general order of 1213, and the second in the second edition of the *Charta Caritatis* of 1341.^f Their objections to polychrome, and to richness of ornamentation of every description, arising evidently from the extent to which the abuse of this species of decoration on the walls, and in the vestments and utensils of the Church, had been carried, are emphatically conveyed in their various prohibitions on this head, which descend even to the clasps of their books and the lettering of their manuscripts.^g Lastly, we have the following remarkable order in regard to stained glass:—*Cap. lxxiii.* "Vitree aube flant, et sine crucibus, et picturis." Strong colour is to the eye what strong drink is to the palate; and we gather from the strength of the remedy in this case what must have been the extent of the disease at the time when these rules were drawn up. Nothing short of total abstinence having been considered by the Cistercians of that day, as by the Temperance Societies of our own time, to be likely to be effectual.

That these rules, and others, which regard

^a *Cap. lxxvi.* "Nemo nostri Ordinis Roman eat, nisi cum Episcopo sui Ordinis."

^b *Cap. lxxvii.* "Non est nostrum consuetudinis monachum, vel conversum prostratum in ecclesia, jacere in oratione, sed super genua, vel stans, et corpore."

^c *Cap. xxi.* "Decernimus ut omnes Ecclesie nostre, ac successorum nostrorum in memoria tercia Regule, sanctum Mariæ fundentur, ac dedicentur."

^d *Cap. xix.* "Sculpturas, vel picturas in ecclesiis nostris, seu in officinis aliquibus Monasterii, non flant, interdiciamus. Cruces tamen pictas, que sunt lignee, habemus."

^e *Superdilatatus, et curiositates notabiles in sculpturis, edificiis, pavementis, et aliis similibus que deformant antiquum Ordinem honestatem, in Abbatis, gregibus, vel celatibus nostris ne flant interdiciamus.*

^f *Cap. xli.* "Campare Ordinis nostri ita flant ut unus tantum pulset eas, et nuquam duo simul."

^g *Cap. lxxv.* "Vires decet virili voce cantare, et non more leuato, timidis, vel, ut vulgo dicitur, *filis nobilis*" (i.e. falso).

^h *Cap. x.* "Omnia Monasterii ornamenta, vas, utensilia sine auro, et argento, et gemis, prout calicem, et fistulam, que quidem duo sula argente, et deaurata, sed aurea nequaquam, habere permittimus."

ⁱ *Cap. xlii.* "Interdicimus ne Ecclesiarum nostrarum liras aurea, vel argentea, sine degegnata, vel deaurata habeantur retinaculis, que una *firmamenta* vocantur."

^j *Cap. lxxlii.* "Littere unius coloris flant, et non depicte."

* Amongst English Cistercian abbeys of the first class are to be reckoned the following:—Fontaines, Furness, Kirkstall, Ryland, Revaux, Jervaulx, Tintern, Netley, Beaulieu, Bulwark, Kirkstead, and Croxden.

exclusively the architecture of their buildings, and which, as not applying to the matters in question, I have not here referred to, were strictly observed during the first two hundred years of the existence of the order, there is little doubt. And although, in consequence of the almost total disappearance of the Order, and the alienation or state of ruin in which the whole of their buildings exist: at the present time, there remain little or no traces of their decoration or furniture, yet I can vouch for the fact,—having visited the remains of all the chief abbeys of this order in France, England, and Germany,—that the instructions of the *Charta Caritatis* in regard to their architecture were strictly observed during these two first centuries; and we may therefore conclude that, in the matter which interests us,—namely, their wall decorations and their windows,—there was the same uniformity of observance.

Singularly enough, however, the most beautiful stained glass that I ever beheld, I saw in the ruined abbey-church of a Cistercian monastery, in 1832. It was designed, in all probability, just at the time when the severity of the rules of the Order in this respect, as also in others, began to be relaxed. The abbey of which this church formed a part was founded in the year 1133, at Altenberg, near Cologne, by Eberhard, Count of Berg, whose descendants rebuilt the abbey-church, from the designs and under the superintendence, it is said, of Erwin von Steinbach, the architect of Cologne Cathedral, in the latter part of the thirteenth century. At the dissolution of the monasteries, the abbey was converted into a manufactory, and suffered from a fire in 1815, which destroyed the conventual buildings and injured the church; but when I visited it, in 1832, the church, though roofless and in ruins, still retained the whole of its magnificent Geometrical windows, filled with the most elegant stained glass. The Prussian Government has, I believe, since restored the roof and repaired the church, and it is to be hoped, has thereby saved the glass. The design of the building, which, from its windows and moulded detail, belongs, evidently, to the period ascribed to it, bears in every part the impress of its Cistercian origin,—simplicity and elegance of design being its chief characteristics. It is lofty and of noble and stately proportions, but entirely devoid of all florid ornamentation; what carved work there is is chiefly in the pier-capitals, having much gracefulness in its composition.

It is, however, to the stained glass of its noble windows that I desire to call the attention of those who are interested in the subject we are considering. It is scarcely necessary to say that they contain no "pictures," and no patches of gaudy colour. They consist, in fact, exclusively of designs of foliage, arabesques, and diaper-work of the greatest elegance, and of infinite variety, arranged chiefly in geometrical patterns, executed in grisaille, and other light colours; and belong in all probability to the latter part of the Period in which the church was built,—that is to say, to the latter part of the thirteenth and the commencement of the fourteenth century; in other words, to the very best Period of Christian Art.

Of the artistic nature of these designs, and of the admirable manner and material in which they are executed, it is impossible to speak too highly. Of even feminine fairness and gracefulness, they surpass, in my opinion, all the examples of this kind that we have in this country, not excepting the Five Sisters of York; and if, in the matter of stained glass, it were desired to select works of art that would most fitly typify and represent the purity and simplicity of Anglican worship, I should not hesitate to indicate the windows of Altenberg Abbey Church as the models we should adopt. In such a case as that of Salisbury Cathedral, for example, where nearly all the windows are of common white glass, if the Dean and Chapter, instead of permitting them to be filled one by one, at rare intervals, by "private munificence," at a great cost, with deeply-stained glass of the kind usually supplied by glass-stainers at the present time, were to adopt some general plan by which the whole of, or at least the lower windows of, the cathedral might be filled, in the course of a few years, by public subscription, with stained glass of really artistic and graceful design, and of the character of the windows of Altenberg Abbey Church, enriched with smaller portions of deeper colour, introduced sparingly and in the judicious manner already alluded to, an admirable work might be accomplished, at

one-third of the cost and in one-fifth of the time that would be otherwise required, which would mark the commencement of a new era in the art of glass-staining in this country. For it is hardly to be doubted that an example thus set, by which it could be shown that works of real art, more in harmony with the character and spirit of English worship, could be produced at a cost which would bring them within the reach of all church-restorers and church-builders, would be rapidly followed, in this progressive age, by the almost universal adoption of a mode or fashion, which, offering a happy medium between the painful glare of common glass, and the gaudy sensuousness of a typical memorial window of the present day, would be assuredly recognised in the latter part of the nineteenth century as a considerable improvement on that which prevailed during the earlier part of the same century.

I need scarcely say, in conclusion, that were such a fashion to become prevalent, the argument in favour of extravagantly-coloured wall-decoration, based upon the present use of deeply-stained glass in our windows, would naturally fall to the ground.

EDMUND SHARPE.

THE NEW INFIRMARY BUILDINGS FOR EDINBURGH.

The plans for the new infirmary on the grounds of Watson's Hospital, at Edinburgh, are now in the hands of the managers. The foundation-stone of the buildings is to be laid with full Masonic ceremony by the Prince of Wales.

The general scheme adopted by Mr. Bryce is that of the Pavilion system. In the site he found the advantage of a southern exposure, together with a sloping surface, which admitted of buildings being so placed that those to the southward should not prevent the genial breezes from playing on those further north. Mr. Bryce has arranged his wards so that their windows shall look east and west, so as each day to get the morning sun on one side, and the afternoon sun on the other.

The main front of the infirmary is turned towards the important thoroughfare of Lauriston; and here, as a matter of course, the architect has introduced his most important façade. The style adopted is an adaptation of the old Scottish, the frontage in some of its features bearing a marked resemblance to that of Holyrood Palace. In the centre is an elevation fully 160 ft. long and three stories high, in addition to a half-sunk basement. The main feature in this block is the great tower, which projects slightly from the general line, and has its base pierced by the main entrance. The arched doorway is flanked by a window on each side, as also by a series of pilasters supporting an ornamental cornice. Over the cornice is a three-light window, surmounted by a triangular pediment, apparently intended to be filled in with sculpture. The next stage of the tower is occupied with two plain windows, and a panel for an inscription or sculptured design. Above this point the tower rises clear of the wall-head—a massive square structure, with round corbelled turrets at the corners. The upper stage of its front wall is pierced by a three-light window, with arched heads. Towards the top the tower walls are corbelled outwards, and finished off with a cornice, above which rises an octagonal spire, carrying a vane and weather-cock. On the wall-head in front is a panel for a clock-dial. At the east and west sides are ornamental chimney-stalks, which combine with the spire and pinnacled roofs of the turrets to form a group. The elevations on the east and west sides of the tower balance each other. The ground-floor windows are plain; those of the first floor are surmounted with projecting pediments; and those of the top story terminate above in gables, which rise above the wall-head and diversify its outline. On a level with the upper windows a corbelled turret springs out at each end of the elevation. The roof is high-pitched, relieved with a row of small dormer windows, and finished above with an ornamental crest-rail. The central block presents towards the east and west a sky-line of stepped gables.

From the central building, which may be generally described as designed for administrative purposes, there runs out at each end a low range, showing to the front large four-light windows, and finished above with a stone balustrade and flat roof. These are corridors giving access to the pavilions, which go to complete the north frontage, and contain the wards of the

surgical hospital. Of these pavilions there are four on the north side, which, being placed end-on to the corridors, run out at right angles to the extent of 110 ft. beyond the line of the central block, and present their outer ends as prominent features in the general façade. The two inner ranges, distant each about 28 ft. from the central building, form with its front three sides of a spacious square, which will be gravelled over, and will form the carriage approach to the main entrance. As seen from the front, the pavilions present two distinct elevations, one on each side of the central block. There is a stepped gable, flanked by two round towers, like those of Holyrood; then an open screen, consisting of a low balustrade and range of stone columns about 10 ft. high; then other two round towers, with stepped gables between. Next is the central elevation already described, and on the other side a series of round towers and stepped gables, with open screen as before. In the centre of the screen, on each side, a short flight of steps leads down to an airing-ground, being the space inclosed between two pavilions and the corridor at the back, by which they are connected. These spaces measure about 80 ft. in width, that being the distance maintained between the pavilions. At the south end of each is a low building, 30 ft. by 30 ft., projected forward from the corridor, and intended to be used as a class-room. The pavilions are two stories in height, besides half-sunk basements. In their north ends they present three-light windows with stone mullions. The side elevations are plainer in design, but relieved here and there with stepped gables, turrets, and chimney-stalks.

The main-front architectural features are reproduced in a less ornate form, and under various modifications, all through the design. The central block is occupied with a spacious entrance-hall and staircases, manager's room, stewards' accommodation, and a variety of other offices. On each side branch off the corridors, 12 ft. in width, which give access on the right to the female, and on the left to the male wards. Each pavilion, or block of wards, seems to be as nearly as possible an exact duplicate of every other. The ward, with a height of 15 ft. 6 in., occupies the entire width of the pavilion, 28 ft., and its entire length as well, with the exception of a portion next the corridor, which is appropriated for a kitchen, convalescent-ward, private ward, doctors' room, nurses' room, and bathroom. At the opposite end, the interior of the round towers gives space for other necessary offices. Each ward is thus complete in itself, and may be isolated from the rest of the hospital, without interfering with the efficient treatment of its inmates. The ward proper has a range of windows and a fireplace on each side. The beds are placed between the windows, at distances of 9 ft. from one another. In the four pavilions which run northward from the corridors, and two others, not formerly mentioned, which run south, there are in all 16 wards (not to speak of private wards), containing 280 beds; besides 3 reserved wards, with 48 beds, to be used when the ordinary wards require to be vacated, for cleansing or other purposes.

From the rear of the surgical-house a low range, in which space is found for a commodious operating-theatre, besides corridors and stairs, leads to the present Watson's Hospital-buildings, which are to be retained and turned to account as residences for officers and accommodation for various administrative departments. Access to the latter part of the establishment is provided in the shape of piazzas, with open galleries overhead. A portion of the intervening ground, measuring 140 ft. by 80 ft., is proposed to be laid out as a garden, and to be used, in connexion with the piazzas, for the recreation of patients. In its general arrangement, the medical hospital repeats the features of the surgical department.

The medical hospital contains fifteen wards (besides private wards), with 340 beds, and is also provided with four reserved wards, making up 100 beds, to be used in cases of emergency. It thus appears that, exclusive of reserved wards, the two hospitals contain between them accommodation for 600 patients.

In addition to this, there is the fever-house—a separate building, placed at some distance to the south-west of the surgical hospital. This block has round towers at both ends. The fever-house is designed to make up about 40 beds. Between the fever-hospital and Lauriston is the pathological house, containing a lecture-theatre of ample dimensions, and a chemistry-room. The mortuary, washing-house, laundry, work-

shops, &c., are situate still farther to the west, at a distance from the public thoroughfare.

At each end of the north or Lauriston front a gate and hedge will be placed. The spare ground to the south of the medical hospital, sloping down towards the Meadows, is proposed to be laid out as pleasure-grounds.

THE APPROACHING INTERNATIONAL EXHIBITION.

Fans.

It seems necessary to repeat that the special object of the Exhibition is to exhibit selected specimens, and not everything that a manufacturer can produce; and it will thus be distinguished from previous Exhibitions, in which allotments of space were made to manufacturers and others, who filled them as they thought fit. All objects must also be submitted for the inspection and approval of committees of selection. The exhibitions will be distributed into four divisions, three of which,—fine arts, scientific invention, and horticulture,—will recur each year. In the other division different classes of manufactures will be included in turn each year, till every branch of industry has been represented. In the fine art and scientific invention divisions, no object will be entitled to admission unless it be distinguished by some special quality, such as novelty, excellence, or cheapness.

In the several classes of manufacture the goods will be distributed into a sufficient number of sub-divisions to bring the different branches of each class together, so that similar productions from different countries and localities will be placed in immediate juxtaposition, in order to facilitate examination and comparison.

We are asked to mention that artists, manufacturers, and others who have not expressed their desire to be admitted as exhibitors in 1871, are requested to do so before the 10th of November next.

The Fan Competition is exciting some interest. Her Majesty the Queen offers a prize of 40*l*. (1,000 francs) for the best fan exhibited in the International Exhibition of 1871, being either a work of painting or carving, or a combination of both, and executed by a female artist or artists under twenty-five years of age, subject to the conditions mentioned below. Mrs. Herbert Taylor offers a prize of 25*l*. for the second best fan. The Lady Cornelia Guest and the Baroness Meyer de Rothschild offer separately a prize of 10*l*. for each of the two fans next in the order of merit. All these are to be awarded subject to the same conditions as those decided on by her Majesty for the first prize. The conditions of competition are obtainable. The awards will be made by an international jury selected by the commissioners of the competing countries. The commissioners, as already notified, do not intend to award prizes to exhibitors. They will, however, afford every facility to societies and individuals desirous of offering prizes for the encouragement of art or industry in connexion with the annual international exhibitions; and are prepared to receive such offers, and to publish the conditions of competition which the donors may wish to prescribe.

In connexion with the Fan competition, we may mention that the September part of the *Journal of the British Archaeological Association* contains a very interesting article on "Fans,—their Antiquity and Uses," by Mr. Henry F. Holt. The writer refers to the use made of the fan in the eighteenth century in recording the event of the day. Literature, music, politics, and fashion were alike made subservient to its power, and to an extent which can now be hardly imagined. In like manner church or opera, senate or theatre, became the medium of its exhibition. Thus, when Dean Swift's "Gulliver's Travels" appeared, all the principal events were depicted on both sides of the fan. The same result followed the production of the "Beggars' Opera," the favourite songs in which were painted on the fans, and political emblems were so ripe that a lady's opinion was as readily known by her fan as by her patches. A similar practice prevailed in France, and in the time of the Revolution their artists were fond of recording the principal events of the period upon fans, among which may be mentioned "The Mountain Child of the Republican Constitution," "The Triumph of National Religion over Atheism, Pantheism, and Scepticism," "The Fête of Agriculture," &c. Occasionally (although very rarely) "fans" were adapted in their orna-

mentation to the useful. At the close of the eighteenth century a fan was advertised in the *World* especially adapted to the frequenters of the opera, and was thus described:—"These fans present at one view the number of boxes, including the additional ones; the names of subscribers, &c., and have been carefully compared with the plan of the house, as kept at the office."

In the eighteenth century fan-making was an extensive and important business, and called into requisition the talents of the highest and best painters, many of whom commenced life as fan-painters. In England at this period an Italian artist, named "Pozzi," painted fans from designs applied by West, Reynolds, and Capriani, and which, according to Miss Barney, were painted on leather, thereby meaning "chicken's skin," which she described as being "more beautiful than could well be imagined." In like manner, France produced in the eighteenth century many artistic celebrities with whose names "fans" are intimately associated. Amongst them may be mentioned Watteau, Godefroy, Frangenaud, Boucher, Lelu, and Wille fils. Occasionally, says Mr. Holt, the fan was made to perform the office of "prompter," as occurred on the occasion of the market-women of Paris, offering a congratulatory address to Marie Antoinette on the birth of the Dauphin, when the spokeswoman had the address (written expressly for the occasion by M. de la Harpe) set down on the inside of her fan, and to which she repeatedly referred without the least embarrassment.

ON THE UNION BETWEEN SCIENCE AND LABOUR.

DR. LYON PLAYFAIR, president for the year of the Birmingham and Midland Institute, delivered an address at the opening of the session, "On the Intimate Union between Science and Labour." This union, he said, is far from being simple. It is not science which creates labour, or the industries flowing from it. On the contrary, science is the progeny of the industrial arts on the one side, and on the other of the experiences and perceptions which gradually attach themselves to these arts. So that the evolution of science from the arts is the first circumstance of human progress, which, however, quickly receives development and impulse from the science thus evolved. Industrial labour, then, is one of the parents, and science is the child; but, as often happens in the world, the son becomes richer than the father, and raises his position. It may not be the waste of an hour if we consider these relations more closely.

The new president then proceeded, in a very able address, to work out his theme with many illustrations. We can only give a specimen of his method—I see opposite my study-window as I write a house in course of erection, and the labour of the builder will serve my purpose as well as any other. An Irish hodman is carrying a number of bricks up a ladder, in order to supply material to the builder. The sight is familiar to us still, though not so much so as it was a few years since, because a change is passing over this form of labour. Let us study the reasons for the change. The Irish hodman is a human machine, unskilfully and expensively put into operation. He felt that himself, in his fine, confused way, when he wrote to his friend in Ireland, "Dear Pat, come over here and earn your money; there is nothing for you to do but to carry the bricks up a ladder, for there is a man at the top who takes them from you and does all the work!" The man at the top is a skilled workman, more nearly fulfilling his human functions, for he is using intellect in his work. The hodman is a worker also, but only a user of his own brute force in a very unintelligent way. Every time that he ascends the ladder with his load of bricks, he is carrying up his own weight in addition to that of the bricks; his force is thus wastefully expended. After many years his employer perceives this, and substitutes human labour first by that of a horse, then by that of a steam-engine. Now, when you pass a house in course of erection, you will see a horse trotting over a prescribed course. It is pulling up a whole barrowful of bricks by a rope and a pulley. The horse, tended by one man, is doing the work of seven or eight hodmen, and with much economy of money, inasmuch as the cost of the hay and oats, from which its power is derived, scarcely exceeds that

of the beef, potatoes, and beer of a single hodman; while increased economy of labour is also attained, because the weight represented by the bodies of seven hodmen is not drawn up along with the bricks. Food, burned within the bodies of the men and the horse, is in both cases the source of power. Again, in large houses the horse disappears, and a small steam-engine draws up the bricks. Economy is again achieved; for the coal, which is the food of the engine, is less costly than the hay and oats required for evolution of force in the horse. A single man, using scientific knowledge in the guidance of the engine, is now doing the work of several horses or many men. Let us analyse the changes which pass over the forms of labour illustrated in this particular case. The first tendency is to substitute the brute force of a man by an intellectual superintendence of a cheaper form of force, either animal or physical, the aim being to obtain economy of production, either through economy of time, or by the substitution of a cheaper form of force for human labour. In fact, economy of time generally follows the economical substitution of force. Savages have an utter disregard of time in the performance of labour. They will expend a month in sharpening a single arrow. Some of the rock crystal cylinders worn by chiefs for ornaments are stated to take two men's lives to perforate. The Kamtschadals of North-Eastern Asia take three years to hollow out a canoe, and one year to scoop out the trough in which they cook food. As soon as a savage tribe employs fire, instead of implements made of stone or bone, to hollow out their canoes, they are using a natural power to economise time and brute human force, and are on the high road to civilisation. In human progress it is always so, for it is a natural law that the sweat of the brow should be lessened by the conception of the brain. The economy produced by the substitution of cheaper for dearer forms of force is remarkable in all cases where it is applied. The Prussians saw this very well when they wanted to make England declare coal as contraband of war in the present campaign, that it was representative of so many men added to the enemy; for three or four pounds of coal, even in the wasteful way in which it is used, are more than equal to a man's force.

SCHOOLS OF ART AND OF SCIENCE.

The Dorchester School of Art.—The annual meeting and distribution of prizes in connexion with this institution, which was established about two years ago, have taken place at the Town-hall. Prior to the commencement of the proceedings, the friends of the school inspected the specimens of work executed by the pupils. Above the platform were ranged a number of drawings in chalk and water-colours, while around the hall were numerous specimens of freestone and modelling. The chair was taken by Mr. John Floyer, M.P. The Rev. B. L. Watson, as hon. secretary of the school, presented the annual report, which spoke of the continued prosperity of the school. During the year 1869 it was attended by 88 students, of whom 74 remained on the books at Christmas. At the Government examination on the 10th and 11th of March, in this year, 17 students presented themselves for examination in freestone, of whom 8 passed; in geometry, 8, and 5 passed; in model drawing, 17, and 10 passed; and in perspective, 6, and 2 passed. In freestone, 3 passed "excellently" gaining prizes; in geometry, 3; and in model drawing, 5. Eleven prizes were consequently awarded to nine students for excellence in examination. In April, 253 works, by 52 students, were sent up to South Kensington for examination. Of these 3, Miss Emson, Miss Maskew, and Mr. Edward R. Pearce, were deemed worthy of being admitted to the national competition, and five third-grade prizes were awarded. Payments were made on account of works executed by seven artisan students. The Science and Art Department having offered prizes for the best designs for fans, three of the students competed; and, though no prize was gained, the design by Miss Coombs was purchased for its excellence by the Department. Income of school for 1869, 195*l*. 6*s*. 5*d*.; expenditure, 176*l*. 6*s*. 1*d*. The magistrates of the county continue the gratuitous use of the Shire-hall. The necessity, however, of securing as soon as possible a more permanent home is not to be lost sight of. The committee desire to recognise the efficient services of Mr. Campbell, the master.

The Liverpool School of Science.—The tenth session of this school was opened in the small concert-room at St. George's Hall, and Professor Huxley, LL.D., F.R.S., distributed the prizes which had been gained by the students during the past session. Professor Huxley said he understood that the school was established in 1861. In 1865-6 the number of students amounted to not more than twenty-eight, and out of that number not more than thirteen presented themselves for examination, of whom only seven passed. But that might be considered their lowest point—their point of difficulty. He heard, and one could not be surprised at it, that with those results there was some talk of giving up the great enterprise in which those who started the institution had embarked; but, happily, wiser and more tenacious counsels prevailed, and now they saw a very considerable improvement in the affairs of the school. He was informed that now they had 151 students, and out of that number forty-one had presented themselves for examination; and although he did not know the exact number of those who had passed, it was certain that the number must be considerable, for no fewer than sixty-three names were passed in the different groups of examination either in the first or second class. Therefore the progress of the last five years must be considered eminently satisfactory; but, looked at from the point of view of any one who thought what ought to be the history of an institution of the kind in Liverpool, he could not quite so heartily congratulate them. He was informed that this school of science had not even at the present time any precise local habitation; that it had no laboratory, no place in which experiments could be performed, and in which practical teaching could take place. He was told, that in the way of positive endowments they were enriched to the singular extent of 17l. 13s. 6d.; and he had learnt that their income from other sources, leaving aside for the moment the school fees, which were turned to the purpose of giving the very modest reward which was given for the labours of the teachers, did not amount to 100l. In conclusion the professor urged the people of Liverpool not to slacken that grand public spirit which had done so much in diminishing the physical evils of their great town; to remove those obstacles which clog the path of mute Miltons and silent Hampdens; to give them a helping hand, and to aid them, as far as possible, to grasp that helping hand. The Earl of Derby said, for nearly the whole of the nine years that the Liverpool School of Science had been in existence he had been one of the vice-presidents, yet he had only been present at one distribution of prizes; but it was never too late to mend, and he should be happy to place 200l. in the hands of the treasurer, the proceeds to be laid out in a yearly prize, or in prizes, to be adjudged as the committee pleased.

The Brighton and Sussex School of Art.—The eleventh annual meeting of this school has been held at the Town-hall, Brighton. The mayor presided, and opened the proceedings with a brief address. Mr. F. Merrifield next read the annual report, and the certificates and prizes, which the mayor distributed. The meeting, which was select, though not large, was addressed by the borough members. Mr. J. White, M.P., alluded specially to some of the ways in which the rules of true art are violated; Professor Fawcett, M.P., regarded art more in its political relations. The Rev. Dr. Griffith urged ably the necessity of specific schools for different technical subjects. Mr. F. Merrifield described the working of the Brighton School of Art; and Mr. C. Lamb, in a characteristic speech, castigated the townspeople for not contributing more liberally towards the school, and set a good example by promising a contribution. The report stated that during the year 1869, 527 persons had received instruction at schools under the direction of the master, Mr. White, of which number 430 had been taught at national and other similar public schools, 25 at the day classes of the School of Art, and 57 at the evening classes for artisans, schoolmasters, &c. There were also 15 female students. A good many trades were represented in the School of Art. The second annual examination took place in March last, when, in freehand drawing, 10 were excellent, and 48 passed, against 8 and 43 respectively in the previous year; in geometry, the numbers were 10 and 8, against 3 and 6; in perspective, 2 and 5, against 1 and 3; in model drawing, 4 and 18, against 1 and 8; in mechanical drawing, none went up in 1869, one did so in

1868 and passed. The total number of prizes received from last year's work was 20, against 11 the previous year, and 4 certificates against 1 on the former occasion; there had therefore been a total increase of 50 per cent. With a larger subscription list the committee could greatly develop the utility of the school, as well as allow the head-master a better remuneration than the inadequate one he now receives.

The Government Commission on Applied Science. At the recent meeting of the British Association, Professor Williamson, F.R.S., made a communication respecting the resolution of the Committee of Section B, on the proposed establishment of a new school of applied science by Government. He said that the Commission appointed by the Government to make inquiries respecting scientific education had now been for some time prosecuting its inquiries, but it was credibly reported that they intend to take a course of action in this matter precisely of the kind objected to—establishing a special college for the purpose of training engineers for the Indian Department of the Government service. He said that there were at present universities in Great Britain which did this, and that if the Government carried out their intention they would not be in a position to deal impartially with the general question undertaken by the Commission. Besides, if it could be shown that such a college would be advantageous, let it be established after the whole subject had been dealt with. The section the previous day had passed a resolution in accordance with this opinion. The president considered that the committee of the section were quite justified in the resolution which they had adopted. After the Government had undertaken to make the inquiry, they had no right to establish such an institution until the Commission has reported.

SANATORIUM FOR DURHAM SCHOOL.

THE Dean and Chapter of Durham, who have always shown a great interest in the well-being of their cathedral school, have recently erected a convenient sanatorium for its use, in place of the small sick-rooms connected with the master's houses.

The new building, which is separated by the playground from the school, occupies a most delightful situation on rising ground, having a southern aspect, and commanding beautiful views of the cathedral and the wooded banks of the river, with an extensive panorama beyond.

It is mainly constructed of brick, faced with Jowlan blockers and Danbown dressings, is designed in an early type of Gothic in harmony with the adjoining school, and consists of a large central hall with four large rooms or wards for boys, rooms for parents or friends, but which can also be used for boys if required, matron's and servants' rooms, bath-room, kitchen, and offices, disinfecting and work room. The main building is two stories in height, with cellars under the whole of the east side, and the hall extends from front to back on both floors. The whole of the upper floors are constructed with Dennett's fire-proof flooring, and all rooms are ventilated by Doulton's air-flues. The cost of the work (exclusive of the site and furniture, which have also been given by the Chapter), is upwards of 2,300l.; and the whole has been carried out from the designs and under the superintendence of the cathedral architect, Mr. C. Hodgson Fowler, by the undermentioned tradesmen:—mason, Mr. J. Taylor; joiner, Mr. George Gradin; slater, Mr. R. Rule; smith, Mr. J. Chisman; plumber, Mr. Laidier; and painter and glazier, Mr. W. Hodgson.

THE NEW SEWERAGE SCHEME FOR DUBLIN.

It has at last been finally agreed upon that the Dublin Corporation shall accept 350,000l. at five per cent.—four per cent. to represent the interest, with one per cent. as a sinking-fund, to exhaust the principal in a number of years. This sum will be advanced by the Government on security of the rates.

The plan of a parallel sewerage (confined to the city) each side of the river, which we suggested in these pages, is that adopted in the new scheme, but its efficiency depends much on the completeness of the outfall. Carrying the sewage to a point below the tideway, and emptying it into the sea in an untouched and unutilised state, would be a mad and mischievous act.

The stench in the Liffey, for three miles of its length, from King's Bridge to the North Wall Lighthouse, will certainly in a manner be abated, as the small sewers will be intercepted from passing into the river. This, so far, will be a great relief. We, however, can hardly credit as a fact that the whole of the valuable sewage of such an important city as Dublin will be wastefully cast into the sea, at a point where the greater portion of it is certain to be carried back again into the river-bed, to entail more laborious dredging operations than are at present needed to render the harbour navigable.

What about the unreclaimed strands of Irish town and Clontarf. Can no scheme be adopted whereby some hundreds of acres of useless sandbanks, less than three miles from the city and in sight of the harbour, can be rendered profitable. The sewage of Dublin could be well utilised in this direction. We would caution the corporation not to throw away a convertible material that will help them to pay off their mortgages and lighten the city rates. A tidal river is the windpipe of a city; if this tidal windpipe is a short and narrow one, like the Liffey (and unlike the Thames and Clyde), its mouth is very likely to be blocked up beyond the measure of its own natural relief or swallow. The open sea, properly speaking, does not commence until the bar is crossed at Poolbeg Lighthouse. Inside this a sort of inner bay or harbour exists. If the sewage is dispersed at any point within these limits, then we unhesitatingly say that the new sewerage scheme of Dublin will prove a delusion.

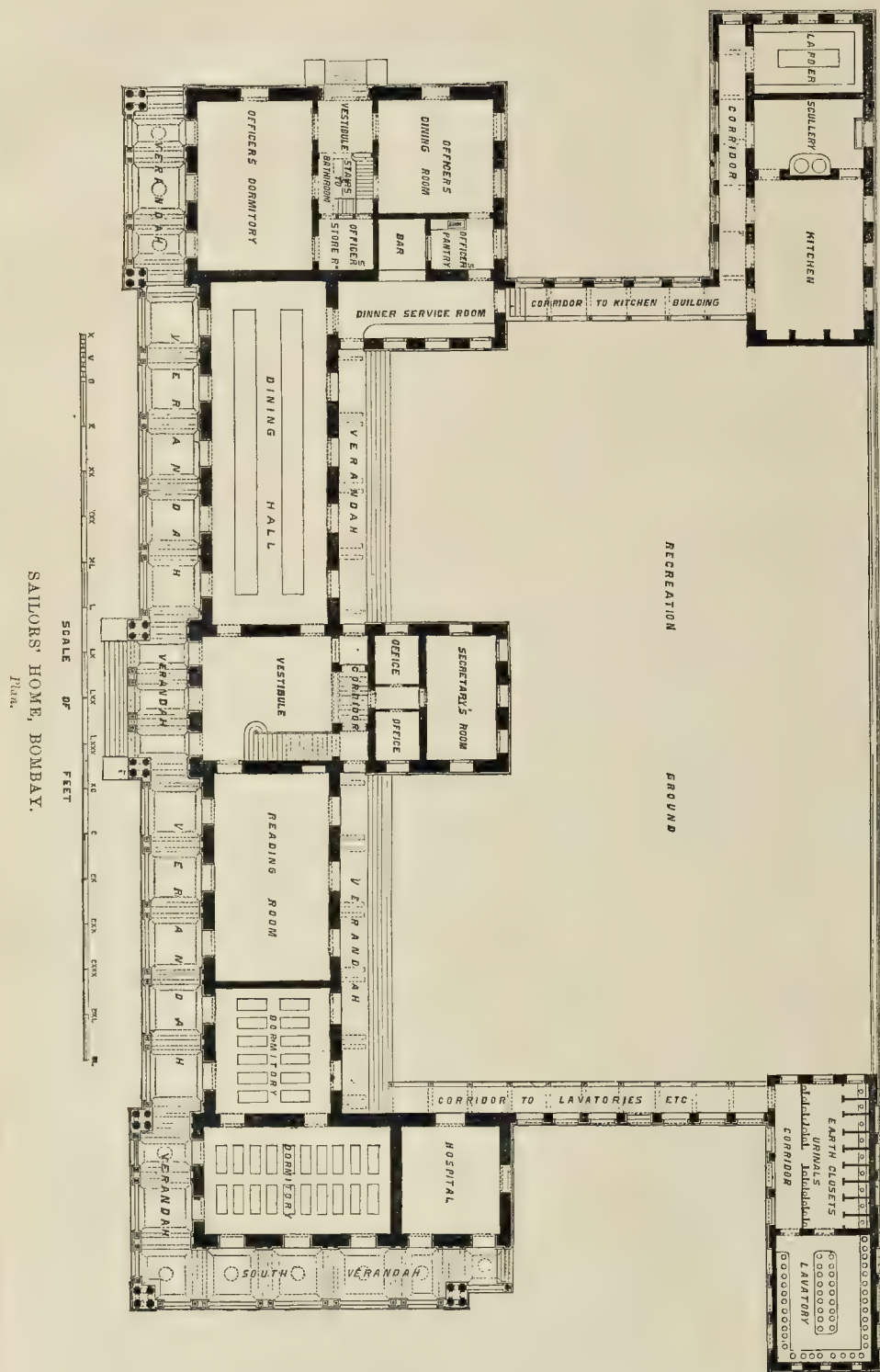
SAILORS' HOME, BOMBAY.

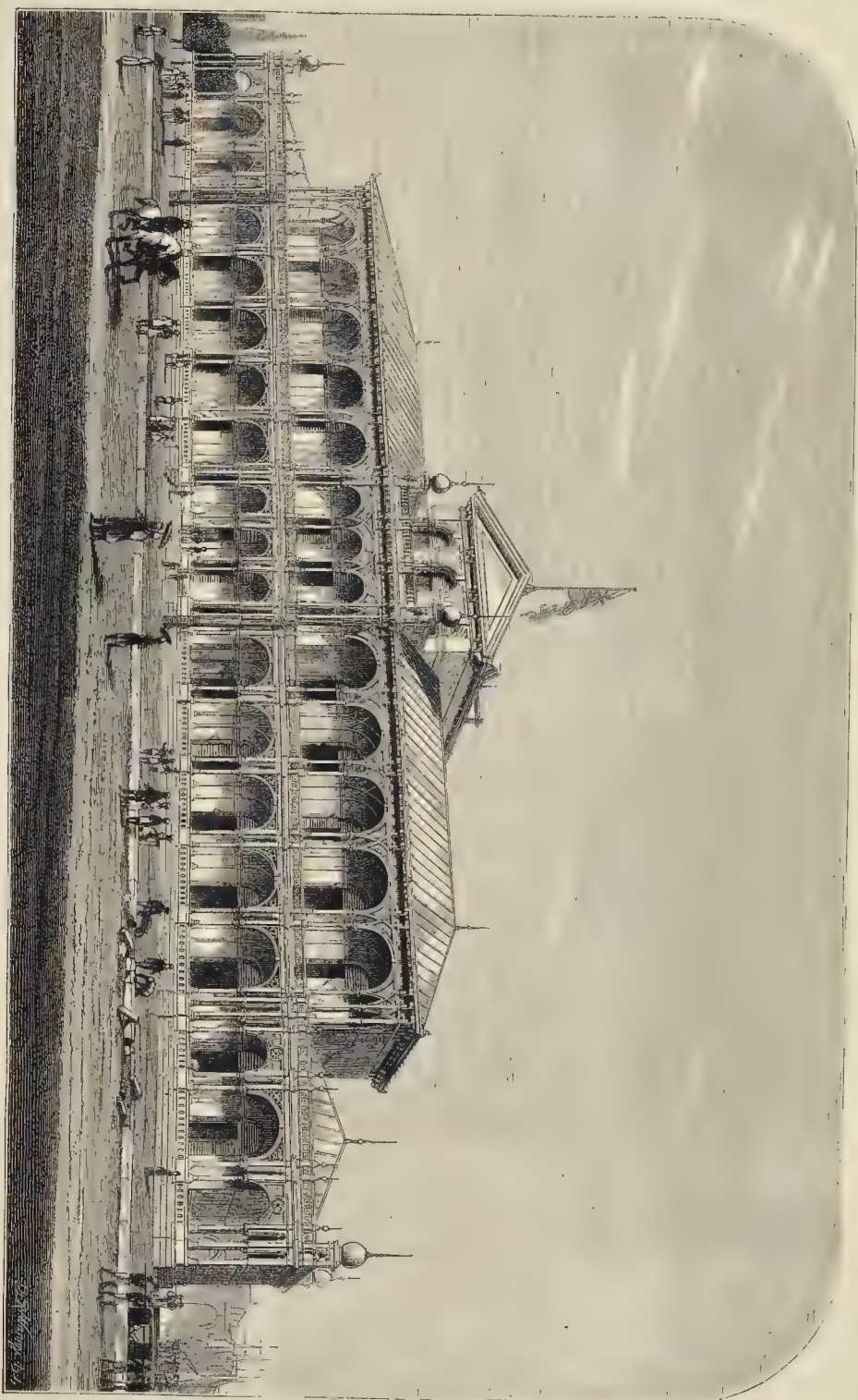
ON the occasion of the recent visit of the Duke of Edinburgh to Bombay, it was determined to commemorate the event by the erection of some permanent work of public utility; and the happy idea was suggested that nothing would so appropriately celebrate the visit of the Sailor Prince as the foundation of a new Sailors' Home, plans of which had already been prepared, the existing building having been found entirely inadequate to meet the constantly increasing requirements of the port. The foundation-stone was accordingly laid by his Royal Highness, in the presence of Sir Seymour Fitzgerald, the Governor of Bombay, and a large concourse of natives and foreigners of distinction. Eager to signify their appreciation of so auspicious an event as the visit of a royal prince of England, some of the native princes subscribed largely to the funds; the Guicowar of Baroda alone contributing the munificent sum of 20,000l. In consequence, however, of some misunderstanding in regard to the site, the building has not yet, we believe, been proceeded with.

We give a general view of the proposed new Home, with a plan of the ground floor, as designed for the site originally given by Government, on the Colaba-road, which possessed a frontage towards the sea of 300 ft., with a western aspect. The central block and south wing comprise complete accommodation for 126 seamen; the north wing is devoted entirely to officers' quarters; and the Home master's residence is placed in the attic story, in the centre of the building. The kitchen department is placed in the north-east; and the lavatories and earth-closets for seamen in the south-east angle of the site, communicating respectively with the main building by means of covered corridors. Wide verandahs encircle the whole edifice to the west and south, and smaller ones at the back. These it is proposed to construct entirely of iron, which would be made in this country and sent to Bombay ready to fix. The floors throughout are to be constructed with rolled iron joists and cement concrete. The windows are, in all cases, to have double casements, the one glazed, and the other "Venetian." The roofs are designed to be constructed throughout of iron, covered with Italian zinc, laid on solid boarding; and special precautions have been taken to secure thorough ventilation, and to provide against discomfort (particularly in the dormitories, which occupy the whole of the upper story) from the great heat of the climate. It should be stated that the plans have been so arranged that, by the addition of either one or two stories to the north and south wings, the amount of accommodation might easily be doubled.

Estimates for the ironwork have been obtained from Messrs. Andrew Handyside & Co., of Derby; and the whole has been designed by Mr. J. Macvicar Anderson, of London, architect.







SAILORS' HOME, BOMBAY.—MR. J. MACLEAR ANDERSON, ARCHITECT.

SASHES AND SASH-HANGINGS.

SIR.—The discussion that has already taken place in your columns is of so interesting a nature, that I beg you to allow me to say a few words on the subject of sashes generally.

The question appears to me to be under three heads:—

- 1st. What kind of sashes shall be used.
- 2nd. How they shall be hung.
- 3rd. What they shall be hung with, and other such details.

The first question is conclusively answered by your note to the letter of "M. H." (Sept. 17). Climate is the great regulator of such matters, and ours, a mixture of about eight parts of bad to four parts of good, forbids the general use of French casements, which practically have no medium between being either quite open or quite closed. The second question is also almost settled by the same consideration. The idea of balancing the sashes by each other's weight is by no means new, though constantly reappearing. Your correspondent, "A Working Man," has discovered it for himself. "The Experienced Mouse" has used it long ago, and Marygold's patent rack slips are essentially on the same plan. In all these the abolition of the weights is gained by the loss of independent action, and this is attended by a total loss of comfort in winter time. The other idea of using springs instead of weights is unpractical, and fitted only for models, as a few figures will show. Suppose a top sash to weigh 30 lb., the springs must be sufficiently strong to produce a friction rather greater than this, say 35 lb., and a pull of 5 lb. will then suffice to draw down the sash. But, on raising the sash, it is necessary to apply a force equal to the weight of the sash plus the friction caused by the springs (for these act equally in going up and coming down), requiring therefore a push of 65 lb. The various contrivances spoken of by the "Mouse"—the facings of leather, cork, &c., are all of this class, and subject to the same defect independently of workmanship, which, if bad, may add indefinitely to the power required.

Mr. Bullivant's sash, so curiously supposed by "A Working Man" in his last letter to be the ideal of "G. L.," is a very ingenious modification of the double-hung sash, and much facilitates cleaning, &c.; but since this is accomplished by temporarily detaching the weights from the frames, a great inconvenience results in its application to heavy plate-glass windows.

The balance of advantages being so strongly in favour of the ordinary double-hung sash, the third point is with what to hang them. The choice lies, so far as I know, between common cord, catgut, leather cord, and Sawyer's rack slips. These last are a modification of Marygold's slips, in which the weights are retained. Toothed slips are fitted to each side of the sash, and gear by small pinions into corresponding racks on the weights, a very unnecessary amount of trouble and cost, merely to avoid using sash-lines. Of the others named, leather cord is somewhat weak for its size, as compared with best sash-line; catgut gives way soon, copper-wire cord even sooner; copper chain is very good, if carefully soaked in oil, to ensure all the joint-pins being oiled. I have known a large chain cut through in three months, owing to a "dry" pin. Its disadvantage is that when the sash, at any subsequent time, is taken out of its frame, the chains often get badly wrenched sideways, by carelessness, and are then permanently injured. On the whole, I prefer the best flat-thread sash-line (ordinary jute-mixed fluff sash-line is mere rubbish), and would recommend it to be well served with tallow, or some such preservative before use.

The system of hanging sashes to conceal the "frightful ropes" so mysteriously learnt by "the mouse" has one great defect. He says, under this plan "the weights will go down much further than usual"—apparently an advantage; it should read, "Will require to go down much further;" in other words, the side-frames of the sash must be carried down below the sill, to—say, the floor-line, involving considerable extra cost, and spoiling the building up of the frame.

In the double-hung sash, then, perfect? By no means. Much has been done, by avoiding painted sash-frames (in best houses), to allow the sashes to run freely, as it can scarcely be expected that a sash, originally properly fitted to a groove, will work comfortably after that groove has been reduced by the thickness of three coats of paint now and then. But a sash that shall

be permanently free running, thoroughly watertight, and easily removed and replaced by ordinary servants, for cleaning, &c., has not yet been brought out. I do not speak of metal sashes, as their great cost is simply prohibitory.

The best thing to do is to provide a ready means of working the present sashes; but these, sir, are not advertising columns, so I will say no more on that point, remaining,

W. M.

In addition to the material for hanging sashes mentioned by "W. M.," we take the opportunity of mentioning Mr. Hookham's Patent *Steel Ribbon Sashline*. This is formed of a double band of watch-spring steel covered with a close binding of copper wire, and protected inside this binding with a water-proofing preparation. It claims to be superior to the lines now in use in every respect. Hemp lines become harsh through the action of the atmosphere, and are always breaking. Wire lines are unadapted for running over small pulleys; and chains are, if well made, too expensive for the purpose. It is claimed for the steel ribbon sash-line that it is not liable to be affected in the same way as the hemp line. Secondly, the thin bands of tempered steel bend over the pulley and become straight again without injury; at the same time that their breaking strain is astonishingly high. Thirdly, sashes hung with this line run with great freedom. It seems to deserve a trial.

THE ROYAL ARCHAEOLOGICAL ASSOCIATION OF IRELAND.

THIS Association—late the Kilkenny Archaeological Society—held its October meeting on Wednesday, the 5th. New members were elected.

The secretary called attention to the appeal of Sir William Wilde through the press for subscriptions to form a fund to prevent further desecration at Roscommon Abbey, and repair that interesting ruin and the O'Connor Tomb; as also to the movement of the Rev. R. Richey, Ardmore, to rebuild, by subscription, the conical portion of the summit of Ardmore Tower—at present in a very perilous state,—using the original stone for the purpose. Both were most heartily approved of by the meeting, as the restorations proposed were in safe hands with the two gentlemen named.

Mr. Robertson, Hon. Curator of the Museum, reported the safe arrival of a quantity of curious pieces of ancient timber, oak, and deal, which and formed a framed structure in the Crannoge in Ballydooleagh Lough, and was presented by the Earl of Enniskillen.

Mr. Watters, Town Clerk, Kilkenny, exhibited some ancient documents from the Municipal Archives at present in his keeping, which seemed to excite a good deal of interest amongst the members.

THE PRINTERS' ALMSHOUSES, WOODGREEN.

ON Saturday afternoon, a large number of the subscribers and friends of this institution assembled at Woodgreen, to witness the ceremony of laying the foundation-stones of two new wings to the almshouses; that of the south, or commemoration wing, being laid by Mrs. Figgins, widow of the late treasurer; and that of the north, or "Maries" wing, so called after the wife and daughter of Mr. J. Wright, of Kingston-upon-Thames, who bequeathed a sum of £2,000, to the institution for the purpose, by Earl Stanhope.

The architecture of the wings will be Tudor Gothic, and the estimated cost is £3,334, all of which has been obtained; but donations are earnestly requested, in order to endow the new buildings. The north wing will contain residences for the accommodation of ten married couples, and the south for six widows. There will be thus sixteen additional residences; and although there will be ten on the north side, and only six on the south, the wings will be of the same length, inasmuch as the former will have rooms back and front, and the latter will have them all in front. The architect is Mr. Charles Bell, Strand; and the builder is Mr. W. Henson, of City-road. The buildings are expected to be completed for habitation early in February next.

The Printers' Almshouses, which sprang from the Printers' Pension Society, was instituted in 1841. After eight years' successful operations, sufficient funds were accumulated to erect a

residence capable of affording an asylum for twelve aged and infirm printers. The foundation of this, the original building, was laid on the 11th of June, 1849, by the present Earl Stanhope, then Viscount Mahon. Owing to many adverse circumstances, the building then commenced was not completed for several years. On the 11th of June, 1856, the elected inmates took possession of their respective apartments for the first time. Since then there has been a regular succession of inmates, and the only drawbacks to the benevolent operations of the institution have been want of house accommodation and want of funds. The inmates are provided with every domestic comfort that they could reasonably expect. As a certain subscription to the funds of the institution is a condition of admission, the inmates may be said to be reaping the benefit of their own provident habits in early years.

ST. PAUL'S CATHEDRAL.

SIR.—In an article in last week's *Builder*, on "British Museum Restorations," it is said that the restorations of St. Paul's Cathedral consist of painting it with several coats of oil-colour.

This remark seems calculated to convey a wrong impression of the intention of the Dean and Chapter, and the Committee.

A good deal of old oil-colour has of late years been removed, and none put on, except as a necessary ground for gilding. The intended decorations will assuredly not be in oil-colour whatever other method may be adopted; and it is the desire of the Committee to use principally mosaic and marble.

The restoration of Sir James Thornhill's work in the dome, which was done nearly twenty years ago, may indeed have given some colour to the remark; but the dull effect of this painting has had a powerful influence in suggesting the use of mosaic in what is intended, and indeed commenced. Even the restoration of the paintings in the dome referred to was not, strictly speaking, in oil-colour, but with the use of a so-called encaustic vehicle, in which wax is an important ingredient.

F. C. PENROSE.

A PROTEST.

DAVID, the King, refused to offer unto the Lord his God of that which cost him nothing.

The generous old Hebrew sentiment is still alive with us Christians, even in this age of vanity, falsity, and outside show, as proved by many a noble instance of heroic endurance and steadfast self-spending; but, alas! the reverse is also to be found among us.

When I read in the *Times* of October 3rd, that, possibly with some strangely-perverted notion of acting charitably and benevolently, some persons had sent to the Society for Aiding the Sick and Wounded, many bales of filthy, greasy rags, that were obliged to be burned as quickly as possible, for fear of infection being produced by them, I said, "There must be some mistake here. No English women, let alone English ladies, could have done this: these rags must be the clearings out of some factory, where they have been used for wiping grease off machinery. If any decent woman had such things in her house, she would never let them be packed up and sent in that state."

Yesterday, I am sorry to say, my high estimate of what English women can or cannot do was somewhat shaken. I went to see the works of art in Bond-street that have been gratuitously presented for the relief of German widows and orphans during the present war. Of the bad taste of English neutrals making any distinction between French and German sufferers, when relief is the subject under consideration, I need not speak, that matter having been already commented upon in the *Builder's* pages; but in no paper have I seen any honest criticism on the works exhibited; and therefore it is that I trouble you with these few lines.

With the exception of the pictures of our talented Princesses; Carl Haag's beautifully truthful old head; P. Levin's touching little bit, "Unterstützung für Wittwen und Waisen;" A. M. Caswell's "Bullslaughter Bay;" Coudery's "Harold;" Hoyoll's "Ferdinand Freiligrath;" Dighton's "Lodge Gate at Aldermaston;" Voick's "Tom Motke;" Miss Farmer's "Sketch;" Helander's genre picture; Helen Miles's "Design

• Not exactly.—Ed.

above the want of a job, as your excellent pages often early show; but it is unaccountable to me how an architect, builder, and clever workman should need a recommendation, as well as a job.

It was a wicked insult, and I think I thoroughly understand my trade. Whether I was clever or not I cannot say; I am content to know that I was always in constant employment, while the "Jacks-of-all-trades" in my neighbourhood were always lounging about public-house corners.

Magnificently carrying out a job, I believe means boldly, courageously. Well, sir, I have known many a "botch" in my experience to be as good a hand as a lion, ready to undertake anything, and, oh, Jupiter! what a Juggernaut of fallen *deities* and butchered materials have not mine eyes seen! With a vivid recollection of many building abortions, I am pleased to remember that I was only

A ONE-BRANCH HAND.

"LIFTING HOUSES."

Sir,—This process, as also "Moving them bodily," as you expressed it in a former number, is by no means confined to Chicago, but is a daily occurrence in every city of the United States. In New York you may constantly witness removals of all kinds; one day lifting a house up bodily, some 14 ft. or so, giving a temporary strange appearance, with the street door up in the air, as it were, while building a large new ground-story below, and up to it. There is no difficulty whatever in the matter. The writer has had considerable experience in New York in all this sort of thing, and would think no more of putting in an estimate and contract for a removal of any sort than he would for the most ordinary building transaction. He has seen a row of houses moved from one side of a street to the other, the same having to be turned wholly round in the process, and this in New York, where the soil is a treacherous compound of rocks and sand. As a constant subscriber, I enclose my card, and am, Sir,

CONTRACTOR.

CASES UNDER METROPOLITAN BUILDING ACT.

THE GROUND STORY.

At Hammesmith, Police-court, Mr. Yates, jun., of Mary-street, Shepherd's-bush, appeared before Mr. Dayman, to answer an adjourned summons, at the instance of Mr. Knightley, the district surveyor of Hammesmith, for constructing chimneys upon corbels at the ceiling level of the basement.*

This case has been adjourned several times, and had created considerable interest in the profession, in consequence of it being a case having expressed an opinion that the ground story of a house was that which was next to the footings. That was also the defendant's view of the question, which was the point at issue, but Mr. Knightley said it was commonly understood by the profession that the ground story was the same as the ground floor, which was on a line with the road. The case, however, stood over for further consideration, and in the mean time articles were published, and letters written by surveyors and architects, all pointing out that the opinion was wrong.

Mr. Dayman now said that he had not read any of the articles, in order that he might arrive at an opinion founded upon the construction of the Act of Parliament. Having read several sections, and pointed out to the defendant the interpretation to be put upon them, he said that he had arrived at the conclusion that a ground story in effect to remove the present chimneys, or carry up a brick pier from the foundation.

The defendant at first intimated his intention of appealing, but afterwards consented to abide by the order.

SHEFFIELD.

The New Music-hall.—At a meeting of the directors of the Company for the Erection of a new Music-hall, an account of which we have already given, a letter was read from the Duke of Norfolk, offering a donation of 200*l.* towards the erection of an organ for the large hall. The meeting was then made special, to consider the best means of obtaining a grand instrument, equal to any organ in Yorkshire. The following makers were named as likely to be asked to send in specifications and tenders, viz.:—Cavallie Coll & Co., Paris; Shiltze, of Germany; Willis, of London; and Brindley, of Sheffield. The cost of the instrument is not to exceed 2,000*l.*, and a sub-committee was appointed to make inquiries. The share-list, we are informed, is increasing, thirty new shares having been allotted since the corner-stone was laid, on the 1st September, 1870. The building is in a forward state, and will, it is expected, be roofed in by January, 1871.

The Proposed Public Museum.—At a recent meeting of the town council, the Free Library Committee were instructed to report on the desirability of a public museum being established in and for the borough of Sheffield; and that committee unanimously decided to recommend the council to establish such a museum. As to the ways and means, they were of opinion that all the council would be called upon to do would be to purchase or erect a suitable building for the museum, to pay the salary of a curator, and the

expenses incidental to keeping the museum in a proper condition. The foundation of the museum would be the collection belonging to the Literary and Philosophical Society. A suitable building, the committee thought, could not be obtained for much less than 5,000*l.* (which amount could be borrowed under the Libraries and Museums Act), the interest upon which would be between 160*l.* and 200*l.* a year. It was estimated that the annual cost of keeping up the museum, inclusive of interest upon the borrowed capital, would be about 500*l.*; and the committee, we understand, propose to raise this sum and also the amount required for the establishment of a branch library somewhere in the neighbourhood of Brightside and Attercliffe, by levying a penny library rate instead of a three-farthing rate, as is now the case. So largely had the rateable value of property in the town increased that it was thought the extra rate would produce somewhere about 2,500*l.*, and that allowing 700*l.* for the expenses of the two branch libraries—the one already existing at Upperthorpe, and the one to be established at Brightside—there would be a balance of about 500*l.* to be appropriated for the purposes of the museum.

CELLAR TRAPS.

Sir,—Why pubicans' cellar-trap-boards should be allowed to encroach across the pavement is a mystery. In some cities it is not permitted; in London, we are oft, to avoid barricades of tubs, barrels, stretched ropes, and rolling oaks, forced to take to the road. The owners of these traps (tender-hearted "pubs.") stud them with gigantic conical hobnails. To torture tender-footed pedestrians is a crying wrong. Many of these rotten traps will not stand the dead weight of a live man; so perhaps it is as well to steer clear of them.

R. T.

LONDON BUILDERS' SOCIETY.

The following is a copy of an agreement lately come to by the members of the London Builders' Society:—

"The members agree that they will not tender for any works in competition, the quantities of which have not been taken out by a surveyor agreed on by the builders at a meeting of the competitors.

They further agree that they will not sign any legal contract for works obtained in competition that does not contain a full and fair arbitration clause.

It is also very important to point out the meaning and intention of clause 7 of the conditions of contract as agreed to by the Council of the Institute of Architects, which is that 'priced bills of quantities' are not to be demanded from builders, but variations from contracts are to be estimated according to an agreed schedule, or at fair measure and value.'

ACCIDENTS.

London.—Two accidents have occurred at the Hall of Arts and Sciences, now erecting at Kensington. The first was to a painter. The man was at work in the upper part of the building, and while so occupied dropped his brush down a large shaft. This shaft ascends from the ground to the top in a sloping and zig-zag manner, and contains several bends or angles. The painter, thinking his brush might have lodged upon the uppermost edge, leaned over, but losing his balance he was precipitated headlong into the shaft about 50 ft. It was impossible for any one to follow, and no one knew in what part of the shaft the man was, or whether he was alive. Great excitement prevailed amongst the men, as the brickwork at the bottom is of an immense thickness, and if broken through might jeopardise the safety of the upper structure. The other case was that of a lad about fifteen, who was lathing for the plasterers, when the plank he was standing on gave way, and he fell about 15 ft. on the edge of a large tub beneath, and thence into the water. He fell upon his chest, and the injuries he received are likely to prove fatal.

Glasgow.—Mr. David Law, sen., and Mr. David Law, jun., builders, have been apprehended on a charge of culpable homicide, in connexion with the recent fall of a portion of a house in course of erection at Hillhead. They were afterwards liberated on bail of 200*l.* each.

Edinburgh.—A plasterer, in the employment of Mr. Baird, Pitt-street, has been killed, while

engaged on a new building at Warrender Park. He ascended a scaffolding about 10 ft. in height erected in the stair of the building. While ascertaining whether the plaster was dry he felt the scaffolding moving, and in order to maintain his balance he leant backwards. Before he was able to recover himself, however, he fell, and, his head striking the stone steps, he was picked up insensible. The poor fellow was conveyed to the Royal Infirmary, where he died. A mason, while employed repairing a chimney on the top of a five-storied building in Chester-street, overbalanced himself and fell to the ground from a height of about 50 ft. He was picked up insensible, and removed to the Royal Infirmary, where it was found that he had sustained a severe fracture of the skull.

SURVEYORS' CHARGES ON THE LAST GOVERNMENT CONTRACT.

Sir,—A rumour is going about, backed by the assertion of one of your correspondents, that the surveyors engaged upon Government work in taking out the quantities for the Home and Colonial Offices have charged 6,010*l.* for their work: this appears to be at the rate of 2½ per cent. upon the estimated cost, viz. 240,000*l.* Considering the character of the building, and its great size and the repetition of parts, about half of such a sum, I believe, would be the usual charge. Such an assertion, I think, ought not, for the interest of the profession to which these gentlemen belong, to remain uncontradicted; and I am sure they will thankfully accept the opportunity of setting the public right which the publication of this will afford them.

As the charges of the surveyor are added to the builder's tender, employers seldom know how they are paid; and this is another reason why the rumour should not continue, or the public may now think they are being charged more than the usual remuneration.

A. B.

* It is perfectly correct, we are informed, that the surveyors' charges in the case in question amount to over 6,000*l.*, or 2½ per cent. on the amount of contract.

HORSE PERILS.

Sir,—I have just read in this day's paper of a fatal accident to three out of four ladies, through a runaway horse. It is possible to remedy this; and I again beg space in the *Builder* to explain my method of stopping the headlong speed of frantic and restive horses. A complete electric apparatus can be purchased in a small case. Let one of these be fixed in an out-of-the-way nook in the carriage, two wires to hook to harness, beneath which have two very thin copper plates properly placed. In the event of a runaway, the driver and inside occupants would only have to press a glass knob to stop instantly the mad career of the strongest horses.

R. T.

P.S.—It could be adopted for equestrians also.

NEW MASONIC HALL, RICHMOND, YORKSHIRE.

If the M.W.P.G.M. the Right Hon. Earl of Zetland has given up his bâton as commander-in-chief; at least he has not retired from the energetic practice of those high Masonic duties which have distinguished him as one of the most popular Grand Masters of England.

On the 23rd of September, assisted by the Provincial Grand Lodge of Yorkshire, he opened the new Masonic Hall in Richmond, for the practice of the ancient rites of Masonry; supplying a want which has been long felt by the brethren in this picturesque old town and its surrounding neighbourhood.

The ceremony of dedication was conducted with all the "pomp and circumstance" befitting the occasion, Dr. Cambridge, of York, P.G.O., kindly presiding at the harmonium, with an ability worthy of a better instrument.

The hall, and site upon which it is built, are both the generous gifts of the noble earl to his Masonic brethren.

The hall is situated on a most commanding site in New-Biggin. The end elevation towards the street, and internal decoration, are in the Doric style. In the pediment over the porch the Masonic and Zetland arms are entwined.

The lodge-room is 50 ft. by 25 ft. by 25 ft., and is lighted by a dome in the roof. To the

* A report of the first hearing will be found at pp. 669 and 711, ante.

right and left of the entrance-hall are cloak and refreshment rooms. A system of warming and ventilation has been adapted in the lodge-room, the main cornice of which and the dome-light are enriched with plaster-work.

The whole cost of the building and fittings was about 800l. Mr. Christopher Palliser, of Northallerton, was the architect.

THE OFFICE OF WORKS AND ARCHITECTS.

Sir,—I have read with great interest the letter of "A Tax-payer" which appears in your last impression. If it be true that the architects of Government works, who are themselves members of the Institute, have become parties to any agreement by which the Institute regulations are to be ignored, and its position as to the possession of drawings is to be abandoned, I for one am unable to see, unless these gentlemen resign their fellowships, what is the actual use of the Institute. I have no expectation that this letter will induce their withdrawal in such case: the Institute looks, I fear, too mercifully on all such sins of commission.

A PROVINCIAL ARCHITECT.

PURIFICATION OF THOROUGHFARES BY DELIQUESCENT CHLORIDES.

A PAPER on this subject was read at the meeting of the British Association in Liverpool (Section B, Chemical Science), by Mr. W. J. Cooper. In the course of it, Mr. Cooper stated that in many towns the salts have been tried this season, with various results, according to the nature of the roadway; and nearly all kinds of pavement have been experimented on at Westminster.

As soon as the area of the experiment at Whitehall and Knightsbridge was extended throughout the district, the saving in water and labour was at once made evident. By using one ton and a half of salts per day, costing 3l. 15s., the labour of ten horses, carts, and men can be dispensed with, costing 4l. 10s. (at 9s. per horse, cart, and man), and consequently the quantity of water they would put down is saved, viz., 350 loads of 250 gallons, or 87,500 gallons, which, at 10d. per 1,000 gallons (the average price for water in London), would amount to 3l. 12s. 11d. per day, in addition to the saving in labour of 15s. per day, showing a clear gain of 4l. 7s. 11d. per day, after paying for the salts.

The importance, in a sanitary point of view, of the use of these chlorides, has, Mr. Cooper said, been clearly established. "The deliquescent chloride of aluminium, recently introduced to public notice by Professor Gamgee," he continued, "seems to meet all the requirements needed in the antiseptic of the future, and I propose to add a sufficient percentage of this chloride to my patent salts for street watering."

STAINED GLASS.

Gloucester Cathedral.—Three painted glass windows have just been inserted in St. Paul's Chapel, the restoration of which is being carried out at the cost of the Earl of Ellenborough. They are the work of Messrs. Burlison & Gorylle, of London, and consist each of three lights, partially obscured by the reredos. In the centre window is a representation of the Lord, seated in majesty, clothed in a crimson robe and white mantle, and surrounded by an aureole, cherubim, and fourteen angels, kneeling in adoration, and holding palm branches and crowns. In the upper lights are six angels bearing scrolls inscribed "Te Deum laudamus." The side windows, which are an expansion of the central subject, have each ten angels arranged in four tiers, and playing upon various stringed instruments, pipes, and a small organ. The dresses are white, relieved with yellow, and the backgrounds throughout are blue, spangled with yellow stars. In the upper lights on the left are four crowns, and in those on the right four swords. Among the fragments of which the ancient painted glass formerly in these windows consisted were some quarries with the relics of Andrew Whitmay, and a tree or sprig of "white May," with entwined scroll. Andrew Whitmay, after holding certain local livings in the time of Henry VIII., became suffragan to the Bishop of St. David's, with the titular see of Chrysopolis

(now Soutari), near Byzantium, and was prior of St. Bartholomew's Hospital, Gloucester.

Clifton Church, Yorkshire.—A memorial window of stained glass has been placed in the south aisle of this Church. The window has two lights, in which are represented Moses with the two tables of stone on one side, and Elias with a scroll on the other, the head lights bearing the monogram J. H. S. The window is from the works of Messrs. Hardman & Co., Birmingham, and has been placed in the church by Mr. Lawson, of Brighouse. The inscription states that it is in memory of the late William Byrne Lawton, of Clifton, and has been put in by his employers, Thomas Robson, Henry Byrne, and Samuel Henry Byrne, of Clifton Bridge, "in grateful appreciation of his faithful services and energetic usefulness." This, says our authority, the *Hull and York Guardian*, is the only window of stained glass in the church.

Cotton Church.—A two-light window has been placed in the west end of this church. The execution of the work was given by the late Dr. Wright to Mr. Smiddy, of Malton, who has carried out his commission. The subject is Christ Healing the Sick. Beneath the figure is the inscription, "He healed many that were sick of divers diseases," and in another position "In memory of John Wright, surgeon, born 1792, died 1864; also of Sarah, his wife, born 1798, died 1867."

Sheffield Parish Church.—A new memorial window has just been put up in the chancel of this church. The window is the gift of Mr. Henry Unwin, and is in memory of his brother, the late Ald. Unwin. It consists of six lights, divided into an upper and a lower tier. The upper lights represent the five wise virgins on the dexter, and the five foolish virgins on the sinister sides, the centre light being occupied by a representation of our Saviour as the Bridegroom. Underneath are the words, "And they that were ready went in with him to the marriage; and the door was shut." The three lower lights represent three distinct subjects. The first is, "The Temptation of our Lord," and illustrates our Saviour and the tempter. The centre light contains a large figure of our Saviour, as "The Light of the World," the representation being an exact copy of Holman Hunt's picture. The last light has several figures in it, one of which bears a large sword, and underneath is written, "The Sword of the Spirit." The new only remaining unstained window in the chancel will shortly be filled by a stained window, which will be erected by Mrs. G. Hounfield, to the memory of her husband. The window just put up comes from the establishment of Messrs. Camm, Smethwick, near Birmingham; and the brass is the work of Messrs. Parkin & Bacon, of Sheffield.

Sharnou Church.—In the south aisle a memorial window has recently been erected by Mr. Parkin, to the late Mrs. Parkin. It has a floriated ornamentation supporting a medallion, containing initials of the lady's name, surrounded by a border of lighter colour. It was executed by Mr. Camm, of Smethwick, near Birmingham. To the same artist is entrusted the execution of the memorial to be erected in the south transept to the late warden, Mr. Whitehead, who died so suddenly.

PROVINCIAL NEWS.

Northampton.—The plans for the new post-office in Abington-street, which have been prepared by Mr. James Williams, of her Majesty's Office of Works, have been sent down to Mr. Wetton. The front elevation of the building, which is devoid of ornament, consists of three stories, with three windows and a door on the ground-floor, and four windows on each of the other stories. On the basement will be the seizure store-room of the Inland Revenue department, store-room, letter-carriers' retiring-room, sorters' retiring-room, battery-room, coal-cellars, passages, stairs leading to sorting-office, &c. On the ground-floor will be the public office, with telegraph desks for the public, the postmaster's room, the sorting-office, telegraph instrument-room, messengers' room, &c. The first-floor will be devoted to the business of the Inland Revenue, and will contain a public office, surveyor's room, room for surveyors' clerks, collector's room, store-closet, lavatory, closets, passages, &c. The second-floor will also be devoted to the Inland Revenue, and will contain a journal office, superior's office, store-room, store-closet, lavatory, passage, &c. The work, we understand, will be proceeded with forthwith.

Wolverhampton.—That portion of the new corporation buildings in course of erection which forms the police-barracks is now finished. The barracks are at the rear of the new town-hall, and are approached from Red Lion-street. They will face a spacious drill-ground, and a broad verandah will run along the front of the barracks, which will form one side of the drill-ground. The first room entered is the charge-room, where persons taken into custody will be first brought. The room is large, light, lofty and well ventilated, and a like description, modified according to requirements as to size, applies to every other room in the barracks. Adjoining are the apartments of the female searcher; while on either side of a long, lofty, and well-constructed corridor there open out inspector's sitting-room, sergeants' sitting-room, general reading-room and library, drill and conversation room, mess-room, kitchen, fitted with large cooking-apparatus, pantry, a drying-room, heated with hot water, and a store-room. A broad flight of stairs leads to some twenty-five bedrooms opening out of a corresponding corridor on the first floor. There are added a bath-room and other conveniences. Some nine months must elapse before the police force of the borough, who live in barracks, can change their present wretched quarters for their new lodgings. At present the principal rooms are the temporary offices of the borough surveyor, the rate-collector, and inspector of nuisances; and the meeting-place of the committees of the town council; and until the whole premises are completed, and the several offices and rooms provided for these officers and purposes are occupied, the police must remain where they are. To form the drill and barrack yard, a large quantity of earth and soil has to be removed. The whole of the works are progressing.

Barnsley.—New Gasworks, erected at Old Mill, for the Barnsley Gas Company, have been opened by the chairman, in the presence of Mr. C. Hawksley, of the firm of Messrs. T. & C. Hawksley, the engineers, and a number of the directors. The works are fitted with all the most modern appliances and improvements, and are capable of making a large quantity of gas. In the evening the whole of the workmen had supper in a large room at the works. Both the new and old works, together with the corn exchange and other public buildings in the town, were illuminated with gas devices on the occasion.

CHURCH-BUILDING NEWS.

Gayton (near Stamford).—The church here has been restored and re-opened. The work of restoration has been done by Messrs. Habershon & Pite, architects, London, and Mr. Whitmore, of Stamford, has executed the work. Under the plans Mr. P. Fitzgerald has lengthened the chancel by 11 ft.; the plastered ceiling and gallery have been removed; the roof has been thrown open and lined with stained timber; pews have been given way to comfortable benches; and a series of new stone arches, which open to a new south aisle, have been built. On removal of the gallery it was found that there would be a deficiency of sittings. For the building of a new aisle a new fund was opened, and the Earl of Harrowby, the Earl of Shrewsbury, and Miss Moore contributed towards it. A vestry has been also added to the north side of the church. Mr. Habershon says:—"The church retains several features of the olden time, which have been scrupulously preserved. Among others, the fine Early Norman arch, with zig-zag and billet, is of peculiar beauty. It has been carefully restored. There is also a canopied recess in the north chancel wall, containing a recumbent figure of probably the twelfth century. Many old figured tiles remain which have been worked up in the aisles. Every ancient stone and every moulding connected with the church has been preserved and re-inserted. The prevailing style is Earl English."

Accrington.—The church of St. John the Evangelist, Accrington, has been consecrated by the Bishop of Manchester. The church was built about two years ago, to supply an accommodation for public worship which had long been felt in the rapidly-extending district of St. James's. The style is Gothic. The edifice is capable of seating 852 persons, and half of the seats are free. The total cost was about 6,700l.; but there remains a debt on the church of several hundred pounds.

Frampton.—The parish church of Frampton has been restored and re-opened after consecra-

tion. The church now consists of nave, north and south aisles, and a triple chancel, with arcades, and the chancel approached from the nave and aisles beneath broad archways. The porch is south, while most of the parishioners live in a northerly direction: it is supposed the southern end of the parish was the more populous when the church was built. But there is a facility of approach to the north door, which is reached through a pleasant avenue of chestnut trees. The earlier portions of the building are in the Perpendicular style, with modern insertions: the Decorated and Gothic prevails in the windows and the tower. Last March, the building had to be closed, and soon after the vicar and churchwardens wrote of it that it had been inconveniently built for the purposes of public worship as conducted in modern times, saying:—

"Two large chancel aisles belonged to the lay rector, and were at one time enclosed by railings. Some years ago the vicar obtained the use of them for the parishioners, and they were fitted up with seats. But the blocks of masonry which supported the chancel arch were so large as to impede both sight and sound, and it was determined therefore to take down the arches which gave admission to the chancel and its aisles, and to rebuild them farther to the eastward, thus lengthening the nave and its aisles, and also to extend the central chancel to the eastward, so as to maintain its due proportion, and to provide space for the choristers."

For 1,550l. the contractor had then guaranteed to make these alterations and to put the building in a weather-tight condition. But as there was no provision for floor or seats or even renovating the interior of the walls, and the old timber was to be used in restoring the roofs, an additional sum of 250l. was required to make the church fit for divine service. As at Minsterworth, the architect of the restoration was Mr. Woodyer, of Guildford, and the clerk of the works Mr. Denney; and Mr. Chapel, of Tring, Hertfordshire, has carried out the contract. The two large side galleries have been taken down; the chancel has been extended 17 ft., and its arches rest on half pillars attached on the east side to the chancel walls and on the west to the piers which form a common support for the arches of the nave and side aisles; the chancel aisles, each lighted by three windows, have been thrown into the nave; the thick buttresses impeding light and sight and sound have been removed to the beginning of the new chancel, and much lessened in size; the walls have been cleaned and replastered; the organ has been removed from the north to the south aisle, while pews for the Court fill the former; there are some seats for the choir in the chancel, and several new seats appear in the church. The pulpit has changed sides. The open-timbered roof has been in part unveiled; and, outwardly, there is a new covering of Tectury tiles to the chancel and aisles, and the churchyard has been extended. The old oaken chancel-rail remains, and so do the open seats with benches, oaken doors, and linen-fold patterns; and the stone and brick floors have been untouched, but that in the chancel and aisles will be renewed when money is forthcoming. The Perpendicular east window is new, in memory of the late squire, Mr. H. O. Clifford, by as Clayton & Bell, and has the Crucifixion for its central subject; and there are two painted windows in memory of the Watts family. The west window, in the first of the three stages of the tower, has been recently filled by the relatives of Mr. Thos. Watts. The south window bears the date 1734, suggesting some restoration of the work at that time. The stone seems to have been brought from Ireland.

Hanley.—The old Church of St. John, Hanley, has been re-opened, after having been closed several weeks for alterations and repairs. The most material alterations made in the building are the removal of the old ceiling and the substitution of an open woodwork roof. This has not only had the effect of improving the appearance of the interior, but also of diminishing the degree of effort necessary to be put forth by the minister in order to make himself distinctly heard in all parts of the building. The organ has been removed from the western gallery, and two windows therein, which had been built up, have been re-opened and filled with tinted glass. The interior has been cleansed, and repainted in a simple style, and in one or two minor particulars improvements have been made. The cost of the recent alterations is 500l. The sum of 450l. has already been subscribed towards the contemplated re-building of the chancel.

Tamworth.—Elford Church has been re-opened, after undergoing alterations and improvements, at a cost of about 3,000l., which has been borne solely by the Hon. Mrs. Howard, of Elford Hall.

The architect was Mr. G. E. Street, of London, and the builders were Messrs. Charles Clarkson & Son, of Tamworth. The church is of very ancient date. The chantry chapel contains a new painted glass window, representing the Ascension of our Saviour, executed after a Dresden design by Messrs. Ward & Hughes, of London.

Everton (Liverpool).—The foundation-stone of the Church of St. Ambrose, Prince Edwin-street, Everton, has been laid. The new edifice is intended to meet the wants of the rapidly-increasing population of Everton, and will be an auxiliary to the Church of St. Peter, Backville-street. The Church and School Extension Society have given 1,000l. towards the site and 3,000l. towards the building, the cost of which is expected to be about 5,500l. Mr. G. E. Grayson, of Liverpool, is the architect, and Messrs. Burroughs & Sons, of Liverpool, are the builders. The style of the new edifice will be Early Decorated Gothic. There will be a nave, chancel, north and south aisle, and two west porches, and sittings will be provided for 700 persons. Ornamented brick will be used in the construction inside and outside.

Southampton.—The church of St. Lawrence, which has been closed for a week or two for cleaning and decoration, has now been re-opened for divine service. The chancel has been decorated from the designs and under the superintendence of Mr. Charles Vaughan, of Southampton. The triplet of pillars supporting the chancel arch are brought out in Aberdeen granite, as are also the pillars that support the groined roofs of the body of the chancel and its apsidal termination, and the pillars supporting the hood mouldings of the three windows of the apse in porphyry. The mouldings of the chancel and apse arches being of an exceptionally plain character, diapering has been employed, the fleur-de-lis (an emblem of the Trinity) being in the outer moulding, the endless oval (as an emblem of eternity) marking the architrave, a leaf of the soffit edges imparting the appearance to the distant observer of the characteristic tooth-ornament, while the soffit is relieved by the grape and iris leaf (as an emblem of purity). The walls of the chancel and ribs of the groined roof are of Caen stone coloured, the bosses being in vermilion, picked out in blue and gold, and the roof sky-blue. On the semi-sexagonal apse the most elaborate part of the work has been bestowed. The side walls up to the window string-course are in maroon, with gold fleur-de-lis, the centre space being filled by a cross garlanded with the kiro, the candles, and other belongings of the altar. The capitals of the pillars that support the hood mouldings of the windows and the groined roof of the apse are decorated in gold, blue, and red, the ribs—of Caen stone colour—being relieved by a leaf moulding, and the roof itself is in ultramarine blue with white stars. The three single lancet windows are in stained glass, erected some years ago, and have, as the central design, the Baptism, with the Agnus Dei as the dexter and the pelican the sinister lights, and the jambs are ornamented with the iris leaf.

SCHOOL-BUILDING NEWS.

Abington.—A new school for the parishes of Great and Little Abington, built at the sole expense of Mr. E. J. Mortlock, has been opened by the Vicar of Great Abington. The school consists of a main room, 40 ft. by 18 ft., and also a class-room, 15 ft. square. It is built of red brick, the window-ells being of Ketton stone. By the liberality of the same gentleman the chancel and greater part of the nave of Great Abington church have been entirely reset. A field also has been granted by Mr. Mortlock as a recreation ground for the use of the poor of both the Abingtons.

Bristol.—The new building in St. Philip's, intended for ragged schools, mission church, and soup kitchen, according to the local *Times*, is nearly completed. It consists of two large rooms, with class-rooms annexed, capable of accommodating nearly 400 children. Under the class-room is a soup-kitchen, now being fitted up. A small playground has also been secured. One of the class-rooms has been opened for mothers' meetings and serving classes; and the boys' room will be opened as a day, night, and Sunday school as soon as possible. An appeal is made for funds.

Hyde.—The corner-stone of St. George's new school has been laid. The school, which will be entirely of stone, will be built in a Gothic style,

and will contain three class-rooms. It will be 100 ft. by 40 ft. in extent, and will accommodate about 800 scholars. The total cost will be 1,150l.

Worcester.—St. Clement's new Boys' School-room has been opened. It is built on a space hitherto used as a playground, and adjoining the present schools. The ground was somewhat irregular in shape, but Mr. Ernest A. Day, the architect, has made the most of it. The front wall is close up to the line of Church-walk, the entrance being at the end near to that by which access is obtained to the existing schools. A space of 9 ft. at the end has been reserved for a porch and cloak-room, the remainder being the school-room, the dimensions of which are 47 ft. by 30 ft. The roof is an open one, the interior height being 12 ft. to the wall-plate, and 28 ft. to the apex. The dressings of the building are stone. The school affords accommodation for 117 boys.

Manchester.—The foundation-stone of the Albert Memorial Church Branch Schools has been laid. The site is at the junction of Sanderson-street and Rowbotham-street, and contains 12 square yards. There is to be a mixed school, with porch entrances from Sanderson-street, and class-room adjoining, and an infants' school with separate porch from Rowbotham-street. Built in the Gothic style, the edifice, which is to be about 75 ft. long by 26 ft. wide, will be faced with selected bricks, and relieved with coloured bricks. Adjoining the school building a teacher's residence will be erected. The plans have been prepared in accordance with the requirements of the Privy Council, and each of the rooms is well fitted, affording accommodation for 231 children. Playgrounds will also be provided. The cost, including inclosure walls and fittings, is 1,250l. Messrs. Wade Brothers, of Miles Platting, are the contractors for the whole of the works, under the superintendence of the architect, Mr. John Lowe, Manchester. The building will cost about 800l., towards which Government has given 250l. The site, worth 100l., has been presented by Mr. Howarth, of Bristol.

Kennington.—The first stone of a National new School-room has been laid at Kennington. It would seem that the Regency-square School has been established about fifteen years for the education of boys and girls in connexion with the Established Church. Lately the number of scholars has greatly increased, and this fact, together with the necessity of having separate schools for the boys and girls which did not heretofore exist, made it desirable to build another school, and accordingly a piece of ground at the rear of the present school was selected for that purpose. The building is to cost 600l. The architect of the school is Mr. Charles Gould; and the builders are Messrs. Nixon & Sons.

Hollington.—A new school has just been built in this village, and opened. The school, with a class-room, and master's house attached, has been erected at a cost of 900l. It is in the Elizabethan style, of Hollington stone, rook faced. Mr. Christian, of London, is the architect; and Mr. William Thorley, of Ellastone, the builder.

Isleddenden Pook.—The corner-stone of the new schools near to Blackwood Hall, just above the station, has been laid. The schools are to receive 300 children. These schools are being built after the designs of Messrs. Parr & Strong, London, and they are to consist of mixed and infant schools, with master's residence. The larger room when ready is to be used for divine service on Sundays, until the completion of the church, which is to be commenced early in the next year. The school buildings with their gables, and the church with its lofty spire, will eventually form a group seen from Brierley, Midgley, and the surrounding country.

Newcastle-under-Lyme.—The foundation-stone of a new school for girls has been laid at Chaseton. The building will consist of a school-room, 50 ft. by 20 ft.; class-room, 15 ft. by 14 ft.; porch, lavatory, furnace for boiling water for tea, and the usual outbuildings and play-ground; to be built of red bricks, with stone traceries and mullioned windows; but the copings and buttress set-offs, usually done in stone, are to be of Staffordshire blue brick and tile ware. There will be open stained roofs covered with tiles. The style of the buildings will be Decorated Gothic, similar to the existing schools adjoining. The architects are Messrs. Ward & Son, of Hanley, and the contractor is Mr. Lea, of Chaseton.

Rothwell.—The new Free Grammar Schools

recently erected in Rothwell have been opened. The new edifice is situate at the east end of the town, on the site of the old school, and faces the street. It was built by Messrs. Barlow & Bullin, of Rothwell, builders, from a design by the rector. There is a residence for the master. The main building is capable of being divided by folding-doors into two large rooms, one being intended for girls and the other for boys. The boys' room is 40 ft. by 18 ft., and the girls' 33 ft. by 18 ft., and to each a class-room is attached. The height of the side walls is 15 ft. The roof is of open deal, stained and varnished. The school is lined with Harborough pressed bricks, the external material being "chopped" native stone, with white stone quoins. The estimated cost of the new building is £501, the materials of the old building having been utilised as far as possible. The school will accommodate upwards of 200 children.

York.—New church day and Sunday schools have been opened in the Walmgate district. A large plot of ground, of the value of more than 400*l.*, was placed at the disposal of the rector and churchwardens, on which to erect the schools. The ground for the parsonage-house, now in course of erection, near the schools, was purchased of the corporation for 300*l.* The schools, which are intended, as day, Sunday, and infant schools, with the addition, in winter, of night-classes, have been erected and fitted up in accordance with the rules laid down by the Committee of Council on Education, and consist of schools for boys, girls, and infants, each 36 ft. by 18 ft., with class-rooms adjoining. The front, towards the Church of St. Denis, is of red bricks and stone dressings. The play-grounds, which are spacious, are surrounded by a low wall and ornamental palisades. Mr. Rawlins Gould, of this city, was the architect employed, and the work has been executed by the following contractors:—Mr. Biscoe, for brick, stone, and plaster work; Messrs. W. Bellerby & Sons, joiner's work; Mr. T. F. Wood, slating; Mr. R. Walker, plumbing and glazing; Mr. W. Walker, ironwork; and Mr. Armit, painting. The cost of erecting the buildings has been upwards of 1,400*l.* In the schools about 250 children, in the whole, can be accommodated. The interior wood-work and fittings consist of plain deal stained and varnished.

Cambridge Wells.—The memorial stone of new schools has been laid here. Mr. J. Wimbles is the architect, and Messrs. Willcombe & Oakley are the builders. There are at present between 200 and 300 children attending the school and eighteen teachers. One principal room will be 50 ft. by 25 ft.; the second room, 15 ft. by 15 ft.; over that and the staircase there are to be two more rooms, one for a young men's class and the other for a library, and at the back there will be two other rooms for the use of the church-keeper and the parsonage-house.

Leicester.—St. Martin's Schools have recently been much enlarged and extended by taking in the part formerly used as the master's residence, and bringing the front forward to the line of the street. Formerly there were only two common school-rooms, one for boys and the other for girls, but the alterations have added three good and airy rooms for classes to each department. The old part of the building has been renovated, new flooring having been laid down, and walls and panelling erected where required. The alterations and additions have been carried out under the direction of Messrs. Shenton & Baker, architects, at a cost of 1,250*l.*

Books Received.

Perpetuum Mobile; or, a History of the Search for Self-motive Power, from the Thirteenth to the Nineteenth Century. Second series. By HENRY DIRCKS, C.E., LL.D., &c. London: Spott, Charing-cross. 1870.

PERHAPS it may be something new to many of our readers to be told, that since the opening of the present century, and not a few of them quite recently, at least eighty-six English patents and twenty-three French ones, for perpetual motion, have been obtained, or at least asked for, in this country. Though actually for perpetual motion, these patents are in general said to be for the obtaining of "motive power." They are all, however, for the obtaining of self-motive power, by means of mechanical contrivances, combining levers, wheels, and weights, water and air, to go on for ever, or at least as long as the materials

last, and without any continuous supply of motive power, such as winds or tides, steam, water-falls, &c., might afford. The true nature of these "motive power" patents we have now and then spoken of, and adduced as curiosities, but Mr. Dircks records them at considerable length, and a strange and lamentable exhibition of misused mechanical ingenuity they do form.

Amongst the more recent patentees (1865), we observe, is Mr. James Smith, of Liverpool, a practical man of business, if we mistake not, but also a noted squarer of the circle, about which he is ever and anon squaring up to ex-Professor de Morgan, the mathematician. Conjointly with some wrong-headed mechanic, Mr. Smith, as a capitalist, gives his name (and his money) to four patents, and one abortive application for a patent, for a self-moving engine to supplant the steam-engine; and on which, according to Mr. Dircks, he has spent between 8,000*l.* and 10,000*l.*, with the usual result of "wait a little longer." Baron von Rathen, who, a good many years since, endeavoured to bring into use an engine worked by compressed air in iron bottles, appears now (or at least in 1865) to have joined the corps of crazy self-motive power seekers, by taking out a patent for retaining the compressed air motor in perpetual activity by causing the engine itself to work an air-compressing apparatus.

Although, in general, the modern perpetual motion seekers keep the idea of self-motors discreetly in the background, so far as words are concerned, this is not always the case. Two poor French fellows, labouring under a twofold ignorance of the English language and of the laws of mechanics, boldly speak of their patent of 1867 as being for "the use of all kind of industry, and called the perpetual movement," and they thus describe the application for provisional protection, which, however, was mercifully refused:—

"This machine or apparatus is of triangular form, and has for notional power the reaction and for a of weight, which keep continually raising a smaller one, which is what constitute and produce its perpetual movement. Its march cannot be impeded by any shocks of any kind whatever. Any system of escapement at known can be applied and regulate its march and direct it at will. All kinds of connections can be applied to it according to the wants required. It can also be adapted to clocks."

In *Notes and Queries*, Mr. De Morgan thus vigorously defines the impossible problem of the perpetual motion:—

"The purse of Fortunatus, which could always drop a penny coin, though never a penny was put in, is a problem of the same kind. He who can construct this purse may construct a perpetual motion; in this way. Let him hang the purse upside down, and with the stream of pence which will flow out let him buy a strong steam-engine, and pay for keeping it at work day and night. Have a new steam-engine ready to be set in motion by the old one at its last gasp, and so on to all eternity. A perpetual motion demands of the nature of things a machine which shall always communicate momentum in the doing of some work, without ever being fed with any means of collecting momentum. It could be compassed in a certain way, if this is, by retaining the work done to do more work, which again should do more, and so on—if friction and other resistances could be abolished, and nothing thrown away. In this way the fall of a ton of water from a height of 100 ft. might be employed in pumping up as much water into another reservoir, which, when landed, if it be lawful to say so of water, might, by its subsequent fall, pump up an equal quantity into the original reservoir, and so on backwards and forwards, in *secula seculorum*. But not a drop must be wasted, whether by adhesion to the reservoir, by evaporation, by splashing, or in any way whatever. Every drop that falls down must be made to raise another drop to the same height, so long as the sockets have friction, or the air resists, this is impossible. In fact, matter, with respect to momentum, has the known qualities of a basket with respect to eggs, butter, garden-stuff, &c. No more can come out than was put in; and every quantity taken out requires as much more to be put in before the original state is restored. So soon as the law of matter is as clearly known as the law of the basket, there is an end of looking for the Perpetual Motion."

The history of perpetual motion, says Mr. Dircks, is a history of the fool-hardiness of either half-learned, or otherwise totally ignorant persons.* In the infancy of sciences, whether medicine, chemistry, agriculture, mechanics, or others, there were of course, some errors which received a certain amount of favour, and even encouragement; but the crudities of every science are fast disappearing.

Were we to admit for argument's sake that some delicately arranged instrument might possibly be contrived to show a tremulous action,

* And yet we find that the more recent patentees of whom we have just spoken comprise a colonial bishop, a professor of philosophy, and another of languages, two barons, a knight of the most noble and ancient order of the Temple, four military men, a doctor of medicine, a barrister, several gentlemen, two civil engineers, several mechanical engineers, a brass manufacturer, a millwright, a smith, a saddler, a bobbin manufacturer, a surveyor, and a geologist, besides others whose professions are not named.

its accomplishment would not be of the least practical value, or reward the toil and anxiety of its inventor. But although inventors have sought a power exceeding the steam-engine in some cases, while others have satisfied themselves with more lowly designs, based on capillary attraction, neither the one nor the other has attained the faintest shadow of success. From the infant machines projected in the thirteenth century to the last hydraulic, pneumatic, weighted, and lever-worked pretensions, patented as motions, no motion whatever has resulted from the one or the other to the present day. Not a solitary discovery is on record, not one absolutely ingenious scheme projected, or one simple self-motive model accomplished. Under such circumstances, what shall we say of the modern mechanic who shall hereafter presume to add his dreary dreams to the lifeless lumber of the last seven centuries? No language can be too severe in denouncing the continuance of research in this insane undertaking; nor any criticism too sarcastic in exposing the foolish results pompously published by a class of blind, deaf, and doggedly stupid projectors; who, bringing obloquy on themselves, are a discredit both to their country and to the present enlightened age. Nothing can excuse the fostering of such crazed conceits as the present history records, curious in themselves, as regards olden times, but ridiculous in a modern garb; they are, therefore, presented here as a warning to simple-minded experimenters and novices in mechanical science, in the hope thereby effectually to break the neck of this monster mechanical delusion.

Mr. Dircks's history is illustrated by engravings from various authentic sources, in papers, essays, letters, paragraphs, and numerous patent specifications, and is preceded by an interesting introductory essay.

A Short Historical and Architectural Account of Llanercost Priory. By R. S. FERGUSON, Barrister-at-Law, and C. J. FERGUSON, Architect. London: Bell & Daldy.

In the compass of a pamphlet the Messrs. Ferguson have given an interesting account of Llanercost, an Abbey of Black Canons, eight miles from Carlisle. The buildings are beautifully situated in the valley of the river Irthing, close to the Pict's wall, and are mostly of the thirteenth century. Two photographs of the buildings, and a measured plan, agreeably illustrate this welcome essay.

VARIORUM.

Mr. Allnut's "Record and Historical Map of the War" shows the routes of the French and German armies, the situation of the battles, and the towns surrendered. It tells with a few lines and flags the tale of an astounding series of triumphs. The same gentleman also publishes a diagram showing the highest price of Consols each day during the war, from July 1 to September 30. The range is from 93½ down to 83½.

The October Number of *Home News for Australia*, 64 pages, is a remarkable digest of remarkable news, and reads like a volume of universal history.—The list of contributors to Mr. Tom Hood's *Comic Annual* this year will include, among other well-known authors, Mr. Leland (Hans Breitmann), whose contribution will be the first of his writings to appear originally in an English periodical. The Brothers Dalziel will execute the engravings. The result will doubtless be popular.

Miscellaneous.

Parcels Trains.—The attention of the Post-office authorities is called, by the *Echo*, to the great want of a cheap parcels delivery throughout the country, so that, for a few pence, an interchange of commodities, in retail, might be promoted to an immense extent between towns, and especially by help of the halfpenny postage-card, of which tradesmen, as well as their customers, will make constant use. A Londoner, for example, wants a small roll of the tastefully spiced mutton, or beef, freshly "cured," of which a Paisley tradesman advertises him by post-card. He cannot get it in London, except at enormous cost, and not fresh, from some West-end tradesman. He orders it from some Paisley post-card, or by enclosing stamps or order, and gets it next day, carriage 3*d.* or 6*d.* No end of such cases might be adduced.

The Architectural Society of Northampton.—The annual meeting of this society has been held. The proceedings of the day (and a very fine day it was) commenced with an excursion, the rendezvous being the Castle Ashby station. There the members from the west assembled. The train from the east end of the line coming later, there was time for the earlier comers to visit Earl's Barton, which was not in the programme. The party afterwards proceeded successively to Grendon, Strixton, Bozeat, Easton Mandit, Yardley Hastings, Castle Ashby, Whiston, and Coggeshoe. The meeting was held in the Assembly Room, the Rev. Lord Alwyne Compton in the chair. The report, which showed an unexpected surplus in hand, was read and adopted, and office-bearers elected. The Rev. Owen Davys then read a paper on the Choral Arrangement of Churches. Mr. Davys was of opinion that in cross churches the best place was in the centre, when the organ should be suspended as at Ely. When the choir is in the chancel, the organ should be placed behind it. He objected entirely to placing the organ on the ground. The musical effect was far superior from above than from below. The choir should be isolated from the congregation. The Rev. H. J. Biggs then read his paper "On the Connexion of Architecture with Freemasonry, and on Masons' Marks." The Rev. G. A. Poole denounced as a fallacy the supposition that the Freemasons of the Middle Ages had any connexion with modern Freemasonry. They were of no greater authority, he said, than the other guilds; and he repudiated the notion that modern Freemasonry had any title to take part in the religious ceremony connected with the laying the foundation of a church, when they were not in reality masons at all.

City Commission of Sewers.—On Tuesday the Streets Committee brought up a report recommending that the carriage-way of Moorgate-street and Finsbury-pavement should be paved with asphalt of three different descriptions. They stated that they had received applications from Mr. Barnett, the patentee of iron asphalt paving, and the Limmer Asphalt Company, to be allowed to lay down specimens of their asphalt, by way of experiment, in some parts of the city, and that in consequence they had considered it expedient to try in Moorgate-street and Finsbury-pavement those descriptions of asphalt and that of the Val de Travers Company, the thoroughfares having a different class and amount of traffic from that in Cheapside and the Poultry. The cost of the experiment would be 4,620*l.* In the case of the Val de Travers Company, who would have the largest space allotted, and 169*l.* in that of Mr. Barnett for a paving of 250 square yards. The Limmer Company offered to pave gratuitously 500 yards, and to keep it in repair for a year. The report created some discussion, and eventually an amendment by Mr. Deputy Farrar, postponing the consideration of the report for six months, was carried by a majority of ten in a Court of forty-four members. On the recommendation of the same committee, orders were given to pave with wood a portion of George-yard, Lombard-street, at the suggestion and expense of Messrs. Barclay, Bevan, & Co., the bankers.

Liverpool Master Builders' Association. The fourth annual general meeting of this association has been held at their rooms in South Crescent Chambers, Lord-street. The committee presented their annual report and balance-sheet, which were adopted. They congratulated the association upon its success in dealing with the labour question, which has brought the relationship between the great majority of the operatives and themselves into a more satisfactory state than has existed for many years. Should any dispute again arise in the bricklayers', masons', carpenters' and joiners', or painters' branches of the building trade, provision is made in the rules for referring such disputes for settlement to a public court of arbitration, instead of resorting to strikes or lock-outs, as has hitherto been the practice. The following gentlemen were elected the officers for the year, viz.:—Mr. Edward Hughes, president; Mr. George Romo and Mr. Thomas Urnson, vice-presidents; Mr. James Landale, treasurer; Messrs. S. H. Holme, R. Makinson, S. Lyon, E. Gabbutt, C. Wells, James Leslie, Jones, W. Wither, J. Corkill, P. O'Connor, Thomas Harrison, John Tancer, W. Callaghan, T. Arrowsmith, John Price, W. Merrick, and D. Radcliffe.

Steam Cultivation.—A visit to Mr. Edmund Rack's farms, at Braydon Manor, Charlham, and Castle-hill, has been described in the *Wiltshire Standard*. The party, it is said, were wonderfully struck with the vast improvement both in the grass and the tillage. The tillage was in a beautiful state, principally due to steam cultivation, which was going on in force, on Fowler's system. Of the 300 acres, rather more than 150 acres are under steam cultivation for wheat crops, which Mr. Rack believes the land capable of producing in good quality and quantity continuously, the crops after clover, beet, or beans not having been so good as wheat after wheat. At the time of the visit to Braydon, Messrs. Slater & Porter's 10-horse double engine was at work on the land, having been there eighteen days, during which time it had ploughed the 150 acres nearly twice over, doing its work in a capital manner, and much to the satisfaction of both Mr. Rack and his friends. It was interesting to witness the contrast between Mr. Rack's farm and the lands adjoining, which are under the old-fashioned treatment; the visitors endorsing Mr. Rack's opinion that all the poor land now lying in "Braydon Forest," and let at from 7*s.* 6*d.* per acre, may by means of the steam cultivator, and capital combined with skill, be made in a few years worth 2*l.* or 3*l.* per acre, and that some of the finest crops may be grown there, although it was a local proverb that "nothing good came out of Braydon."

The Drainage of Middlesbrough.—Mr. Robert Morgan, C.E., of the Local Government Act Office, has made his report upon the two schemes for the drainage of Middlesbrough. He says there are 7,000 houses in the borough, of which 406 only have water-closets, the remaining having covered ashpits. The ex-borough surveyor (Mr. John Denning) estimates the cost of his scheme at 22,680*l.* 16*s.* 6*d.*, and the borough surveyor (Mr. Latham) estimates the cost of his scheme at 17,641*l.* 6*s.*; but to this sum must be added the cost of sewers in the north portion of the town, viz., 3,170*l.*, which makes the total 20,811*l.* 6*s.* After fully explaining the schemes, Mr. Morgan says,—"That of the two schemes before me Mr. Denning's deals most comprehensively with the requirements of the town, and may, with certain modifications, additions, and combinations at certain points with Mr. Latham's scheme, be adopted with advantage by the Town Council." Mr. Morgan concludes his report as follows:—"I therefore recommend that Mr. Denning's plan for the sewerage of Middlesbrough, with certain modifications, be adopted."

City Offices Company.—An extraordinary general meeting of this company was held on Thursday last week, at St. Clement's House, Clement's-lane, Mr. Ald. Dakin in the chair. The chairman, in moving the adoption of the report and accounts, said there was no material alteration in the balance-sheet except in one amount, which might be considered very satisfactory, received for surrender of the lease of the Cornhill premises. Those premises were held by the Crédit Foncier Company on a lease, of which 1½ year had yet to run. The rent under that lease would amount to 11,375*l.* The Crédit Foncier manifested a great desire to surrender the lease, and ultimately their offer to pay 10,000*l.* and surrender was accepted. In addition to this, the City Offices Company had an accruing interest running over the period, which would bring in 500*l.* in addition. Within the last few days the ground-floor and basement of the premises had been let to a banking firm for 1,000*l.* a year, and the directors had great hopes that they would be enabled to let the remainder of the premises at a good rental.

A Water-tight Rain-Tank.—I took out the soil in breadth and depth the size I wanted my tank; I then laid a double course of brickbats, and ran Portland cement in among them till they were just covered; I then built up the sides with brickbats and Roman cement, and when the whole was finished, I coated the inside with a thin layer of Portland cement. Every bat, before it was laid, was dipped into a pail of water. The months of April, May, June, July, and August are the best months in which to construct such tanks, because the cement has the chance of getting firm before being rendered shaky by frost. Mine was made just about midsummer. I ought to say that it was not made for the purpose of catching rainwater, but for holding a daily supply of river water; but I am convinced the same principle of construction would apply to tanks for any purpose or position.—*Gardener's Chronicle*.

Irish Cairn Sculptures.—At the last meeting of the British Association, a paper "On Ancient Sculptures and Works of Art from Irish Cairns," by Dr. Conwell, was read. The author described an excursion which he made on June 9th, 1863, to the Loughcrew Hills, two miles from the town of Oldcastle, where he found the remains of thirty-one cairns, partially destroyed, no allusion to which could be found on the Ordnance maps. The rural population of the neighbourhood believed these heaps of stones to be the magical work of a witch. Fourteen of the cairns contained chamber stones richly covered with sculpture; in some cases the work being punched, and in others clearly and cleanly out and engraved. He exhibited drawings of the devices; also a variety of curious articles in amber, bone, glass, bronze, iron, stone, &c. Dr. Conwell could give no explanation of the meaning of the numerous devices and symbols.

Sales of Land.—*Cockermouth.*—The Lorton Hall estates were sold by auction, under a decree of the Court of Chancery, at the Globe Hotel, Cockermouth. Lot 1, consisting of 109 acres, or thereabouts, situate near to Lorton Hall, and known as the Church Side Estate, was sold for 6,010*l.* Lot 2, the Home Farm, containing 65 acres, was purchased for 3,750*l.* Lot 3, Capshaw, consisting of 21 acres, was knocked down for 900*l.* Lot 4, Brooms, containing 23 acres 2 roods, was knocked down for 250*l.* Lot 5, Flatt, consisting of 6 acres, was purchased for 420*l.* Lot 7, Highside, consisting of 41 acres of arable, pasture, and wood land, and 64 acres of common land, was sold for 2,160*l.* *Swindon.*—Mr. Dore sold by auction a piece of land situate on the south side of the proposed new road leading to the Swindon railway Station, and immediately opposite the goods shed, containing 6*a.* 0*r.* 36*p.* The land previously offered, and belonging to the same estate, had sold in some cases as high as 10*l.* or 12*l.* a perch. Messrs. Thomas Arkell became the purchasers at 1,850*l.*

South Kensington School of Science and Art.—On Tuesday afternoon Dr. Zilli commenced a new course of forty lectures on the Historical Development of Ornamental Art, in the Lecture Theatre of this institution. The lecturer said students would no longer receive merely practical instruction, which might have the effect of turning them into machines, but they would also be made thoroughly acquainted with the theory of art, in order to expand their minds and powers of production. He would endeavour, by avoiding all one-sidedness in the treatment of his subject, to give them the best of the realistic, historical, and critical schools; to develop in their minds a thorough knowledge of art, enabling them to arrive at originality.

The New Foreign Cattle Wharf.—Besides the large sheds for cattle, and the space for tying cattle in the open, there are pens for 2,500 sheep; and slaughterhouses and offices are being erected. There are three slaughterhouses, each of 60 ft. length by 30 ft. width, and seven houses, each of 48 ft. length by 16 ft. width, these being built of strong timber uprights and plates, with plank floors and walls, and the carcasses are suspended to stout beams, "crabs" being provided for hauling up the slaughtered cattle. The accommodation is said to be sufficient for the butchering of 700 cattle per day, and 1,600 sheep have been killed and dressed in a day.

Gathering of Public Servants, Coventry. A social gathering of public officers and servants of this city, was held at St. Mary's Hall last week. The city surveyor, Mr. E. J. Parnell, and his assistant, Mr. Whitley, jun., had arranged that a dinner should be given to the various men in the employ of the corporation, the expenses for which were raised by voluntary contributions, and the dinner was well served by Mr. Whitley, senior. The hall was decorated. Mr. Councillor Crutchlow occupied the chair, and Mr. Bird, master of the workhouse, the vice-chair.

Municipal Offices, Liverpool.—It was stated at a recent meeting of the Liverpool town council that the cost of the newly-erected municipal offices in that town was 162,687*l.*, including 33,000*l.* for the site, and that the annual expenditure on the establishment would be about 3,600*l.*

Cregeen's Sash and Casement Fasteners.—In these fasteners no spring is used. A hinged catch locks the fastener when in its place.

Building Trades' Institute for Technical Education.—On Tuesday evening the annual meeting of the Manchester and Salford Building Trades' Institute for Technical Education, took place at St. John's Schools, Garside-street. The chair was taken by Mr. W. R. Corson; and there were also present Messrs. Jacob Bright, M.P., W. R. Callender, jun., Alderman Rumney, T. Clay, and others. The secretary then read the report, which stated that the industrial supremacy of England had been endangered for lack of knowledge, and that in spite of the practical aptitude of her people. It was therefore somewhat gratifying that though the number of members was not very large, yet there was reason to believe that the interest in the Institution was becoming more generally appreciated by those for whose benefit it was established, and that the session that was about to commence would be an improvement on the last.

The Technical Education Movement.—The deputation from a committee of a proposed university for technical education has had interviews with the Lord Mayor at the Mansion House. At the last interview, Mr. Alderman Gould explained that the deputation had brought up their report in an amended form. The amended report was read by Dr. Mill, and the Lord Mayor having expressed his approval of it, he was requested to allow his name to be put down as chairman of the executive committee, and to call a public meeting. In reply, his lordship said he had no objection to try the experiment, and by holding a meeting they would be able to ascertain whether the public were with them. If the public were not with them, they must wait till they were.

Buxton Towers, Salop.—The owner of this castle presided in person at a dinner which he gave to eighty workmen and others, in celebration of the completion of the centre and left wing of the building, on Monday last. The building is somewhat Norman in character, and is erected with red sandstone, in massive proportions. The architect, Mr. Harry Percival, of Newchurch, in Rosendale, put in half a mile of railway to a quarry which he opened on the estate, and he has erected the structure without external scaffolding, and by the aid of ordinary workmen in the locality. The great hall and marble staircase, with a bold window of six lights thereon, by O'Connor, of London, are chief features.

A Draughtsman to Liverpool Council.—At a recent meeting of the Liverpool Town Council, Mr. Alderman Weightman moved the adoption of the following recommendation, agreed to by the improvement committee:—

"To appoint Mr. Edward Hale as draughtsman, to prepare the necessary drawings, &c., for the lodges, entrances, and lodges, at Sefton Park, at a salary of 7*l.* per month, subject to one month's notice."

Mr. Fairhurst remarked that there were five draughtsmen in the borough engineer's office who were under notice to quit, and he thought that one of them should get the situation. After some further conversation, Mr. Weightman withdrew the recommendation for the present.

Laying the Memorial Stone of the Church of St. Columb, Omagh.—The Duke of Abercorn laid the memorial stone of the parish church of St. Columb, Omagh, on Saturday, 8th, in the presence of a large number of the prisoners of Drumagh. The total cost of the building will amount to about 5,400*l.*, the greater part of which sum has been contributed by the prisoners, the balance being a grant made by the late Ecclesiastical Commissioners for Ireland. The Duke addressed the meeting.

Large Transactions.—The report of the directors of the Conservative Land Society, submitted to the shareholders, at the meeting on 10th inst., at the Norfolk-street Offices, gives the receipts for the quarter, which were 36,693*l.* 7*s.* for the financial year ended at Michaelmas, 183,276*l.* 15*s.* 11*d.*; and the grand totals, 1,583,359*l.* 15*s.* 2*d.* The withdrawals were 399,971*l.* 3*s.* 9*d.* The reserve fund is 10,500*l.* The auditors were re-elected, and the report adopted. Viscount Ranelagh occupied the chair.

Chairmanship of Board of Works.—The *Parochial Critic* prints the circular letter of five applicants for the appointment, viz.:—Mr. C. Westerton, Mr. Robert Freeman, Mr. P. H. Le Breton, Mr. John Savage, and Lord Robert Montague.

The South London Tramways.—The tramway from Brixton to the Westminster-road, the present terminus being at the corner of Hercules Buildings, opposite to the Female Orphan Asylum, has been opened for public traffic; the carriages, which will hold forty-six persons inside and out, and be drawn by two horses, running every five minutes. If the tramway fare is to be kept at 2*d.* for the above distance of a mile, the omnibuses will not have any reason to fear the competition.

The Fungus Show at the Royal Horticultural Society, on the 5th inst., proved very attractive. Notwithstanding the drought, a great many fine and curious specimens were exhibited; and as there was no collection in the first class, which was confined to edible fungi, the prizes were awarded to Mr. G. Worthington Smith and Mr. James English, whose collections were considered of equal merit, while the second prize was given to Mr. Hoyle.

TENDERS.

For laying out land at Worthing. Mr. Alexander Peebles, architect:—	
Carrington	£1,535 0 0
Peacock form	2,762 17 8
Carter	1,830 0 0
Drye	1,670 0 0
Blaker	1,680 0 0
Hynes	1,449 0 0
Blackmore	1,440 0 0
Hubbard	1,438 0 0
Cole	1,334 0 0
Pursey	1,334 0 0
Vickers & Crane	1,316 0 0
Clarke	1,177 0 0

For farm buildings, Ramsbury, Wilts, for Mr. C. Lafer. Mr. Jas. H. Money, architect:—	
Cruse	£1,175 17 0
Dyer	1,045 0 0
Simonds	976 0 0

For farm homestead, Standen Farm, Wilts, for Mrs. General Dunn. Mr. Jas. H. Money, architect:—	
Dyer	£2,886 0 0
Woodridge	2,199 0 0

For the erection of new entrance lodge to Huchenden Park, Bucks, for the Right Hon. B. Disraeli, M.P. Mr. Arthur Vernon, architect:—	
Loxley	£210 0 0
Nightingale	383 0 0
Corby	381 0 0
Spence	373 0 0
Reaser	345 0 0
Woodbridge	347 0 0
Almond	330 0 0
Nash	316 0 0
Cooper (accepted)	256 10 0
Johnson	270 18 0

For Primitive Methodist Chapel, Lincoln-street, Hull. Mr. Mungrate, architect:—	
Clarkson	£2,734 0 0
Skinner	2,631 0 0
Johnson	2,610 0 0
N & J. Hall	2,440 0 0
Mungrate	2,400 0 0
Robinson (accepted)	2,380 0 0
Sergeant (too late)	2,360 0 0

For the erection of a dwelling-house and stable, for Mr. George Allen, in Victoria-road, Romford. Mr. E. C. Allan, architect. Quantities supplied:—	
Gordon	£657 0 0
Hinds	658 0 0
Davey	556 0 0
White (accepted)	627 0 0

For the erection of a minister's house, for the Congregational Church, in the West-end-road, Romford. Mr. E. C. Allan, architect. Quantities supplied:—	
White	£776 0 0
Nightingale	670 0 0
Hemlin	623 0 0
Wright	623 0 0
Hinds	617 10 0
Reed	597 0 0
Foulson	587 0 0
Hicks	588 0 0
Holmes	585 0 0
Warr	581 0 0
Davey (accepted)	559 10 0
Death	558 2 6

For the erection of a dispensary, relief offices, work-rooms, &c., at Notting hill, for the Kensington Board of Guardians. Messrs. James Broadbridge & Josiah Houle, architects:—	
Lot, Brass, & Son	£10,299 0 0
R. & T. Forgetter	9,860 0 0
Saul	9,338 0 0
Mungrate & Thurgood	9,258 0 0
J. & S. Williams	9,250 0 0
Crockett	9,189 0 0
J. & A. Wright	9,110 0 0
Chappell	9,091 0 0
Wignore	8,985 11 6
Henshaw	8,976 0 0
Scivener & White	8,893 0 0
Longhead & Way	8,800 0 0
Cowland	8,776 0 0
Temple & Foster	8,745 0 0
Hill, Kedwell, & Waldram	8,493 0 0
Horsley	8,397 0 0
Foster	8,298 0 0

For New Congregational Church, Reading. Messrs. W. & J. T. Brown, architects:—

Contract No. 1.—Schools.	
Sheppard	£288 0 0
Wheeler Bros.	850 0 0
Grover	836 0 0
Woodroffe	800 0 0
Barnicot	785 10 0
Matthews (accepted) ..	767 0 0

TO CORRESPONDENTS.

T.C.—P.P.—L.—S.—M.—I.—L.—P.—A.—P.—G.—S.—R.—W.—M.—H. H. B.—Capt. G.—H. G. R.—H. A.—J. M.—A. V.—J. R.—J. C.—Dr. Z.—T. M.—R. A. B.—S. M.—Fidler.—Dr. D.—B.—Mr. T.—G. P.—H. F.—Messrs. F.—C. R.—J. H.—E. C. A.—Messrs. R.—R. T. B.—J. Y. (see Apply to Secretary).—J. D. (shall have attention).—W. E. W. (glad to receive information).—"Bona of my Wanta" (unavailable postponed).—"Survey of Towns" (ditto).—"Fertile"—Letter in last, "Man the Boat," should commence "Suppose a block to have six sides,—not 'a single' as printed. We are compelled to detain pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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[ADVERTISEMENT.]

BUENOS AYRES GOVERNMENT CERTIFICATE.—TRANSLATION.—"We, the undersigned, at the request of Messrs. James C. Thompson & Co., certify that the IRON SAFES of Messrs. CHUBB & SON, London, of which these gentlemen are Agents, were exposed for several hours to the Fire that took place in the Offices of the National Government on the evening of the 26th instant; that in our presence they were easily opened with their respective keys; that the moneys and important documents they contained were found in perfect order; and that these Safes are now in use in the National Treasury Office.—Buenos Ayres, July 31st, 1867. (Signed) J. M. DRAGO, Treasurer of the National Government. JOSE TOMAS ROJO, JUAN M. ALVAREZ.

A true Copy.—A. M. BELL." A large assortment of these SAFES may be inspected at CHUBB & SON'S, Makers to the Queen and the Bank of England, 57, St. Paul's Churchyard, London; 68, Cross-street, Manchester; 28, Lord-street, Liverpool; and Horsley-fields, Wolverhampton.

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Just Published, price 3*s.* THE REPORT OF THE SEWAGE COMMISSIONER OF THE TOTTENHAM LOCAL BOARD OF HEALTH, on the DISPOSAL OF THE SEWAGE of their District. Edited by F. P. MASHALL, C.E. Surveyor to the Board. E. & T. B. SPON, 45, Chancery-lane.

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The Builder.

VOL. XXVIII.—No. 1446.

Sewage Irrigation.

SEWAGE IRRIGATION is progressing. The Vice-Chancellor is the great incentive. Town sewage pollutes a stream so as to cause nuisance injurious to trade, to occupation, or to health. The Court is applied to, and almost as a matter of course, the required injunction is granted. The town authorities then look about for means of escape. Something must be done to abate the nuisance. Chemical treatment has been tried on sewage at town after town, but only to prove a failure, and irrigation has to be resorted to. Chemistry has broken down at Leamington, at Cheltenham, at Coventry, at Northampton, at Halifax, and, indeed, at most other places where precipitation by chemicals has been tried; the singular feature in the case being that chemical treatment of town sewage, for the purposes of obtaining commercially paying results, and rendering the effluent water pure, has never been advocated by any chemist of reputation. Patents have been taken out by adventurers, and by honest enthusiasts, just as patents are taken out for many other impossible purposes,—perpetual motion, for instance;—and, no doubt, other persons will take out patents for similar purposes. Select committees at times receive very curious evidence on many questions,—all on oath. This in itself is a curious fact. Men of repute swear to the truth of their statements. A swears black is white; B swears that black is green, or something quite as contrary, and about which there ought not to be any difference, because demonstration proves that white is white and black is black, and not green. A civil engineer, a well-known chemist, and a Professor swore last session that chemical treatment of town sewage is the true remedy, and that irrigation will swamp land, poison vegetation, produce malaria, generate hydatids (tape-worms, &c.), and that, to sum up, the results of irrigation will be sickness and death in most horrible forms. The reply is, irrigation is as old as civilisation. Sewage application to land (at Edinburgh) has gone on over some parts of the existing sewage-farm two centuries, and over the greater portion from sixty to thirty years. The sewage is black and stinking before it reaches the land. The carriers are large open ditches very foul, and volumes of this putrid sewage in excess are flooded on to the surface without due care to prevent nuisance. Official and other inquiry has, however, shown that local disease has not been caused by emanations from this sewage-farm. Cows are stall-fed on the grass so grown; and the milk and the butter are both wholesome and abundant. In the hospitals of Edinburgh, no case of enterica taint (though looked for) attributable to the sewage-farm has been recorded. What difference can there be betwixt solid town manure and liquid (sewage) manure? If there is danger in using

liquid, there is similar danger in using solid manure; as, if there be the ova of tape-worm in one, there will be in the other. But this bugbear may be discarded. Sewage-farms will soon be as "plentiful as blackberries," and, if people will only inspect those at Bedford and at Romford, they will see the crops of cabbages, mangolds, carrots, turnips, and other garden produce as fine as the prize specimens of the best agriculturists. But besides being fine (large), the vegetables are good—so much better in flavour than vegetables as ordinarily grown that they might be new specimens of a newer and finer sort. The money produce of an acre of sewage-farm varies from 25*l.* to 75*l.* for crops of four and six months' growth. Sewage farming is beneficial in several ways, as the land produces from ten to twenty times more produce, of a better quality, and finds profitable employment for ten times the number of men on the land. The sewage of London, now wasted, and horribly polluting the Thames at Barking and Crossness, might be applied in irrigation over 30,000 acres of land on the margins of the river betwixt London and the sea, increasing the annual produce up to an equivalent of that obtainable now from 300,000 acres, under ordinary farming, employing ten times as much labour, and producing milk, butter, and cheap market-garden vegetables of the finest sort, better than any now to be obtained at Covent Garden at any price. If Government aided the metropolitan parishes to purchase the requisite 30,000 acres of land, and laid it out for sewage irrigation by rooting up useless fences, levelling, deep draining, forming conduits and carriers, making roads and tramways, there need not be one able-bodied pauper on the relief-books of any London parish; as any willing man can perform farm labour if fit to work at any occupation; and the work may be "piece-work;" not mere "task-work," but, as during the cotton famine, with distressed cotton operatives, "work for wages." Sewage-farm work would not be so complicated or so difficult as executing town improvements, such as sewerage, draining, forming streets, paving, and such work. The increase of pauperism in London is alarming, and the present course of Poor-law legislation is calculated to increase it. Improved workhouses and hospitals, vagrant wards, out-door relief and medical relief (though at present not to be done without), will draw up to the metropolis every tramp who can walk or find means to ride so far, until, wealthy as London is, the poor-rates will become intolerable. But the money cost will be the least evil. There will be such a mass of demoralisation as will become turbulent and unmanageable. Neglected poverty will avenge itself on the rest of the community. No people ever starved off rebellion by subsidising idle men; no nation ever saved itself from subjugation and ruin by purchasing the forbearance of surrounding barbarism; and if statesmanship cannot find a safer remedy for the growing want and misery in England without relying on the present form of Poor-law legislation, the poor will overwhelm the rich, or deprive riches of their supposed contingent comfort. Trade-unions, Chartism, Fenianism, socialism, and infidelity thrive under purblind legislators. There may be ways to govern men so as to secure health, morality, comfort, and peace at home. But a compact with idleness, by any form of law (Poor-law), as amended, will not lessen vagrancy and pauperism.

What has town sewage irrigation to do with this question? may be asked. Well, the reply is, a population of 12,000,000 living in towns produce sewage which pollutes the streams and rivers, but if applied to land, in irrigation, would increase the food produce of 200,000 acres to an equivalent of 2,000,000 acres, and would also find employment for ten times as many men as are now working on the

comparatively unproductive 200,000 acres. A nation, we waste our wealth in many ways to produce nuisances; as in the sewage of towns, and in so-called "waste products of manufactures," chemistry shows that there is no waste product, if it is only treated as science indicates, and is put to its proper uses.

STRAY NOTES IN LANCASTER.

THE first impression produced on the visitor to the county town of Lancashire is not very inviting, nor giving any great promise of interest either architectural or picturesque, unless narrow, irregular, devious streets, and various eccentricities of level and incline, may be held to constitute somewhat of the latter element. The houses that line the streets are mostly deficient in picturesque or architectural effect, to an extent unusual in a town built on such an ancient site and with such a long history behind it as Lancaster: what there may once have been in the way of domestic architecture having been evidently demolished, and rebuilt in the true builder's style of the eighteenth and nineteenth centuries. A feature, however, peculiar to the district is to be noted, in the shape of an unusual style of doorway of the earlier part of the seventeenth century, specimens of which are in preservation here and there, and which appear like the last echoes of the faded Medival style. One of these is to be seen in Bridge-row, a steep, narrow, crooked lane, said to have been formerly the chief street of the town: the jamb mouldings of the doorway consist of a half-roll, a hollow, and a wave moulding, the whole resembling what one would generally accept as a late Rectilinear moulding; the form of the lintel (for it is not really an arch) is what would be a very flat ogee, but for a drop about 1 ft. square in the centre, terminating in a double wave on the soffit; the whole of the jamb mouldings (about 14 in. girth), are mitred right round, following the outline of the door head. It is an odd-looking feature, and might be a puzzle as to the date, which, however, is cut on the square drop-stone mentioned, and fixes it to the early portion of the seventeenth century.* Lancaster is not, however, deficient in special objects of architectural interest, however uninviting in its general aspect. The parish church, which stands at the highest part of the town, close to the castle, is a large building of very late Gothic date, lately restored internally by Mr. Paley, and presenting now a good and satisfactory interior with an expression of solidity without heaviness. The point of attraction, however, in the church, is the carved oak reredos, so used and styled now, but which is in fact of older date than any portion of the church, and possibly was brought from one of the dismantled north English abbeyes, perhaps Furness. Whatever its origin, it is unquestionably one of the finest specimens of carved woodwork in England, as we have before now pointed out, and in itself well worth going out of the way to look at. There are eighteen divisions or bays, consisting of open tracery canopies, with pinnacles between, standing partly against the wall under the east window, and partly in two returns coming up to the altar-rail on the north and south aisles; the returns having also stalls with folding miserere seats. The tracery in each compartment is different in design, of late Decorated style, and showing some most curious combinations of form, and each canopy shows deep flat crocketing and finials of wonderful richness and elaboration of design, all varying throughout; the cusping of the ogée arches on the lower portion of each canopy is terminated on each cusp by a small head, not much more than 1 in. in diameter, carved with the minutest delicacy; and the mouldings of the canopies and sub-arches are hollowed and undercut to a depth usually found only in stone moulding. Altogether this is a remarkable work, and especially so for the characteristic and thoroughly wooden treatment of the carved foliage. A large and in many respects fine organ, of the old school, and not in the best repair, occupies the west gallery (a pre-restoration feature); this it is now proposed to bring down into the church to get it nearer the choir at the east end. Let us hope that the church authorities do not meditate burying the instrument alive in an organ-chamber alongside of the

* 1629, if we remember rightly; a heavy rain at the time was unpropitious to making written notes.

chancel, in the manner we have more than once protested against; its best position would be against the north side of the nave, to meet all demands. An offensively violent east window, by Wailes, of the "gorjas" type recently described by a well-known correspondent, exhibits all the colours of the rainbow on the strongest possible scale; while a foil to this is exhibited in a perfectly harmless window of Messrs. Clayton & Bell, in the south aisle, which at all events steers clear of the sin of "polychromy," showing little but a variation of tertiary browns. The close contiguity of those two windows furnishes the most striking instance we have seen of the utter absurdity of permitting the unrestricted indulgence of individual taste in stained glass in the same edifice. There might be arguments adduced in favour of the tone and style of either of the two windows mentioned, taken separately; but that the same building should be lighted through windows designed in a totally different scale of colour, is ridiculous. The stained windows of a church, if not all by the same maker, should at least be designed with reference to each other and to the building, and be under the supervision either of the architect or of some competent designer, who should have the ordering of the whole, so as to produce at least some approximation to chromatic harmony and unity of effect. Externally the church shows little for remark, but the view from the churchyard, flanked by the heavy square masses of the castle, is very fine; on one side, towards Morecambe Bay and the Westmoreland hills, and in the other direction across the lower portion of the town to the rising ground on the outskirts, against which the fine tower and spire of the Roman Catholic church rises, light against the hill and dark against the sky beyond. The general aspect of the two famous castle is pretty well known; the entrance-gateway contains some transitional work in the way of groining and corbels, and in the large courtyard is a circular arch, in the wall of part of the building, said to be Roman, but which has certainly been cleaned and reset, from the appearance of the stone, and is, therefore, somewhat apocryphal. The main portion of the castle is the restoration or rebuilding of the late Mr. Harrison, of Chester, restorer also of Chester Castle; his work is neat and well executed, but decidedly tame in comparison with the best of the older portions. Descending the hill, we shall find the Roman Catholic church before mentioned worth looking at, as a capital specimen of good, sober, modern Gothic work, not showing anything very new in the treatment, but a very successful example of what it was probably intended to be, a reproduction of genuine Medieval art. It is built of a fine, hard, light-coloured stone of the district, very pleasing in tint, and looking as if it would stand well. The lofty spire is a particularly fine one, all the more satisfactory in effect from the decided and almost visible *entasis* in the lines, which gives it a full, plump, and well-nourished appearance that would be felt even by those who do not know how it is produced. Internally the difficulty of producing a three-aisled church which shall be convenient for worshippers has been well met by the employment of comparatively slight piers and a wide arcade; and there are some monuments and shrines in the church showing carving and bas-reliefs (chiefly alabaster) of considerable merit, though in some cases rather overdone in the decorative carving, a remark which may apply also to the nave capitals, which are somewhat too exuberant in style, though not more so than is commonly the fashion of modern Gothic carving. The church is from the designs of Mr. Paley (now the firm of Paley & Austin); and that the Lancastrians appreciate their principal resident architect is implied by the fact that all the new buildings of any consequence in the town are from the same hand. What are we to say, however, to the eclecticism which will build barracks in the Scottish Gothic style, or a semblance thereof, and a bank in the Italian or quasi-Classical style? There seems to be a current impression among bankers that the exigencies of their business imperatively demand Classic "fronts;" it is probably to this that we are to set down this aberration of a Gothic firm from the path of their predilections; but these little sins carry their own retribution, for the new bank in Lancaster will scarcely rank, in external aspect at least, as the happiest of its architect's inspirations. Those who have given their sympathy and habits of design to one style do not readily succeed equally well in another; or we are, perhaps, to regard the tame aspect of

the Lancaster Bank as a little bit of wickedness on the part of its Gothifying architects, making a sly point in favour of their favourite style by the erection of a feeble Classic building as a foil to others in an opposite style? We have heard of such things before now. Practically, the new bank seems likely to answer all its purposes well in the internal provisions of plan, vault accommodation, &c.; not to mention the marbled iron columns, the well-known insignia of a bank interior. But Messrs. Paley & Austin will certainly do themselves more credit, in the eyes of architects at least, by their large asylum (a kind of provincial Earleswood) half of which (the centre and one wing) is now nearly completed. The building stands on a most effective site on a rising ground in the outskirts of the town; it will be, when complete, a parallelogram with projecting wings and centre, the centre marked by what may be termed a tower, with a high pyramidal roof, of very picturesque but not eccentric outline; the portion of the wall immediately beneath the eaves is left as an open arcade with a row of pointed arches; we presume it is to be used as a promenade or prospect tower. The whole building is, we must say, one of the most satisfactory examples we have seen of architectural expression attained by a simple and unpretentious breadth of treatment; by character in the masonry, which is exceedingly good, of the same light stone (we believe) as the Roman Catholic church, and relieved by a very few bands of a darker red stone; and by ornament sparing but well chosen, and of dignified character. This may be described as mainly of Early Gothic character; among other features the inverted volute of the transitional period appears with good effect in the caps of the shafts in the centre doorway and elsewhere. At the back is a separate block of building, reached by a covered way, for washing and drying rooms, &c. The principal internal feature is the large dining-hall, roofed with a timber roof of laminated ribs. The rest of the interior presents no special feature of interest, as the institution is not yet in operation. The kitchen is a large airy apartment, supplied with cooking stoves and ranges, by Messrs. Bennett, of Liverpool. The work, as we said, is incomplete so far, one wing having been finished first, for the more speedy reception of inmates. The second wing is now commenced, and when the whole is completed, the architects may, we think, be congratulated on having produced a building which, without any undue expenditure on purely architectural features, will have a fine and picturesque outline from a distance, and will show on a nearer inspection that solid and durable expression obtained from characteristic masonic treatment, rather than from applied ornament, which belongs to work done in a true architectural spirit. In these respects this asylum forms a contrast to the more pretentious building of the same nature on a neighbouring site, the Ripley Hospital, by a Liverpool architect, which, in general treatment, is certainly not to be commended or admired as an example of architectural design.

A pleasant suburb it is that rises from the town on the hill opposite the asylum, where some quiet home-like residences, built of the light-tinted stone of the district before mentioned overlook an undulating landscape, not without its points of interest and beauty. Lower down we may notice rows of the regulation English middle-class dwellings, with not only the inevitable bay-windows all in a row, but a characteristic shrub of the cactus species in the centre of each small garden, as if this, too, were a part of the design; thus carrying out the principle of uniformity a degree further even than is usual in this class of house. From the high ground in the suburbs we may notice, too, that here, as often elsewhere, distance lends enchantment to the view; and that Lancaster, dull as its streets may be, appears from a distance as a most picturesque town, with its undulating outline crowned by the castle and the church tower. It is satisfactory, also, to learn that Lancaster is no longer under the reproach which once attached to it, of being one of the dirtiest and worst-drained of towns. Under due pressure brought to bear by some of the more enlightened inhabitants, drainage has been carried out effectively, if we may judge by the results. Whether the political morality of the town, which suffered so much in public opinion some time since, has undergone any analogous process of purification, we did not learn; and, perhaps, the question does not

rightly come within our limits. Remembering, however, that the removal of material dirt is, as we are now beginning to see, an important step towards the process known as "cleansing the moral atmosphere," we may take leave of Lancaster in a hopeful spirit.

A RUDIMENTARY MANUAL OF ARCHITECTURE.*

A SMALL volume, published under the above title,* furnishes one more indication that the study of architecture is beginning by slow degrees to be recognised as one worthy the attention of those who wish to be, and to be thought, educated people; if, as we suppose, the fact of a supply indicates the previous existence of a demand. Most of the recent books written specially for the use and instruction of amateur students of architecture have so far resembled each other, that they have been the work of amateurs, and that they have given an overwhelming preponderance in their considerations to one style, and to one variety of that style, viz., English Gothic. As far as regards the object of making the public acquainted with the principles of architecture, both these conditions are unfortunate. Architecture is, of all arts, the one which presents most stumbling-blocks to dilettantism, because it is the one art which is based on practical necessities, and it is, more than any other, inseparably blended with constructive conditions, which must be understood and appreciated before the merits of a style or of a design can be properly criticised. And the overweight given by modern (especially clerical) amateur writers to one style is a fatal mistake, unless the avowed object be merely to give a history of that style, and to recommend it as the only one worth following. What general readers really require, in regard to a subject which they are not expected to fully go into, is to have the leading principles which form the basis of the subject clearly laid down and defined, and to have such a broad general view given to them as will enable them afterwards to attach the true degrees of importance to details which may subsequently come under their notice. Instead of this, the public are presented, in handbooks and lectures, with a quantity of isolated facts about this and that style of architecture, with little attempt to discriminate as to right and wrong principles of architectural design, and the deficiency is made up for by a great deal of eloquence and rhetorical declamation on the emotions you are supposed to feel on entering a Gothic building; all very well in its way, but, as Hamlet says, "Something too much of this."

It may be replied, and very likely with perfect truth, that this sort of writing about architecture is all that the general public care about; they want to be amused, not instructed. Nevertheless, we cannot but regret that the author of the well-got-up and pleasantly-written little book before us has not been able to steer more clear of the defects of other amateur writers on the same subject. On the rhetorical charge, indeed, we can acquit him personally; his flights of rhetoric occur only in the shape of quotations from reviews and magazines. And it would be very unfair to Mr. Mitchell to say that he does not recognise the existence and appreciate the value of leading principles in design; but he has not made them sufficiently the basis of his book; various isolated remarks would lead us to conclude that he has a clearer perception on this head than he has been able to convey to his readers. The definition given of architecture, as "the art of constructing buildings upon correct and scientific principles, in which strength, utility, and beauty are combined," if somewhat vague, is, at all events, broad enough; and we cannot be too often reminded that "good architecture is always truthful, i.e., it will always be what it seems to be, both in construction and material;" but the statement that "architecture is the noblest of the arts, as pressing all other arts into its service, for those of the painter and sculptor occupy but a subordinate part in producing the general result," is a somewhat amusing non sequitur, involving also the total ignoring of poetry and music as among "the arts." Writers on art, however, have long enjoyed a tacit privilege of each praising his own

* A Rudimentary Manual of Architecture: being a History and Explanation of the principal styles of European Architecture—Ancient, Mediaeval, and Renaissance—with their chief Variations described and illustrated; to which is appended a Glossary of Technical Terms. By Thomas Mitchell, author of "The Stepping-Stone to Architecture." London: Longmans, Green, & Co.

particular arts as "the noblest." But our author, whatever his own perceptions may be, does not succeed in bringing them to bear on the elucidation of some of the most important parts of his subject. He observes with truth, at the head of his chapter on Greek architecture, that "the term *classic* as applied to any one style of architecture is fallacious. No such style exists, but two styles are ordinarily included under that term, viz., the ancient Greek and Roman;" but he fails to discriminate the vast distinction of principle and feeling which separates what is usually called Classic from Gothic art, the fundamentally diverse end and method of treatment which distinguish the two schools of art;* and, with regard to architecture, the remarkable distinction between the *scale* of Greek and Gothic architecture; the one preserving always the same relative proportion of parts, so that a large building is only a small one magnified, the other preserving nearly the same actual scale of detail in large and small buildings, and multiplying parts instead of enlarging them. The system of subordination of parts in Gothic architecture is recognised *en passant*, but so important a principle might well have received special illustration. The remark is made (p. 170) that the sculpture of the "Decorated" Period in English architecture "loses much of the stiff conventional character and severity of the Early English style, and more closely imitates natural forms and foliage;" but the author fails to see that this section of conventional versus natural forms in ornamentation is at the very root of the whole principle of architectural ornament, and instead of being mentioned as an incidental matter might have claimed a separate chapter for its elucidation, even, or we should rather say especially, in a "rudimentary" work. And how far the author is *au fait* in regard to construction, the basis of architecture, we may conjecture from the description given of a tie-beam roof (p. 177), where we are told that "the king-post stands upon the tie-beam, and extends up to the ridge-piece or apex of the roof, which it supports."

The fact is exactly the reverse, Mr. Mitchell. The king-post hangs from the junction of the principal rafters, and supports the centre of the tie-beam, to prevent it "sagging," and thus to gain stiffness for the roof, without the waste of weight and material which would be caused by a tie-beam sufficiently thick to stand without such support. The head of the king-post certainly receives the ridge, because it makes a convenient "seat" for it, but the rafters support it, and the king-post itself is in a state of tension, not of compression. This may be thought a small mistake; but no one who understood anything of construction would have made it. *Ne sutor ultra crepidam*: i. e., amateur architects should not take on to expound construction.

We are constrained thus plainly to point out the deficiencies of the book, since its author tells us in the preface that he "has endeavoured to supply a want that has long been felt in the preparation of a text-book for the preliminary education of the student." We must beg leave to say that his book is not by any means fitted to take such a place, and that a far better text-book already exists (though very badly illustrated) in Mr. Garbett's small treatise on the "Principles of Design in Architecture," which Mr. Mitchell does not include in the list of works to which he is indebted, though he might have learned a good deal from it. Taking the book, however, simply as a readable *résumé* of the leading styles of architecture for the use of amateurs, there is a great deal to praise in it. It is well written, in point of style, throughout (not, we are sorry to say, a common characteristic of architectural works). The author devotes a short chapter to the early history of architecture, rather suggestive than historical, however; and then gives, in separate chapters, a sketch of the Greek, Roman, Byzantine, Romanesque, and Medieval styles; the latter occupying by far the larger portion of the book. What he states as to the facts and characteristics of each style is, in the main, quite correct; and some of his occasional criticisms are good and well introduced; in particular, the remark on the radical difference between the Romanesque and the round-arched Gothic, the former consisting of a succession of horizontal stories nearly independent of each other in design, the latter showing the first

symptoms of the sway of the vertical line over the horizontal; and the comments also on the ill-judged combination of architrave and arch in the Roman style: indeed, it is surprising that a writer who expresses himself with so much judgment on some points in connexion with his subject should have failed so much with regard to others.

We do not believe the statement, repeated once more by our author, that many of the finest of the Greek temples were unroofed and open to the sky; the Greeks were incapable of anything so thoroughly illogical and inartistic; nor is the theory of the "wooden origin" any more applicable to Greek architecture than to several other styles; the connexion is by no means so close, we imagine, between the timber and the masonic features as has been supposed by some writers. But in the main the chapters on Greek and Roman architecture give a fair outline of their respective characteristics, as also the chapter on the Byzantine style, in which the connexion of the architectural with the national and religious influences of the period is sufficiently indicated. Medieval architecture is more fully treated of, in four or five chapters and with tolerably copious and well-selected illustrations; the description involving pretty nearly what may be read in most manuals of Gothic architecture, without any specially new observations: but the important subject of the Gothic vault, so remarkable in its development and in its constructive influences on the style, receives by no means adequate attention or illustration, and is described in very "amateur" language,—*as gr.*, that "the joints or seams where the arches intersect are mostly covered by a moulded rib." Now, in all but the later and most ornate traceryed vaulting, the ribs form an integral portion of the construction, being in fact the framework of the whole roof, with interspaces arched in lighter and thinner stone-work (or occasionally in chalk); Mr. Mitchell speaks as if the ribs were applied on the surface like a modern joiner's moulding. In selecting Warrington Church as an illustration of the Gothic spire, he has made a happy choice, though the engraving is rather too small; but there could not be a finer example of the best and most characteristic style of Early English spire. The east window of Merton Chapel, Oxford, is not so felicitous an example of the geometrical window tracery; a better one might well have been found,—as to design, at least.

The author very rightly gives due place and recognition to the Renaissance, which many recent writers (especially amateurs) have ignored altogether, as if it were not as distinct and marked a phase in the art as any other, and therefore historically interesting at least, despite its radical defects. The chapters on modern architecture, indeed, are about the best in the book.

As to the question of the style for the present day, we may observe that there are more force and truth in the remarks of one or two writers of the anti-Gothic party, whom Mr. Mitchell quotes with reprobation, than he is ready to admit; and that certain criticisms of Mr. Ferguson's, of which only a part and not the whole is quoted, were not too strong for the buildings against which they were specially directed; and that writer certainly never said anywhere that Gothic detail "must necessarily be poor." Mr. Mitchell, in short, like most of the amateurs at present, is a "Gothiciser," to which we should have no objection whatever, if he would give rather better reasons for his faith. His suggestion of a Gothic employment of domed forms as a point of departure, though not new, is well repeated.

To the book is appended a short glossary of architectural terms, which will be of use to readers; and though, for reasons aforesaid, we cannot allow the book a standing as a text-book suitable for students, as its author seems to regard it, we can say with truth that the majority of persons who may read it will know more about architecture when they have finished it than they do at present, and that they will find it very easy and pleasant reading. The illustrations are well got up, and mostly well-selected.

We are sorry to have to qualify our praise of the writer for his work; but there has been too much of loose dilettant writing on architecture; and a small book on a great theme should only be attempted by those who have thoroughly mastered the subject.

THE STONE PERIOD: EARLY MAN.*

IN anticipation of a visit to the Blackmore Museum in Salisbury, I have been asked to speak of the stone implements and other objects of which the collection consists. This collection is chiefly remarkable for the admirable manner in which it enables us to study the simple arts which prevailed, in various countries and at different times, in what is known as the Stone Period. Much misunderstanding appears to prevail as to what is meant by the "Stone Period," and it may be well to deal with this question at the very outset. Some tribes of men are, at the present day, living in their Stone Period; others have but recently emerged from it; whilst we learn from the discovery of certain chipped flints and rubbed stone hatchets that tribes, of whom history tells us absolutely nothing, existed in their Stone Period in regions where a far higher state of culture is historically known to have prevailed for centuries. The Stone Period, therefore, affords us no measure of time, not at least of time *positive*; it exists to-day, existed yesterday, or thousands of years since; the Stone Period, however, is of great value as a test of human culture. It represents to us a culture stage in which man was, and is, fain to supply his needs by means of implements and weapons formed from natural substances, such as wood, stone, shell, bone, horn, and the teeth and claws of animals. During this period some tribes made use of the native copper or meteoric iron which they collected; but these masses were merely hammered into shape: they were treated only as malleable varieties of stone, and were not melted and cast into the required forms.

There is evidence of the existence, in some countries, of a Copper Period, during which native copper was melted and cast into tools and weapons. But a great advance was made upon the use of unalloyed copper, when it was discovered that an admixture of tin imparted a hardness to this comparatively soft and ductile metal. It is highly probable that many copper implements were re-cast during the Bronze Period, with the addition of tin, and the comparative scarcity of ancient copper tools is, in part, due to this circumstance.

Then there is the Iron Period, during which the art of reducing iron from its ores was discovered, and this metal superseded the use of both stone and bronze for cutting instruments and for many other purposes. It is probable that no absolute uniformity has prevailed with regard to the sequence of these culture-stages; in some countries the Stone Period may have lingered on much longer than in others, and in some countries perhaps neither a Copper nor Bronze Period may have existed. But in every country there appears to have been a Stone Period, although it by no means follows that the ancestors of the present occupants of the soil were the stone-using people. Indeed, in dealing with these culture periods, no general rules can be applied to the remains found in various countries and districts; each series of facts has to be separately and cautiously investigated before we can venture to pronounce an opinion upon it.

It is natural that every young science should have to pass through a stage in which its teachings are misunderstood, and, not unfrequently, are misrepresented. Pre-historic Archaeology appears to be still in this phase of its existence, and, in particular, these typical stages of human culture,—the Stone Period, the Bronze Period, and the Iron Period,—have provoked the criticism of some who have, and many who have not, made themselves sufficiently acquainted with the published views of archaeologists upon the subject. For instance, in an article which has recently appeared in the *Quarterly Review*, under the title of "Non-Historic Times," allusion is thus made to the classification of Pre-historic remains by the Danish antiquaries:—"First came an age when the country was inhabited by savages, ignorant of the use of metals, and only employing stone and bone for all the purposes for which tools are necessary." So far well; but then follows:—"And as a corollary to this, every monument which contained no metal, or in which any flint implements were found, was at once relegated to those remote ages." The writer then adds:—"There was a delightful simplicity about this system that made it instantly popular. Every one could distin-

* On this head the reader may refer to a paper in the *Builder* for March 20, 1869, under the title "What is Classic?"

* By Mr. E. T. Stevens, read at the recent Congress of the Wiltshire Archaeological Society.

quish between stone, bronze, and iron implements; and as this was all the knowledge required to determine the relative age of any 'find,' or of any monuments, it was universally adopted.* Now, although these passages form strictly a criticism of the Danish system of classification, yet many readers of the article would be led to suppose that they really express the present views of archaeologists, or at all events of Sir John Lubbock, whose work, "Pre-Historic Times," is the first upon the list which heads this article, and is supposed to be, although it actually is not, reviewed by the writer of "Non-Historic Times." But, in order to prove that Sir John Lubbock does not hold these opinions, it is only necessary to turn to the third page of "Pre-historic Times," where we find this passage:—"Stone weapons of many kinds were still in use during the age of bronze, and even during that of iron; so that the mere presence of a few stone implements is not in itself sufficient evidence that any given 'find' belongs to the stone age."† Had this passage been written, purposely, in refutation of the views ascribed to archaeologists by the writer of the *Quarterly Review* article, the wording could scarcely have been more precise and to the point; and yet this passage was in print five years before the article in question was published, and in a book which is supposed to be reviewed in this very article. If, therefore, the passages I have cited from "Non-historic Times" are not wanton perversions of Sir John Lubbock's views, it is clear that the reviewer either did not read or did not read aright the book he professed to review. And yet statements such as these are frequently allowed to pass unchallenged, and become articles of faith with such as are either too indolent, or too careless to examine into the subjects for themselves.

The writer of "Non-historic Times" notwithstanding, the stone, bronze, and iron periods do afford us valuable tests of human culture, although they are, even at best, no more than rough tests; for, whether in ancient or in modern times, it will be found that the development of civilisation has not been at all uniform in operation.

The Stone Period is usually a period of savagery; the Bronze, of barbarism or low civilisation; and the Iron Period, that of the middle level of civilisation and onwards. This ideal scale, however, requires much qualification. For instance, we know of no savages above the culture level of the Maoris, Caribs, and Cherokees who have lived in the Stone Period during historical times. But it was not invariably so in pre-historic times, for the Swiss lake-dwellers, during their Stone Period, led a settled life, were a pastoral and agricultural people, and attained a condition to be regarded as barbarian rather than savage. Perhaps of the three, the Bronze Period affords us the most safe and reliable test of culture. The typical bronze-using races of modern history are the Mexicans and the Peruvians, and what is known of them agrees well with our dim information of the pre-historic bronze people of Europe and Asia, so as to justify the opinion that bronze always indicates a state above savagery, though at most extending to the middle range of civilisation. It is interesting to find that the bronze-using Mexicans largely employed stone implements for cutting purposes, and no weapon appears to have been more dreaded by the Spanish invaders than the Mexican wooden sword armed at the edges with flakes of obsidian. We have thus in the case of the ancient Mexicans very clear evidence of the contemporary use of bronze and stone implements.

The Iron Period is wanting in the definitiveness of the two other periods. Iron is, indeed, the universal accompaniment of the higher civilisation, but it also descends into the savage state. Modern iron-using people of Asia range from Persians, Hindus, and Chinese, down to the barbarous Kalmuks and Khirgis, and the savage Ouyaks; while, in Africa, the Kaffir and Hottentot tribes, though ironworkers, are in general culture below the ironless Mexicans and Peruvians. It is evident, therefore, that the diffusion, or the independent discovery, as the case may be, of the art of iron-working has, in some instances, taken place without a corresponding elevation in civilisation. Indeed, the iron-using Malay, Tartar, and African tribes in their ideas of ornamentation, the forms of their

weapons, and in some other respects, present striking analogies to the pre-historic bronze-using people of Europe.*

Imperfect, however, as the Stone, Bronze, and Iron Periods may be as tests of culture, they contrast in this respect very favourably when examined side by side with the other industrial arts. For instance, it might be imagined that the art of making pottery would furnish us with one of the very best tests of culture; but, at the outset we find that certain of the lower savages, such as the Australians, Fœgians, and Bushmen, when first observed by Europeans, did not make pottery, and were absolutely ignorant of its use. Some pre-historic races also appear to have been unacquainted with the art of making pottery. None has been found associated with the flint implements of the Drift; and scarcely any, if any, which can be assigned with certainty to the period of the cave-dwellers of Dordogne and the South of France. Nevertheless, speaking generally, knowledge or ignorance of the potter's art affords a fair low-level test of races, separating the lower savage from the upper savage; but that this rule is not universally applicable is shown from the fact that the Tahitians and New Zealanders did not make pottery, while the much lower Papuans of New Caledonia and the Fijians were potters.

Having thus explained my views to you of what I believe the Stone Period to be, you will at once be in possession of the key to the system adopted in the arrangement of the Blackmore Collection. In that collection you will find the specimens classed partly as tests of culture, partly according to the country in which they were found. For instance, the stone implements found in France, in the drift, the caves, and upon the surface soil, are each arranged in a separate group, because each series is believed to represent a distinct stage of culture; in such cases the classification by country, in the Blackmore Collection, ceases to be a primary, and becomes only a secondary sub-division.

In a National Ethnographical Museum, such as the Christy Collection, a general system of classification by country may, perhaps, be adopted with advantage. But in the Blackmore Collection, the chief object of which is to illustrate the simple arts of the Stone Period, and to enable students to study them as tests of human culture, in this comparatively limited field of inquiry, I believe that our system is the most simple, and the most intelligible which can be adopted.

We do not class our specimens according to material; all objects, no matter of what material, if found associated with each other or met with under circumstances that justify the belief that they were in contemporary use by the same people, are arranged together; and although a few stone implements of the Bronze and Iron Periods are placed in the same cases with some which belong to the Stone Period, they are placed there only for purposes of comparison and illustration, not because they happen to be of a similar material. The collection formed by Messrs. Squire & Davis, when it reached this country, was classed and catalogued strictly according to material; consequently a group of objects found in a single tumulus, if one was of pottery, another of stone, a third of bone, and a fourth of shell, would have been divided from each other and placed in four different cases, although collectively they serve to illustrate but one incident in the customs of a particular people. These specimens are now arranged, as far as possible, in distinct groups according to the tumulus in which they were respectively found, and without any reference to the material of which they are composed.

By limiting our collection to objects illustrative of one branch only of a vast subject, there is less to distract the mind, visitors are able to study, minutely and in detail, one isolated series of facts, and to obtain with more facility a general and clear idea of the arts of the Stone Period. Having to some extent succeeded in doing this, their thoughts are naturally carried from the rude stone implements themselves to the men who fashioned them. Then arise such questions as these:—Who were they? What were they? What was the mental and moral state of these men? Was primal man a being little above the brute; or was he every whit a man, ignorant as the merest child, perchance, of all the industrial arts, but still in mental powers a man, and nothing less?

According to one theory, man in the lowest, or even in anything approaching the lowest, stage of savagery never did, and never can, unaided, raise himself to a higher scale of culture. It is contended that when such savages are brought into contact with civilised races, it is extremely difficult to teach them the simplest arts; that they seem never to invent or discover anything for themselves, and for the reason that even "necessity is not the mother of invention," except to those who have some degree of thoughtfulness and intelligence;—in point of fact, that we are to regard all savages as degraded men, whose ancestors lived in a higher state of culture; but privation, suffering, or oppression has done its work, and in these savages we see the result.*

Another school arrives at a diametrically opposite conclusion. They consider that the primitive condition of man, was that of savagery in its lowest stage, and that from this condition certain races have independently raised themselves. According to this theory, instead of existing savages being the degenerate descendants of men who enjoyed a higher state of culture, all civilised races have sprung from savages.

There is something to be said for and against both theories, and the truth probably lies between the two extremes.

The assumed inability of savages to raise themselves to a higher state of culture appears at first sight to be borne out by experience; for instance, successive forms of civilisation have swept over the Bheels, in India, but they remain savages still, and although they now carry the breech-loading rifle of the Englishman, they are armed themselves with bows and arrows of the same pattern as that carried by their forefathers in the time of the Greeks. In fact, the state of culture with some tribes appears to have fossilised, and become stationary for an indefinite period, or until destroyed by being brought into contact with races in an advanced state of culture.

Unfortunately, very slight evidence of the early history of civilisation is to be obtained by direct observation; that is, by contrasting the condition of a low race at different times, so as to see whether its culture has altered in the meanwhile. The contact requisite for such an inspection of a savage tribe by civilised men, has much the same effect as the experiment which an inquisitive child tries upon the root it put in the ground the day before, by digging it up to see whether it has grown. At all events, it is a general rule that original and independent progress is not found among a people of low civilisation in presence of a race in a higher state of culture. It is natural enough that this should be the case, and it does not in the least affect the question, whether the lower race was stationary or progressing before the arrival of the more cultivated foreigners.

There is less difficulty in disposing of the other assertion, that savages seem never to invent or discover anything for themselves. If collections, such as that in the Blackmore Museum, teach anything at all, it is that savages in every stage of culture do invent, and do discover things for themselves. The isolation of particular forms of weapons or tools in particular islands or regions naturally leads to the supposition that they were independently invented by the people who alone use them. For instance, I have said that the Fijians were excellent potters, this excellence in the manufacture of pottery led to an extraordinary development of the art of cookery, for they were able to expose their ware to the direct heat of the fire, and to boil their food in this manner. This development of the art of cookery amongst the Fijians led to the, apparently, independent invention of that very civilised instrument, the fork, which they used for fishing the hot morsels out of their various soups and stews, and the use of which appears to be unknown (except as introduced by Europeans) to the other islanders of the Pacific. Indeed, the use of forks in eating was unknown to people so advanced as the Greeks and Romans, and in England we were without forks until the beginning of the seventeenth century.

But if we admit that savages can invent, and consequently progress, in the industrial arts and in knowledge, we must also allow, I think, that decline is possible. Indeed, few will deny that both decline and progress in art and knowledge

* *Quarterly Review*, No. 256, 1870, pp. 443, 434.

† "Pre-Historic Times," 1st edition, 1865, p. 3; 2nd edition, 1869, p. 3.

* See E. B. Tylor, in *Trans. International Cong. Pre-hist. Archaeol.*, 1868, pp. 11–14.

* See "Origin of Civilisation" by Dr. Whately. See also "The Dawn of Art," by the Duke of Argyll, in which latter work some of these views are not supported.

are now actually going on in the world, and it is probable that evidence may yet be forthcoming to prove that degradation as well as development has happened to the lower races beyond the range of direct history. The miserable "Digger Indians" of North America, who lead a wandering life, lurking in holes and caves, slinking from the sight of other Indians, and subsisting chiefly on wild roots and fish, were not always in this deplorable condition; for they are in part Shoshonees or Snake Indians, reduced to their present state of degradation by their enemies the Blackfeet, who obtained guns from the Hudson's Bay Company, overpowered the Snakes, took away their hunting-grounds, and compelled them to sink to their present culture-level, causing them to abandon certain arts which they practised in their more fortunate days. The culture-history of mankind, however, is probably not the history of a course of degeneration, or even of equal oscillations to and fro, but of a movement which, in spite of frequent pauses and relapses, has, on the whole, been forward; and there appears to have been from age to age a growth in man's power over nature, which no degrading influences have been able permanently to check.

Primeval man appears to have possessed a mind capable of reasoning, disposed to reason, and able to acquire, to accumulate, and to transmit knowledge, thus enabling each succeeding generation to start from a higher and still higher vantage-ground of accumulated knowledge.

I confess that I am unable to trace any unnecessary connexion between a mere babyhood in the industrial arts and a low state of moral culture, but upon this branch of the subject time will not allow me to enter.

Neither can I touch upon another point, of great interest, the question of the Antiquity of Man. I have said that the Stone Period "affords us no measure of time," neither does it afford positive; but in arriving at conclusions with regard to time relative, the Stone, Bronze, and Iron Periods are as valuable to us as are the successive types of fish, reptile, and mammal to the geologist.

TILBURY FORT.

EVERY one knows of Tilbury Fort (on the Thames), and recalls Queen Bess and the Spanish Armada on hearing its name. A few days ago the Chapel in the Fort was re-

opened, after about half a century of desecration, in the presence of a large number of clergy, officers, soldiers, and the neighbouring gentry. The Bishop of Rochester preached an effective sermon on the occasion, and at the close of the service a collection of offerings was made towards purchasing a harmonium, and providing further fittings. The prayers were read by the rector of the parish, the Rev. R. Henry Killick, who is also the chaplain of the fort. This chapel, which is said to have been consecrated in the reign of Elizabeth, had for many years been used as a billiard and reading room, until the present rector brought the subject before the notice of the War-office authorities, who in consequence have restored it. Messrs. Cobham, of Gravesend, were employed on the work.

SOME OF MY WANTS.

I WANT bankers to furnish to such of their customers as may desire them key-rings, on which should be engraved the name of the bank, and the customer's number. Thus: "L. D. Westminster Bank, customer 2,409." In case any customers' keys were lost the person finding them would not know the name of their owner, but, on taking them to the bank, the banker could and would restore them.

I want our streets infinitely better lighted, particularly our back streets. What with early closing of shops, and street widening, we seem to have no lights at all in some places.

I want each district of the Metropolitan Board of Works to publish and sell to the public for sixpence a map of the district, say on a scale of 9 in. to the mile; and to deliver them gratis to certain public persons and bodies.

I want the physical and moral good of the town of North Woolwich to be thought worthy of some consideration.

I want the press and the general public to be admitted freely to the meetings of all Guardian Boards, and to the meetings of all vestries.

I want proper officers to be appointed to examine our gas and water supplies, and if the supply should any month be bad that these officers should be empowered to strike off a certain discount from the charges, both public and private, that month to be made by the said companies. If very bad the whole charge should be struck off.

I want butchers to place on their tickets and

their bills the price *per pound* which they charge for their meat.

I want the platforms of our railway stations to be nearly or quite on a level with the floor of the carriages, and closer to them than they sometimes are.

I want carpets beaten on barges or other suitable vessels on the Thames.

I want the classes of railway carriages to be readily distinguished by passengers. A hemisphere of a white colour placed above the door of a first-class compartment, of a red colour above the door of a second class, and of a bright blue colour above the door of a third class, would seem the easiest guide. Smoking compartments might have a black band across their hemispheres.

I want omnibus proprietors to paint their steps white; so that outside passengers of a dark night may see where to plant the foot.

I want railway companies to place at each station a special list of trains stopping at that station. They content themselves with sticking, in perhaps some obscure place, a *general* timetable, and you may find on it the information you want if you can.

I want children in poor schools taught how to clean themselves. If the first half-hour of school were devoted to lavatory teaching and practice, the effect would be very good.

I want the sleeping apartments of domestics, particularly in hotels and lodging-houses, to be strictly examined. Also those of assistants in various businesses, as petty drapers, grocers &c.

I want a better mode of raising and dropping the glass of railway carriage-doors. Perhaps the late interesting discussion in the *Builder* on sashes may afford some hint for an improvement.

I want in various parts of London maps placed for strangers' guidance. The spot where the map is placed should be distinctly shown on the map.

I want bed-room candlesticks to be made with a receptacle for matches attached to them, and a rough place for striking.

I want whip sockets to be made trumpet-mouthed, and with a hole at bottom, so that the whip may be placed away easily, and the water will run out. Many a poor hard-working horse gets extra cuts because his driver finds it difficult to put his whip away.

I want the Embankment and Finsbury and Southwark Parks to have as many approaches as possible. They need not be too elaborate.

I want the post-office to sell a cheap letter-balance. One would think that for sixpence or a shilling a balance might be sold, and guaranteed to act correctly.

I want blind carts (i.e., those carts from which the driver can only see to the front of him) to be done away with by some means.

I want every householder in London to have a "squelch," and I want him to wash his pavement every day.

I want architects always to carry the stairs of houses up to the roof. That ladder which reaches from the top floor to the roof is invariably in the cellar when a fire happens.

I want persons wheeling trucks, whether empty or not, to have the handles of the trucks towards them, not projecting in every one's way.

I want the cruel, silly bearing-rein to be universally abolished. None but fools use bearing-reins. Government should at once put a heavy tax on these devilish instruments of torture.

I want better lodgings for policemen and curates.

I want, in numbering streets, that the odd numbers should be on one side and the even ones on the other; but I do not want that No. 46 should be opposite No. 145. Divide the street, before commencing numbering, into spaces, say of one-sixteenth of a mile (110 yards), and allow twenty-four numbers to each side of that space.

I want catalogues of private libraries to be lodged in the British Museum.

I want to know how I am to get admission to my own house if I should be out when it catches fire.

I want printing points, as commas and periods, to be more distinct. A period should be a large dot almost as high as the type, a comma should be quite small.

I want a railway-station in Southwark-street. It is a long way from London Bridge to Waterloo Junction. Many a passenger is lost.

I want the various vestries and Boards of works in London, in making their return to the



Gateway, Tilbury Fort.

central Board of what they have done during the fifteen years of their present constitution, to make also a return of what they have not done.

I want houses to be examined as to chances of fire, and of escape from fire. A nice arrangement that was in a recent fatal fire, which placed the candle-end cupboard under the stairs.

I want water-closet inspection of every house, —light, ventilation, trapping, &c.: all should be seen to by public officers.

I want every landlord of small house property to be compelled to lay on water: one pipe for a row would be enough.

I want little front gardens to be better attended to. Many a poor man, for ten shillings a week and materials, would be glad to keep in order thirty of these (at present) miserable spots. He would make a whole street fresh and beautiful in a month.

I want a constant supply of good water cheap, and supplied through a good sized pipe. The trick of making the supply-pipe very small in one part must not be allowed by any means. Nor must water be supplied by meter; were it to be so, some mean wretches would not allow a quart a day to be consumed in their houses.

I want boats to be cut at the edges ready for reading.

I want swimming-baths (floating) to be established on the Thames, and I want every London child to be taught to swim.

I want the names of our railway-stations to be called out more clearly. If the person calling out used the word "Attention!" before calling out the name of the station, good, in my direction, would result.

I want a large dining-room, &c., to be established for the City work-girls. Should our City men want to know how to establish one, Sir Titus Salt would soon tell them.

I want a number of Faulkners to be established by our parish authorities all over London. Should any one want to know what "Faulkners" are, he is informed that they are the excellent lavatories, &c., established by Mr. Faulkner at Ludgate Railway Station, at Broad-street Railway Station, and elsewhere. Could not these be established at every fire-engine station? The firemen are very neat, clean, bright fellows, and have a great deal of time upon their hands. Of course, the Faulkner would soon be closed when the men were wanted elsewhere.

I want publishers not to advertise books as "octavo," "post octavo," "duodecimo," "quarto," &c., words to which few persons attach correct ideas; but as "6 in. by 8 in.," "9 in. by 12 in.," &c., those figures representing the inches in length and breadth of the books.

I want "a.m." and "p.m." in speaking or writing of the hour of the day to be done away with. Far better to let the hours run from 1 to 24. Our clocks would require no alteration.

I want our parsons to pay more attention to sanitary matters among their charges. Some of them declare openly that such subjects are no concern of theirs.

I want a new chair to be established at our universities to be called the chair of Sanitary and Domestic Science; and it would not be amiss to make Dr. Lankester and Mr. Rawlinson the first Professors. It would make our young clergy better than our old.

I want the filtering beds of our water companies to be kept neat, and not in so "mangy" a condition as some of them now are. Black, rank grass, dock-weed, insect-covered hedges are not nice accompaniments to the purification of water.

I want tickets to be placed inside cabs, so that without asking the driver a ticket may be taken.

I want proper pavements and roads to be made before houses are allowed to be built. Houses are now stuck up in fields, and years elapse before the approaches are decent.

I want water companies to furnish at the back of their bills an account of where and what their works for gathering, subsidence, filtering, distributing, &c., are; so that consumers may know all about the "manufacture" of the article they pay for.

I want all cab-horses to be inspected by properly authorised persons weekly.

I want oysters cheaper; and now that the demand for oysters for Paris has ceased, I think that they ought to be.

I want two-floored seats to be placed upon the Thames Embankment: the lower ones would be covered, so as to enable a pedestrian to escape from a shower of rain; and the upper ones would be raised, so that the water of the river might

be seen from them. Ascent to the upper by steps at each end.

I want milk-vendors to send out the milk and the adulterations in separate vessels, so that each consumer may mix them for himself, according to his taste.

I want the marine-store shops to be placed round squares, or at any rate located together, so that there might be stricter sanitary and police supervision of them. About twenty such collections of these shops would be enough for the metropolis.

I want boots and shoes to fit easy and to look tight.

I want publicans who are proved to sell adulterated drinks to be deprived of their licences. Samples should be tested on system.

I want shopkeepers to paint their shop-fronts often, and of a light colour, so as to help the gaslights considerably. A large retail trader in Holborn, who makes a net profit of 24,000*l.* a year, paints his shop-front a light stone colour two or three times a year, it is said.

I want the pavements kept much more clear of shopkeepers' goods than they are. Some neighbourhoods, as Lower Wandsworth-road, Battersea, where I happened to be a few weeks back, seem to be quite spoiled by the practice of leaving only a small part of the pavement for the public.

I want omnibuses to place outside in large letters where they are going to, and not where they have come from. Reversible boards would do this nicely. Whether white horses should be used as a signal for one route, grey horses for another, piebald for a third, roan for a fourth, and so on, is worthy perhaps of consideration.

I want names of streets, courts, &c., up at all turnings; and in the case of new streets, or newly-named streets, I want for two years at least the name of the street placed on every house.

I want the architect of the New Law Courts to somehow put St. Clement's Church inside his building. It would improve the Strand, it would (in a measure) sanctify the New Law Courts, and it would benefit the church itself.

I want people who practise "vociferously" the piano, the corneopane, &c., to live a long way off from me.

I want the names of railway stations to be placed many times at each station. If all advertisements admitted were painted in a perfectly horizontal manner, and the names of the stations a little out of the straight, the station name would be sure to catch the eye.

I particularly want the projected Mid-London Railway to become an accomplished fact.

I want the river stairs to be looked to by the Thames Conservancy better. A gas-lamp and a hand-rail and a table of fares are simple necessities at each.

I want the East London (Thames Tunnel) Railway managers to carry out the scheme mentioned by the chairman at a late meeting, and convey third-class passengers from Wapping to Rotherhithe for a halfpenny,—it would be nearly 4*d.* per mile.

I want the Tower Subway to be opened for more than sixty-six out of the hundred and sixty-eight hours of the week. The Thames Tunnel used to be open every moment of the year.

I want plumbers to be restrained from placing those catch-foot rolls of lead along the outside of their shops.

I want Raphael Brandon's excellent scheme of cheap railway travelling to be carried out.

I want Elihu Burritt's Ocean Penny Postage to become an accomplished fact.

I want all candidates for the office of vestrymen to pass a Government examination. Knowledge of figures, of their own localities, &c., essential.

I want railway companies, when they open a new station, to issue with the tickets for that station a small clear map of the district, say for a mile round the station. They would soon get strangers (the people they want) to go there. Such maps would not cost more than a trifle per thousand. The maps might also be placed in the time-books.

I want—yes, I especially want—a periodic inspection of all basement floors of London. Oh, what a revelation!

I want Miss Burdett Coutts to live for ever.

I want to see the Builder's Parliamentary Library established; and, very particularly,—

I want a general index to the first twenty-five years of the Builder, including the "Miscellaneous."

MIRAILLEUSE.

"RESTORATION AT THE BRITISH MUSEUM."

We are requested to publish the following letter:—

Sir,—My attention has only this day been directed to an article in the Builder, of the 21st inst., headed "Restoration at the British Museum," in which it is asserted that the frieze of the Parthenon and other sculptures in the British Museum have been cleaned "by the aid of some powerful chemical, chlorine, or alkali, or acid," to the detriment of their surfaces, which the writer of the article asserts to have been thereby eaten away and disintegrated. As the keeper of the Greek and Roman sculptures in the British Museum, I beg to state that it is untrue that any of these sculptures are ever cleaned by any chemical application, such as the writer in the Builder describes. The process of cleaning now in use, and which is repeated periodically, is precisely that "simple washing with water and a sponge," which the writer of the article recommends. C. T. NEWTON.

We can only repeat what we have already said, that to clean a piece of dirty and weather-stained stone or marble by the simple process of sponging it over with pure water is an impossibility. By this process, of course, the loose dust is removed, and no damage done, and certainly no stain of any kind removed from the surface, even much less from the substance of the stone below the surface of it, and to which weather-marks and stains always sink. Should Mr. Newton doubt this, let him request his housemaid to clean the door-step by the mere process of sponging it over with pure water, and wait for her reply. We all know that every weather-stained and dirty door-step in respectable London is daily heartstoned, as it is termed, merely from the well-known fact that no mere cleaning with water and flannel and brush will so far touch it as to clean it, or, in other words, reduce it to an even level colour. We ask his attention to this fact. Once more, the little portico in front of the Athenaeum Club-house is, as probably he well knows, every year or so cleaned of weather-stains and marks of wear and tear. How is this done?—by sponging the columns over with pure water? No; they are thoroughly restored by the process of diligent scraping and even cutting away of the stone, because no mere surface cleaning will do the work; you must go deeper and remove some of the stone surface itself, and come to the pure stone. All such work as this, unfortunately, is left to the care of common labouring stone-masons; and it is melancholy to reflect on the fact that the subtle work of a great artist should come to be at the ignorant mercy of such agents.

Does Mr. Newton really know himself what has been done, and what substance has been used, whether chemical or not, in the cleaning process which has been going on at the British Museum? It is a great question, and worth a little attention. It is absolutely impossible to produce by the simple action of sponging with pure water the cleaned effect of the bust of Marcus Antoninus, and the other busts in the Roman Gallery, and in that of the Satyr, which we before particularly mentioned, and we defy any human being to do it. Some solvent more powerful than water must have been employed, whatever may be the case just now. Unless, indeed, that water be thrown on it with a powerful mechanical force, and thus, as it were, break the stone surface as with a rain of minute bullets. The Mansion House, some two or three years back, was cleaned in this way. Were those unfortunate Greek fragments put through this process? But, after all, what does it or can it matter how the Greek work has been cleaned, provided it has been done: no matter whether water or chemical, acid or alkali, weak or powerful—our business is with the deplorable result. All signs and evidences of age and time are removed, and the stone or marble looks new as if just from the quarry. Why remove the time marks? With what object has it been done? And how are the works better now than they were when time-marked and with the evidences on them of a great antiquity? Surely the evidence of the time which has elapsed between the days of Phidias and the present hour is a something and worth the keeping. Why has Mr. Newton, through a mason's labourer, with sponge and water only, if it be so, washed it all away?

Sir W. Tite, M.P.—According to the Gazette, the Queen has been pleased to give orders for the appointment of Sir William Tite to be an Ordinary Member of the Civil Division of the Third Class, or Companions, of the Most Honourable Order of the Bath.

CREWE HALL RESTORED.

THE restoration of Crewe Hall, which was almost entirely destroyed by fire four years ago, has just been completed, under the direction of Mr. E. M. Barry, R.A., and on the 12th inst. Lord Crewe celebrated the event with an entertainment. A view and plans will be found in our volume for 1869 (pp. 486, 487). It may be mentioned that one apartment, called the "Cain and Abel Room" is now exactly in the same state as it was when occupied by the Emperor Napoleon some years ago, having almost escaped the ravages of the fire.

In the hall are placed the following lines, composed by Mr. Warburton, of Arly Hall, Cheshire, who is well known for his antiquarian lore:—

"N'er in this hall of olden days
Rebuilt, may fire henceforward blaze,
Save that which on the hearth doth cheer
Each welcome guest who cometh here."

The proceedings began with the consecration of the domestic chapel, the decorations of which have been well executed by Messrs. Clayton & Bell. The consecration ceremony was performed by the Archbishop of York, who was assisted by the Bishop of Chester, Lord Crewe's chaplain, and other clergymen.

At two o'clock Lord Crewe entertained his guests in the dining-room of the new edifice.

Lord Houghton, in proposing "The Architect," asked them, in looking around, to consider for a few moments what must have been the merit and skill of the architect who could have built such a house. Such a work required something more than mere technical ability; it required a full appreciation of our old English architecture, and the means of adapting that architecture to the requirements of modern times. Such an architect Lord Crewe had been fortunate enough to find.

Mr. Barry replied by expressing the pleasure his work had afforded him, and paid a tribute to those who had co-operated with him. An architect was in the position of a commander-in-chief who was necessarily much absent from his army. He therefore required above all things good "eyes" and good "hands" on the work. He had been fortunate in both. In the clerk of works, Mr. Leslie, he had had "eyes" that he could not praise too highly; while it would have been impossible to have fallen into better "hands" than those of Mr. Plucknett (Messrs. W. Cubitt & Co.). He also alluded to those who had so greatly contributed to the artistic effect of the work, Mr. Weekes, R.A., Mr. Marks, Messrs. Clayton & Bell, Messrs. Craze, Armistead, Philip, Powell, and others. He also referred especially to the careful modelling of the elaborate plaster work by Mr. Mabey, who had shown great skill and ability. As to himself, he should never forget the kindness and confidence shown to him by Lord Crewe, at a time when he had too much reason to know that architects were not always so treated.

GLENDALOUGH.

The celebrated round tower and ancient churches of Glendalough, in county Wicklow, Ireland, are sadly in want of attention and repair, it would seem. At a meeting of the Royal Historical and Archaeological Association of Ireland, held in Kilkenny in July last, Dr. Colles, the chairman, brought before the Society a proposition for taking such steps as might be calculated to preserve from destruction these far-famed architectural and monumental remains. The round tower is becoming very ruinous. The cathedral and the priests' church have suffered woefully from sacrilegious hands. The other churches, round which burials no longer take place, have escaped this danger, but are rapidly being broken up and reduced to mere heaps of stones by the luxuriant growth of young trees in the crevices of their walls. In a statement on the subject, Dr. Colles says:—

"The repairs which should be executed at Glendalough may be divided into the cheap and easily executed, and the costly. The former, which should be undertaken at once, are:—

1. Clearing away the trees from the Abbey, Trinity, Our Lady's, and the Rightheart Churches.
2. Securing St. Kevin's House, and placing all loose sculptures, &c., therein.
3. Repairing the breaches in Trinity and Our Lady's Churches and Cathedral, and in the sacristy and roof of St. Kevin's House.
4. Railing in the Priests' Church and the north door of the Cathedral.

The more costly repairs are:—
1. Thorough repair of the round tower, and restoration of the conical cap.
2. Excavation and restoration of the Abbey."

3. Ditto of the Rightheart Church.

4. Ditto of Our Lady's Church.

5. Excavations in the neighbourhood of St. Kevin's House, and possibly (6) rebuilding the chancel of St. Kevin's House.

In each of the above lists I placed first those repairs which seem most urgently required.

Lovers of the picturesque may be horrified by the proposal to clear away the trees. But only the trees actually growing out of the walls need be interfered with, and with such an abundance of others, these would not be missed. The buildings should be inspected once a year, to prevent fresh seedlings from taking root."

Dr. Colles offered, if the Association sanctioned the proposal, to issue the circulars and work up the preliminary operations as to getting in the subscriptions, which he would hope to have completed before returning to India. As regarded the directing and superintending of the operations, Mr. Graves communicated with Mr. Thos. Drew, F.R.I.A.I., who at once consented to take that portion of the arrangements on himself. Of course, nothing could be done without the consent of the proprietors, in which position the Mining Company of Ireland stood. He had asked a friend, a member of that body, to bring the subject before their Board, and the result was most satisfactory. He hoped that there would be no difficulty in collecting a sufficient sum for the purpose, considering the great importance and historic interest attaching to Glendalough; and he was already promised a donation of 10*l.* as a beginning.

Mr. Graves said this was not the first work of the kind their Association had undertaken and accomplished. They had collected and expended a large sum for the preservation of Jerpoint Abbey, and nearly 200*l.* for the reparation and protection from further injury of the seven churches of Clonmacnois. He would expect even a wider sympathy for the proposed work at Glendalough, as the ruins were more generally known, and their scenic and architectural beauty appreciated by the public.

The Chairman said that returning to Ireland lately, after an absence of twelve years in India, it had made him most and to witness the serious deterioration which had taken place in the ruins at Glendalough in the interim.

The cordial approval by the Association of the arrangements proposed by Mr. Colles was unanimously agreed to.

Mr. Graves observed that perhaps it might be possible to obtain some assistance from the Government towards such an undertaking, if the public first showed that they were willing to exert themselves to carry out the object, by subscribing.

THE METROPOLITAN SCHOOL BOARD.

THE Executive of the Social Science Association, feeling the great importance of obtaining an efficient school Board, wisely called a meeting for Wednesday last, to consider whether any steps might be taken to assist in securing the election of men without reference to their political or religious opinions, and solely on the ground of their personal fitness and acquaintance with the educational necessities of the metropolis. Dr. Lyon Playfair occupied the chair, and stated the object of the meeting. Mr. Edwin Fears pointed out the importance of having men on the Board who were acquainted with education, and could form an opinion on such questions as whether large or small schools were the more desirable, and what should be their general organisation, instead of men whose chief qualification was that they were connected either with the League or the Union, or with some peculiar views as to party or sect. Mr. M'Cullagh, Mr. P. P. Torrens, M.P., as the author of that part of the Bill under which the Board would be formed, urged that almost every part of London differed from the other intellectually and morally, and it was essential that the specialities of all should be thoroughly represented at the Board. The meeting was not held to put forward candidates, but merely to point out the principles on which the selection should be made. Referring to the great extent of the electoral bodies under the Act, he expressed an earnest hope that the franchise would be used honestly and with discretion, as became the occasion and the great purpose in view; and speaking of the accumulative vote observed that it was intended to be used only as a defensive weapon in time of need, and not as an ordinary working tool. The Board should not be legislative, but judicial and administrative, and he hoped that no one would enter it tied up with pledges or tests of any kind, while at the same time he should be sorry to see any section or any opinions excluded. Unless the people had confidence in the Board its labours would

come to nothing. On the motion of Mr. G. W. Hastings, seconded by Professor Amos, the following resolution was passed unanimously:—

"That in the judgment of this meeting the opportunity which is now for the first time afforded to the ratepayers of London of electing a School Board for the entire metropolis, and, therefore, of making adequate provision for the education of the people, is one which imposes upon the ratepayers, individually, as well as collectively, the duty of bringing forward and supporting candidates, who, from their acquaintance with the educational necessities of the metropolis and with the educational system of this and other countries, as well as from their known sympathy with the large classes who will be more immediately affected by the provisions of the Education Act, will be likely to make efficient members of the School Board, and do their duty without regard to sect or party."

The resolution was supported by Mr. Payne, Mr. Godwin, Mr. Chadwick, Canon Cromwell, and Mr. Applegarth. Mr. Biggs then moved a resolution authorising the Education Committee of the Association to take measures for the carrying out of the principles set forth in the first resolution, which was seconded and carried.

The subject is one of the greatest importance, and we would strenuously urge on the ratepayers the necessity of giving the most careful consideration to it, so that men may be elected who understand the subject and sympathise with the wants of the poor.

THE HABERDASHERS' COMPANY.

THE dinner given by the Master and Court of this ancient Company on Tuesday last was very noticeable. Mr. William Hawes, the present master, had gathered around him as visitors a number of eminent men, and in proposing their names as toasts under various heads, made some singularly appropriate and effective speeches, which elicited responses similarly striking. Thus Major-General Brownrigg and Captain Sherard Osborne spoke for the army and navy; Professor Tyndall and Sir William Fergusson for science; Mr. Newmarsh and Mr. Leone Levi for science as applied in practice; Baron Gadin, the well-known French marine painter, for art (making a touching appeal for his country at the same time); and several others on cognate subjects. The City was not neglected, Alderman Fumis and Sheriff Jones representing it. The hall, built a few years ago under the direction of Mr. Snook, the company's architect, has been recently effectively decorated.

EXHIBITION IN BOND STREET.

A WINTER Exhibition of Pictures has been opened at what is termed the Old Bond-street Gallery, and comprises 346 works, of very various degrees of merit. "In Black and White" (21), C. S. Liddell; "The Pallas refuting at Devonport" (28), H. T. Dawson; "On the Lesser Neath, South Wales" (57), J. B. Smith; "Roses" (61), J. Blackham; "A Bank of Wild Flowers" (294), A. Nichol, a little over-large; and "The Eve of Life" (66), P. Jackman, will be found bright spots in a somewhat sandy plain. Mr. Chester, Mr. Frost, A.R.A., Mr. Weekes, Louise Romer, Mr. Rossetti, Mr. Ernest Griest, and others, also contribute agreeable works. "Monkey Island" (310), H. Bright, is an amusing piece of extravagance.

THE SEWAGE QUESTION.

Edmonton.—The local Board of Health at Edmonton has just decided upon carrying out a thorough system of drainage and upon the utilisation of its sewage. Up to this time the sewage of the district has been allowed to pass into the River Lee, to the pollution of its waters; and the Home Office and the Lee Conservancy Board have both protested, the latter threatening to enforce the heavy penalties it is entitled to by law. The local Board has at last decided, however, to adopt the drainage and utilisation works recommended by Mr. Eachus, C.E., and to entrust to that gentleman the carrying out of the design.

Birmingham.—One of the principal and most embarrassing questions now occupying the attention of the Birmingham Town Council is that of the utilisation of the sewage of the town. The outfall at Salfley was at first understood to be simply an experiment; but by degrees it has grown into large and permanent works. This accumulation of sewage matter, says the local *Journal*, is a stupendous and continual nuisance; and, with two or three injunctions held in *terrorem* over its head, it behoves the Corporation

speedily to devise some means of utilisation which shall relieve the residents of Gravelly Hill and Erdington of an evil they have long suffered, and the borough from the liability of heavy legal proceedings. In view of the discussion which will shortly arise on the subject, several members of the Council have visited the works at Saitley. Councillor Walker has for many years advocated that the sewage shall be pumped up into a reservoir, not more than 100 ft. above the level of the mouth of the sewer, below which, he says, there is plenty of adjacent land to consume the whole of the matter, even if it were used over 20,000 acres. The owners of land, he thinks, would doubtless be willing to pay such a price as would recoup the Corporation for the outlay. In order to test his theory, Mr. Walker, about six years ago, gave a pump which was put down at the outfall, and by which sewage has since that time been forced through a carrier to boats on the canal. Mr. Walker has modified his original plan to the extent that he now suggests that the sewage should be sent into depôts on the high lands, where it should be left to consolidate, and from which the farmers would fetch it as they required. Various objections are raised to the scheme, the principal one being that it is too expensive. The plan advocated by those who oppose Mr. Walker's scheme is that the sewage shall be carried by gravitation through conduits on to land on the side of the Tame, to be purchased by the corporation, either under powers which they now possess or by special Act of Parliament. It is stated that between the outfall and Water Orton there are 3,500 acres of land upon which the 20,000,000 gallons of sewage daily raised could be employed in irrigation, sufficiently to so purify the water running off as to make it harmless to the fish in the river. As matters stand at present, these seem to be the two schemes between which the corporation have to decide.

Cheltenham.—The first annual letting of the sewage farm by auction has just taken place. There was a very large company present. The farm of 119 acres, exclusive of one field kept by the commissioners for experiments, is all pasture land, and was divided into six lots. Notwithstanding that the sewage has as yet been but imperfectly applied to the farm, the prices realised were very high, and will be sufficient to guarantee the town, notwithstanding the large outlay to which it has been put, against any loss. The rate per acre varied from 5*l.* 18*s.* to 8*l.* 13*s.*, and the total was about 870*l.* for the year, leaving out of the question thirteen acres reserved by the commissioners, and which, having been laid down with rye grass, is expected to realise 20*l.* per acre. The total yearly payment for interest and repayment of the thirty years' loan is 1,100*l.*; so that even at the rate per acre obtained the first year, the difference between the receipts and the yearly charge would be very small, while the farm will be the freehold of the town, and the works paid for at the end of thirty years. Under the deodorising system, and with continual threats of action for fouling the brooks, the yearly cost was little short of 1,000*l.*

VESTRY REPORTS.

St. Mary's, Islington.—The annual report of the local surveyors of highways, 1869-70, has been issued in a printed form. According to this report, expectations from the steam road-roller of Messrs. Aveling & Porter have been fully realised. The roller is a 15-ton one, and not so heavy as to crush material, or do any serious damage to gas or water mains, shallow drains, &c. The stones, by being fixed at once, are not reduced to round pebbles on all their faces as heretofore, in the supposed economical mode of making the public traffic do the work, to the torture of horses and damage to vehicles. The metal is thus fit for new fixture when the road requires breaking up. The roller is supplied with steel spikes to the driving-wheels, to aid in the breaking up.

The average number of yards rolled per day for each street, was as follows:—

	Superficial yards.
Upper-street	658 730
Highbury New Park	956 923
Holloway-road	295 924
Park-street	564 050
Canonbury-lane, square, and place	613 473

or an average of 650 superficial yards nearly per diem. The cost of rolling (including labour, cartage, watching, water, coals, coke, wood, oil,

&c.) was 4*l.* 3*s.* 6 235*d.* per diem, or at the rate of 1 541 pence per yard. The character of each work varied.

The streets are now cleaned by one of the sweeping-machines and one of the scraping-machines of Messrs. Smith & Son, of Burnard Castle, Durham. The reporters, Messrs. Cormack and J. A. Clements, strongly recommend them. They have found that whereas the sweeping-machine (including two men, wear and tear of machine, oil, and brooms), costs 16*s.* 3*d.* per day; the same amount of work done by hand-labour (including nine men and wear and tear of brooms) would cost about 1*l.* 9*s.* 2*d.* per day, or at the rate of 55 71 per cent. in favour of machine-work. The scraper, with the same allowances, they find costs about 15*s.* 0*d.* per day; whilst doing the same work by hand-labour would amount to about 1*l.* 18*s.* and a little under a farthing per day, or at the rate of 39 56 per cent. in favour of machine-work. These calculations are without the cost of purchase and interest, which would be very small.

The first cost of the scraper is 26*l.* 15*s.*, and that of the sweeper 16*l.*

There are 74 miles of roads and 136 miles of footpaths under jurisdiction in the parish.

Holborn District.—The usual sanitary report by Mr. Septimus Gibbon, medical officer of health for this district, has been printed. The death-rate has here been 25 63 per 1,000, or above the average (24 66), but slightly below that of the central districts.

During the past year, the Artisans' and Labourers' Dwellings Act has been applied to fourteen houses in Bell-court, Gray's-inn-road, and to ten houses in Union-court, Suffolk-hill. The works ordered in the former court comprising additional cisterns over the closets, dustbins, and extensive repairs, especially to all the window-frames, have in all but four houses been carried out in a satisfactory manner. In those four houses the leaseholder is executing the specified works in a dilatory manner.

The houses in Union-court will all be taken down, as soon as the negotiation for their purchase by the Corporation of London is completed. The sanitary improvements effected have been numerous.

St. George the Martyr, Southwark.—The 14th annual series of reports for this parish has been printed. The report of the Medical Officer of Health, Mr. H. Bateson, M.D., states that the fears of relapsing fever have not hitherto been realised. The scarlet fever epidemic, however, has prevailed here, as elsewhere. The deaths in the parish from all causes were 1,740, and in excess of the preceding year by 239.

WORK WITH A WILL.

MR. LEONE LEVI delivered the introductory lecture to the Evening Classes at King's College, London, on the 7th inst.,—an appropriate and eloquent discourse. In the course of it he said, —

There is a great completeness and variety, certainly, in our scheme of studies for the session; we are now commencing; and I can well imagine that it may be a source of grave deliberation with many students ere they can decide which of these attractive studies is entitled to their special preference. To learn them all is impossible. To have a smattering of many sciences is of but little use. But you need have no such difficulty of selection if you have some definite idea of the occupation or profession you wish to follow. Do you nourish a silent desire to be a great merchant—to become a millionaire some day, sooner or later? Do you wish to have a seat as a governor of the Bank of England? Or to reach the position of scientific producer, like Whitworth, Armstrong, or Fairbairn? Or to possess the skill and calculating power of a Watt, or the engineering grasp of a Stephenson? Or do you, *bonâ fide*, anticipate the day when you may be the Lord High Chancellor? Are these the fancies that run in your mind whilst you are quietly pursuing the studies before you? My friends, I congratulate you for nourishing in your hearts the ambition of rising to great altitudes. It is well to have an honourable ambition. But you must not lose time. Begin at once to learn those branches of science which you will absolutely require. Suffer nothing else to distract your mind, or to dissipate your powers. The great difficulty you have to contend with is a disposition to frivolity, restlessness, inconstancy. Have, then, a stern, unshakable will to conquer,

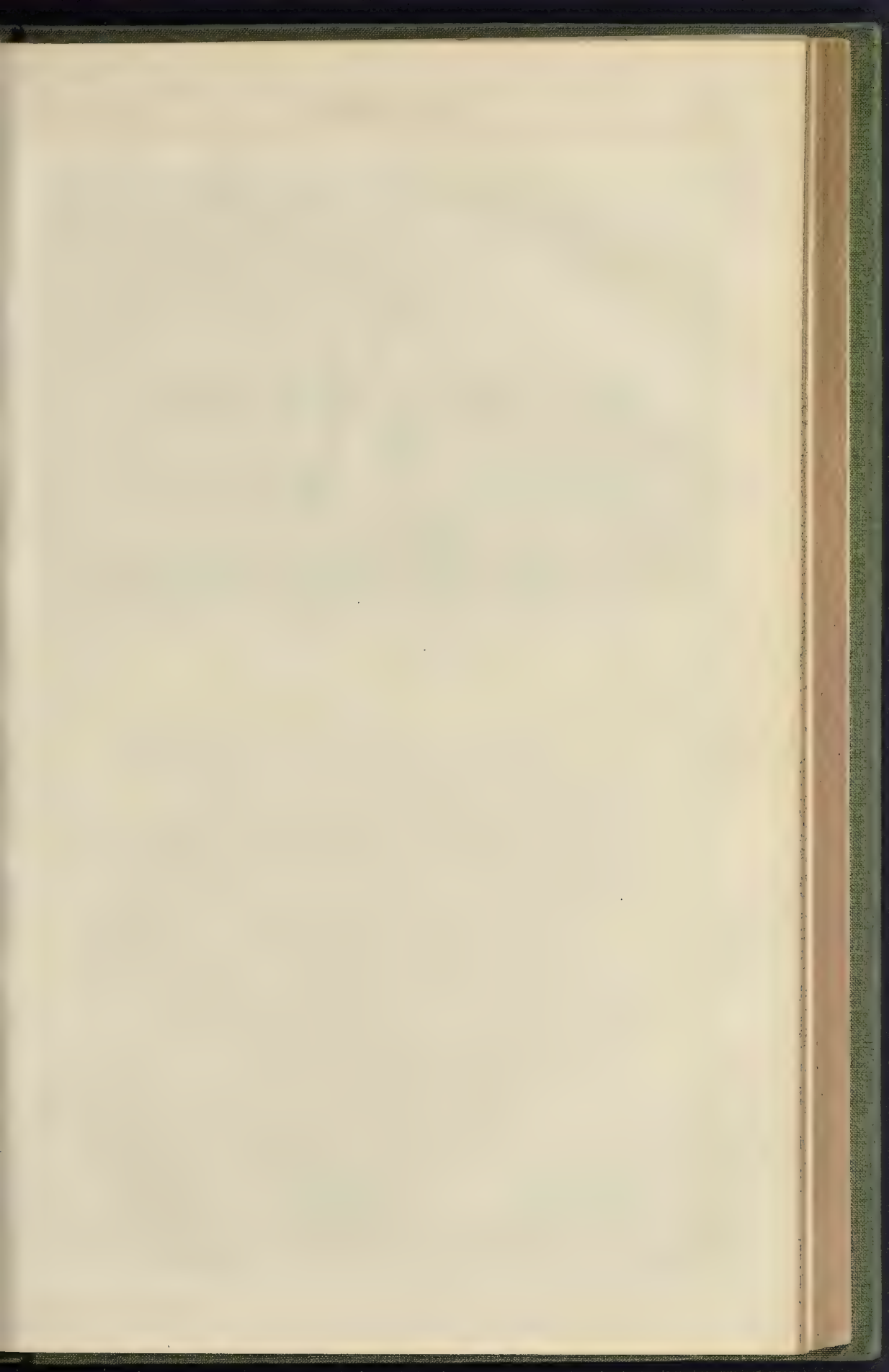
and you will conquer everything. When Alfieri was asked how did he succeed to become a poet, he answered,—

"Voll, semque vollì, e fortissimamente vollì."

"I willed it. I always willed it, and intensely willed it." Depend upon it, it is not so much to any natural gift that we owe our success, as to the firmness, and even obstinacy, with which we set ourselves to master the difficulties before us. And dismiss any idea, I pray you, that you will get on quite as well without any hard study for it is not so. It is now universally admitted that scientific knowledge is absolutely necessary for every industry, and employers will not employ persons who do not possess it. We may fancy that a mechanic or artisan, a clerk or an officer, may become, by practice and observation, insensibly disciplined to perform works by the hands with wonderful dexterity, but I doubt whether the clear head and the sound judgment necessary for any profession can be acquired by merely inspecting what others are doing. Let the transactions of a counting-house be ever so judiciously conducted and methodically adjusted, yet if a youth is not furnished with the requisite knowledge to obtain the best advantage from what he sees there transacted, he will not be much the wiser for it. All that is done will seem to him much confused and perplexing, and, after years of labour, he may remain utterly unprepared to take a wide and firm grasp of the various operations which are necessary in the prosecution of business. A combination of study and practice is the best preparation for the professional or mercantile career.

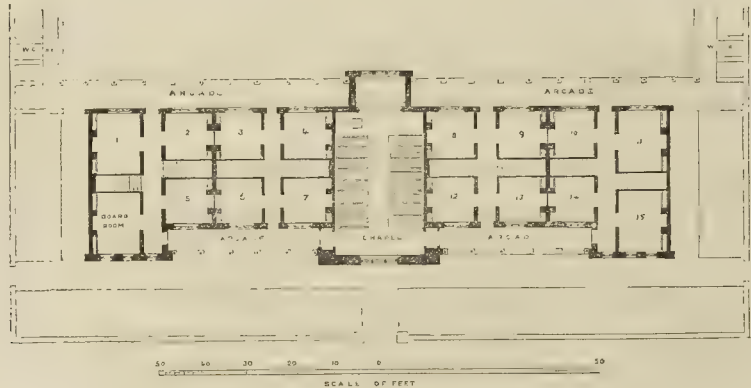
THE MEANING OF TECHNICAL EDUCATION.

At a meeting held in the new Mechanics' Institute, Slough, at which Mr. Sagden presided, Mr. Buckmaster, after explaining the scheme by which aid is given to classes established for teaching drawing and science, went on to say,—Although I have been engaged for some years in directing public attention to the importance of science and art as a part of national education, I have never been able to attach a very definite meaning to what is now called technical education, which, in its rigid definition, means teaching the arts, but, in its popular definition, means teaching almost everything. I wish you to understand that all I have ever advocated is the teaching of elementary science and drawing, pure and simple, leaving the practical application of this knowledge to the workman. Teach a carpenter some geometry and mechanics, and he will find the practical application of these sciences to a hundred different purposes in the workshop which would have escaped the notice of purely scientific men. Science with practice is the true principle upon which we ought to proceed, and all that we can hope to do is to teach science, and not be over-anxious for immediate results. An argument which is frequently urged in favour of scientific instruction is that other countries are beating us in many of our important industries. I see the Lord Mayor of London demolished this argument by counting the number of steam-engines between Boulogne and Paris which were made in English workshops. On the Great Eastern Railway he might have counted an equal number made in Belgium. In those industries requiring a knowledge of art other countries are no doubt equal, and perhaps superior. With reference to the great industries of iron, machinery, cotton and woollen manufactures, I am not competent to offer any opinion. It is, no doubt, the duty of every man to be as perfect as possible in that industry by which he serves the community and provides the necessities and comforts of life for himself and his family, but this is not the highest good. Men are not to be taught these sciences because they have to build houses, construct steam-engines, and weave cloth. Men are to be educated because they are men; and every labourer ought to strive for that higher life and culture which nothing but that special knowledge called science will ever give him, and which is far more valuable in the prosperity and happiness of a state than cheap cloth. Science will do much towards making many occupations more healthy and cheerful. It will some day or other wipe away those volumes of smoke which cut off all visible communion between heaven and earth.





EARLE'S RETREAT, FALMOUTH.—MR. ALEXANDER LAUDER, ARCHITECT.



Plan of Ground Floor.

EARLE'S RETREAT, FALMOUTH.

EARLE'S RETREAT, Falmouth, or, as we should prefer to call it, the Earle Retreat, the gift of Mr. George Earle, of Philadelphia, occupies a very healthy and eligible site on one of the most elevated positions in Falmouth.

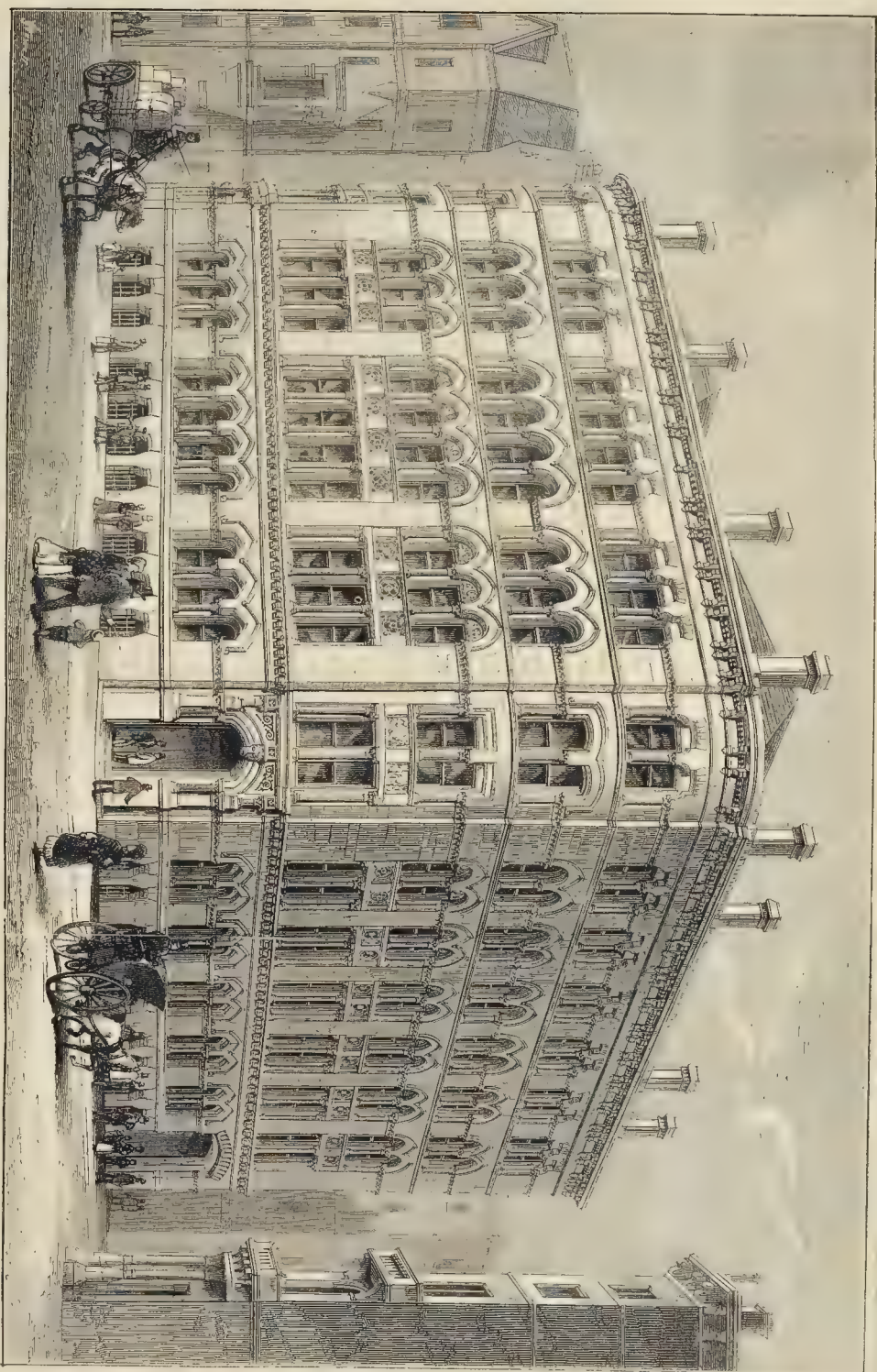
The buildings comprise a chapel, surmounted with a bell turret, a board-room, and thirty-two rooms, providing accommodation for fifty-two inmates, with all the needful accessories. The chapel is seated for 150 persons. It has an open-timbered roof, in four bays, the principals carried on carved granite corbels. The roof timbers, seating, lectern, and desk are of pitch-pine, varnished. The chapel is lighted with

geometrical windows, of Bath stone, filled in with stained glass, supplied by Mr. Solomon, of Truro.

The dwellings are approached by two arcades, of five bays each. The pillars stand on granite bases, and consist of polished polyphant shafts, carved Bath stone caps, with arches in alternate bands of red and white bricks. The dwellings are light and airy, are fitted with closets, and comfortably furnished.

The buildings are erected from the designs of Mr. A. Lander, architect, of Barnstaple, by Mr. J. Roberts, builder, of Falmouth. The freestone work was prepared by Mr. W. Yonings, of Barnstaple; the polished serpentine and polyphant by Mr. J. Murphy, of Penzance.

This munificent provision is for aged natives of Falmouth or for residents during a period of not less than twenty years. The rooms are arranged for married couples, widowers or widows, bachelors or spinsters. The inmates must be of well-known good character, independent of any particular religious or political opinions. The sole government of the Retreat is vested in the brother of the founder, Mr. Frederick Hobart Earle, during his lifetime. Afterwards by twelve persons to be elected, six by the corporation of the town of Falmouth, and other six by the Local Board of the parish. The founder has made ample provision for the maintenance of the building in perpetuity. The entire cost of the erection, furniture, &c., will be about 2,100l.



A MANCHESTER WAREHOUSE, PORTLAND STREET—Messrs. Clegg & Knowles, Architects.

WAREHOUSE, PORTLAND-STREET,
MANCHESTER.

THIS warehouse (the property of Mr. William Carver), now in course of erection, from the designs and under the superintendence of Messrs. Clegg & Knowles,—to whom Manchester is indebted for other specimens of warehouse architecture,—is being built for Messrs. George Frazer, Son, & Co., merchants, of Manchester. The building occupies a site bounded by Portland-street on the west, Silver-street on the east, Abingdon-street on the north, and David-street on the south; comprising an area of 884 square yards. The principal fronts to Portland-street and David-street are entirely of stone, with red granite shafts to the entrances. The other fronts are of brick and iron work. The style adopted is Italian Gothic, with carving freely applied. The warehouse contains a sub-basement for the machinery (sunk about 20 ft. below street level), basement story for the packing-presses, ground-floor, and four upper floors, with an attic in roof. The principal offices and sample-rooms are placed on the first-floor, the other floors being appropriated to warehouses and offices for the several separate departments of the Manchester trade. The sub-basement will contain eight hydraulic packing-presses, with 14-in. rams, to lift 360 tons; two 25-horse boilers; two 20-horse high-pressure steam-engines; six sets of pumps; and all other machinery requisite for working the hoists and cranes. A covered loading-way extends through the rear of the building from Abingdon-street to David-street, containing a loading platform, two swing cranes, and two hoists for raising goods. Mr. William Southern, of Salford, is the contractor for the superstructure; Messrs. Higgins & Son executed the cellars and foundations. The machinery is being fitted up by Messrs. Norbury & Shaw, engineers, Salford. The carving is being executed by Messrs. Simpkin & Stewart, from designs supplied by the architects.

The building may be taken as a good example of the warehouses which are common in Manchester.*

THE SOCIAL SCIENCE ASSOCIATION.

A FEW NOTES THEREON BY A WORKING MAN.

SIR,—Before the echoes awakened by the late meeting of the Social Science Association are lost in the distance, I wish to say a few words to the members of working men's societies upon the great importance to them of taking a larger part in the annual proceedings of that great association. It seems to me a meeting once a year, and the reading of some papers at the society's office to a few select gentlemen, is not sufficient for the ventilation of the great questions opened at the annual meeting. Last winter a course of four lectures was given on health and economic science, and they met with partial success: that, so far as it went, was something towards further utilising the Association and extending its influence. That is not enough. What I want to see is the members delivering lectures on vital statistics and economic laws, wherever there is a working-man's or any educational institution. As the members of the Association are to be found in almost every town in the kingdom, they could become the nucleus for forming sociological societies throughout the country, and open up great and important questions, which have hitherto been neglected by every class of the community. The disease of neglect is fearful to contemplate; it is rampant in every house, and injurious in every home. If the objects of the Association were generally taught, and sanitation, in its widest phase, became a household question,—and it might if it had home missionaries who properly understood the physical wants of the nation,—the science of life and order would soon form a part of the every-day existence of the people. At present the Association is only a nine-days' wonder, to be then forgotten until the next annual meeting.

Looking over the reports given by the daily papers, I was surprised to see the small amount of interest the meeting elicited. The *Times*, the great organ of public opinion, was a day behind in its report; and if its readers happened to be readers of the *Standard*, they would have been addressed by the *Times*, as the President's very able address did not appear until the Friday. It followed that course throughout, and at the close it

gave the members a knock-em-down in the shape of a leading article, condemning the objects of social reformers and the further meetings of the society. And as the big one, so the smaller. The little gentleman hailing from Fleet-street, calling himself Mr. Punch, in a paragraph, which was neither satirical nor funny, describes the proceedings as "twaddle." In the opinion of the satirist, it is twaddle for a large number of the best men and women of this or any other country to meet for the purpose of discussing the wrongs, miseries, and evils which humanity now suffers, and which are not fixed by any law excepting the immoral one, but are all removable by taking a proper course; and the object of the Association is to provide the means and remedies for the removal of the social diseases which now afflict and scourge society. *Fie, Mr. Punch!* you did better in your youth. Humanity thus suffers. The members of the Association know that most of the ills are by proper treatment removable. Science advances, but as yet it has done but little to alleviate the condition of the masses. Progress is obstructed through the ignorance of the many and the selfishness of others. Man's inhumanity is the cause of many evils, and when one considers the present condition of society, with its labyrinths and mazes, some of which are still untried; its general chaotic state; with its wealth and poverty, the latter often in such close proximity that it jostles the other,—Lazarus, in the lowest depths of despair and misery, for whom no Abraham's bosom is provided, often wishing the earth would open and swallow him, is in many instances scarcely a stone's throw from Dives and his sumptuous family, who flaunt about with their lofty airs, and seem to think the earth was created for them, and them only. I have often, on looking out of the back window of some high mansion, compared the inside with the out, and have asked the question whether there is no danger in the contrast. A general uneasiness pervades the working classes; the best of them are dissatisfied with the condition of things, and the lower strata will not bear examination. Thunder is heard in the distance; the storm is brewing; every upheaving brings it nearer. The darkness is portentous. Some day it may break, and shatter the fragile vessel now called upper society. It may, by judicious foresight be avoided, and, as all reforms are preceded by discussion, and all remedies to alleviate human suffering are subject to the same law, talk is essential to the progress of mankind. It leads to work, and as concerted and individual action is required for the great work which the Social Science Association has undertaken, the jeers of the world-be-witty, and the sneers of the so-called organs of public opinion, are in every sense indecorous, and show a callousness to human suffering, and an obliquity unworthy of them.

Among the various subjects discussed, none were of greater importance than that relating to criminal statistics. In modern society robbery is a crime punishable by law; that is, some forms of robbery, where articles of value, if only to the amount of a penny, are taken. The persons so acting are liable to incarceration till justice as meted by magistrates is paid and satisfied. There are at present different degrees of criminals: the hardened gaol bird, known as the habitual criminal, often a victim of parental misrule; with him crime is a trade, and looked at as the proper means of gaining a living. Another class is the casual or accidental class of criminals, and both are the vicious offsprings of the present state of society. Criminal law, too, is somewhat like its victims, desultory and uncertain, as the sentence is left to the caprice of the magistrate and judge's idea of what is sufficient punishment. The causes of crime are entirely overlooked, and, in fact, there is no part of law in which more anomalies exist than in the one known as criminal or felon law. The condition of society is not favourable to the right understanding of *meum et tuum*; and the remark that an honest man is a fool, and is sure to go to the wall, as he is out of place in a dishonest age, is a common saying among workmen. It is a suspicious age,—at least so far as the transactions between individuals are concerned. It is said that like begets like, and, as many are dishonest, they are of the opinion that every one is an exact counterpart of themselves. Fraud, cunning, and hypocrisy are the characteristics of the age. The tradesman does not steal, or take a purse direct from another man's pocket; but in business—and really the word is a wonderfully con-

venient one; and he who by misrepresentation persuades some one to give a shilling for an article worth only sixpence, is looked upon as a clever salesman who has made a good bargain. Surely this is a wonderful age! An honest man from a distant country, happening to be in this world of London, must be much struck by the sign-board representations. Everything is genuine: no shoddy or veneer—everything is real. "Good man, enter here and buy; you cannot be deceived, as my transactions are above-board." The law, so strict and enforceable against the man who steals a penny in a direct way, has no hold upon the man who robs me of a shilling in an indirect form. And at the present time another Blackstone is wanted to define the law of things, and what are public rights and wrongs. From early years to old age, many workmen are engaged in nefarious transactions for the benefit of their employers. They are thus a party to the common frauds, but are not participants in the profits. The influence of such work must have a deteriorating effect on the life and morals of the workmen. They, through knowing their employers are continually cheating the public, become so habituated to dishonesty, that they cannot see anything wrong in taking from the employer that which they require, and which they believe is a remuneration for their joint robbery of the public. The causes of crime are rarely, if ever, considered in the proposal for its eradication. But in future legislation they must be considered. To have honest workmen there must be honest employers; not schemers, who shuffle at every turn, and in the course of business cheat every one they come in contact with. Some more notes, "On Pauperism and Labour," I had put down, but I find there is no room. But what I have written is, I think, of some little interest: it is what the workmen say, only in a slightly different form; while honesty is a crime, and fraud business, the influence of such opinions will injuriously affect the character of the whole community.

JACK PLANE.

SURVEYS OF TOWNS AND DISTRICTS,
AND HOW THEY ARE MADE.

APART from all scientific considerations, and others of a national character, it must be admitted that the trigonometrical survey of the United Kingdom has, so far as the public and individuals are concerned, more than fulfilled the object it was intended to accomplish. It is, in fact, the only reliable survey of the country that we possess, for that executed under the authority of the Tithe Commissioners includes only certain districts and localities. As the latter was made for a specific instead of a general purpose, its application becomes very limited in its sphere; and, moreover, the majority of the plans are little better than useless to a professional man. This arises from two causes: one is the time that has elapsed since they were surveyed and plotted, and the other that accuracy is not their distinguishing characteristic. Surveyors have but little reason to bless the Ordnance Survey, as it undoubtedly deprived them of an enormous amount of future work. It is not too much to assert that it completely extinguished them as a separate profession, and made surveying a subordinate branch of the business of a civil engineer, in which state it has since remained, and it will probably always do so. There is very little question but that the introduction of railways also assisted to bring about this merging of the inferior branch into the superior. The regular old-fashioned surveyor was purely and simply a measurer. His knowledge and capabilities seldom went beyond the chain, offset, rod, and cross-staff, and the man who was acquainted with the mysteries of the most rudimentary angular instrument was regarded with mingled feelings of envy and admiration. The scales upon which the trigonometrical survey was plotted, 1 in. and 4 in. to the mile respectively, were too small to be of any real utility, in cases where the ground was to be occupied by extensive and important architectural and engineering works. The latter scale, however, answered pretty well for general purposes, in which the subject of preliminary plans and estimates was alone under consideration. This was the minimum scale allowed, by the Standing Orders, to be used for the Parliamentary plans of proposed lines of railways, harbours, docks, waterworks, and most kinds of engineering projects. Consequently the necessity for making a separate survey of the land through which the railway ran was obviated in

* Several important buildings now in course of erection in Manchester will shortly be illustrated in our pages. The new Exchange in our next issue.

all districts which had been plotted and mapped on the 4-in. scale. *Hinc illu lacrymæ*, say the surveyors.

But however well the Ordnance plans were adapted for general utility, they failed, in consequence of the smallness of the scale, to answer in instances where works of a detail character were concerned. Thus, although adequate for the Parliamentary plan of a line of railway, they were totally inadequate to afford a proper or accurate delineation of the ground for the working or contract plans. The latter are plotted upon a minimum scale of 200 ft. to the inch, while the former are on one of 1,320 ft. to the inch. Reduced to what are termed natural scales, the usual method adopted by French engineers for expressing the proportion between the actual object and its representation on paper, they would be respectively equal to $\frac{1}{6600}$ and $\frac{1}{3300}$. In order to extend the advantage of the Ordnance survey to towns, it is intended to publish, by degrees, a series of plans, upon the enlarged scale of $\frac{1}{4000}$, or 41.66 in. to an inch, so as to admit of drainage and other works being at once laid down upon them, without necessitating a survey of the district. Some of the parishes near London have been published to this enlarged scale, but for several reasons they do not fulfil their intended object. In the first place, they are enlarged plans—that is, they are enlarged from the other plans on a smaller scale, and it is well known that, notwithstanding all the care and skill in the world, enlarged plans are not accurate. They certainly serve exceedingly well to exhibit in a general way, any proposed scheme of drainage, sewerage, or other engineering works; but when these have reached the stage when they pass from contemplation to execution, it becomes necessary to have the whole district carefully surveyed. At present there are but very few of these enlarged Ordnance maps published, and it will be a long while before they become numerous. As specimens of graphical art they are very indifferent, and not to be placed in comparison with the splendid examples from which they are enlarged. This is only what might be expected, when it is borne in mind that they are zincographed: a process that does not admit of delicate work. There is one use, or rather abuse, to which these enlarged plans are put, to which we shall presently refer, and for which, it must be acknowledged, they hold out strong temptation to the unscrupulous. On the other hand, local boards and others who employ surveyors, by their parsimonious and niggardly manner of dealing, indirectly contribute to the fault, and may certainly be, in one sense, fairly regarded as *participes criminis*. True economy is far removed from parsimony as from extravagance. It is a happy mean between the two, and somewhat difficult to arrive at. It has nothing to do with the amount of actual value of the objects under consideration. The rich man is not unfrequently a miser; and the beggar, in his own way, can be as extravagant as the prince.

A fresh survey of a large portion of the parishes throughout England will undoubtedly be necessitated by the drainage and sewerage works, which must sooner or later be undertaken by every town in the kingdom having a population beyond five or six thousand. It will not be long before the result of the labours of the Rivers Pollution Commission will be made manifest by the passing of an Act forbidding, under heavy penalties, the discharge of any sewage or refuse matter of any kind whatever into a river, stream, or natural watercourse. We frequently witness in the advertising columns of this journal notices requesting surveyors to send in tenders for the survey and plans of a certain district. One of these instances has lately become notorious, and we will therefore select it as a very good example of the manner in which these jobs are managed. We have taken the trouble to carefully go into the estimate of the work to be done, the time it will take, and the actual expenses of chairmen, assistants, mounted papers, and other items inseparable from office work, and have not the slightest hesitation in asserting that it is simply absurd to suppose that the work could be properly performed for the amount accepted. It is about a third of what the tender for *bona fide* work should be, and constitutes another instance of the miserable penny wise and pound foolish principle by which all local authorities appear to be actuated. The answer these gentlemen will make will be,—“But we do not get our plans and surveys executed at this ‘absurd’ price; there they are hanging up in the board-room. Go and see how

beautifully they are done.” We have looked, and we have seen them, and greatly admired the colouring, the lettering, the thin lines, and the thick lines, and come to the conclusion that they were excellent specimens of the draughtsman’s art; but there their merits terminated. Upon checking them by actual measurements on the ground, they have been found to be “so far out” as to be almost worthless for the real purpose for which they were intended. Many will perhaps exclaim, “What signifies a few feet one way or the other?” If the plan continues to hang always on the walls of the board-room, it certainly is not of much consequence whether it be accurate or inaccurate. But let us suppose the following case, which is not of uncommon occurrence, and will probably be a very common event. The local authorities require land for irrigation. They apply for their powers of compulsory purchase, and the landowners, ratepayers, and other interested parties organise a formidable opposition. Under these circumstances the Local Government Act Office appoints an arbitrator, generally two, consisting of an engineer and a barrister, the one to sift the plans and the other the evidence. There are counsel employed in the case, and each party produces its scientific and professional witnesses. The plan and survey of the district is the key to the whole matter; it is essentially the *pièce de résistance*. It is examined by hostile engineers, scrutinised by hostile counsel, and if there is a flaw or mistake in it, there is not the slightest chance of its escaping detection and exposure. We do not go so far as to assert that the party would lose their case on account of the inaccuracy of their plan; but it would certainly not advance their interests.

Let us now proceed to investigate how the existence of the Ordnance or any other maps enables a survey and plan to be completed at a much lower rate than if those auxiliary plans did not exist. If there are no plans whatever of the district, every feature of the surveys and every object on the ground must be obtained by actual measurement, or they cannot be otherwise plotted on the plan. Some of them can of course be sketched in, and no doubt very frequently are, when the price paid is not sufficient to ensure close and accurate work. But when these plans are to be had the surveyor can, if he chooses, after laying down the main lines in the field and plotting them, fill in from the plans, instead of from actual measurements: consequently whatever errors exist in the one are perpetuated in the latter. However desirous of turning out perfectly good work, yet a professional man must cut his cloth according to his measure. If his employers are too parsimonious to allow him a sum which would permit him to do justice to them and to himself, then they are to blame and not he if they discover that they only get what they paid for; that is, an inferior article. A thoroughly accurate plan of a town and district is worth any sum in reason. An inaccurate one is not worth the paper upon which it is plotted, and entails, in the long run, more expense than would have sufficed in the first instance to pay for it half a dozen times over, not to mention the trouble and uncertainty it is constantly giving rise to. So long as local authorities continue to pay for professional services on the inadequate and niggardly scale lately brought before the public, so long may they expect their plans to be a combination of inaccuracies and inaccuracies, and to consist of partially *bona fide* and partially copied work, instead of genuine examples of triangulations, measurements, and dimensions plotted from actual field notes.

T. C.

COLOR IN STAINED GLASS.

SIR,—The eclectic issues raised by Mr. Sharpe’s original letters on this subject are of importance, and undoubtedly deserve the attention of all, both patrons and painters, who wish to maintain artistic glass-painting, and prevent its practice—as is now too frequently the case—simply as a mechanical vehicle of colour.

The entire exclusion of figure-subjects, and the employment of geometrical and conventional forms are contentions on which I do not now enter, beyond saying that these conceptions have not as yet been developed in anything like the extent and beauty of which they are capable.

Of old works there are few remaining, if, indeed, the mode ever largely prevailed. Mr. Sharpe is apparently narrowed to two or three extant instances for his illustrations, and only

one of these is of any scale or completeness. Most modern attempts in this direction are simply execrable, and have been chiefly, it would seem, carried out under unfavourable influences.

Conventicles have, in our time, afforded the main field for these essays, where dialike of subject-windows, from their show and treatment, has ruled their exclusion; or limited means have compelled patrons to be content with simpler effects. Under these circumstances it is not to be presumed that we should find much artistic feeling fostered or expressed. Recent examples in the severe form, of any worth, are so rare, that one may be allowed to notice a rather meritorious work just finished at Holy Trinity Church (by the Triangle), Hoxton. It is a rose-window of considerable sphere and well-apportioned tracery filled with glass in patterns, the whole of which are described by the *lead-work*, the glass being “pot-metal” exclusively; as means would only allow a spare employment of decorative colour. The example is, I think, at the present time, of special interest, as showing what may be done in a truthful and artistic manner in the direction Mr. Sharpe has proposed. And it certainly indicates how wide a scope there lies in the direction for studious design and honest execution. The inverted saints and other abnormal fillings so often seen in “rosses” or circular-windows, must assuredly yield in any æsthetic comparison with a well-designed pane in the treatment now contended for. The example cited was, I believe, executed by Messrs. Pitman, by whom the church has recently been polychromed.

J. J.

ST. MARGARET’S (R.C.) CHURCH, DUNFERMLINE.

This church, designed by Mr. R. Thornton Shiells, of Edinburgh, is of a style not usually adopted in the present day, but it was so prescribed to the architect. The plan consists of a nave, without aisles, terminated by a semicircular apse, upon each side of which is projected a semicircular chapel. Above the doorway is an organ gallery. The area is lighted by coupled windows, arched and divided by a shaft with foliated cap; between each couplet is a fluted Corinthian pilaster, supporting a dentilled cornice, from which springs a semicircular coffered ceiling. The floor is to be unencumbered by pews; chairs are to be provided for the worshippers. Pilasters, entablature, and elliptical pediment are features of the exterior. A bas-relief above the doorway represents the landing of the saint at St. Margaret’s Hope, near the ancient city of Dunfermline. The interior, which measures 70 ft. by 30 ft., and to the apex of the roof 36 ft., is ultimately to be decorated in colour, but this and the furnishings are not yet settled. Operations are to commence forthwith. The architect should try to persuade his client to let him submit a design of another character.

THE MAIN DRAINAGE OF DUBLIN.

SIR,—In your last impression you have a shor leader on the proposed main drainage of Dublin, a work tardily resolved on, but most urgently needed, owing to the almost incredibly filthy condition in which the river Liffey has long been suffered to progress in a cumulative ratio. The proposed plan is a very good one, but your article naturally complains of the apparent folly of the intention to cast all the valuable sewage of Dublin into the sea near the mouth of the harbour, where it is supposed by the writer much of the foul matter may be washed back to Dublin by the flood-tides.

While I demur to this assumption, and believe, from an intimate knowledge of the locality, that there is little to fear from returning sewage, I beg to say that there is no difficulty whatever in carrying out an excellent and cheap scheme for the utilisation of the Dublin sewage, in the immediate vicinity of the proposed outfall into the sea. No city that I know, in fact, has such obvious and convenient facilities for the purpose in the great strand at Clontarf, called the North Bull. There a large island or peninsula can be formed, of from 1,500 to 2,000 acres, surrounded wholly or partially by the sea, protected by very moderate embankments, and consisting of sand mixed with a little mud, just suited to sewage irrigation. A large portion of this waste is already over high-water mark, and the rest is slowly warping up.

The proposed outfall will skirt the edge of this

suggested reclamation and literally there is little to do (beyond making the embankments) but to let the sewage flow over the land, instead of pouring into the sea.

This plan has been for some years put forward by me, and has been explained to the Dublin authorities, who have been only deterred from taking it up by threats of opposition from proprietors on the neighbouring shores of Clontarf and Howth. The apprehensions of these proprietors, I feel convinced, are groundless. A belt of salt water of several hundred yards in width would interpose between them and the nearest point of the proposed sewage farm, while the porous nature of the land to be enclosed would prevent all stagnation, and the growing crops alone would take up all sewage that did not sink into the sand.

In such a situation, I believe a very good profit could be made on the outlay, the sewage being at the threshold of the farm without expense.

In the metropolis sewage utilisation scheme for London, to which I was engineer, and which was suspended for want of public support, a culvert of over 40 miles in length and 10 ft. diameter, and costing one million sterling, was necessary to lead the sewage to the Maplin Sands, where a farm of 12,000 acres was to be made to utilise the sewage upon. How vastly better situated Dublin is in this matter will at once be seen from the above statements by any one who can, like myself, add C.E. to his name.

G. W. HEMANS.

TAR PAVEMENT.

SIR,—I am afraid the specification for footways in your last number is too expensive for general use; so I annex one of pavement of which I have laid a lineal mile in this town (Bury St. Edmund's), this year, at a cost of 1s. 3d. per superficial yard. I may add that the price varies with the quantity laid as one time, and the cost of material in the neighbourhood.

Hot breeze from gas-works, 3 bushels.

Hot shingle from a 2-in. mesh, 1 bushel.

Hot tar, 1 gallon.

Mix the whole thoroughly, and pass through a 1-in. mesh, and part through a $\frac{3}{4}$ -in. mesh. Lay 2 in. thick of the roughest material, and roll it; then $\frac{1}{2}$ in. of the second and $\frac{1}{4}$ in. of the finest. Then sprinkle fine white shingle, and roll well with a light and then with a heavy roller. The proportions have to be varied according to the quality of the breeze and shingle, and the weather during which the pavement is laid.

THOS. H. MERVEN.

"HOUSEMAIDS' KNEE."

CANNOT something be done, by the influence of the *Builder*, to abolish the common practice of housemaids and general servants going upon their knees to clean doorsteps? Some houses, in the suburbs of London, have as many as ten steps, besides landings and carriages. These it is the custom to keep scrupulously whitened, and this is generally performed, in all weathers, by female servants. What necessity is there for so much use of heartstone? In some country towns, Bath for example, a whitened doorstep is rarely seen, yet attention is given to all necessary cleanliness. If, to please Londoners, the steps must be whitened, let it be done with a brush, or mop, or some appliance by which it can be performed in a standing instead of a kneeling position, and with some other material than heartstone, but equally or more suitable. This is a subject which is surely worthy the consideration of architects and builders, with the view of introducing improvements, by example in their own households, and for general adoption by housekeepers. It relates to cleaning certain portions of their own works. The question may be carried still further, and it may be asked, what necessity exists for kneeling at all in floor-cleaning?

Mr. Richard Davy, in a communication to the *Medical Journal*, in reference to "Housemaids' Knees," remarks, that during the past year twenty-one cases of this affection have been registered as in-patients at the Westminster Hospital (one man and twenty girls), demonstrating that some mechanical improvements are needed in the common scrubber's necessities. He maintains that it is an unnecessary and quite a cruel custom that servants should sub-

ject their knees to the cold pavement or damp floor, and their burses to continued pressure, to ensure a clean doorstep, a bright hearth, or a polished floor. Housemaids who, of course have too much self-pride to knuckle down and clean their halls, use the American squeegee-brush, or a long-handled mop; the women in Holland clean their steps with an appliance combining the brush and wiper; the Parisian gargon washes his floor with a footbrush, and so on. Let, therefore, our poor English girls be supplied with brushes and wipers, that can be used in the erect posture. Then our housemaids will be eased of a frequent and painful, if not a dangerous affliction; our hospitals will be provided with more empty beds; and employers will be spared the inconvenience of sending their broken-kneed drudges into the wards of the nearest charitable institution.

Let me add the suggestion that all those of your readers who are acquainted with really good and practical means of accomplishing the above objects, should make the same generally known.

A. S. C. B.

"CLAUSES OF CONTRACT."

We have received, at the moment of going to press, a communication on this subject from the Institute of Architects, expressing surprise that the "Headings for Conditions of Contract" should have been printed "without authority," and "minus the preamble, which, by common consent, was to be prefixed to the Conditions in question," copy of which is now sent. The document came to us from two separate quarters, and, so far as we are concerned, no other authority was needed. It was not accompanied by the Preamble,—which we now print.

"GENERAL HEADINGS FOR CLAUSES OF CONTRACT."

MEMORANDUM.

[Approved at a Meeting of Council held on the 1st Aug., 1870.]

The Council have had under consideration certain headings of clauses for contracts between builders and their employers, as proposed by the Builders' Society, and have referred them for examination to a committee. The Council, upon the report of this committee, submitted to the Builders' Society modifications, which they thought necessary to make in the headings suggested by the Builders' Society, so as to render them acceptable to the architect and his employer.

The attention given by the Committee and Council has been limited to the clauses submitted to their consideration by the Builders' Society; but, of course, other clauses are necessary to establish fully all the relative responsibilities of the employer and employee.

At the same time it is to be observed, that the Council cannot pretend to lay its members to the adoption of any headings of clauses of contract, which the Council may think either reasonable or expedient; for, in such a legal document, the employer must rely wholly on the opinion of his architect and legal adviser, both as to specific heads and matters of the contract and as to the form in which they should be drawn, in order to give them the proper legal effect.

The responsibilities of the contract lie between the employer and contractor alone; the architect being merely the adviser of the employer, and acting as an equitable medium between the two. Any responsibility which he may professionally have, rest between him and his employer. Consequently, all obligations in the contract lie between the contracting parties only.

The absolute control of the execution of the work, in all its particulars, must rest with the architect, who is expected to exercise a just and fair judgment between the two parties; though a reference is but equitable, if desired, in questions as to the quantity, extent, or value of extras and omissions, alterations or additions, subject to any special provisions in the contract on this head, as to written authority, periodical delivery of accounts, &c., &c.

THOMAS L. DONALDSON, } Hon. Sec.
JOHN P. REDDON, }

PLANTING THE THAMES EMBANKMENTS.

At last week's meeting of the Board of Works the following report from the Parks, Commons, and Open Spaces Committee as to planting the Albert Embankment with plane trees, and the surplus land laid out and planted in a similar manner to the Victoria Embankment, was adopted:—

"Your Committee have proceeded upon your resolution of the 30th ult., directing them to take the necessary steps for planting the Albert Embankment this autumn, and to report thereon at an early date. It will be remembered that on the 24th of July last the Board had before them a report by the Works and General Purposes Committee, from which it appeared that certain of the plots of spare land on the Albert Embankment were proposed to be laid out and planted. Your committee have had before them a report by Mr. McKenzie, in which he recommends that 181 plane trees should be planted along the Embankment, and at certain other points referred to by him, and that the spaces marked on the plan accompanying his report should be enclosed with an iron fence of the same pattern as the one for the Victoria Embankment, and planted about with deciduous trees and shrubs. The total cost, including all materials, shrubs, labour, and planting, is estimated, your committee find, at

about 3,000*l.*, and they are of opinion that this is a reasonable amount, and that the necessary works should be carried out. They recommend this course for adoption, and that it be referred back to them to take all necessary steps for the purpose."

THE PREMIUMS OF THE INSTITUTION OF CIVIL ENGINEERS.

AMONGST the subjects for approved original communications on which the Council of the Institution of Civil Engineers will be prepared to award premiums arising out of special funds devoted for the purpose, are the following:—

1. On the Strength and Resistance of Materials, practically and experimentally considered.
2. On the Theory and Practical Design of Retaining Walls.
3. On Land-slips, with the best Means of preventing or arresting them, with Examples.
4. On the Principles to be observed in laying out Lines of Railway through Mountainous Countries, with Examples of their Application in the Alps, the Pyrenees, the Indian Ghats, the Rocky Mountains of America, and similar Localities.
5. On Peculiarities in the Systems of Construction adopted for Railways in different Countries.
6. On the Principles which should be observed in laying out the Streets and Thoroughfares of Towns, or of the successive Extensions of large Towns and Cities.
7. On the most suitable Materials for, and the best Mode of Formation of, the Surfaces of the Streets of large Towns.
8. On the Advantages and Disadvantages of Subways, for Gas and Water Mains, and for other similar purposes.
9. Accounts of existing Waterworks, including the Sources of Supply, a Description of the different Modes of collecting and filtering Water, the Distribution to the Consumers, and the general practical Results.
10. On the Principles applicable to the Drainage of Towns, and the Disposal of the Sewage.
11. On the Employment of Steam Power in Agriculture.
12. On the Theory and Practice of the Modern Methods of Warming and Ventilating large Buildings.
13. On the Supply of Gaseous Fuel in Towns for Heating Purposes.

HALIFAX BENEFIT BUILDING SOCIETY'S OFFICES COMPETITION.

SIR,—As a competitor in the above-named competition (the drawings for which were sent in in February last, under motto), will you allow me the privilege to suggest to the committee, through your columns, the desirability of advertising the rotation in which the respective designs will be taken until one is found which the author can carry out for the amount of his estimated cost; and, if the designs are numerous, of returning a number of those lowest on the list to their authors? My reason for suggesting this is, that during the eight years which have elapsed since the designs were sent in, all the information we have obtained has been through a letter in your columns nearly three months ago, in reply to a previous letter of inquiry, in which the author of design had been chosen, but the author could not carry it out for the amount of his estimate, and that a second design had then been chosen, and the author placed upon his trial on the point in which the first failed. Of course the principle is all that can be required, but the means of carrying it out do not seem to be quite so well considered.

SUPPENSE.

SASHES.

SIR,—In a recent impression of the *Builder*, I note, under the above heading, the remarks of a "Working Man," who states, "He has seen in the Museum of Patents, South Kensington, some sashes by Mr. Bullivant, which he approves." During the building of a house for myself, I brought consideration to bear upon every appliance I thought to be necessary to the health and comfort of my family. Although I may have made many mistakes (which my friends may avoid), I have no reason to regret having adopted Mr. Bullivant's sashes. They are free from all the objections urged against the old-fashioned sliding sashes. They are perfectly air-tight, work easily, are free from all rattle, and they also possess that long-desired advantage—impunity of removal (from the inside), for cleaning or other purposes. Were these sashes generally adopted, many distressing accidents would be avoided.

GEORGE JENNINGS.

MAN THE BOATS.

THE complications of Mr. Ambrose's apparatus seem to me to condemn itself. I will endeavour to describe Cooper's, premising that I never saw it but once, and that about fourteen years ago. Boats are commonly hung over a ship's side by a pair of davits, which are simple two cranes. A ring-bit is fixed through the fore-foot, and another through the stern-post of the boat with a single-block permanently strapped on each ring. A stout rope pendant is fast to each davit-head, rove through the blocks, and continued round a roller (one over, the other under), which is fixed across the boat's amidships, the ends being simply tacked through a hole at each end of the roller. Another rope is fast to a staple on the roller, and lies coiled away in the stern-sheets. When ready for lowering, the boat's crew sit in their places with the oars tossed ready to drop in the water; the roller is shipped for use, the pendants are wound up on the roller, the weight of the boat being dependent on them, and the third rope, which keeps the roller from revolving, is taken round a post fixed to the after-thwart, and held by the crew. At the word the coxswain eases his rope, the roller revolves and the pendants unwind, the lowering rope being wound up turn for turn on the roller as the pendants wind off. As soon as the boat takes the water, the coxswain throws the turn of the rope off the post, the roller revolves freely, the pendants unwind by the weight of the boat, and the boat (not being fastened) leaves the roller, slips through the blocks, and the boat is clear of the ship. The crew drop their oars into the water, and the roller is taken out

of the crutches in which it worked, and stowed away. For hoisting the boat, a third and larger davit is provided, fixed midway between the other two, to which is attached the ordinary double or treble purchase tackle. A rope sling is hooked by four legs to each bow and quarter, the large eye from which the legs radiate being hooked to the lower block of the tackle. The danger in hoisting is considerably reduced by the boat being hung from the centre, and the power employed being concentrated. The danger and also labour might be further lessened by taking the fall from the davit head straight up to the mast-head, and down to a crab winch, or in a steamer through the deck to a drum in the engine-room. I describe from memory, but trust I am understood.

F. T. MULLETT.

[Here the discussion may end.]

STEAM ROLLER WORK.

A REPORT on work performed by the steam-roller in Marylebone has been made by Mr. Greenwell, the chief surveyor. The roller was hired from Messrs. Aveling & Porter for a month on trial. It was a fifteen-ton one. The report says—"The total number of yards rolled in thirty days was 23,145, and the expense of hire of roller, fuel, and water, 711. 17s. 11d., which, after deducting for time expended for raising spikes, shows the cost of rolling to have been 2 67 farthings per superficial yard. The expense would be reduced by purchase, at least 30 per cent. The price varied considerably in the several streets, ranging from 1 04 farthing in Devonshire-street, where a considerable length was open with few hindrances and little traffic, to 4 08 farthings in Paddington-street, where only a short length was open with interruptions by traffic, and the material much cut up by heavy vehicles. From data as to the cost of rolling by horse labour, I find the average of a considerable number of streets to be a little under two farthings per yard, and more recently York-place and Townshend-road cost respectively 2 39 farthings and 3 49 farthings per yard. This shows horse-rolling to be nominally cheaper; but the vast superiority in every way, now almost universally acknowledged, of the work done by the steam roller, will prove the latter to be far the more economical. Less labour is required by sweepers, and less mud is removed by their operations than from the old system of coating macadamised roads. During the night-rolling which was introduced into Gloucester-place and Baker-street, the inhabitants of the locality who noticed a rough and almost impassable way in the evening, were agreeably astonished to find a road ready for their use in the morning.

ROYAL ARCHITECTURAL MUSEUM.

THE museum is re-opened, and convenience for study afforded, both daily from 10 to 4, and on the evenings of Tuesday, Thursday, and Saturday, from 7 to 9.30. Those who may care for systematic teaching in the various branches of architectural art may carry out their wishes at a trifling expense by joining the classes now formed in one of the rooms of the museum. We are informed officially, that during the recess the collection has been partially re-arranged, and the upper gallery has been railed round, and access to it obtained by a permanent staircase. This gallery will now be occupied by a collection of casts from Amiens and other places, and it is hoped, by a selection from the Royal Academy. The catalogue will then be proceeded with, and a copy sent to each member. From this architects will be able to point out to their pupils the particular objects they may wish them to study without themselves visiting the museum, and the selections of casts of which copies are required, and for supplying which arrangements are now complete, will thus be facilitated. New subscribers are earnestly invited.

CHURCH-BUILDING NEWS.

Rickmansworth.—The first stone of a district church at Croxley Green, in the parish of Rickmansworth, has been laid by Lord Ebury. The site is a triangular piece of ground, shaped by three roads. The architecture is Early English. The nave will be 63 ft. long, 25 ft. wide, and 40 ft. high; the chancel, 30 ft. long and 20 ft. wide. There will be a reredos forming an arcade running along the east wall; on the north side the vestry and organ-chamber; and on the south a porch. The tracings of the doors and windows will be of Donington stone, and the roof of Staffordshire tiles, diaper pattern. A small tower will be surmounted with a spire, covered with Staffordshire tiles. It will be 83 ft. high, and is

designed for bells. The contract is taken for 2,318l., by Mr. S. Clark, of Bath. Mr. John Norton, of London, is the architect. The total sum already subscribed is 2,200l., and about 500l. more are required.

Heaton Norris.—The alteration and enlargement of St. Thomas's Church, Heaton Norris, have been effected, and the edifice re-opened. Two hundred additional sittings have been provided; the whole effect of the exterior and much of the interior of the church altered; and many necessary repairs effected, for between 900l. to 1,000l. Externally, the sharply-pointed Gothic has been brought into harmony with the nave, and the whole made to look like one tolerably harmonious whole. Additional sittings are obtained in the corners between the transepts and the shallow chancel. The old transepts have had new roofs, new timbers, and new slating. The old roofs were much out of repair, and the ceilings over the galleries came down so low that they could easily be touched with the hand. The new roofs are open to the top, and the gallery seats are consequently much more airy and comfortable. The north and south transepts are gabled, and have, externally, a dignity which before was wanting. The new chancel aisles are also gabled, and a few buttresses added where required. The old bulbous-looking belfry, in the last stage of dilapidation, is replaced by a new and larger turret, covered with oak shingle, and surmounted by a cross and weathercock. It is divided and arranged to contain two bells: one cast by Mears, of London, is already hung. A large gabled porch has been built over the north door of the nave, and another over the door of the north transept. The two west doors have wooden gabled projecting roofs over them. All these features have done something towards giving church-like effect to a building which, three months ago, had not a vestige of either. A greater difficulty remained with the old round-headed windows. These have now all been filled with stone tracery, mullions, and jambs of a kind designed in detail to suit the old round-headed frames, and yet such as would consist daily with the chancel of a few years ago. The new pews are of a more comfortable shape than the old, and places for hats, &c., have been contrived under the seats. The low flat ceiling of the nave, opposite to and joining the transept, has been removed, and an open roof substituted. The glass has been taken from the old window openings between transepts and chancel aisles, and the space filled with wrought-iron ornamental grilles or scroll-work. The contractor was Mr. T. Darnbrough, and the architects were Messrs. Medland & Henry Taylor, of Manchester.

Torington.—The church here has been restored and re-opened. Upwards of twelve months ago it was closed to undergo the necessary work of restoration. Mr. Ewan Christian, of London, architect, was called in professionally, and he prepared the plans and drawings. The sole contractors engaged were Mr. Pape and Mr. Watson, both of Beverley, the former to carry out all the masonry, the latter to complete the joiners' work. Mr. W. R. Dick was clerk of the works. On commencing operations the first duty was to clear out the internal fittings of the edifice, which were of the old-fashioned and inconvenient sort. The walls were attended to where required, and pointed throughout. The tower needed restoration. The repairing of it is still going on. The principal work in connexion with the tower is the restoration of the embattled parapet, and providing it with eight carved pinnacles. The south wall of the nave is of Saxon work, having in a fine state of preservation herringbone masonry, which has not been interfered with. To this part of the church has been added a south aisle, which is approached through an arcade, in order to correspond with the north aisle on the opposite side, which is divided from the central part of the nave by Norman arches. It is supposed that on the ground where the new south aisle is erected there formerly stood an ancient chantry. The roofs are entirely new, that covering in the chancel is Pointed Gothic in design, with moulded ribs and panels and carved bosses. The nave and aisle roofs are open-timbered and high-pitched, the timber being stained and varnished, and the whole covered with Westmoreland slates. A new porch has been built at the south end of the nave immediately adjoining the tower. The flooring of the edifice has been entirely relaid in concrete; that of the nave is of dressed stone, and that of the chancel is laid with Minton's coloured tiles, intermingled with encaustic tiles

within the sacarium. The seats are of deal and open, having square ends pierced with quatrefoils and other ecclesiastical devices, and book-boards are also provided. In the winter season the church will be warmed with hot air by Mr. Hadon, of Trowbridge. The windows are filled in with plain glass. The new one in the south aisle is of three lights, with quatrefoil heads. The east window is of three lights, and is supplied with stained glass by Hardman, of Birmingham. The centre light represents the Resurrection; the side lights are illustrative of the Good Samaritan and Dorcas distributing raiment to the poor. The church originally could seat 230, but by the new style of pewing adopted in the restoration, the sittings will accommodate 320, or an addition of 90. The expense incurred by the restoration will be about 2,200l.

Tamworth.—The foundation-stone of a new church has been laid at the little hamlet of Dosthill, in the parish of Kingsbury. The new edifice cost about 850l. The design was by Mr. Holmes, of Birmingham and Burton-on-Trent, architect. The site was given by the vicar of the parish, the Rev. C. T. Cary. The building will be of stone, and is dedicated to St. Paul. The old chapel will be used as a Sunday-school.

Kniveton.—The old church here has been restored, if we may so term it. Portions of the edifice are of the Norman period. A part of the east wall, which was in a very dilapidated state, has been rebuilt, and nearly all the walls re-pointed, and at the corner of each coigns have been placed. The whole of the exterior has been recoloured. Round the eaves of the roof 'tonguing' has been placed, for draining into an adjoining brook. The steeple has been repaired, and the nave re-gilt. The porch has been renovated. Two iron gates have been placed in the entrance, the floor re-paved, and the rough stone seats removed and replaced with oak benches. In the interior of the edifice the aisle has been newly paved throughout, and plain open seats have taken the place of the old-fashioned pews. The old pews have been removed from the chancel and stalls for the clergy and the choir have been substituted. The old Communion-rails have been removed from the chancel, and new ones, composed of iron and oak, have taken their place. The ironwork has been painted blue; the ends, of the forms of the *fleur de lis*, are gilded. The ceiling of the chancel has been coloured, and dotted with gold stars. In the nave the ceiling has been cleaned, and the beams have been stained dark oak colour. The front of the old gallery has been lowered, and open seats have been substituted for the old pews. The bottom of the tower, which was formerly used as a coal-cellar, has been converted into a vestry. Previously there was no vestry, the clergyman being obliged to robe in the presence of the congregation. For the evening service the church is lighted with three-branched candlesticks, placed at the end of every other seat. The east and also two of the chancel windows have been glazed. The churchyard is in a very bad state. The ironwork of the alterations is the work of Mr. G. Webster, an inhabitant of the village, and we believe the whole of the other work has likewise been executed by Kniveton artisans.

Thorndon.—The parish church of Thorndon All Saints has been re-opened. The flint work of the west wall has been re-pointed. Some shabby patches of brickwork on the north side still call for removal. The roof has been restored as a wagon-roof of the Decorated period. A deep moulded cornice, with ball-flower, and other ornaments in the principal hollow, marks the edge of the wall-plate from which the spars spring. The timber used is yellow deal, varnished. In restoring the roof the architect followed the pattern of the old one, of which about 20 ft. remained in its original form at the west end of the nave. At the point where the chancel commences is a semicircular rib, springing from stone corbels representing angels, and this is all that breaks the uniformity of the appearance of the roof from east to west. New benches have been made throughout the church. They are all of oak. The old poppy-heads were preserved, and used as far as possible, and the new ones were carved to resemble them. The west end has a four-light Decorated window: the mullions had been replaced with cast-iron bars, all of which have been restored with stone. The reredos is new. It is a carving in oak in three compartments, or three canopied niches. The style followed in the details is that of the Decorated period. The north niche has the *Agnus Dei* carved on a diapered ground, and the one on the south side the pelican. The centre and

largest recess is filled with a representation of the Lord's Supper. This work was designed by the architect, and the carving was executed by M. Abalos, of Louvain. The recesses was presented to the church by Mr. Bridges, a relative of the rector's. The church is lighted at night by a series of standards, each of which holds three candles. These are placed in the nave, on the backs of the benches, and in the chancel there are other candles arranged in groups on each side on coronal burners. An apparatus for warming, by Gedgey, of East Dereham, is fixed beneath the floor of the nave. The total cost of the works recently completed is about 1,100*l*. Mr. R. M. Phipson was the architect.

Thorpe Morieux.—The church here has been reopened, having undergone considerable repairs and improvements. The walls were in part ruinous and declining from the perpendicular, the roofs were almost unsafe, the fittings discreditable, the area was blocked up by high pews and a western gallery, and altogether it was just falling into decay. Contracts were entered into for the restoration, at a cost of nearly 1,500*l*, from designs by Mr. J. D. Wyatt, architect. Mr. H. W. Andrews, of Bury, undertook the contract for the general carcass. Mr. Dinkin, of Bury, was clerk of the works, and executed the pulpit, screen, and altar-rail and table. The tiles for the floor were from Mr. Godwin, of Hereford; the new stained-glass windows were of O'Connor; the brass lectern was supplied by Hart & Sons, London; and the warming apparatus (hot air) by Sidney, of Dereham. The stone carving was by Farrants, of Bury. The church is of three different styles of architecture, which are more distinctly marked than in many buildings. The chancel roof is a wagon panelled one, that of the nave is open-timbered. All the walls were attended to and partly rebuilt, the rubble and stone quoins shown externally, and the walls re-plastered inside. The church is now floored, different patterns being worked in in the sacra-mentum. Several slabs of the Harrison family have been preserved *in situ* as far as possible. The church is built on a slope downwards from the tower, so that the seats in that part appear when looked at from the east end arranged as a graduated gallery. The new seats have finials of quatrefoils and flowers. The chancel seats have poppy-heads. Some of the fragments of carving found in different places have been worked into a dwarf rood-screen. It is intended as money shall come in to stencil the walls and introduce new paintings and colours.

Cardiff.—The completion of the spire of Canton Church has been celebrated. The church, itself was built about ten years ago, but the funds were not sufficient to complete the chancel and the chancel arch was bricked up, service being carried on in the nave only. About two years ago an effort was made to complete the edifice, by the erection of a chancel, surmounted with a tower and spire, and externally this work has been completed, from a design by Mr. W. P. James, architect, the original idea being to place the spire and tower over the western and not the eastern portion of the edifice. The work has been carried out in conformity with the original style of the church, which is Norman, the tower and spire being built with Newbridge stone and Bath stone dressing.

Lelant.—The ancient church of Lelant, which is situated on the edge of the sandy townships whereover Hayle, has been reopened for divine worship, after having undergone partial restoration. The church, which is very old, some part of it having been built in the twelfth century, had become much dilapidated. The work of restoration was undertaken by Messrs. Bone & Son, of Liskeard, the architect being Mr. John Sedding, of Bristol and Penzance. The interior of the church first demanded attention, although some parts of the roof were in as sorry a plight. The centre pews have been removed and replaced by lower and open ones of oak. The chancel has been much improved, the flooring having been laid with tiles, and new screens put up. The pulpit, which was a clumsy, old-fashioned structure, has been removed for the time. Several of the old pews still remain. Up to the present time 220*l*. have been expended on the work. The other necessary repairs will be completed as soon as the funds are forthcoming.

Strasbourg Cathedral.—Not simply the restoration, but the completion of the cathedral is already being discussed. On the restoration of peace it will probably be attempted.

Books Received.

Polychromatic Masterpieces of Monumental Art in Italy from the Fifth to the Sixteenth Century. Represented by Twelve Perspective Views in Coloured Plates by HENRY KOHLER, Royal Commissioner for Art-building and Teacher of Architecture in the Polytechnic School at Hanover.

This work, the publication of which has been commenced by Mr. Baumgaertner in Leipzig, promises to be remarkable. Improvements in chromo-lithography have given us many fine works, such as "L'Architecture Polychrome chez les Grecs," by Hittorff; "The Grammar of Ornament," by Owen Jones; "Specimens of Ornamental Art," by Gruner; "Ornaments and Painting from Pompeii," by Zahn, and the "Italian Frescoes" published by the Arundel Society. But, as the publisher points out, we have no work showing complete buildings or apartments, giving the entire effect characterizing them. The book, of which the first part is before us, will, as a first instalment, include twelve artistically-finished perspective and, at the same time, coloured representations of the polychromatic masterpieces of Italy, which justly enjoy the admiration and universal acknowledgment of the civilised world.

The first number, containing plates representing the interior of the Camera della Segnatura and the interior of St. Peter's at Rome, executed in the ateliers of Messrs. W. Loelliot and Winkelmann & Sons, in Berlin, is before us, with letter-press in German, French, English, and Italian, giving a concise explanation of the plates. On completion of the numbers, the work is to be furnished with an introduction in the same four languages, setting forth in a critical manner the polychromatic treatment of the Italian monuments in its historical and æsthetical development.

The second number is to contain plates representing the Sistine Chapel and Stanza of Heliodorus, and is to appear in the course of 1870. We shall be able to speak more at length when the work is further advanced. Suffice it at present to say that the two views issued are admirable specimens of the art, careful in detail, and exquisite in tone.

We understand copies can be seen and purchased on application to Mr. T. W. Maynard, at the rooms of the Arundel Society.

Ardfert Cathedral, in the County of Kerry. Measured, drawn, and lithographed by ARTHUR HILL, B.E., Architect, 22, George-street, Cork. 1870.

In May of the present year the Institute of British Architects awarded a medal of merit to Mr. Arthur Hill for measured drawings of several ancient buildings in Ireland, submitted in accordance with the regulations of their annual dance with the regulations of their annual offering prizes; and these, under the general heading, "Ancient Irish Architecture," Mr. Hill proposes to publish. Ardfert Cathedral, now before us, is the first, and the Church at Kilmalkedar, near Dingle, and that of Temple-na-hoe, Ardfert, will follow. The illustrations of Ardfert Cathedral comprise a series of ten plates, 17 in. by 13½ in., lithographed by the author; six photographs, and descriptive letter-press, illustrating the architecture and present condition of the building. The main part of it is of the thirteenth century, with the west door of a previously-erected building, probably twelfth century. The door-head is semicircular, and has a rougher discharging arch above it, with key-stone, which takes a pointed form, and may have been put in afterwards. The choir is lighted by a lofty triplet at east end, and a range of nine lancet-headed windows on the south side. The drawings are executed with firmness and precision, and the photographs in the copy before us are particularly good. We wish Mr. Hill success in his undertaking.

Miscellaneous.

Laying the Foundation-stone of a New Masonic Hall in Newcastle-on-Tyne.—A suitable site having been obtained in Maple-street, plans for the building were prepared by Mr. J. Johnstone, architect, and a contract for the work entered into with Mr. W. Foggins. The building is now being proceeded with, and the foundation-stone has been laid with Masonic ceremony.

The Metropolis Valuation Act.—A document, issued from the Home Office, has been received by the local authorities throughout the metropolis, announcing the appointment of the General Assessment Sessions, under the provisions of the Metropolis Valuation Act, in Middlesex, in the City of London, and in those portions of Surrey and Kent enumerated as being within the metropolitan area. Also the orders and regulations of Court naming the respective persons appointed to hear appeals, fixing the tables of fees payable by appellants, &c. At a Court held under the presidency of Sir W. H. Bodkin, it is ordered that in every appeal to a special sessions from a decision of an assessment committee, the appellant with one security is compelled to enter into recognisances in the sum of 20*l*. before a justice of his district, for the due prosecution of the appeal and payment of costs ordered by the Court, but it is not to apply to any assessment committee, overseer, or surveyor of taxes. On every appeal from either assessment committee or special sessions to the "Assessment Sessions," every appellant with his securities must give at least 50*l*. recognisances for expenses and costs. All appeals to be entered by petition to the "Assessment Sessions" by the 14th January following the final approval of a valuation list by an assessment committee. The list of fees payable is formidable, especially as regards the "Assessment Sessions." Indeed, so exorbitant are the fees for hearing, &c., that it is scarcely likely many of the ratepayers will carry their grievances to so high and expensive a tribunal as the "Assessment Sessions," but will content themselves with the decision of the special sessions or assessment committee.

The New Workhouse, Upper Holloway.

The new workhouse now in course of erection in Upper Holloway, for the parish of Islington, is destined to give the guardians a little more trouble than they had bargained for. It is generally admitted the building ought to have been finished long ago. Why it has not yet been completed and handed over to the guardians for occupation is a question which the indignant ratepayers would be very glad to have answered. But there seems very little chance of their being informed of the cause. It is well known that serious differences exist between the architect and contractor. Recently, whenever the solicitor or architect appears before the Board with reference to the building, the guardians resolve themselves into committees, and thus, in excluding the reporters, prevent an anxious public from knowing what is being done. Some ugly rumours are already afloat that the cost of the building will largely exceed the estimate, and that possession will not be obtained without expensive litigation.

An Opera House for Wolverhampton.

The people of Wolverhampton have now an opera house. This has come about by the spacious and convenient room of the Exchange having been adapted by scenic erections to the purposes of theatrical representation. Mr. Hand, the secretary of the Exchange Company, has been joined by Mr. Leonard, decorator, of Chapel Ash, and they two are making the venture. The scenic arrangements are those of Mr. Leonard himself, many years decorator and scene-painter at the Dublin Theatre.

Fire at the Gaiety Restaurant.—The other evening a cloud of smoke issuing into the Strand from some cellars under the wine department of the Gaiety Restaurant announced that a fire had broken out below. It was soon found that some straw and packing-cases had become ignited; but, as it was known that there was nothing of an inflammable nature in the construction of the lower story, there was no fear that either the upper part or the theatre was in danger. A similar alarm was caused by fire in these cellars some time ago.

Demolition of the Old Borough Gaol.

Hull.—The chairman of the local Gaol Committee reports that there have been taken up from the foundations of the gaol 555,000 bricks, which have been sold at 1*l*. per thousand, nearly double the money they cost taking up and dressing. At the time the superstructure was being removed, it was suggested that the foundations would not be worth removing, but Mr. Symons (amid the laughter of the committee) said he believed there were nearly as many bricks underground as above, and suggested that they should be taken up. Mr. Symons may be congratulated on making so profitable a suggestion.

Tron Church, Edinburgh.—A large stained glass window, subscribed for by a few of the leading members of the congregation, has just been fitted up in this church. It is a triplet tracery window, divided by a transom, and contains six illustrations—the Annunciation to the Shepherds, the Worshipping of the Wise Men, the Presentation in the Temple, Christ among the Doctors, the Baptism, and the Sermon on the Mount. The subjects are all executed in the Mosaic style of glass-painting. The centre light contains the lamb and banner, and the side lights have angels in the attitude of adoration. The whole has been designed and executed by the Messrs. Ballantine. The window, which will cost about £701, is on the east side of the church, and looks out upon the South Bridge. There is some likelihood of the window on the other side being also filled up soon.

Settling down of a Steamer on the Stocks.—At Low Walker, near Newcastle-upon-Tyne, a number of riveters and painters were busily engaged in putting the finishing touches upon a small screw steam-vessel, about 500 tons burthen. Several of the riveters who were working at the hull incautiously removed too many of the blocks on which she stood in order to facilitate their operations, when she started forward as if being launched, the shores sprang away, and owing to the inclination on which vessels are built, she settled to the earth, a distance of about 3 ft., and so quickly and easily that a casual passerby would not have observed that the vessel was in other than its proper position,—but crushing in its descent a number of the workmen. Four men were killed on the spot, and nine dangerously injured, besides four slightly injured. Such was the force with which the vessel fell, that it crushed those it killed into the earth, from which they had afterwards to be dug by means of spades and other implements.

The Alexandra Palace, Muswell-hill.—A meeting for the promotion of Mr. Fuller's tontine and art-union association scheme for the establishment of the people's palace in the north of London, has been held at Wood-green. Mr. Fuller explained his proposal, of which we have before spoken, and Mr. Scott Russell and he explained how they, in association with Mr. Cole, C.B., assisted the Prince Consort in establishing the '51 Exhibition, and its building, which Mr. Fuller and Mr. Russell also managed, with a few others, to have re-erected at Sydenham. It was finally resolved—"That this meeting, having heard the plan proposed by Mr. F. Fuller, for opening the Alexandra Park and Palace, hereby declare its opinion that the project is practicable and well worthy of adoption, and request those gentlemen who shall enter their names as subscribers for shares, to act as a Wood-green Committee for carrying out the proposed scheme." The capital proposed to purchase and complete the building ready for opening is 605,000*l.*: too large a sum.

Rochester New Corn Exchange.—The corner stone of a new Corn Exchange has been laid by the mayor, who subsequently opened the Castle grounds, which had been acquired on a long lease from Lord Jersey, to be formed into a recreation-ground for the use of the citizens. The corporation take charge of the Castle and grounds, and will bear the expense of maintaining them in order; but the cost of laying out the grounds—2,000*l.* or more—will be met by public subscription, a large sum having been already promised. The new Corn Exchange, a large building, is being erected in the rear of the present Corn Exchange, which will serve as an approach from the High-street to the new building. There is no opportunity for effective display on the exterior of the new building, from its situation; but the great hall in the interior will be a fine one, while in other parts there will be a library and a variety of offices. It will cost 5,000*l.* or more.

Free Library and Museum, Middlesbrough.—At a meeting of secretaries and other representatives of various lodges and trade societies in the town of Middlesbrough, the following resolution was carried unanimously:—

"That this meeting heartily approves of the proposed free public lending and reference libraries, newsroom, and museum, and that the representatives of the various societies here present, agree to bring the subject before their respective members at an early date, in order to ascertain their feelings and wishes on the question, and that they will report the same to the chairman of this meeting."

Gift of a Marble Statue to Hull.—At a meeting of a sub-committee to decide as to the position to be occupied by the marble statue which Mr. Sheriff Leetham has promised to present to the town of Hull, one of the niches in the porch of the Town-hall has been fixed upon. The work of preparing the statue has been given to Mr. W. D. Kayworth, jun., of Hull and London. The statue will be one of Michael de la Pole, first Earl of Suffolk, and Lord Chancellor, son of Sir William de la Pole, whose statue already adorns the Town-hall.

Working Men's College, Great Ormond-street.—The new term has commenced, and the men are at work again. The programme of Art Classes shows the following arrangement:—Monday and Friday—Life class: visitors, Mr. Lowes Dickenson and Mr. W. Cave Thomas. Monday—Antique class: teacher, Mr. Cave Thomas. The Elementary classes are:—Tuesday—Pencil and chalk; Thursday—Water colour, Mr. G. Rosenthal. Wednesday—Ornament and Perspective class, Mr. W. H. Brewer. We hope to hear of a large number of members joining.

The late Mr. Edward Cresy.—We hear with great regret of the premature death of this gentleman, who was principal assistant clerk at the Metropolitan Board of Works, and architect to the Fire Brigade. The various buildings lately put up for the Brigade were erected from his designs. He was private secretary to the late chairman, Sir John Thwaites, and did good service. His father was well known in the profession, especially by his "architectural antiquities of Rome," published in conjunction with Mr. G. L. Taylor.

TENDERS.

For alteration of beer-vaults in Waterloo-road, Brompton. Mr. W. Ebbv, architect:—

Bennett & Cooke	£432 0 0
Sidley	405 0 0
Brindley & Critchlow	381 0 0
Hall	335 0 0
Lambrook	280 0 0

For alterations and additions to Guildhall and Assembly Courts, Swansea. Mr. C. J. Phipps, architect. Quantities by Mr. Tasker:—

Morgan	£3,750 0 0
Williams	3,507 0 0
T. Hess	3,459 0 0
Thomas, Watkins, & Jenkins	3,109 0 0
J. O. Rees	2,945 0 0
White	2,750 0 0
Everal (accepted)	2,675 0 0

For completing six houses, Berridge-road, Gipsy-hill, Norwood, for Mr. James Lord. Mr. H. A. Alexander, architect:—

Water	£1,250 0 0
Potter & Ferriss	1,250 0 0
W. H. & J. Mansbridge	1,200 0 0
Parker	1,000 0 0

For the erection of Welsh Congregational Chapel, Shirland-road, Paddington. Mr. P. Wilkinson, architect:—

Brass	£2,013 0 0
Richards	2,717 0 0
Temple & Foster	2,505 0 0
Ebb & Sons	2,423 0 0
Thompson & Smith	2,327 0 0

For stable buildings, enclosure walls, &c., Dudley House, Nightingale-line, Clapham, for Mr. H. C. Green. Mr. M. P. Notley, architect:—

Maxwell & Sons	£297 0 0
Notley	919 10 0
Easton & Chapman (accepted)	893 0 0

For lodge at Egham, Surrey, for Mr. J. K. Farlow. Mr. R. P. Notley, architect:—

Oades (accepted)	£425 0 0
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For the erection of a villa residence at Hampstead, for Mr. J. Harvey. Mr. W. A. Dixon, architect:—

Eaton & Chapman	£3,695 0 0
Higgs	3,612 0 0
Manley & Rogers	3,455 0 0
Mann	3,455 0 0
Henshaw	3,385 0 0
Wicks, Bangs, & Co.	3,280 0 0

For erection of church, schools, and house, Skinner-street, Bishopgate-street, for the inhabitants of St. Botolph, Bishopgate. Mr. E. N. Cotton, architect:—

Sir-pson	£5,619 0 0
Jackson & Shaw	6,420 0 0
Palsson	6,425 0 0
Abby & Sons	6,465 0 0
Corder	6,191 0 0
Prichard	6,187 0 0
Henshaw	5,835 0 0
Erass (accepted)	5,820 0 0

For extension and alteration to premises, connected with the Gas-pipe works, for Messrs. W. Wright and Others. Mr. J. Collyer, architect:—

Vickers	£500 0 0
Hackett	478 10 0
Shepperson	454 0 0
Andrews (accepted)	426 0 0

For the erection of premises, Nos. 4 and 7, Hart-street, for the City of London Property Company. Mr. A. B. Crockett, architect. Quantities supplied by Mr. Cubitt Nichols:—

Turner	£2,474 0 0
Trollope	2,170 0 0
Hill & Keddell	2,160 0 0
Coleman	2,160 0 0
Myers	2,148 0 0
King & Sons	2,067 0 0
Macey	2,059 0 0
Newman & Mann	2,044 0 0
Rider	1,936 0 0
Abby & Horner	1,930 0 0
Brass	1,883 0 0
Corder	1,750 0 0

For dwelling-house and shop at Careham, Surrey, for Mr. Woollett. Mr. R. Martin, architect. Quantities supplied by Mr. F. Sparrow:—

Scribner	£233 0 0
Brown	575 6 4
Hunter	567 0 0
Jarrett	546 0 0
Ward	535 0 0

For rebuilding warehouse, 108 and 107, Shoe-lane, for Messrs. J. & B. Delagans. Mr. R. Parkinson, architect:—

Anley (accepted)	£3,020 0 0
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For a warehouse, to be built in Old Swan-lane, Upper Thames-street, City. Mr. H. R. Abraham, architect. Quantities by Mr. Pether:—

Myers & Sons	£1,960 0 0
Brown & Robinson	1,910 0 0
Holland & Hannan	1,884 0 0
Merritt & Ashby	1,787 0 0

For Waterworks at Kidderminster:—

Goodman & Burton	£5,146 0 0
Dixon	3,693 0 0
Everal	3,485 0 0
Hilton (accepted)	2,830 0 0

For Croydon Cemetery. Mr. Baldwin Latham, engineer:—

Stevens	£2,337 0 0
Dickinson & Oliver	2,140 0 0
Anderson & Dunmore	1,768 0 0
Cole	1,760 0 0
Wright	1,615 0 0

For rebuilding premises, No. 19, Albert-terrace, Knightsbridge. Mr. Dudley, architect:—

Scyer	£1,352 0 0
Railton	1,324 0 0
H. Kelly	1,285 0 0
Byth	1,281 0 0
Turrel	1,247 0 0
Blackman & Morley	1,223 0 0
Fulson	1,195 0 0
Scrivener & White	1,184 0 0
Snowball	1,167 0 0
Shi Lito	1,135 0 0
Basham, Brothers	1,115 0 0
Tiley	1,090 0 0
Perry	1,024 0 0
Gough	991 0 0
Hurst	887 0 0

For villa residence, Warley-street, Nottingham, for Mr. J. A. Howitt. Mr. J. Collyer, architect:—

Ward	£1,238 0 0
Mariott & Co.	1,231 0 0
Acton	1,229 0 0
Lynam	1,210 0 0
Curtis	1,205 0 0
Bell & Son	1,189 0 0
Burton	1,180 0 0
Vickers	1,169 0 0
Slm (accepted)	1,125 0 0

For house at Lenton, for Mr. J. Thorpe. Mr. J. Collyer, architect:—

Marshall	£842 0 0
Smith	896 16 0
Pringley	880 0 0
Attenborough	881 0 0
Jolley	869 0 0
Vickers	870 0 0
Slm (accepted)	861 0 0

For house and business premises, Park-row, and Derby road, for Mr. Bellaby, dentist. Mr. J. Collyer, architect:—

Selcwick	£1,793 0 0
Johnson	1,070 0 0
Ward	1,067 10 0
Mariott & Co.	1,061 0 0
Attenborough	1,040 19 0
Underwood	1,039 0 0
Bell & Son	1,034 0 0
Vickers	1,030 0 0
Je. et	881 0 0
Slm	884 0 0
Andrews	966 0 0
Marshall (accepted)	954 0 0

For alterations and additions for warehouses at Bedford-street, Covent Garden, for Mr. F. Dangerfield.

A. Cross, architect. Quantities furnished:—	
Patman & Fotheringham	£3,199 0 0
Cole & Son	2,974 0 0
Kelly, Brothers	2,913 0 0
Newman & Mann	2,929 0 0
Clemence	2,907 0 0
Howard & Co.	2,617 0 0

For alterations and additions to warehouse at Bedford-street, Covent Garden, for Mr. C. Hodgson. Mr. A. Cross, architect. Quantities furnished:—

Newman & Mann	£1,235 0 0
Patman & Fotheringham	1,228 0 0
Kelly, Brothers	1,147 0 0
Cole & Son	1,136 0 0
Howard & Co.	1,036 0 0
Clemence	992 0 0

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VOL. XXVIII.—No. 1447.



Settlement of the
Sewage Question.

It is high time that the sewage question should be settled. The subject is one of extreme importance, both from a sanitary and from an economical point of view. It is one which it is not especially pleasant to discuss. Pressing, with more or less incidence, on each of us, it yet involves con-

siderations which are hardly suited for ordinary conversation. From this natural disinclination to making use of the ordinary modes of collecting and diffusing information, additional obscurity is thrown upon a subject beset with chemical and with mechanical difficulties. Men who have studied the subject are apt, unless they are unusually reticent, to be regarded as bores. Thus the information which has actually been collected is, so to speak, stored up in tanks, instead of being allowed to filter through the public mind, and to leave that mass of ignorance which is dignified by the name of public opinion.

In this, as in all other so-called "questions," the first requisite is to arrive at the knowledge of actual facts. Facts, duly collected, and duly assorted, are the great foes of "questions." They exterminate discussion. They have an aptitude for arranging themselves under the form of laws. But facts picked up here and there, in order to supply weapons for argument, or props for foregone conclusions, are among the most dangerous sources of error. The light which, bearing on a well-known beacon, assures safety to the mariner, who knows its true bearings on his course, may lure the ignorant and unwary to shipwreck.

The object, therefore, at which it is essential to aim in this matter, is the appreciation of the actual facts which we have learned from the chemical and mechanical investigations of the last quarter of a century. They must be regarded not as isolated phenomena, but as a whole. They must be weighed, not according to their harmony with this or that pet hypothesis, or foregone conclusion, but as forming a special body of scientific information. When we thus investigate what is actually known, we soon find where our science is limited. We know in what direction to seek for further light; and we are in a position to tell whether the time for action has arrived, or whether wisdom commands us to await the results of further investigation. To that great body of our readers whose professional duties or habitual studies lead them to deal with the important questions of sanitary precautions, of town building, or of scientific, that is to say, of intelligent, farming, we think that it will be a matter of no small satisfaction to find how very nearly the great "Sewage Question," as we showed in our last issue, has really ceased to be a question at all.

To the historic part of the subject it is hardly necessary for us to return. It must be familiar to our readers. To commence by a review of the instructive cleanliness of the domestic cat, and to draw a parallel between the very praiseworthy habit of that animal and the detailed injunction of the great Jewish lawgiver, is not our purpose now. Years have passed since these illustrations, now public property, were first brought forward in our pages. Neither is it necessary to withdraw the decorous veil which the good taste of the printer's devil draws over the notes of those travellers who speak of Continental abominations. It is, happily, unnecessary to give any detail of the establishment and worship of filth in Portugal, in Southern Italy, in the country districts of France; or even to cite the venerable but ever commanding testimony of the author of "Waverley" as to the dangers of the nocturnal wanderer in the streets of Auld Reekie. The first procedure of nascent civilisation, whether it be a step in advance or no, in providing a special locality for refuse matter, has been long since passed under review. Mid-den heaps, stagnant ditches, open cesspools, heaps in cellars, covered cesspools, and tunnel middens, are known to be so many seed plots of typhoid fever and of cholera.

The lowering of the death-rate in towns where works and regulations destined to promote public health by promoting personal purity have been carried out, is a fact placed in evidence by the medical officer of the Privy Council. In twenty-five towns thus taken in hand the death-rate has been lowered in almost every case, and in many instances considerably so. At Cardiff it has been reduced from 33.2 per mille to 22.6 per mille. At Newport a similar reduction has been effected. At Merthyr Tydfil the reduction has been at the rate of 21 per cent.; at Macclesfield, 20 per cent.; at Croydon, the like amount. These figures refer to the general mortality. If we look to the special causes of death which are fostered into a virulent activity by neglected drainage and sewerage, we find that in nine towns the diminution in the number of deaths from typhoid fever has exceeded one-half, and in the remaining towns it has been between one-third and one-half; Bristol, with a reduction of 33 per cent., standing at the bottom of the list, and Salisbury heading the count with a reduction of 75 per cent.

In the case of epidemic cholera, the effect of proper sanitary measures is actually that of "stamping out" the pest. Merthyr Tydfil presents a very striking example. During the epidemic of 1848-49, cholera carried off 267 persons out of 10,000. During that of 1866 the number of deaths did not exceed 20 out of 10,000. Salisbury descended from a mortality of 180 to one of 14. Alnwick, from 205 to nil. Reduction in the number of deaths by cholera from sanitary works is not only a general rule, but a rule with no exception.

In the case of some other of the most obnoxious diseases that afflict mankind, the indirect influence of sanitary works in properly draining the subsoil has perhaps been more valuable than their direct effect. Phthisis has been diminished, in a more or less considerable degree, in consequence of the drying of the soil which has, in most cases, accompanied the laying of main sewers in the improved towns. In Salisbury, Ely, Ragby, Banbury, and other towns, where the drying of the subsoil has been considerable, the deaths from consumption have been reduced by from one-third to one-half of their number. In Leicester, where there was a great reduction in the subsoil water during the time the sewage works were in progress, the death-rate by phthisis subsided by 41 per cent. of its previous amount at all ages, and by 32 per cent. from the death-rate of females at the middle age of life. With a rise in the subsoil water since the completion of the works, the phthisis death-rate

has again somewhat risen, although it still remains far below its former amount. But in cases where impervious pipe sewers alone have been introduced, and where no alteration has been made in the level of the subsoil water, no decrease in phthisis has taken place. It must be remembered that the removal of the predisposing causes to any particular form of disease may cause the tendency of increasing the proportionate activity of other disorders, inasmuch as it leaves a greater number of the feebleness members of the population exposed to attack.

It is not only health and long life that are attendants on the work of the sanitary engineer, but, as we have a thousand times urged, decency, self-respect, and morality.

The influence of drainage, as distinct from sewerage, on the spread of phthisis is only one out of many facts that point to the duty of separating the works intended to remove the storm water and surplus rainfall from those properly belonging to the removal of refuse from the houses.

This part of the subject possesses an engineering importance of the first character, and it is one to which a proper degree of attention has been by no means yet directed. To the comparatively low and finely-distributed rainfall of the greater part of Great Britain it must be attributed, that we have hitherto been able to practise a false and deceptive economy in this respect. The sudden and hearty down-pour which comes upon our neighbours some ten degrees southward of our latitudes, is such as to demand adequate provisions for its discharge; and when southern cities make any attempt at sanitary engineering, they never complicate the subject by attempting to conduct a regular and an accidental flow of water through the same limited channels. Even in London we have, within the present year, found serious evil to result from that barbarous system of hydraulics. Its prevalence is, no doubt, a main reason that has led to the temporary failure of more than one attempt to apply the sewage of towns to the purposes of agriculture.

The seven water companies that supply London with water deliver through their mains the quantity of one hundred and seventy millions of metric tons in the course of the year, being at the rate of nearly thirty-two gallons per diem to each person. When we consider the absolute requirement of each person for purposes of food and of cleanliness, and remember how far the bath (even in its most convenient, and perhaps most refreshing, form of a sponge bath) is from being a universal requisite, it is pretty clear that nearly nine-tenths of the water supply must be mainly required for the service of the sewers. The dilution thus effected in their less limpid contents is upwards of a thousand per cent. For economic purposes this dilution is more questionable in its advantage than for sanitary purposes. Looking forward to the time when pumping will be requisite, in one locality or another, for all town sewage, it is clear that any undue or unnecessary dilution will cause a direct waste in the expenditure of steam power, and in the general magnitude and costliness of the hydraulic work, to say nothing (for the moment) as to the diminished value of the fluid.

Now a square mile, if covered with 24 in. of water (a low average rainfall) represents 1,728,000 metric tons. For the 122 square miles of the area of London (to say nothing of the much larger surface comprised within the surrounding watershed), this rainfall will therefore amount to 211,000,000 metric tons, or about 125 per cent. of the regular water supply. Thus for every four tons of ordinary discharge provision must be also made for five tons of extraordinary discharge. The first is spread over 365 days; the latter may be absent for three months, and then may come down, with a sudden energy, with the over-due supply, to make up

for loss of time. Economy, certitude, good order, all are set at naught by this combination of the regular and the irregular. The whole system of sewerage, including the pumping apparatus, may be suddenly called upon to perform thirty times its ordinary duty. The liability to such a sudden pressure must either involve enormous outlay, or present us with a system of drainage liable to break down whenever we are visited with a quasi-tropical shower. Nor does this view regard the abstract part of the system alone. Its reproductive, or self-supporting, part (for to that we must steadily look) will be no less seriously deranged. If the effluent fluid was worth 2d. per ton in dry weather, it will be worth scarcely anything on the day of such a storm as we have not rarely witnessed.

It is thus evident that by our present almost universal system of turning the general rainfall into the sewers, we commit an offence against both sanitary and economical law. We pollute at the spring-head the courses of our rivers, diverting to this evil purpose the whole of the storm-water for which we make provision in our towns. We involve great outlay, great incoherence, and incompleteness of action, in those works of sanitary engineering which must, sooner or later, be undertaken by all towns and centres of population. And, in previous soils, where the subterranean sewage, properly so called, must be carried in impervious conduits, to avoid contamination of the whole subterranean lake through which the drainage has to be led, we leave the district water-logged, and lose one important part of the sanitary benefits of drainage. At Chelmsford the separation of sewage and drainage is actually effected; the storm-water being carried off to the river by surface-channels and by superficial conduits, and the sewage being conveyed by pipe-drains to a pumping station at the lowest part of the town.

The system of water circulation, when once brought to comparative perfection, involves so much of what we may call wholesome luxury, is so conducive to health, and diminishes to so large an extent the amount of domestic labour (a matter which presses more heavily upon society from year to year) that no doubt can be entertained as to its future prevalence and general adoption. No other system will compare with it for a moment in these important characteristics. It is therefore sheer loss of time to give very minute attention to the subject of ash-closets, earth-closets, *fosses mobiles*, or any other less effective methods of keeping our houses sweet.

The destruction of fish, and the loss of one of the chief charms of rural life, by turning running streams into open sewers, are offences against social propriety under any aspect of the case. But when we consider how the germs of the most fatal diseases are thus scattered broadcast among the riverain population, there can be no room for doubt. Health, no less than comfort, bids us to imitate the process of organic life by keeping up a constant water circulation through our habitations. Health, and even safety, no less imperatively demand that we shall not, in so doing, poison the sources of our water supply. That we have done, and are doing, this to a considerable extent, there is not the shadow of a doubt.

The various processes that have been invented for the purpose of disinfecting the water which has served as scavenger to our great towns, before it returns to those natural channels by which it must alternately make its way to the sea, are many, and often are ingenious. One point to be borne in mind, as affecting this part of the subject, is, that we seek at the same time an æsthetic and an economical object, and that, in the pursuit, we have to contend with both mechanical and chemical difficulties. Taking the average diluted fluid which is produced, not for its own sake, but for the sake of cleanliness at home, the solid matters which we have to remove from it are partly mechanically suspended and partly chemically dissolved. Again, that which offends the nose is one thing, and that which endangers the life is another. It is possible entirely to remove the former, and yet to leave in the apparently pure and actually limpid water abundant germs of organic poison. The sulphuric acid, which imparts the most offensive character to animal refuse, forms about a sixth part of the solid ingredients. It is possible to lay hold, chemically, of this sulphuric acid (and, indeed, this is the chief object of the use of clay, alum, or other forms of alumina), without much affecting the organic matters, which

amount to nearly one-half of the solids. Thus we have to regard both product and loss, to see what elements of agricultural value we can educe, and, at the same time, to test chemically the purity of the effluent water. Under this double test, bearing in mind that the chemical processes employed are limited as to cost, almost every empirical system has broken down. We have filtration processes, precipitation processes, an A B C process; we have employed lime; lime and chloride of iron; carbonates and sulphates of lime and magnesia; per-salts of iron alone; superphosphate of magnesia; sulphate of iron, lime, and coal-dust; crude sulphate of alumina; sulphate of alumina, sulphate of zinc, fine charcoal and slaked quick lime; alum, blood, clay, charcoal, and manganese; all without a satisfactory result. There has been no lack of money for experiment, and costly works have in some places been undertaken, but no such success has attended the efforts, as all would so gladly welcome if attained. At Leicester and at Blackburn the River Pollution Commissioners report the failure of the lime process; at Chelmsford filtering tanks have been abandoned; at Northampton the employment of the lime and chloride of iron process has entailed an injunction from Chancery in protection of the river Nen; at Croydon the use of per-salts of iron has been tried and abandoned; at Cheltenham Dr. Bird's A B C process is about to be given up. Regarding the double requisites of economical result and purification of water, failure stares us in the face.

It is highly satisfactory, however, to find that, after all, the most effective and reliable is also the most simple and natural procedure. The purifying nature of the earth itself, a fact which underlies such methods as those of Mr. Moule and Dr. Bird, is the one grand feature from which hope may be derived. Sewage water, if filtered through a sufficient depth of soil, loses both its suspended and its dissolved elements of evil, and leaves them in the proper condition, as the nutriment of vegetable life. The fact is, that we must no longer regard the disposition and treatment of sewage as a distinct engineering question. It is a portion of the theory and practice of scientific farming. It holds closely to the important and hitherto-neglected subject of irrigation. It affords the means of converting a waste of blown sand into a luxuriant garden. It is a matter requiring due care, adequate capital, and intelligent adjustment to the soil and conditions of each district of the country; but, these being given, the result is no longer problematical. Everywhere evidence may be collected to the same effect. The volume, by Mr. Corfield, just now published, under the authority of the committee appointed by the British Association,* will do much to remove any existing doubt as to the superiority of the irrigation system. Here are the conclusions at which the writer arrives, bearing out much that we have long persistently urged:—

(a.) That by careful and well-conducted sewage irrigation, especially with the application of manure, the purification of the whole liquid refuse of a town is practically perfect, and has been ensured in cases where it was not at all the object of the agriculturist; and that it is the only process known by which that purification can be effected on a large or small scale.

(b.) That by it the value of land is enormously increased—at least doubled in every instance. That perfectly worthless land, hitherto sea- and river-land, can be made in this way to support large and valuable crops.

(c.) That the quantity per acre obtained from all crops is enormously increased.

(d.) That it reduces to a great extent, or entirely renders unnecessary, the usual amount of artificial manures of all kinds, by supplying a manure especially adapted, from its complex constitution, for the nourishment of crops, supplying it moreover in a state of solution, that is to say, in the most readily absorbable condition, and supplying at the same time that most necessary aid to vegetation, water, by which the value of the manure during the greater part of the year is almost doubled.

(e.) That by it the farmer is rendered almost entirely independent of the weather, so that he can be practically certain of his crops, and moreover be able to transplant them as much as he pleases.

(f.) That with all these advantages, it is no wonder that wherever sewage has not been wastefully applied, it has been found to pay; and that when its management is more thoroughly understood, it will doubtless be found to be a valuable source of income to the towns. In fact, in the words of the Rivers Pollution Commissioners (1870), "intermittent filtration is a costly process with no possibility of any return; whilst irrigation, although it may in the first instance require a larger outlay of capital, affords a hopeful prospect of a return for the capital invested."

We recommend for a wide study the patient, candid, and ample digest of facts upon a momentous subject which has been drawn up by Mr. Corfield.

* "A Digest of Facts relating to the Treatment and Utilisation of Sewage." By W. H. Corfield, M.A. London: Macmillan & Co. 1870.

LONDON LOCAL GOVERNMENT.

If attention can be spared for awhile from the frightful aspect of foreign affairs to home matters, we would earnestly bespeak it in good time in favour of the proposed adjustment of our local difficulties, arising from the fact of our want of proper government for the Metropolis. Our home affairs are not happily quite so disorganised as they would be in a state of war; still even now they may be said often to present the appearance of a state of siege. At any rate, they continually exhibit conflicting elements nearly as disturbed as if produced at a period of revolution. And, indeed, the local government of London may be said to be in a revolutionary condition, or at least on the verge of being revolutionised, for we have the distinct promise of the Home Secretary that this subject shall be one of the first dealt with in the coming session.

If we can trust, too, the signs of the times: the distress of the Metropolitan Board of Works on losing their chairman, and the difficulty they seem to find in nominating a new one; the general objection to the expense and inefficiency of the present system, which daily appears in some shape or other; the want of confidence in vestry elections, as shown by the discussions of working men and others on the Education Bill; this business is ripe for legislation:—an important fact for Mr. Bruce, who has been careful in this, as in other matters, not to go too fast, but who may be now assured that the time for action is come.

Of more importance to a besieged city even than gunpowder, are food and the small individual necessities which go to make up existence, and so we may say of more importance to us here at home are the comparatively small details of daily occurrence than even the fall of cities and empires abroad, at least within the limited sense we wish to put upon the phrase. And it may not be inopportune when the cleanest and best cared-for city in the world is running the risk of passing away—perhaps into a mere heap of ruins—to learn the lesson which we might well have learned before, viz., how to clean and keep our city;—while in our turn we taught another, viz., how to economise our means and keep our local representative system at work without the necessity of imperial dictation and control.

Prudently to govern ourselves in such matters is indeed a worthy end and aim of a great community. Yet, strange to say, such domestic details are neglected; such local government as we have is decaying, and things of home interest are only mentioned to be left alone to take care of themselves; while foreign or distant business is made all important; and this by a population priding itself on the practical character of its institutions, and its care of individual home interests. Naturally enough, therefore, complaints arise; but without going to the root of the evil, without an effort to provide the real remedy, all evaporate in noise or a newspaper letter full of grumbles. Not a week passes but the public, by one of its wrong-righters, or one who has felt the shoe pinch more sorely in his own case than others, complains in no measured terms of the chaotic state of our metropolitan domestic arrangements, or even of the deliberate mismanagement of vestries, boards, or offices of works. In fact, officials of all grades connected with our London Home Government, as it is facetiously termed, or "anarchy," as it has been described, have to bear the brunt of well-meant but often narrow-minded complaints; first as to streets wanting mending, then as to the sharp stones with which they are mended, anon as to the snow and slush which make them nearly impassable, and soon after that as to the dust and dirt which are not kept down by watering, and again, the slipperiness caused by the water-carts. The want of constant-service water supply for daily use or in case of fire, the daily robberies and calls for the police, and a host of other social questions, including cab regulations, street barriers, traffic obstructions, besides the more important main improvements of drainage, as to open places, &c.; all are the subjects of indignant articles in the public press; while, on the other hand, the outcry of ratepayers is becoming louder and louder, as the burden of local and metropolitan taxation increases more and more.

The worst of all this is its truth; and it needs no arguments to show that such complaints ought not to be well founded or inceptable of remedy in a city which knows what real local

government ought to be, but which hesitates so strangely to agitate for the application of this to itself. Now we venture to say this is scarcely dignified, scarcely in accordance with the ordinary business habits of Englishmen, scarcely likely to lead to any good result, and certain not to remedy the abuses complained of.

What is wanted in the way of machinery already exists, however, and what is wanted in motive power is but latent. In the midst of much apathy, we are glad to acknowledge the activity and energy with which the Metropolitan Municipal Association have persistently urged this important question upon the public and its Parliamentary representatives. Some time ago we referred to the fact that the subject which, in 1868, dropped from the hands of Mr. Mill had been taken up by Mr. C. Buxton, and we noticed with pleasure the reception which a deputation of gentlemen, headed by Mr. Buxton, met with from Mr. Bruce, who spoke earnestly, and promised the early attention of the Government to Metropolitan Municipal Reform. A whole session of Parliament has passed since then; the way is cleared of a large accumulation of necessary legislation; and we have had indeed, as we said, a distinct promise of some practical result.

It is therefore with renewed hope and with earnest expectation that we call attention to the subject and to the remedies proposed, not with a view of expressing an opinion at this moment as to details, but to show the way which seems to promise the greatest likelihood of success. Already the three Bills introduced by Mr. Buxton have been considered and reported upon by the Metropolitan Board of Works and the City Corporation; so that whether the Government measure is to reproduce these, or to run in a different line, it will not be out of place to refer to them. One of these Bills provided for the formation of a series of nine municipal boroughs, to which were to be transferred, and in which were to be vested, all duties, powers, and properties, now exercised by the various vestries district Boards in London. Another provided for the absorption of the Metropolitan Board of Works in a new *Metropolitan Corporation of London*, composed of representatives from the various new boroughs, and of the present Corporation of the City. At the head was to be the Lord Mayor, although the present Court of Aldermen was to be extinguished, or nearly so, while the Chairman of the Metropolitan Board of Works was to become the Chairman of a Works Committee. Thus making a general amalgamation, or fusion of discordant elements into one general council, with one head and one jurisdiction over the whole metropolis, and thus vastly increasing the power and dignity of the ancient office of Lord Mayor of London. To this, at least, the City dignitary can but assent. A third Bill was for the formation of London into a county for police purposes, thus doing away with the absurd arrangements of one set of men inside and another outside Temple Bar, charged with the maintenance of order. The propriety of proceeding upon the lines marked out by common usage and consent is obvious; and if some reformation similar to the above plan is contemplated, we may congratulate ourselves on a scheme worthy of full and fair consideration.

At the same time great tact will be needed to carry any measure which really touches the evils to be remedied, for vested interests in abuses have grown strong; officials have been multiplied, to carry on what may better be done by fewer heads, and much compensation will have to be granted. Honorary posts, too, will have to be abolished, and great opportunity thereby afforded to vestrymen, and other local dignitaries, to show their public spirit, by voting for their own abolition. But the work is great, and personally as well as pecuniarily interesting to every householder and resident in the metropolis, for it involves all the business now carried on by the City Corporation, the Commissioners of Sewers, the Metropolitan Board of Works, and the innumerable smaller Boards throughout the metropolitan area, besides the business of those which otherwise would hereafter have to be created. Indeed, there are many matters now not even thought of by these existing authorities, which must in course of time be taken up by this new body. Even as the Metropolitan Board of Works has found business grow to its hand, and additional burdens placed upon its broad but still far too weak shoulders. For instance, what a relief would it be to our overworked Parliamentary

legislators if they could escape the many discussions on petty details of London management, and our Home Secretary be saved from the difficulties of cab regulation, and of all thought as to tin flags and the like.

Our neglected squares, our sham monuments, and our useless fountains, would have some one responsible for their condition, and her Majesty's First Commissioner of Works would not be called upon to answer questions as to these or even perhaps might be saved from questions about Serpentine mud, or how not to rail in Regent's Park, inasmuch as no public parks or gardens need be left under Government control.

There are three good reasons why—three Ys—we should adopt some improved form of general metropolitan government, which in themselves seem to sum up the principal advantages to be gained, viz., Economy, Efficiency, and Humanity; in opposition to their three opposites, which rule in the present system, viz., Prodigality, Inefficiency, and Cruelty.

The first, Economy,—includes the saving of legislative power above referred to, as well as all the extra official labour now required, and the time of numerous local members which could be often much better employed in doing nothing. The opportunity for economies in expenditure, with larger areas, uniform system, better method, closer supervision, larger contracts, and constant use for plant and materials, is obvious. Also that of uniform system in rating, keeping accounts, scale of payments for salaries, and so on; while all this would as obviously lead to greater efficiency. No one would deny the immense waste of power in the multitude of local boards, and the difficulty of their working economically and efficiently, even when so disposed from the restricted areas with which they have to deal and the involved arrangements required by the arbitrary form of the districts. Matters in this state, of necessity fall into the management of permanent officials. No one can stop the waste; no one insure efficiency.

But Humanity also calls, and the lost lives of both man and beast are often attributable to the present state of affairs. More certain sources of death are our London streets than the annual series of railway accidents, and yet no remedy is adopted, easy though it be. And the maiming and laming of animals is only too easy to be accounted for; yet nowhere is the simple remedy applied because of its cost, though it can be shown to be absolutely more economical to provide for the proper making of our streets than to leave them half finished as at present.

But one of the chief advantages of a proper local government for London, we think, would be the power of attracting the best men for its administration. The honour and the dignity conferred by being a member of the great council being worth contending for, we ought to have men of the highest ability ready and willing to give their attention to it as to the duties of the great council of the nation, and not as now, leaving local affairs entirely to local magnates and third-class dignitaries,—men who are honoured by the office rather than honouring the office they fill without adorning it. Already the Education Board are taking a step in advance of Vestry Boards, nominating men of standing, men of education and experience, men—and, indeed, we may now add women—of large ideas, instead of men simply rising to the surface through the surge of local jealousies.

With such representatives, intent rather upon practical business than upon speech-making, we should hope to have a speedy settlement of the Hampstead Heath and similar questions as to open spaces. Economy would be promoted by an early consideration of the probable wants in certain localities, rather than by a long haggle over terms of purchase. With a powerful body, such as we may hope to see constituted, influential by personal, as well as by official position, there would be less chance of a scheme like the Embankment being marred by the petty tyranny of one department of Government, requiring a strong vote in Parliament to set it right; or of the vested interests in obstruction being able to prevent access to the roadway after it is formed; nor, again, would railway companies be able, let us hope, to defy the authorities east and west, and put up bridges and stations, air-holes and notice-boards, to the disfigurement of the localities and annoyance of every one, without interference or control.

One of the most important questions to be dealt with in a comprehensive manner is included under the head of traffic, com-

prising not only the lines of road and water way, and the removal of all obstructions to the circulation of the population, and the movable part of their goods (such as private bars and barriers, toll-bridges, &c.), but also the vehicles themselves, which, whether they travel on land or water, are alike disgraceful in the present day. Why should such inert barges obstruct our river traffic as at present, and such shabby steamboats be allowed to bump against the new piers which have been carefully provided for their accommodation? and why should our cabs and omnibuses be deemed so incapable of improvement, when everywhere else they are better than in London?

These questions would soon be answered by a strong Government, representing London as a complete unity or community; while such a body would surely find means of passing through Parliament an improved Building Act, or add some important improvements to the present one. At the same time it would re-arrange the not unimportant matter of the appointment of district surveyors, so as to secure the services of the most able instead of the youngest and least known to the world for their ability. To the future builders of London this is likely to become a serious affair; but the thousand and one matters of a like nature which in some way or other affect architects, builders, and inhabitants alike, will demand serious consideration and impartial judgment when the expected measure shall be unfolded in the coming Session.

GAFF MUSIC AND THE OPERA.

To those thoroughly interested in the work and surroundings of the man Shakespeare, it must always be a matter of no small importance to find out, after the writing of his plays, what he did with them and how they were put upon the stage—such as that stage was. We have, in a previous number, endeavoured to give an idea, though a very faint and imperfect one, of the Globe Theatre; and we now propose to show, in part, what it was that that little inconvenient and weather-beaten house enshrined, as part and parcel of Shakespeare and his doings. Every portion of this world-famous little playhouse has been made matter of controversy, and no part more so than its orchestra, where it was, what it was, how many performers in it, and what they did. It seems to be pretty generally admitted that they either stood on the floor of the stage itself, or occupied a little gallery immediately above and on one side of it, and probably on a level with the gallery, marked *a*, in the section of the Globe on p. 780, *ante*. It must always be borne in mind that the main idea of the architect or builder in the construction of the Globe playhouse was the common inn-yard of the time, with its gallery running all round it; and it may be that the gallery, *a*, was simply a continuation of the main gallery, *b*, of the building, indeed just as though it had been an inn-yard octagonal on plan. In the inn-yard it is not unlikely that the "musicians" were posted in this gallery, and it may have been so in the Globe, the stage being narrow and fully occupied by the actors themselves, and the select and privileged visitors. In one of the modern gaffs, where there has been some difficulty with the placing of the orchestra, a small gallery has been specially constructed for it, and from it half the necessary work of the show proceeds.

But if the position of the orchestra in Shakespeare's playhouse admits of doubt or controversy, much more so does that of the number and character of the performers, the instruments they piped on, and the character of the music they played. There are so many notices of music in Shakespeare's plays that there can be no sort of doubt as to the prominent position held by those who did the work of an orchestra in his day and playhouse. It is quite certain that they did a very important work, and were not allowed to spare their breath, for in addition to a volume of evidence we are told in a notice of a play acted at the Blackfriars in 1609, a year in which Shakespeare wrote one or more of his plays, that "when the ladies drew the curtains, the cornets and organs played loud and full music for the act." It is therefore certain that the music, whatever its character or kind, was a most important element in the performance of a play in Shakespeare's time, and that the attention and interest of the play-going public was kept up by the efforts of the orchestra. It is not a little important to bear this steadily in mind, for

in the modern gaff, the lineal descendant, as we contend, of the playhouse of Shakspeare, the musicians never leave the orchestra for a minute, and are perpetually in requisition. Indeed, unlike a theatre, a gaff could not sustain itself without the musical element, always ready for its special work in the way which we propose to explain. It is High Art in a gaff.

But first as to the kind of instruments used in a playhouse in Shakspeare's century. We are told that there were trumpets, cornets, hautboys, lutes, recorders, viols, and organs, and that probably there could not have been more than from eight to ten performers, if so many. What a curious thing it would be to see and hear the Globe orchestra. Did it make more or less noise than our improved men and instruments contrive to make? Did the trumpets outblow the rest of the instruments, or were they softened down to their more modest tone? What a pity it is that poor Shakspeare did not leave us a little account of the mode and manner of the performance, music and all, of one of his own plays; what a light it would have thrown on his plays, and his theatre, and himself. In the gaff of to-day, the ever-to-be-remembered and famous "City," the City of London Theatre, as it once was (it is now, alas! waiting for burial), the band consisted of some five performers—a violin; a cornet—a piston (no modern band could exist without this cornet); two drums, ingeniously played by one man,—i.e., a small drum and a kettle-drum, with which positive wonders are to be done, when you know how; a flute; and a semi-grand pianoforte. As a contrast to a band of this kind, it may be mentioned that in another establishment the band consists wholly of brass instruments,—three cornets and two horns; while in yet one other, but somewhat smaller place, the orchestra is made up of a violin, a cornet, and a pianoforte. In mere numbers, therefore, Shakspeare would seem to have had the best of it. But the really vital and interesting question to us is, what did the band of musicians do in Shakspeare's day, and in his theatre, and what does the orchestra do in a modern gaff, as contrasted with what is done by the immense orchestra of Covent Garden, or the more modest band of an ordinary minor theatre? It is one of the most curious subjects connected with art and theatres and plays that can be well imagined, and we may confess at once that the gaff may stand or fall with it. How far our gaff friend Shakspeare can help us may be a little doubtful; but the "Globe" existed before the "City."

It is not a little difficult to make so new a subject as this duly intelligible to those who have not themselves gone through some troubles to come at it; for very many things have to be considered, some of quite an elementary nature, and others of no small difficulty, and open to not a little controversy. In an ordinary operatic performance at Covent Garden, it is well enough known that the musicians never leave the orchestra, and that the opera consists of overture, airs as they are called, accompanied words or recitative, songs, and choruses,—in short, as in the opera of operas, as it has been fitly named, Mozart's "Don Giovanni," the words of the play are conveyed to the audience through the medium of music; indeed, so magnificently creative and so dramatic is the instrumental music in it that the words spoken or sung are of quite a secondary and subordinate use, the wonderful music completely overpowers them, and no one cares much to know what it is that is said, or what the words mean, the whole story, and a capital one it is, notwithstanding what a modern writer says, is so wrought out and told by the marvellous power of the music. Mozart may well compare with Shakspeare in dramatic power; for, had he had any one of the great tragedies to illustrate with music, he must have divided with Shakspeare the glory of it, for his music would have done one half, at least, of the descriptive work; indeed, may we not say that the one would have negated the other? the words might even have been lost in the stupendous musical accompaniment. Can you, then, some may ask, have anything too good? Impossible, may be the answer; but if at one and the same time and together, you may.

It is quite certain that Covent-garden opera and a gaff drama are at the very antipodes of artistic and social and human things, and that by no means could the opera audience be got to interest itself in the lower performance; but at the same time, be it observed, it would be equally impossible to catch the ear and keep the attention of a gaff audience in her Majesty's Opera House. Stupidity and ignorance! Not so, for the real rea-

son, we can assure you, would be not deafness to the music, but from the fact of the rough audience not being able to make out what is going on or being said; the said audience demanding, first and before all things else, that all spoken words be quite clear and distinct, whatever they are or may pretend to mean. Now, this is going back to a very early and primitive way of doing things; and the question may well be asked, which manifests the highest perceptive powers, which is the most intelligent demand, the words of "Hamlet" or the music of "Don Giovanni," for you cannot have both at the same time. But the music is necessary to sustain and keep alive the dramatic interest; and, probably, in Shakspeare's day, and in the Globe playhouse, and certainly in the modern gaff, this is done, or at least attempted to be done, by a very simple and beautiful expedient: we say attempted, because, with means so slender and place so rough, we are sometimes obliged to take the will for the deed.

In Shakspeare's "Globe" and "Blackfriars," the band, in its gallery or elsewhere, certainly bore a most important part, for we are told that, before the play began, "three flourishes were played," or there were "three soundings," a phrase which seems to have puzzled some commentators not a little; by some it has been thought to indicate a sort of overture, as in an ordinary theatre; but may not the gaff system of doing things throw light on its real meaning? Of course, in the gaffs there is a little music from the band before the "piece" begins, but it has nothing to do with it, and does not in any way indicate its nature; but directly the curtain rises, and before the performer makes his appearance, or says anything,—just, indeed, as he is coming on,—some few bars of music are played by way of indicating his importance and the character of his part. In a genuine gaff this is repeated whenever a performer makes his appearance from the side, and whatever he may be, even if he be only a serving-man. Of course, the length and character of this simple sort of music differs according to the importance of the player, and the character of the part he takes, whether comic or tragic, and for the purpose of indicating it and of deepening the impression to be made. But more than this: not only is the great tragedian of the night ushered on to the stage by this preliminary outburst of music, but during the whole of his villain plottings, and tragic speeches, and pantomimic action in finding out the murder, or in the effort to commit one, a low strain of music is kept up, varied at intervals by louder bars, for the purpose of adding to and sustaining the dramatic interest, and of helping the actor in his work. The actual music is simple enough; but yet it is made at times not a little expressive of the action going on; indeed, becomes in a certain sense operative; but with this important difference, that it is so subdued and subordinated to the words uttered, that it does not interfere with the words, or prevent their being perfectly and distinctly heard and understood. The impression caused by the uttered words of the play is simply sought to be deepened; but not, as in opera, nearly or quite blotted out by the musical accompaniment. The great defect of the opera is that the words and even action of the drama become altogether secondary and subordinate to the all-overwhelming instrumental music. In the last act of "Don Giovanni," so dramatic, and wonderful, and sustained, is the music, that the words are lost; the music does all the work, and Mozart has written the play over again in musical notes! But in gaff music this will not do. The audience want clear words, spoken words, and music simply to deepen or heighten their import, but not to smother them or even to compete with them. In an ordinary theatre no music seems, as a rule, to be needed during the actual performance; both action and talk go on without it, though it is occasionally introduced in modern melodrama. It is very a great art problem in embryo, and is well worth cogitation, not to say an effort on the part of some gifted with the faculty of solving it practically; nay, we had almost said it is the highest of art problems, for if the highest of human faculties be, as we are told, the poetic, surely one equally high is, how best to read it to the world's ear. Opera smothers it outright; the ordinary theatre, as a rule, rejects help of sound; but the gaffs demand a something from the opera, but reject its overwhelming, or, as Shakspeare would have said, its gloomily overlooking power of sound. When this most beautiful idea of helping the

impression made by clearly uttered words first arose it might be very difficult to say, but it seems certain that in the Globe and Blackfriars it was taken advantage of, at least partially. In a curious compilation written in 1609, Shakspeare yet living, Decker's "Guls Hornebooke," it is said, "Present not yourself on the stage until the quaking prologue hath by rubbing got colour into his cheeks, and is ready to give the trumpets their one that he is upon the point to enter;" a clear indication that music, sometimes at least, preceded the entrance of an actor on the stage by way of preparing the audience for him and the part he had to play. If, therefore, the antiquity of the Globe play-house be a matter of interest to all who care about the man who has so immortalised it, must it not be a matter of no less interest as to what it was specially built for, and how the written plays of Shakspeare were put on the stage of the Globe "Gaff" and performed? Yet, more curious still, did Shakspeare write his plays with the idea that in the acting of them music would run along side by side with his charmed words? Or did those "groundlings" and "gallery commoners," who buy their sport for a penny, compel him to play them into humour, or was it all left to these our modern days sinking down into the gutters from high opera; or, did opera itself rise out of it; or, did it indeed come of an older time when words were too few and weighty to be smothered even in the sweetest of sounds; or, last theory of all, Tribes of the Ragged are you alone guilty of it, and living only for the passing hour, is it you only that ask for intelligible words out of an atmosphere of music?

A SERMON ARCHITECTURAL.

On the 2nd inst., on the opening of the Tron Church, Edinburgh, after the large east window had been filled with stained glass, as mentioned last week in our pages, the clergyman, the Rev. J. Macgregor, D.D., in the course of a sermon showing the propriety of adorning the House of God, made the following remarks:—

Although place and form can give no acceptability to worship,—although no virtue is added to the supplication of the humble petitioner at a throne of grace, because that supplication is uttered amid ascending incense and beneath a painted dome,—still, as in these latitudes at least, public assemblies can be held only within the shelter of roof and walls, our first point is that the place where men assemble for the worship of their Maker should, even in the matter of stone and lime, and much more in all the external aids of worship, serve the end they are designed to serve and be the very best which the worshippers can make them. While we rightly believe that the most tasteful architecture and the most chaste adornment cannot make the four walls of a building a house of God; that there is something of infinitely higher importance than painted windows and long-drawn aisles, we think wrongly if we think that these things are of no consequence at all. While I believe that there is no more virtue in a cathedral than in a barn, I believe at the same time that we can worship God better in a cathedral than in a barn. The Communion-wine would serve its end if passed round in an earthen vessel just as well as in a vessel of silver. The Communion-table would be as holy a Communion-table with bare boards as when covered with a snow-white linen cloth. Why do we use the one in preference to the other; but just because we feel that it is more appropriate, more becoming, more helpful to our own devotion, and more suitable to the service of our maker. On the very lowest ground it is surely a right and decorous thing to expend a little of that taste and wealth we pour forth so lavishly in decorating our private residences, in adorning that house where we are wont to assemble for prayer, where our fathers worshipped before us, and our children after us may worship when we are in our graves. The sentiment of David's heart should be that of every true man, "See now I dwell in an house of Cedar; but the ark of God dwelleth within curtains."

The nature which God has given us when not thwarted by silly prejudices or bigotry, craves for and prompts to the use of what is decorous and beautiful in the highest act in which man can be engaged—the worship of his Maker. Everything that can possibly tend to soothe, to solemnise, to elevate the mind, and bring it into harmony with the work of worship, should be

employed in rendering the church a holy and a beautiful house. It is in thorough harmony with what has now been said that just as the common and universal faith of man has been faith in God, just as the very oldest of existing literatures—the Hebrew and the Sanskrit—are very largely occupied with God, even so the oldest and stateliest monuments of the world are buildings which in one form or another owe their origin to the religious instincts of humanity, and have been reared and used for the worship of God. While all other traces of the pagan worship of our forefathers have long since disappeared, the Druid circles of Stonehenge and of other places still remain. The round towers of Abernethy, and of Ireland, are, with the exception perhaps of a few existing words, the only memorials which remain of the far-back age to which they belong. The very oldest, the very highest, and the very largest, of all existing monuments, the pyramids of Egypt, and perhaps served the end of worship. The majestic piles of Thebes and Luxor were temples. The Parthenon, the most architecturally perfect of all buildings, is a temple. The genius and the wealth of ancient Rome could produce no more superb structure than the Pantheon, with its fine portico and its bronze roof, resembling the azure vault of heaven,—and the Pantheon is a temple. Overtopping the city of the Seven Hills, with its 360 churches, rises St. Peter's; and high above the roar of London towers the dome of St. Paul's. Thus, in all time, and in every land, palaces yield the palm to churches and temples. This truth has been beautifully put by another: "How striking a proof is it of the strength of the adorning principle in human nature,—what an illustration of mankind's sense of depending upon an unseen Supreme, that the grandest works which the nations have reared are those connected with religion. Were a spirit from some distant world to look down upon the surface of our planet as it spins round in the solar rays, his eye would be most attracted at the morning light passed onwards by the glittering and painted pagodas of China, Borneo, and Japan; the richly-ornamented temples and stupendous rock-shrines of India; the domed mosques and tall slender minarets of Western Asia; the pyramids and vast temples of Egypt, with their mile-long avenues, of gigantic statues and sphinxes; the graceful shrines of classic Greece; the Basilicas of Rome and Byzantium; the semi-Oriental church domes of Moscow; the Gothic cathedrals of Western Europe; and as the day closed the light would fall dimly upon the ruins of the grand sun-temples of Mexico and Peru." If men of all times, of all colours, of all creeds, have thus spent their best on what they believed to be best, the worship of God, this general agreement of mankind is surely more than a proof of the adorning principle; it is some indication of the will of God for all men.

The preacher then went on to illustrate and enforce his arguments. To show that there were clearer indications of the will of God in this matter, he instanced, first, the Tabernacle in the wilderness, built by a nation of slaves, who had been but a few months before delivered from the servitude of centuries, built by the command, and according to the plan of God, as the grateful offering of an emancipated people. So hearty was their response to this appeal, that women brought their golden ear-rings, and there was more than enough, so that Moses had to restrain the outflow of their benevolence. The result was, that that first church ever reared for the worship of the true God, considering the people who built it, and the place and time of its building, "exceeded in costliness and splendour any cathedral of the present day, when compared with the wealth of the surrounding population." Then, if ever, might selfishness or cautious thrift have asked with show of plausibility, what need for any costly edifice for divine service? Then, if ever, might He who dwelleth not in temples made with hands, have looked down well pleased on the rudest hut which poverty ever reared as a place of praise? For where could nobler natural temple be found than the unrivalled scene which spread around the builders of the Tabernacle; its floor, that broad, smooth plain of Rahab; its walls before, behind, around, on every side the granite ribs of the overlasting hills; their jagged peaks its pinnacles, and the glorious Arabian sky its dome? And yet there, in that grandest of all natural cathedrals, Sinai before them, and the hills around, the command of God goes forth, "Let

them make Me a sanctuary, that I may dwell among them."

He then alluded to the second church built by God's command,—the Temple of Solomon.

After describing its splendour and massiveness,—and some of its stones are still standing, and may until the final consummation of all things,—he said:—"Beautiful beyond all parallel must that Temple have been when in its glory it crowned the steep of Zion. And what I wish you specially to remark is this,—that while the cold and calculating spirit of our age would be apt to murmur at all this blaze and glitter of gold as a needless display, an unnecessary outlay of wealth even for an age and a religion where symbolism was indispensable, it did not seem so in the eyes of Him for whom this Temple was reared. He was well pleased with the offering, and filled that Temple with His glory, and chose it as a house to dwell in."

From all this he submitted that there was a principle which seemed pretty clearly established, viz, that God means us when we worship Him, to do it with our very best. If the devotional feelings of the human heart naturally crave for decorous expression; if even the Pagan in his blindness could rear, out of love to God, temples which will for ages yet be the wonder of the world; if this natural and universal impulse has received the direct imprimatur of Heaven, the only two churches ever built by God's direct command being gems of art, treasure-houses of wealth and beauty; then, he submitted, there are here a set of facts on which Protestant Christians would do well to ponder. He knew the wide gulf which separates Christianity from Judaism, but, he asked, is the God of the Jew a different God from that of the Christian? Is the Old Testament the Bible only of the Jew, and not also of the Christian? He submitted that keeping clearly in view the difference between the two religions, the symbolism of the one, and the spirituality and sublime simplicity of the other, we could learn from God's dealings with His ancient people, His will regarding ourselves, that in all which pertains to worship down from the very stone and lime of the building, up to its almsgiving, its preaching, its praise, its prayer, up to the innermost spirit of the worshipper, we are to give God of our very best for His dear Son's sake; and, in all respects, the lowest as well as the highest, from the altitude of the body up to the altitude of the soul, make His Church "a body and a beautiful house."

IS EDUCATION ESSENTIAL TO IMPROVEMENT IN DWELLINGS AND HABITS OF LIFE.*

LET sanitary truths be taught in every school: we shall then, at least, secure the knowledge to the rising generation. But we shall do more than this: the parents will be reached through the children; the information taught at school will be carried home to the cottage. It will do more than this: it will permeate up to the middle-class, some sections of which are as destitute of sanitary knowledge as any of our labouring poor,—yes, and it may permeate higher still. Every one wishes to have good health and to live as long as possible; yet the very knowledge by which life and health are secured is ignored in every system of education, from the highest to the lowest.

As regards Government-aided schools, I should like to see the Government grant in aid made contingent on the teaching of sanitary information. There are many elementary works that might be used for reading-lessons that would convey the information, such as—the worth of fresh air, the value of pure water, the value of good food, the influence of wholesome drinks, the gain of a well-trained mind. Let this teaching be one of the conditions for the receipt of the grant in aid, and the subject will soon be generally and well understood. If we do this the next generation will not pass through life without securing the desired improvements.

There are already a large section of the labouring class in a position to command the desired homes, if they appreciated them; there are, at the present time, thousands of mechanics and artisans in this country, earning wages ranging from four to ten shillings per day, who are con-

tent to domicile their families in dwellings that cost them from three to four shillings per week rental, while they spend on stimulants and tobacco for their own personal consumption four times the amount of rent they pay. Improve their wants, and they are in a position to give effect to improved desires. How would it aid the health, comfort, and happiness of this class, if only one-fourth of the amount they now spend on stimulants were withdrawn from that expenditure and directed to home expenses? As regards the mechanic, artisan, and mining population of this country, they are already in a position to command the improved homes if they desired them.

The chief causes of pauperism are incapacity, improvidence, and disease; the two first are the direct offspring of ignorance, and the latter is largely promoted by ignorance: to get rid of pauperism we must get rid of ignorance—that is to say, to avoid the perpetuation of the evil, we must remove the producing cause.

Let us review the subject. On the one side we have the mechanic, artisan, and mining classes, earning high wages, and, for want of a correct appreciation, they spend a large portion of their earnings in debasing, instead of raising their condition. On the other hand, in many localities, especially in agricultural districts, there are labourers beyond the requirements of the district,—men, till a few years since, hedged in by the law of settlement to a limited market for their labour,—men still destitute of sufficient intelligence to give them adaptability of mind or body to take their labour into channels where the supply of labour is inadequate, where it would be useful and profitable to others, and, consequently, remunerative to themselves. The schoolmaster is wanted to each class; to teach the one the capacity to earn; to teach each the wisdom to spend; and, in thus doing, to improve their households. And there are many reasons for securing elementary education during the early years of childhood.

Do not infer from my remarks that I imagine the working classes are not improving; I believe we see many evidences that they are improving; there are evidences of this in their co-operative institutions, in their mutual assurance societies, their accumulations of capital in savings-banks: all these evidence economy, which means temperance and self-denial. The implements of the labouring class are accumulated capital. Professor Levi, who is regarded as an authority on the subject, estimates that there are 300,000 carpenters, joiners, and shipwrights, each of whom requires tools costing from 10*l.* to 50*l.*; at an average of 20*l.* per man they amount to 6,000,000*l.* But there is still very much more to be done. Some have to be educated to the power to earn more, others have to be educated to spend more wisely the incomes they so readily command; as these two teachings progress, I have much confidence that they will have a healthful and happy influence on the homes and the habits of the labouring classes.

REPORT OF THE METROPOLITAN BOARD OF WORKS.

THE annual report of the Board, just published, brings together a number of interesting items of information of both prospective and retrospective character.

The principal performance of the Board during the past year has been the completion and opening of the Victoria Embankment on the Thames, from Westminster Bridge to Blackfriars. The estimated complete cost of the work is 1,200,000*l.*, and for the purchase of property and compensations, 450,000*l.* The Southern Embankment had also been completed and opened during the year. The cost had been 309,000*l.*, and 771,616*l.* for property. The chief portion of this work remaining to be completed is a landing-pier near the end of Church-street, in return for a draw-dock at Ferry-street.

With regard to Queen Victoria-street, authorised by the Metropolis Improvement Act of 1863, about 900 ft. of the street have been opened. Three lots of building-ground in the new street have recently been offered on lease by auction, and for two of these lots satisfactory offers have been received and accepted. The Board still retains on hand the large and valuable triangular piece of land near the Mansion House, a satisfactory offer not having been made for the plot. The claims and compensations for property in the street, made by freeholders, leaseholders, yearly tenants, tenants at will, &c., dis-

* From a paper (printed at Chippenham by G. Noyes), titled "Is the better Education of the Labouring Population Essential to any General Improvement in their Dwellings or Habits of Life?" Read at the Bursdeconal Conference held at Chippenham, August 25th, 1870. By Mr. James S. Randall.

posed of as reported, amounted to,—claims, 2,612,106l. 9s. 9d., settled by payments of 1,990,377l. 18s. For properties on the Embankment,—claims for 426,207l. 13s., had been settled by payments of 273,499l. 10s.

The estimated amount to be expended in metropolitan improvements, in progress or authorised, is 597,000l.;—namely, for Stingo-lane improvement, 50,000l.; main drainage and main sewers, 497,000l.; Park-lane improvement, 123,000l.; Chelsea Embankment, 135,000l.; contributions to minor improvements, and for completion of Finsbury and Southwark Parks, and Whitechapel and Kensington improvements, 77,000l.; and fire brigade (capital account), 15,000l.

The new assessment shows an increase in the annual value of the property of the metropolis of 2,462,000l., or from 16,257,000l. in 1868-9 to 18,719,000l. in 1869-70. The estimate of the Board's expenditure was 432,546l.; the surplus in hand from the previous year reduced the amount required from the parishes to 399,306l., or 5-12d. in the pound.

The resources of the Board for the maintenance of the fire brigade are 10,000l. from Government; 14,896l. from the fire insurance companies; 68,988l. from a halfpenny rate over the metropolis; and the chimney fine penalties, 1,139l. from 2,590 such fires in the year. The fire brigade has been doubled in power since 1866, and now consists of 377 men. Its plant embraces three floating steam-engines, 25 land steam-engines, and 56 hand-worked machines. The stations are being increased in number in suitable localities, and three stations, not considered well situated, or for other cause, are to be discontinued. The brigade attended 1,825 fires, not including chimney fires, or an increase of 240 upon the preceding year.

The Board refers to, but leaves open, the important questions of metropolitan government, water supply, and sewage utilisation.

THE EDUCATION BOARD.

WE are glad to hear that Mr. W. Hepworth Dixon is a candidate in the Marylebone division for a seat in the School Board for London, and that his committee have reason to be satisfied with the result of their inquiries. We shall be very glad to hear of his success. Mr. G. W. Hastings, of the Social Science Association, is a candidate in the City division, and would prove a valuable member. The election, which rests with the ratepayers, will probably take place at the end of November. The metropolis is divided into ten parts, which will return in the whole forty-nine members. The office is honorary; the chairman, who will be elected by the Board, will be salaried. The duties of the Board will be very heavy for a time, and will demand the continuous attention of the members. The Society of Arts, through their secretary, Mr. P. Le Neve Foster, have issued an address to the electors of the metropolitan boroughs, earnestly recommending them to apply to well-known friends of education to allow themselves to be elected, and thus set to the United Kingdom an example worthy of imitation.

THE AURORA BOREALIS.

AN esteemed correspondent writes:—On Monday evening, about eight o'clock, a servant came in to tell me of a beautiful red light there was, like a fire. Going out, I saw the most splendid aurora borealis I have ever witnessed. It extended all over the heavens, excepting south. The effect was grand! I thought of the Prussians and burning villages; but here the red light stretched all over-head as well. The richest and brightest colour was in the east, and there Jupiter shone out, large, bright, and clear from the midst of the ruddy mass. Occasionally, bright yellow-white beams darted up through the red; and then again they swayed and swept away, as if blown by the wind, which was very strong and very cold at the time. Once the yellow-white beams took the form of a gigantic figure, with bare arms and hands, which were extended upwards as in prayer. The bend of the elbow of each arm was well defined and quite clear of the figure, and it remained thus for many seconds,—perhaps, even, some minutes. Then over it, as it faded away, shot up an arch of pale red light, extending right across from west to east, passing over Delphinium's diamond of stars, and across Cassiopea down to the Pleiades. The light for some time from the mass in the

east was so bright that it shone quite red on the house, just as that of a fire would do.

It is a most singular thing, this aurora; the light might be thought to be some palpable substance, for the wind certainly affects it, moving on and bending the rays and beams; yet it is impalpable, for the stars (and notably the planet Jupiter on this occasion) shone brightly through it,—just as Arcturus did through the comet's tail,—nowise obscured, but, if anything, magnified. This is the second time this year I have seen the aurora; on the former occasion the light was white and also yellow. It has been seen at other times besides, by the people around; and all say they never remember it to have been so frequent nor so much at a time. I can easily imagine that persons who believe in the material destruction of the earth may well accept this grand demonstration as one of the signs.

"When ye shall hear of wars and rumours of wars, and see signs in the clouds, and men's hearts failing them for fear, then lift up your heads and be of good cheer, for your redemption draweth nigh." I quote from memory, but that is the sense. The wars and rumours of wars we have in plenty, and here are the signs.

FRANCE.

SIR,—I have been reading the letter of the Empress Eugénie, written from the Nile to her "bien cher Louis." It bears date October 27, 1869: a year ago only, and what a change! The perusal has so strongly impressed me with tender sympathy for the writer, that I would fain have all our English papers say some soothing words that might chance to meet her eye;—ay, and that of the poor lone imprisoned Emperor too—much as he is to blame for the miseries of his own people and the sufferings of their enemies,—and console them with the knowledge that foreigners can feel for them in their low estate, though Frenchmen have only bitter words and mean insults to give to those whose very shoes they would willingly, three months ago, have bowed down to kiss. Poor Empress! she may well say, "*Quand on voit les autres peuples, on juge et apprécie bien plus l'injustice du nôtre.*"

I think the letter is a beautiful one,—such as any Sovereign-consort might well be proud to have written, breathing wisely and motherly tenderness, as well as care for the dignity of her Emperor-husband. When she says,—" *Aussi, toi, je crois indispensable à distraction; il faut se refaire un moral comme on se refait une constitution affaiblie.*" one ought to bear in mind that she had left the Emperor behind very weak and out of health.

The French editor was too busy pointing out the little slips in spelling to appreciate the tenderness and anxious love that pervade the letter; but what are a few clerical errors (in one, too, not French) as compared with sense and sensibility? I would a thousand times rather have possessed the gentle mind that composed the letter and all its little faults, than the hard un-Christian maliciousness that pointed them out with an insulting "*sic.*" Sick, indeed, it makes one, of men and things, to find such harshness and want of mercy rife in the world. The same poor-spirited creatures who now pour out insults and abuse would be the first to throw their caps in the air for "*l'Empereur*" were he to return to the Tuilleries in state. In the fable they may read that only the jackass kicked the wounded lion.

AN ENGLISHWOMAN.

ROME.

WITH a view to the ultimate adoption of Rome as the capital and the seat of Government in Italy, the Neapolitan architect, Signor Cipolla, has gone to Rome to examine and report on the various buildings which could best be occupied as ministerial offices. An engineer, Signor Giordano, has also been commissioned by the Ministry to make observations and surveys for the improvement of the Campagna, in a sanitary and industrial point of view. It has been stated that Rome will want good streets, public conveyances, gas and water works, &c. Whatever may be the need of new streets and public conveyances, no one who has any knowledge of Rome during the last ten years can say that there is any want of either gas or water. In 1848 the concession for the gasworks was obtained by the late Mr. James Shepherd, a gentleman well known and much lamented in Rome. After many difficulties he succeeded in establishing the works. The company (of which he was

the grant to the day of his death), has paid 31 dividends averaging 9 per cent. per annum. The gas is superior to that which we burn in London. An extended concession was obtained last year, and a large additional number of public lights will be in use this winter. As to water, in 1865 Mr. Shepherd—in conjunction with another English gentleman, Mr. Fawcett—after much opposition from vested interests and others, and after having deposited a large security in the hands of the Papal Government, obtained the exclusive right to convey to Rome the waters of the far-famed "Acqua Marcia," the "Regina Aquarum" of ancient Rome. The company which these gentlemen formed to carry out the works, and which has since become a *société anonyme*, under the name "Société Acqua Pia," has had also many difficulties to contend with, arising from the collapse of commercial credit, and the obstacles continually placed in the way by the officials of the late government. In August this year, however, at a cost of 160,000l., the Acqua Marcia was successfully brought to the city of Rome. This undertaking will be of the utmost benefit to the newly-emancipated city, particularly in a sanitary point of view.

ROME, OCTOBER, 1870.

Old Rome, rejoice! No more thy children sleep
In cramping fetters which they hate and fear!
No more the autumn winds that idly sweep
Across thy lone campaigns, wild and drear,
Shall wake in vain the silent memory
Of days when freedom was thy coveted lot;
When but to read thy ancient history
Stirr'd e'en the hearts and eyes that knew thee not.
Now shall the columns from its ruin rise!
Now, too, along thy streets again be heard
The freeman's voice—be seen the glance of eyes
That never more will droop at foreign word;
But sway'd by him, their patriot King, this time
Shall rise to fame of purer deeds sublime.

M. Y. F.

LIVERPOOL ARCHITECTURAL SOCIETY.

THE second meeting of this society was held on the 19th inst., Mr. H. H. Vale in the chair. Prizes for sketches done during the recess were delivered to Mr. A. J. Wells and Mr. Bleyard, both pupils of Mr. W. H. Weightman. Mr. Boulton exhibited some photographs of Roman remains found in restoring West Kirby Church, in Cheshire (about six miles from Birkenhead); and Mr. Vale exhibited a photograph of a church erected from his designs in Liverpool, in which a somewhat new treatment of the spire had been attempted, by planning it as an octagon with unequal sides, the angle faces being small in comparison with the others, more resembling a large chamfer off the angle. It was thought this treatment might lend some novelty of expression to the spire, and afford the opportunity for a varied treatment. Mr. T. D. Barry then read a paper on "The Present Condition of the Sewage Question," especially in reference to what had been brought forward on the subject during the recent meeting of the British Association. The paper consisted mainly of a recapitulation of what had been urged in regard to various systems of sewage utilisation, especially as to the respective merits of irrigation and filtration systems, the lecturer being from his own experience in favour of the latter. A considerable discussion took place on the points mentioned in the paper.

BLACKPOOL PIER.

BLACKPOOL PIER was built in the years 1862-3. In 1869 it was determined by the inhabitants of Blackpool to build a sea-wall and promenade the whole length of the town, and the Pier Company took this opportunity of remodelling the entrance to the pier, the designs for which were made by Mr. E. Birch, of London. The castings were executed and the contract was carried out by Messrs. Laidlaw & Sons, of Glasgow, under the superintendence of Mr. A. E. Oakes, resident engineer. The new entrance is 140 ft. in width, and has an easy gradient of 150 ft. downwards from the promenade. The design of the gates and toll-houses is original, and was made by Mr. Birch. The two toll-houses are of octagonal shape. There are four turnstiles, two gates about 6 ft. wide, adjoining the toll-houses, and a pair of gates in the centre, about 15 ft. wide. There are four gas brackets, with three lamps to each, and six flag-staffs, supported on octagonal

pillars. The colour is green bronze, picked out in gold.

The pier is almost entirely constructed of iron. Upon the main portion are erected several ornamental shelter and refreshment houses of an octagonal shape, while at the head is a much larger ornamental shelter-house, which serves as an efficient sun-shade and wind-guard. It is surmounted with a flag-staff and an ornamental lions, which, according to Trinity House regulations, is lighted up between sunset and sunrise. At the head there are also ample landing-stages, which enable passengers to land and embark at all states of the tide. Around the whole pier seats are arranged, forming comfortable accommodation for between 3,000 and 4,000 persons. The total area for promenading purposes is 28,500 ft.

SILLOTH CHURCH.

Sir,—In March, 1865, an advertisement was inserted in certain newspapers asking architects to submit designs for a church to be built at Silloth. Several architects sent in designs, and, after months of delay, that of Messrs. Andrews & Pepper, of Bradford (architects of St. James's Church, Carlisle), was adopted, they estimating the cost at 1,900*l.*, including tower and spire. In the mean time, one of the firm visited the site, and found that instead of an ordinary foundation for the superstructure, it would require one not less than 8 ft. in depth. In consequence of this Messrs. Andrews & Pepper wished their estimate to be increased to the sum of 2,000*l.* The working drawings were all prepared, also plans to be submitted to the Diocesan Society, and necessary forms filled up. However, in August, 1866, the Silloth Church Committee rejected the design of Messrs. Andrews & Pepper, and adopted that of Mr. C. Ferguson (who was second in the competition), which design has now been partially executed without a tower and spire, at the enormous cost for such a structure of 3,400*l.* In addition to this amount there will yet be required a large sum to build the tower and spire and boundary walls. To what extent the church committee are liable, whether it be to Messrs. Andrews & Pepper, or the whole of the architects who submitted designs, or the yet unpaid contractors, are points yet to be decided. CARLISLE.

WORKMEN'S CLUB AND INSTITUTE UNION.

An earnest appeal is being made for increased support to enable the council to carry on the work of the society. The work done last year included the increase in the number of institutions from 355 to 404; the estimated number of members being 68,500. Sixty-eight institutions joined the society—a greater number than in any previous year—making the total number of affiliated clubs 200.

Amongst the works which it is particularly desired to accomplish are the increase of the circulating library to an extent commensurate with the constantly-increasing demand upon its resources; the formation at all clubs of labour registers, with a view to enable workmen (whether members of trade societies or otherwise) to have a more accurate knowledge of the state of the labour market in all towns throughout the kingdom; and the extension of the organisation by which instructive recreation has been provided for Saturday afternoons by visits, under the direction of persons distinguished for their attainments in art and science, to public museums and galleries, to public works and buildings, and to the country for the purpose of studying botany, geology, and other branches of natural science. Some of our readers will, we hope, assist.

THE PROJECTED EASTERN GANGES CANAL.

This canal will take its supply of water from the east side of the River Ganges, at a point seven miles below Hardwar, or the headworks of the present Ganges Canal, and will water 3,000 square miles of Western Rohilkund. The total length of the main lines will be 260 miles, and that of the minor channels and distributing branches nearly 900 miles.

For seven months in the year, or during the Khurree season, the canal will carry a maximum supply of 4,500 cubic feet per second, and

during the remainder of the year, or the Rubbee season, 1,250 cubic feet will be about the average quantity of water which will pass through the regulators at the headworks. The cost per foot of water delivered by this canal, calculated on the average discharge, will be 3,150 rupees. The total amount of the estimate for the whole work completed is a little over 850,000*l.*

The project was prepared, under the superintendence of Mr. J. Parker, C.E., Superintending Engineer 3rd Circle Irrigation Works, by Mr. J. P. Roberts, C.E., Executive Engineer, and his staff of assistants, including Mr. W. C. Hosking, C.E.

Colonel Greathed, the Chief Engineer, in his official report on the project, eulogises the laborious research and professional skill which the Superintending and Executive Engineers have devoted to the subject.

THE HAMSTEAD HEATH PURCHASE.

At the usual meeting of the Metropolitan Board of Works, Mr. Le Breton in the chair, a report was presented from the Works and General Purposes Committee as to the terms proposed for the purchase of Hamstead Heath to be retained in perpetuity as a place of recreation. The report, after detailing proceedings, stated as the general result, that Sir John Mayson Wilson, and all others concerned, were to co-operate with the Board in obtaining the necessary Parliamentary powers, the whole of the lord's interest being conveyed to the Board for public purposes for a sum of 45,000*l.*, and no portion of the heath was to be let for building purposes. The Board was also to pay 2,000*l.* in satisfaction of legal and surveyor's charges, and Parliamentary and other expenses. The claims of the copyholders for any rights they might possess in the heath, should those rights be interfered with (but the amount necessary for the purpose could not at present be ascertained), would, it was believed, be comparatively small. In the event of the recommendation of the committee being approved, the Board would have secured for the comparatively small sum of 47,000*l.* the whole of the lord's interest in a space of ground the value of which, as a means of recreation and amusement, could hardly be over-estimated. The committee recommended that the matter be referred back to them to take such steps as might be required for carrying out the proposed arrangements. The report was unanimously agreed to.

THIS SATURDAY.

A LOAN EXHIBITION of Paintings in Water Colours will be opened for private view this Saturday (29th instant) at the Institute of Painters in Water Colours, Pall Mall, preparatory to public exhibition on Monday. It includes some excellent specimens by G. Bach, Barrett, Bennett, Burton, Callow, G. Cattermole, D. Cox, D. Cox, jun., Dawkins, Duncan, J. Fahey, Copley Fielding, Birkett Foster, A. Frapp, G. Frapp, Goodall, Carl Haug, Hine, Holland, W. Hunt, Jackson, Sir Edwin Landseer, R.A., J. F. Lewis, R.A., Mulready, R.A., Palmer, David Roberts, Rosetti, Collingwood Smith, F. Taylor, F. W. Topham, J. M. W. Turner, R.A., J. D. Watson, and others. The proceeds will be devoted to the National Hospital for Consumption and Diseases of the Chest, on the separate, or cottage, principle, erected near Ventnor, Undercliff, Isle of Wight. —On the same day will take place the private view of the Winter Exhibition of Pictures by foreign and British artists at the French Gallery, Pall-mall; and of an Exhibition of Cabinet Pictures in oil, in the Dudley Gallery, Egyptian Hall. —The Associated Art Institute will hold their first conversations in the evening at the House in Conduit-street. —On the preceding evening, Friday, the opening Conversations of the Architectural Association was to be held at the same place.

CONCRETE AND IRON BRIDGE.

SIR SHANTO ADAM invited several gentlemen to witness the testing of a new bridge erected for him, from the designs of Mr. H. M. Eytan, of Ipswich, over the Waveney, at Homersfield. In designing the bridge advantage was taken of the principle of Messrs. Phillips's patent fire-proof construction, a system in which all the ironwork is completely embedded in Portland cement concrete. The bridge has one arch of a clear span of 50 ft., with a rise of 5 ft. 3 in. The

skeleton of the bridge is of iron, and this is entirely filled in with Portland cement concrete, and rendered with Portland cement, thus forming one continuous beam, getting stronger every year, in addition to the iron skeleton, which is of itself sufficient to do the ordinary statical work of the bridge: the weight of concrete alone is over 100 tons. The spandrels of the bridge are relieved by a raised panel, and in the centre is a casting of the Adair arms, taken from the old three-arched brick bridge. The parapets have an open iron railing in panels, with the monogram "A. S. A." in the centre. The first test applied was that of a five-ton road-roller drawn by four horses. This was passed across several times, and not the least deflection was perceptible. Afterwards a heavy wagon, laden with sacks of flour, weighing altogether six tons, was passed over, and still no deflection could be noticed. Messrs. T. & W. Phillips, of London, who have carried out the work at the bridge, are the patentees of a well-known system of fire-proof floors.

ABOUT THE MAIN DRAINAGE OF DUBLIN.

Sir,—The letter of Mr. G. W. Hemans, C.E., published in your last issue, is almost confirmatory of all the *Builder* advanced the week before and on many previous occasions. He, however, takes exception to what was said of returning sewage to the river, in case the outfall was not carried out a proper length into the sea. Men will differ on this point, and may agree to differ. I know the city of Dublin, its river, harbour, and bay, well and sufficiently long, and every inch almost of its sea-beaches and surroundings is as familiar to me as the spot wherein I was born. With this local knowledge and some experience with the subject at issue, I have no hesitation in saying, that if the sewage of the Liffey were dispersed as is, or was, contemplated, the evil you alluded to would occur, and the new sewerage scheme would in that instance be a most imperfect and mischievous one. The Clontarf Sandbank, or North Bull, as it is called, presents, as you remark, and Mr. Hemans admits, an admirable means for utilising the valuable sewage of the Liffey.

The present Bill of the Dublin Corporation will be the child of many fathers. No amateur production has ever been submitted to such a process of docking, curtailment, castration, or interpolation before as this woefully-mangled "new sewerage scheme." It is, indeed, a hybrid creation, containing much that is valuable in its constitution, and much more that is bad, crude, and undeveloped. No doubt, there will be yet many emendations and alterations before the baptised bantling is ready for public exhibition. The parallel sewer part of the scheme, along the line of the river, on each side, is certainly good, and the only obvious and practical remedy. Which of the two engineers will claim this proposal as his I do not know; but this I do know, that the *Builder* has as good a right, if not a better, to take credit for a portion of the present scheme as any one of the various claimants for the honour. The reclamation of the waste sands of Clontarf and its neighbourhood was suggested long since in your pages, with other ways and means now suggested and partly adopted.

Taking up an old volume, a few days since, entitled, "Observations on Mr. Archer's Statistical Survey of the County of Dublin," published in 1802, I find the present idea of a parallel system of main drainage for Dublin is put forward, among other things, by the author, Mr. Dutton Cook. His suggestions are good, and that one of letting the water of the river into the parallel sewers is still worthy of consideration.

Dublin is supplied with every natural facility for carrying out a perfect and a profitable scheme of main drainage, and it hardly needs the eye of an engineer to see the stark-naked facts that would be sufficient to shame a conclave of idiots into action, instead of a city corporation.

You see, sir, it has taken "dear dirty Dublin" upwards of fifty years to think over one healthy movement towards preserving human life. Next it has taken her talkative corporation seven years to frame a measure of partial relief; and goodness knows how many years, and how many millions it will yet take before the patchwork pattern of other men's minds will be finished. I am a comparatively young man, but I fear much, if the progress in the future is like the advance of sanitary improvements in the past, that I am very likely

to comb a grey head before the Liffey is properly purified, and its sewage profitably distributed.

H. C.

P.S. I would propose that before the Corporation Bill is finally amended for Parliamentary action, a clause be introduced for giving the city power for obtaining, by leave or purchase, the waste sandbanks of Clontarf. Any opposition that could be advanced by the lord of the manor, or neighbouring proprietors, could not possess one grain of common sense or reason in support of it.

It would not only be stupid, but criminal on the part of the Corporation to neglect availing themselves of the opportunity to reclaim and utilise those waste sands, by an easy and fortunate sewage-irrigation scheme, and also a most practical and profitable one.

I anticipate the concurrence of the *Builder* in these views.

ROCHESTER NEW CORN EXCHANGE AND THE CASTLE GARDENS.

THE ceremonies of laying the foundation-stone of the Rochester New Corn Exchange, and opening the Castle Gardens, took place on Thursday, in last week. The architects of the new exchange are Messrs. Flockton, of Sheffield. Although it was termed the "foundation," it was really the corner-stone of the building which was laid by the Mayor, the structure having so far progressed as to enable the large party which assembled to meet on the first floor, which will form the new exchange. It is erected at right angles to the present building in the High-street, and can be used in conjunction with it, if desirable. The amount of the expenditure is not to exceed 5,000l. The new building is approached from the present Corn Exchange by a double flight of stairs. It is 91 ft. in length, 46 ft. wide, and 40 ft. high. At the west end there is a retiring-room, 18 ft. by 15 ft. On the ground-floor there is a room suitable for a library or museum. It is 44 ft. in length, 35 ft. in width, and 12 ft. high, and adjoining this room is one convertible into a kitchen. There are also other accommodations. The present owner of the castle and its grounds, which were taken possession of on the same occasion, is the Earl of Jersey, and his lordship has granted a lease of 80 years to the Corporation, and appointed the Mayor of Rochester for the time being Constable of the Castle, and for the first time for many hundreds of years a standard was flying on Thursday from Gundulph's tower. A large number of persons made their way to nearly the top of the ruins. Surrounding the castle, which, with its tower and embattlements, is upwards of 100 ft. in height, and has walls from 11 ft. to 13 ft. in thickness, are the extensive gardens.

THE WATERWORKS AT KIDDERMINSTER.

THESE works have been initiated in the ceremonial turning of the first sod of the new reservoir. Four years ago the defective state of the drainage was forced on the attention of the council, and a sanitary committee was appointed; and on 10th October, 1866, they passed a resolution requesting Mr. Fairbank, C.E., and Messrs. Goito and Bosley to inspect the town, and report on the best mode of improving the drainage and dealing with the sewage. The reports pointed out the necessity there was for waterworks as well as new sewerage. The proper cleansing of the sewers by a constant flow of water through them was indispensable; and, as the state of the walls from which the supply of water for domestic purposes was obtained came to be known, the necessity for waterworks was still more apparent. The question, however, was shelved for the time. At length the outbreak of fever in the town, which occurred about two years ago, again called public attention to the sanitary defects of Kidderminster. The guardians laid the state of the case before the Home Secretary. A Government inspector came down, and, in consequence of his report, the Home Secretary issued a compulsory order for the works to be proceeded with immediately; and, in accordance with the plans of Mr. Fairbank, whose scheme had some time ago been adopted by the local authorities, and who had prepared detailed plans for the works, the corporation have been making various arrangements for the acquisition of lands, &c., and otherwise preparing for the commencement of the works. Borings

for the water for the supply of the town have been made on Sutton Farm, which is in the occupation of Mr. Boraston, and a plentiful and excellent spring of water has been met with. The contract for the reservoir has recently been made, the tender of Mr. Hilton, of Birmingham, being accepted, and the formal commencement of the work has now been made. The members of the corporation, with the borough surveyor and architect, Mr. C. J. Fairbanks, C.E., and the clerk of the works (Mr. Vales) and other officials, and about 200 of the general public, were present at the sod-cutting.

CITY OF LONDON UNION NEW OFFICES.

THE guardians have invited designs in competition from the following architects:—Mr. F. Chambers, Mr. H. Dawson, Mr. T. C. Clarke, Mr. Thomas Blashill, Mr. J. E. Saunders, and Mr. W. Hudson.

THE WORKMEN'S INTERNATIONAL EXHIBITION.

ALTHOUGH this Exhibition is still open, and will remain open for some time, a meeting of its promoters and supporters has been held in the Agricultural Hall, Islington, when the Lord Mayor and Sheriffs attended to make the announcement of the prize awards. Unfortunately, these were so numerous that it was impossible to declare them all; and as it would have been invidious to mention some and omit others, a discreet silence was observed as to the result of the labours of the jurors. Several speeches were made, and some suggestions were offered as to the benefits which might, under proper management, be derived from this and similar exhibitions.

ANNUAL INTERNATIONAL EXHIBITIONS.

THE Exhibition buildings, South Kensington, are making rapid progress towards completion. The painters and decorators have finished their work in the fine-arts gallery, and Messrs. Minton, Taylor, & Co. have commenced laying the encaustic tiling on the floors. The walls of the galleries are painted in distemper, a pale green, relieved by a broad band of chocolate under the cornice and by skirting, which is also chocolate. The ceiling is ordinary distemper. In the lower part of the building, which has just been taken possession of by the painters, the same colours will be employed, and, with some exceptions, the same style of decoration will be employed. A dado, 5 ft. high, of chocolate colour, will run round the entire court, and the girders which support the fine-art galleries above will be panelled in the same colours. The colour of the tiles for the flooring is dark red. The French supplementary gallery, or annexe, forms three sides of a square, and has direct communication with the exhibition buildings. The court-yard, or interior of the square, is to be laid out as a garden, and used for refreshment purposes. It is proposed to open up to the view of persons in this court-yard the gardens of the Horticultural Society.

NEW SYNAGOGUE IN BRISTOL.

THE first stone of a new synagogue has been laid in Park-row, Bristol, in lieu of one taken by the Corporation for the new street to the Terminus. That building was sold for about 4,000l., and the new building, with the purchase of site, together with the internal fittings, will cost rather more than this sum. Mr. Frigg and Mr. Collins are the architects. The front portion of the site will be occupied by the house of the reader, and the vestibule of the synagogue in the rear of this house will be approached from the street by a flight of steps leading to the vestibule, where there will be an arch of Bath stone. The walls, with the exception of this portion, will be of dressed Pennant stone. The building itself will be 46 ft. by 62 ft., and will have a ladies' gallery round three of its sides, there being a second approach to this by a flight of steps from the vestibule. The ceiling will be filled in with ornamental panels. The builders are Messrs. Beaven & Sons, and Mr. R. M. Bryant, of Old Market, has undertaken the woodwork of the interior. The building will accommodate between 400 and 500 persons.

THE PROPOSED MORTUARY BUILDINGS, CITY OF LONDON.

At a meeting of the City Commissioners of Sewers, Mr. Hora brought up a report from the Sanitary Committee submitting amended plans for the mortuary proposed to be erected in Golden-lane, according to which the buildings were estimated by the surveyor to cost 7,821l., making, with the 5,000l. paid for the land, a sum of 12,821l.

Mr. Haywood said that, in addition to the estimate, steam pipes and hot-air flues would be required, but he did not think there would be anything to increase the cost more than 500l. or 600l. at the outside, so far as his department was concerned. A good deal of discussion took place on the subject, and eventually the report was adopted.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL general meeting of members is to be held on Monday evening, the 31st of October, in compliance with the following requisition addressed to the council, and duly signed:—

"We, the undersigned Fellows of the Royal Institute of British Architects, in view of the recent decision of the Law Officers of the Crown with reference to the ownership of the drawings of the Houses of Parliament, and of the code of conditions sought to be imposed by the Office of Works upon architects employed on Government business, request you to call a general meeting of members of the Institute to discuss these subjects, at the earliest possible opportunity."

The first ordinary general meeting of the session will be held on the 7th of November, when the president, Mr. T. H. Wyatt, will deliver an opening address.

The following papers have been promised and will be read:—"Observations upon the West Front of Wells Cathedral," by Mr. Benjamin Ferrey; "Considerations on the Selection of Building Sites," by Professor D. T. Ansted; "On the Construction of Theatres," by Mr. E. Salomons.

RAILWAY MATTERS.

Proposed New Station at York.—Among the eight deferred works of the North Eastern Company, representing a capital of 761,635l., was one for a projected new station, outside the city walls of York, for which the estimate is 196,635l. The time has come when it is thought this work must, from the increasing traffic, be carried out. The removal of twenty miles of sidings to a point more distant, in order to make way for the new station, is a work of magnitude, and the company have now in hand the formation of the necessary embankments about a mile to the north of the York Junctions, and into the Ouse valley at that point they are emptying about 600 truck-loads of ballast per day. On the formation of the new station all day, "backing-in," as is now done with every train, will be avoided. The whole of the South, Midland, and Scarborough lines will run through the station, and the North Eastern main line from the north will have to be diverted to run in upon the Scarborough branch.

A Small-gauge Railway.—The proposed railway for Glencairn will be unlike other railways. The gauge will be only 2 ft. 6 in., which will of course prevent the rolling-stock from travelling on neighbouring lines, and the drivers will be furnished with check-books, and have power to stop the train to take up passengers between the stations. It ought to be called a tramway. The cost of the line would only average a little over 3,000l. per mile. The scheme, however, is to be "further considered."

THE POTTERY OF DERBYSHIRE.*

AMONGST the manufactured productions of the county of Derby, specimens of stoneware have always held a very distinguished place, a circumstance which is chiefly due to modern times to the many beautiful objects of ceramic art which were turned out from the Old China Factory, upon the Nottingham-road, in Derby. Long before the establishment of these celebrated works, the manufacture of pottery in various forms was one of the chief resources of trade in Derbyshire, and it is very probable that

* From "The Pottery and Porcelain of Derbyshire," By Alfred Wallis, Editor of the *Derby Mercury*, &c.; and Wm. Benrose, Jun., Author of "A Manual on Wood Carving," &c.; for the Guidance of Visitors to the Midland Fine Arts and Industrial Exhibition, held in Derby, 1870. London: Benrose, Paternoster-row.

kilns were erected for this purpose very soon after (if not prior to) the Norman conquest. Tile works upon an extensive scale were recently discovered at Repton, from whence the pavements of many English ecclesiastical buildings of the fourteenth century were furnished. Specimens from this manufactory were exhumed at the Friary, in Derby, when the grounds were dismembered about 1863.

In 1862, a discovery was made upon the estate of Lord Scarsdale, near the top of Barley Hill, in the parish of Duffield, the importance of which cannot be over-rated. Here, in the course of drainage, the workmen uncovered a number of broken earthen vessels, burnt stones and ashes, forming the debris of what had once been considerable Norman pot-works, specimens of which are preserved at Kedleston Hall. One of these is a very fine jug or pitcher, 16 in. high, perhaps the most interesting Mediæval specimen of stoneware that has yet been discovered in the county. It bears the family badge of the Ferrars (who held Duffield Castle from the Conquest to the reign of Henry III.),—namely, the horseshoe and buckle, with other ornamentation.

Even earlier than the foregoing (if tradition and recent discoveries may be credited) were the pot-works at Tickenhall, near Melbourne, where the extensive manufactory of rough pottery is carried on at the present time. There is good reason for believing that a large proportion of the Mediæval vessels, which, under the names of carls, tygs, crinices, pipkins, &c., are occasionally discovered in the Midland district, were made at Tickenhall, where, upon the site of an ancient factory, "wasters," or imperfectly finished pieces, of Norman character, are frequently exhumed.

Paylip Kinder, in his manuscript, "History of Darbyshire," writing of Tickenhall, says:—"Nuna Pomplius here might have learn'd his 'Straine of Frugalitye!' Here are your best Fictiles made by earthen vessels, potts, and pancons, at Tyckhall, and carried all East England through."

It is, perhaps, needless to go back to pre-historic times in contemplation of the funeral vases, in which our British forefathers enshrined the ashes of their dead, or we might enlarge upon the graceful forms, elegant ornamentation, and general adaptability of purposes, which characterise the stoneware of the British, Roman, and Saxon periods in Derbyshire. Much has been written upon this subject, which may be referred to by the curious in such matters.

The Derby China Manufactory.

Taking up the history of Derby China from Heath's Cockpit Hill Pot Works, the name of William Duesbury, in conjunction with the China Factory upon the Nottingham-road, follows that of the Heaths in natural order, although it is by no means certain that this is the proper chronological sequence. Of the early history of the famous manufactory at Derby little is known; even the old hands seem to have had but very obscure ideas respecting its origin, and the most authentic information is contained in the MS. "notes" of Samuel Keys, which we here print, without alteration, from a copy differing somewhat from that published by Mr. Chaffers:—

"Notes by Samuel Keys.—The History and Origin of the Derby China Manufactory being very little known, I shall endeavour to give a few of my own recollections.

China was first made in Derby, I believe, by a man in a very humble way (but his name I cannot recollect). He resided in Lodge-lane, in some old premises up a yard by the (now Brown Bear public house). When he first began, he fired his articles in a small pipe kiln very near, till he had constructed a small kiln in a fireplace in the old premises he lived in. He had only small animals and birds, laying-down lambs, &c.

Mr. William Duesbury the first got his knowledge firstly from that man, and improved on it. I never knew much of Mr. Duesbury's origin, but believe he came from Walsall, or the neighbourhood.

Mr. Duesbury was on friendly terms with Mr. Heath, the banker, and the proprietor of Pot Works on Cockpit-hill, among which Mr. Duesbury had a stock of goods by him, and Mr. Duesbury had improved in his small experience with small China Toy making, and Mr. Heath assisted him in the most liberal and friendly manner, with money and assistance, on a journey and voyage to Ireland on speculation with the goods. The result was favourable. He parted with all his goods to great advantage, returned and paid all his debts to the bankrupt, and opened a connection which enabled him to go on with spirit, and as a respectable manufactory.

Mr. Duesbury was a very old man when I first went, and had been established as a potter for many years. Several painters having served their apprenticeship, and were working as journeymen. I will try to recollect their names—Thomas Bost and Joseph Stables, the only men who used gold, and that genuine brown gold, William

Cooper, William Yates, John Yates, Edward Withers, William Billingsley, Joseph Dutton, John Blood, William Smith, William Loogden, William Taylor, then a biscuit blue painter, John Butler, colour grinder, and three women burnishers, all in the two old painting rooms in the old works. John Duesbury, overlooker.

T. Bost did the principal part of the useful and rich gilding and painting. J. Stables was chiefly employed in gilding figures and slight tea wares. The others were employed at figures, and slight flowers on tea wares. Painters were then alarmed at a useful kiln of wares being drawn, being mostly employed in the ornamental branch. I was the last that was bound apprentice to the first William Duesbury. In a short time after he was affected with a stroke, which deprived him of his speech, and use of his limbs. He lived several months in that state.

The China Manufactory at Chelsea had failed while Mr. Duesbury was going on in a very prosperous way, and he established his manufactory in the most respectable style with models, moulds, &c., from there, and numbers of them are now in use (or might be) to good advantage. He had likewise opened a warehouse in Henrietta Street, Covent Garden.

In a few years after I went, the figure trade was on the decline, and was thought owing to Mr. Duesbury introducing Mr. Brown's Spar Ornaments in his show rooms.

Very soon after Mr. Duesbury was taken with a very low chill. Withers then looked upon as the best flower painter on China in England. But they could not find employ for him, and drove him for refuge to Staffordshire, by giving him a quantity of basket boys, or 'buggards' as they were then called.

Several painters and gliders were put down, and Derby was beginning to rank as the first manufactory in the kingdom. It will be seen in a curious style from nature. Withers was gone, no one knew where at that time, and Billingsley made the attempt with the instructions of Mr. Boreman. He copied out gilding or wares that suited, and when the order was sent off it gave great satisfaction. This order was followed by others, and flower-painting was raising in very high estimation. Single plants were then most fashionable, and Billingsley persevered in flower-painting under the instructions of Mr. Boreman, who first taught him the modern method of grouping, and with what success every China painter knows without any further comment.

When Mr. Duesbury had been here a short time, an order came for some plates, to match a Chelsea plate with a single plant in a curious style from nature. Withers was gone, no one knew where at that time, and Billingsley made the attempt with the instructions of Mr. Boreman. He copied out gilding or wares that suited, and when the order was sent off it gave great satisfaction. This order was followed by others, and flower-painting was raising in very high estimation. Single plants were then most fashionable, and Billingsley persevered in flower-painting under the instructions of Mr. Boreman, who first taught him the modern method of grouping, and with what success every China painter knows without any further comment.

Derby, about this time (1780), and a many years after, was the first fire and workmanship in the kingdom.

I have no wish to go on with the history of the next Mr. Duesbury, he brought it to the highest pitch of excellence, and how it has been conducted, and by who, with the history of them, would be distressing to my own feelings, and unpleasant to others.

There are few, perhaps, who may now recollect part of the remarks I have here given entirely from memory on my part, and what I believe correct. My statements are very brief, and I have given in only a few instances to the rising generation, and for them to make their own remarks from what they see and hear.

When I first went to work, Mr. Taylor painted only blue under the glaze on China. First fired, and he asked permission to paint on the glaze, and paid his foot-ale for it. He was set to matching India patterns, and became very clever and useful.

Very few then knew how to use the wheel, and only water-colour lines were made. All circles, lines, and edges were done by hand. Painters resisted the wheel being used in any other way. Taylor had some ware to match with red lines in the pattern. He attempted to do them on the wheel, but they were rubbed out, and the head of the wheel taken out and hid. In the end he was allowed to do them by process how much better and more true the lines were. Privately after that, some time, gold circles, &c., were done, and the rise of the wheel became more general and useful. Withers after being harassed about in the last years of his life, went to Birmingham, and was employed at the Japan trade. He then went to London, and was very much distressed among the Japan painters. Flower painters were wanted, and he was found out and set to work. But when he came to the time before he could be made useful, and was almost despairing. He at last managed pretty well, and became a respectable flower-painter again, but very inferior to Billingsley.

He died in Bridge-gate in great distress, chiefly owing to misconduct, and was buried by his shopmates.

An interesting account of the origin of the manufactory is given in the different histories of Derby. Whoever may be at the trouble of perusing this, let them bear in mind I have no motive but giving information. It is wrote without the least study, but merely from recollection as I went on. No pains is taken in the writing, and of course I hope there may be no criticism made, but take the set and dead together, being merely a tritling respect towards the trade I class myself a humble member.

21st Decr, 1837."

Mr. Chaffers, from whose important work we have had the privilege of making valuable extracts, has also an account by Mr. Locker (which has recently come into his possession), from which he gathers that William Duesbury was the son of a carrier, at Cannock, in Staffordshire. A variation from the above notes, by Keys, runs thus:—"About 1745, a man, said to be a foreigner, in very poor circumstances, living in Lodge-lane, made small articles in china, such as birds, cats, dogs, sheep, and other small ornamental toys (which he fired at a kiln in the neighbourhood, belonging to a pipe-maker named Woodward)."

In a foot-note Mr. Chaffers observes,—"Mr. Jewitt thinks the foreigner was a French refugee, named Andrew Planché; having in his possession the draft of a deed, which was never executed."

Mr. Chaffers has also an account by Mr. Locker (which has recently come into his possession), from which he gathers that William Duesbury was the son of a carrier, at Cannock, in Staffordshire. A variation from the above notes, by Keys, runs thus:—"About 1745, a man, said to be a foreigner, in very poor circumstances, living in Lodge-lane, made small articles in china, such as birds, cats, dogs, sheep, and other small ornamental toys (which he fired at a kiln in the neighbourhood, belonging to a pipe-maker named Woodward)."

appears again in connexion with the works." The bankruptcy of Messrs. John & Christopher Heath did not take place until 1783, or thirty years after the ascertained foundation of the Nottingham-road Works, so that deductions based upon the existence of such an informal document as that above mentioned must be received with considerable caution.

We may here give a short description of the method of working at the opening of the present century, written in 1810, the technical terms being printed in Italics.

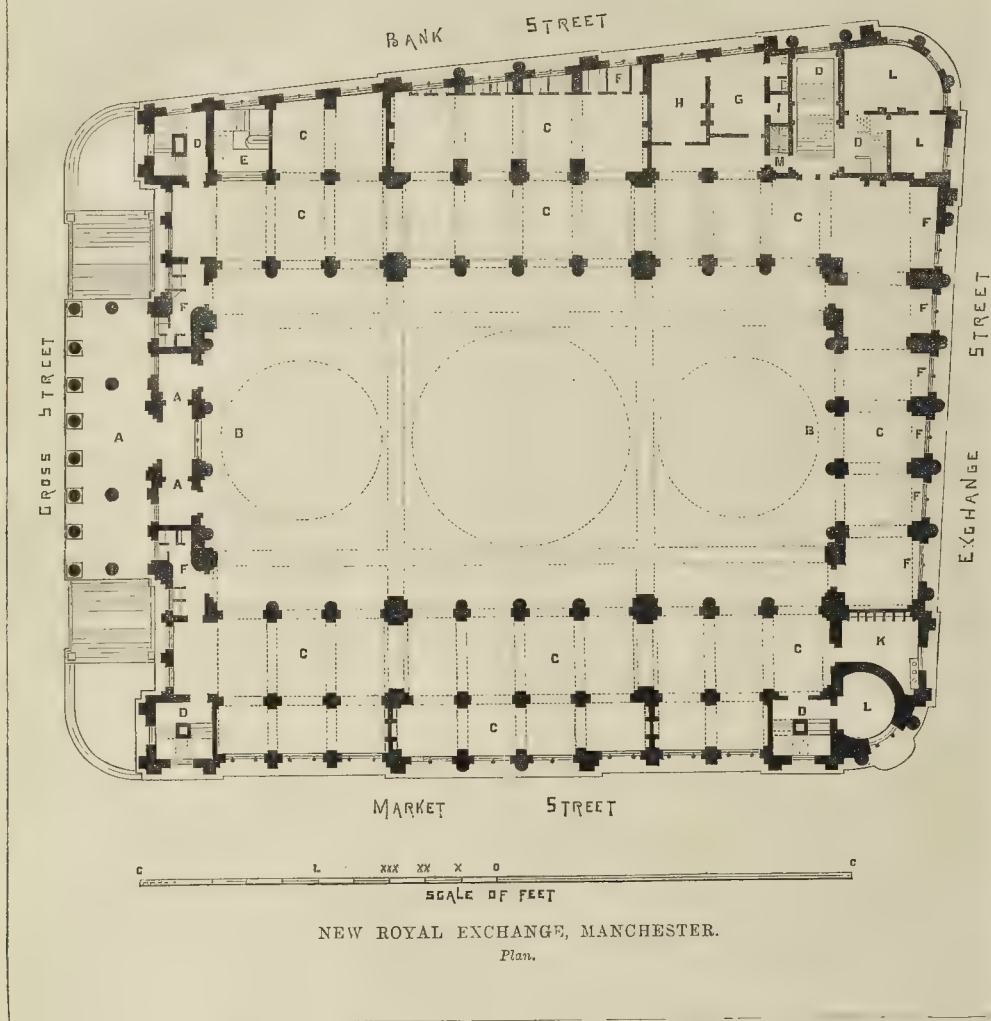
The body of the semi-vitreous were called porcelain, is fine white clay, combined with different proportions of fluxing material. The best kind is absolutely infusible, and takes for glaze a vitreous substance without a particle of lead. When the paste is duly prepared by grinding and other operations, it is consigned to the workman, whose dexterity produces a variety of beautiful forms from the shapeless mass delivered into his hands. Round vessels are usually made by a man called a *thrower*, who works them on a circular block moving horizontally on a vertical spindle. Afterwards they are *finished*, and *handled*, if necessary, by other persons, and are then conveyed to a stove, where they remain till the moisture is nearly evaporated, when they become fit for baking. Oval vessels, such as *tureens*, *tes-pots*, &c., assume their form through being pressed into moulds of plaster or gypsum, by hand. The *saggers*, or cases in which articles are burnt, are various in shapes and dimensions as best regards convenience. These are *set* in the *kiln* one upon another, and when piled nearly to the top have the appearance of piles of cheese. When the kiln is full it is carefully closed, and the ware baked by the admission of heated air through horizontal and vertical flues. This is the *first baking*, and the porcelain in this state is denominated *biscuit*. It is then *dipped* in *glaze* of about the consistence of cream, and carried to the glaze-kiln, where it is again baked, but to a less intense degree of heat than before.

The ware is now delivered to the painters, who, with colour prepared from mineral bodies, ornament it with the required patterns. After this process, it is again conveyed to the kiln, and the colours vitrified. Every coat requires a fresh *burning*: the more elaborate works have to undergo the action of fire several times before they obtain their full effect and beauty. This completes the process with those articles that have no gold in the pattern; but where this addition is wanted it is pencilled with a mixture of oil and gold, dissolved or *thrown down* by quicksilver, aided by heat (Keys says, "brown gold"), and once more committed to the kiln: here the gold comes out with a dull surface, which is rendered brilliant by *burnishing* with bloodstones and other polishing substances. The gold when not sufficiently burnt, will separate in thin flakes; and when over-fired will not receive a proper polish. The highest finished ware in this manufactory is frequently returned to the *enamelled kiln* where the colours are fluxed six or seven times: the best only are finished here for sale.

The making of *biscuit* figures is peculiar to this manufactory, and the pieces themselves are supposed to be equal in beauty and delicacy to any other of a similar kind made in Europe. The various parts of the figures, &c., are cast in separate moulds, and when dried are joined by a paste of the same kind, but thinner in consistency (*slip*). The articles, after undergoing a regular and continuous heat in the kiln, come out extremely white and delicate.

The writer of the foregoing description goes on to remark, that in 1810 the factory was five times the extent of the original building, and even then insufficient to accommodate the workmen. Alluding to the increase of business and the "national importance" of the undertaking, he describes new buildings in process of erection, the introduction of a steam-engine, and other improvements. At this time the manufactory occupied an area equal to 6,000 square yards, and had a frontage of 170 feet. It gave employment to between 300 and 400 work-people—men, women, and children.

[The factory afterwards passed into new hands, and declined, till finally it was given up entirely.] Mr. Locker established a factory in King-street, the plant of which is now worked by Mr. Sampson Hancock, opposite to the Derby Grammar School. Mr. Hancock's specimens are in every way creditable to the town and to himself.



The Artists.

Artists generally are a race of people dwelling in a world of their own, which is but little understood by those outside of the pale; and the clever people employed at the old Derby factory, whose facile fingers have produced those masterpieces of decoration which are gazed upon with such pleasure by all who examine the splendid groups collected together in the Derby Exhibition of 1870, formed no exception to this rule. Nomadic in their habits, they seem to have wandered about from factory to factory, earning high salaries, and spending money freely—mostly improvident, and seldom satisfied. Some of the more staid and elderly amongst them settled down in the town, and became reputable men as teachers of their art; but almost all of them shared the usual artist-fate, and died poor. Many of them were sons of respectable tradesmen and yeomen in the vicinity of Derby, such as Thomas Soar, the noted gilder and designer of arabesques, who was one of the Soars of Little Chester (a yeoman family of great antiquity, now extinct in the male line); and the Yateses, who were connected by consanguinity with several good families of this town. Brewer, Bancroft, Stanesby, Mellor, Whittaker, and others, were also Derby

men of good standing. The modellers were mostly birds of passage, and many of them foreigners.

Wirksworth China and Earthenware Works.

This factory must have been upon a very large scale, and probably was even more extensive than the Derby Works, which it preceded as a china manufactory, but to whose rising power it was obliged to succumb in 1777, when it was finally broken up. The goods made here were of the very finest description, and specimens may occasionally be met with, both of china and earthenware, the decorations of which are very similar to those of Lowestoft. The green colour is bright and peculiar, and the paste is white and very translucent. The pottery from this factory is remarkably soft and fragile. Some articles in white (soft paste, with a thick glaze), with plain gold lines, are elegant in the extreme. No writers upon the history of Derbyshire porcelain have hitherto given any idea of the variety of valuable works turned out from this factory. We are in a position to state that figures of a graceful character, beautifully moulded urns and lamps were made here. In addition to these articles, tea-ware, of a fine and transparent paste, and ordinary earthenware were manufactured. We have not at present been able to trace any distinctive mark to this factory.

Pinxton China Works.

A China Factory was established here about 1795, by Billingsley and Mr. Coke. The paste was of peculiarly fine and transparent character; but the decorations were by no means upon a par with the quality of the material. Billingsley left the concern, after the lapse of a few years, and an inferior description of ware was made by Mr. Cutts, until about 1812.

We note the following list of Derbyshire potteries:—

Alfreton—Red ware.
Belper—Gutter stone-ware, bottles, pitchers, &c.
Brampton—Pot works have been carried on for many years at this outskirt of Chesterfield, for the manufacture of brown-ware flower-pots, &c. Potter's clay of a yellowish or grey colour is found in this neighbourhood; and early specimens of Chesterfield pottery may thus easily be recognised by this tint.
Chesterfield—White, brown, and red ware, and drain-pipes.
Church Gresley—White, yellow, and red ware.
Hartsborn—Various.
Dewby—Stone bottles. A fine class of ware was attempted here in imitation of Wedgwood's black Egyptian, by Mr. Bourne. We have a jar in this material, with cameo groups in the Etruscan style, bearing the stamp F. Bourne, which came from the immediate neighbourhood.
Ilkeston—Newbold.
Smalley—Water-pipes.
Swadincote.
Tickenhall—Red ware, pantheons, &c.
Whittington—Red ware, pantheons, &c.



NEW ROYAL EXCHANGE, MANCHESTER.—MESSRS. MILLS & MURCATROYD, ARCHITECTS.

MANCHESTER ROYAL EXCHANGE.

The Manchester Royal Exchange, of which we this week give illustrations, is now being erected under the direction of Messrs. Mills & Murgatroyd, architects. The building occupies a portion of the site of the Old Exchange, erected some twenty years since, together with a considerable additional plot on the east side thereof, the total area covered being 5,400 square yards. The land being, from its central position, about the most valuable in Manchester, the proprietors were compelled to look to other sources of revenue besides their subscription list (now numbering upwards of 6,000 members) for a return upon their capital of 450,000l.; and as the irregularity of level of the surrounding streets, which will be considerably widened by portions absorbed from the site purchased, necessitated the floor of the Exchange-room being placed some distance above the level of the lowest point, it was determined to make that distance sufficient for obtaining shops below the room, and fronting to three of the streets.

Behind the shops are spaces adapted for stores and a restaurant, and also a central hall, approached from Bank-street, in which carts can be loaded and unloaded in connexion with the two stories of fire-proof cellars reaching to a depth of 24 ft. below the street level. The service to these cellars will be by means of hydraulic hoists. The ceiling of the shops, central hall, and stores, forming the floor of the main room, is fire-proof, consisting principally of rolled iron joists and concrete.

The main entrance to the room is in Cross-street, and consists of an octostyle Corinthian portico, approached by a flight of steps on either side: the columns are 3 ft. 6 in. diameter, and 35 ft. high, and the pediment will be filled with the Royal Arms removed from the Old Exchange, with its supporting figures, &c., and which was a work of the late John Thomas.

The Corinthian order is carried out throughout the fronts of the building. Besides the principal entrance in Cross-street, formed by a fine granite-cased opening from the portico, there are other subsidiary entrances near the four corners of the building; the one at the corner of Exchange-street and Market-street being surrounded by a tower, 180 ft. high, forming a central feature at the end of Victoria-street, which approaches the side diagonally on the axis of the tower. The windows in the angle blocks or pavilions, containing the staircases, have arched heads, which will be filled with groups of sculpture, by Mr. E. G. Papworth, by whom also other figures and groups have been prepared for suitable places intended for their reception, all being illustrative of the industries of the principal towns of Lancashire and of the nationalities with whom her commerce is conducted.

The plan will show the general arrangement. The whole area of the site at this level is, with one or two trifling exceptions, given up to the use of the subscribers, the area of the room itself, of which we shall give a view, being of the large extent of 4,050 superficial yards, as against 1,620 in the old building. This is exclusive of the reading-room (340 square yards), portico, &c.

The room may be said to consist of a central nave, 96 ft. between the walls, and side aisles beyond, extending to the outer walls of the building. The nave is surmounted by a large central hemispherical dome, 62 ft. in diameter, carried on pendentives, and by two smaller segmental domes, the height from the floor to the eye of the central dome being 120 ft. The aisles are less in height than the nave, and above them are constructed ranges of offices, &c., approached by the staircases shown on the plan, and which will be let off, and will no doubt be found very convenient for merchants and others having business to transact on the Exchange. The architectural arrangement of the large room consists of a range of arches springing from pier to pier, those being separated on the side next the nave by columns of red Irish marble, 3 ft. 2 in. diameter and 33 ft. high, and standing on grey marble plinths, 5 ft. high; the large pilasters, also, are cased with red and grey marble, all being from the quarries of Messrs. Sibthorpe & Son, of Dublin. Above the entablature is a clerestory, the shafts carrying the arches of which are of terra cotta, made by Messrs. March & Sons, of Berlin. All the lights of the clerestory will be made to open by machinery for ventilation, for further promoting which shafts are prepared, through which warm or cold air is intended to be driven into the room by a fan and steam-engine placed in the basement.

The contractors for the works are Messrs. Parker & Son, who have themselves executed the masonry and brickwork; Mr. Southern being the contractor for the carpenter and joiner's work, and Messrs. Jaffrey & Lightfoot for the plumber and glazier's work, and for the copper with which the domes and a large portion of the roof of the building will be covered. The plastering has been let to Mr. Harwood.

REFERENCES TO PLAN.

- A. Portico and Main Entrance.
- B. Vestibule.
- B'. Centre Compartment.
- C. Aisles.
- D. Staircases from street level to Exchange Room and Office above the aisles.
- E. Staircases to Reading Gallery, extending over aisles from E to G.
- F. Pay-desks and Offices.
- G. Secretary.
- H. Committee.
- I. Sale.
- J. Attendants.
- K. Lavatories, &c.
- L. Offices.
- M. Service Stairs.

WORTH CHURCH.

SIR,—It is the invariable habit of human nature to shrink from unpalatable truths when affecting itself, and no one can feel aught but sympathy with those who defend themselves manfully and stoutly against false accusations; but it sometimes necessarily happens that truths, however unpleasant, must be told,—witness your own homethrusts, Mr. Editor, at Newcastle, and your equally straightforward words about Worth. It does not always occur, however, that the defences made are hidden under a bush, yet in the case of the old Saxon church, even your ubiquitous eye has failed to light on a report of a meeting of the Sussex Archaeological Society, published in the *Sussex Express* of the 11th inst. Perhaps it has been intentionally kept out of your sight, because you are roughly and not quite courteously handled. Had you seen this article it would have been promptly replied to; and the absence of such reply in your last issue must be my excuse for sending you the newspaper in question. I should strongly recommend you to print it entire, as the most effective gibbeting you could apply.

I am tempted to make a few observations on the subject itself, as well as on the speeches of the Sussex Society, because the inference to be drawn from them is that the members were enlisting the sympathies of the world against unwarrantable attacks made by the *Builder* alone. Why, sir, the whole architectural profession and the distinguished archaeological societies were in arms at the desecration of the place. We know that the Royal Institute of British Architects and the British Archaeological Association protested (alas! too late) against any "restoration" in the way in which it was being carried out; and why is there comparative silence now? I will answer the query,—Because it is known that nearly all the mischief is done, and because it is known that no protest would avail against the determination of the local authorities, who have all along existed in that has been and is being done. Let them, and all our Sussex friends, thoroughly understand that every soul who understands anything of the matter is altogether with you, sir.

Now, sir, let us look a little into the castigation intended to be applied to your guilty back. I have taken the trouble to analyse the matter, and I find that "about thirty" persons were present, which, of course, means fewer than thirty, of whom twenty-three or twenty-four are named specially: there were five or six ladies, nine clergymen, and nine laymen. Of course, there were three or four of the press, otherwise the toast of "the press" would scarcely have been proposed. So, you see you need not wince under the lash, however heartily administered; for the ladies would hardly venture an opinion, and the clergy hang together like certain other persons; and of the laity not one, I venture to say, should assume to speak for the very respectable and talented members of the Sussex Archaeological Society. There are several of its members eminent in their profession as architects, and equally eminent as antiquaries; but they were conspicuous by their absence. A sentence occurs in your last number (in a review, page 839) which may aptly be repeated here: "There has been too much of dilettanti writing on architecture; and a small book on a great theme should only be attempted by those

who have thoroughly mastered the subject." Only change the word *writing* into *speaking*, and it applies to a very large number of amateurs (mostly clerical) who treat of "things that they don't understand." It would be amusing, if it were not deplorable, to hear it said that "it was an agreeable surprise to find the ancient fabric standing with all its most interesting features not only unscathed, but positively improved by the work of restoration, and risen like a veritable phoenix from the ruins of its old materials."

Was the writer aware, I wonder, that the chancel, at least, had been entirely removed? Some credit is taken, too, for the removal of the wooden spire. I doubt if much was ever said in its favour, and no "great outcry" was raised at its removal, but at the possible consequences to the older work; and it may fairly be a question whether a new tower should have been erected, and where its position? This is but an attempt to divert the real complaint.

Hoping that you may live long to help with your good pen to preserve our historical landmarks, I am, &c.,

F. S. A.

MATTERS THEATRICAL.

MR. BUCKSTONE and his company having returned after a lengthened gold-digging expedition in the provinces, both English and Scotch, the *Haymarket Theatre* was re-opened on Monday evening with Sheridan's comedy of "The Rivals," and was filled from top to bottom: a good indication. The comedy was, for the most part, exceedingly well played, Mr. W. Kendal making a good *Captain Absolute*, and the lessee an unapproachable *Bob Acres*. Mrs. Chippendale, Mrs. Kendal (Miss Madge Robertson), and Mrs. Fitzwilliam contributed importantly to the good whole. The novelty of the evening was a comedieta by Mr. Theyre Smith, called "Uncle's Will," wherein Mr. and Mrs. Kendal acted admirably. It is similar in character to "A Happy Pair," in which Miss Herbert and Mr. W. Farren distinguished themselves, and is nearly as good. The writing is bright, and the story compact. Mrs. Kendal, who has a good future before her, has since acted in the "Love Chase," with remarkable success.—At the *Olympic Theatre*, Mrs. W. L. Liston, earlier known as Miss Maria Simpson, shows considerable taste and skill in the getting up of such new pieces as are produced there; thus, in the musical extravaganza called "Paul and Virginia," the scenery, dresses, and appointments are all elegant and appropriate, and the vulgarity of the modern burlesque is avoided. We would rather not see Mr. George Belmore (*Virginia*) descend to the female part, cautiously as he acts it. Mr. Belmore is one of the best actors on the stage, and should now be confined to worthy parts. His acting in "Little Em'ly" is of itself sufficient to prove our assertion. Other parts in this drama are admirably acted, notably by Mr. David Fisher, Miss Ernsstone, and Miss Reinhardt, and with the scenic effects and the interest of the story, sufficiently explains its continuing success.

—The *Manchester Theatre Royal* had an escape a few evenings ago. The company were engaged in the rehearsal of a piece called "The Odds," and a fire broke out in the property-room, which is immediately over the large gallery in the auditorium. It was extinguished before harm was done to the building, but many of the properties intended for the Christmas pantomime were destroyed.—In this piece as now acted in London at the *Holborn Theatre*, one main feature is a mechanical scene representing an express train in motion, at night, and the perpetration of a crime. It is very well managed, but not so well as at the *Surrey Theatre*, where the same scene and effect are introduced in a drama called "Link by Link." Here the rapid passage of the landscape behind (made more evident than at the *Holborn*) and the movement of the smoke render the illusion remarkably perfect. The piece itself is hazy, but two or three of the parts are very well played. Mr. E. T. Smith should make some arrangement to lessen the draft in the dress-circle, which especially by those near the centre, is unbearable. If managers knew how many persons stay away from theatres because of the difficulty of avoiding cold and stiff neck, they would make some attempt to lessen the draughts which blow away money. The upper boxes at the *St. James's Theatre*, where, thanks to Mr. Beazley, a third of the people cannot see the stage, are very bad in this respect. At this theatre, by the way, Mrs. Vezin's acting in the English version of "Fer-

mande" is entitled to the highest praise, and shows her to be an artist of the highest ability. She is well supported by the lessee, Mrs. John Wood, and by Mr. William Farren, who has grown grey hairs, and is laying himself out for parts made famous by his father. We are anxious to see his *Sir Peter Teazle*, which has long been promised.—One line to recommend those who like to see to what perfection gymnastic exercises can be brought, to go to the *Royal Amphitheatre*, in Holborn, the Astley's of to-day, and we end our paragraphs. There are also some elegant riders and very docile horses.

HEAD versus FOOT.

"R. T." writes,—

I had a conversation lately with a country gentleman; subject, "Killing occupations." I mentioned what I saw near Windsor Castle,—numbers of women employed in autumn spreading manure over the fields; a filthy, cold, and damp occupation for females. He drew attention to the poor work-girls in London, who, splashing through the mud noon and night, their shoes often a bunch of wet fragments, sit all day in these damp things in a fetid atmosphere; frequent illness and short lives are the inevitable consequence. Employers of these silly girls should insist on less flaunting head-gear of feathers, flowers, bows, veils, &c., and better "understandings;" this would promote the health and interest of such. One other matter touching the feet. Kamptulicon, a beautiful soft and warm substance, has obtained a bad report on account of its lying close to flooring: not allowing moisture to escape, the boards speedily decay. The idea of perforating stars, diamonds, or other devices does not seem to have occurred to the manufacturers, to enable it to retain and maintain its footing. In this shape it would again become first favourite: 2 to 1 against floorcloth. One blow of a mallet would punch many holes.

THE HARROW-ROAD IMPROVEMENT.

SOME time since the inhabitants of the Harrow-road waited upon the Paddington Vestry and requested them to widen the Harrow-road by pulling down the north side, from the Edgware-road to Paddington-green; also a portion of the west side of the Edgware-road. The Vestry referred the matter to the Metropolitan Board, who instructed their architect to make an estimate of the cost, and he estimates the cost of the improvement at 138,000*l.*, and the net cost at 100,495*l.* The Board of Works consent to carry out the improvement provided the Vestry will pay half the cost, and last week the subject was discussed in the Paddington Vestry, when it was resolved that the offer of the Metropolitan Board be accepted. This desirable improvement will therefore be carried out, and the road, which is only 19 ft. wide at one part, will not only be widened, but a large number of courts at the back, the houses in which are in a miserable condition, will be removed. The money will be borrowed under the terms of the Metropolitan Consolidated Loans Act, and the repayment will extend over a period of sixty years.

THE WATER-GATE.

MAY I trouble you once more upon the subject of the "York Stairs?" I was glad to find a sympathiser in "Father Thames," who made himself heard to purpose in your impression of the 1st inst. I have obtained permission to sketch and measure from the Office of Works, thanks to you, and have availed myself of the same. I learn that the "gate" is claimed by the inhabitants of Buckingham-street, but it may be they would prefer the ownership to other parties if interrogated.

It would be well to find out who really are responsible for the ignominious position and state that this relic of so great a genius as "Jones" has now become reduced to. It is often said, with some truth, that where an evil is made known, or complained of, it is well to propose a remedy. I have therefore one of two suggestions to propose as a remedy, or way out of this difficulty, if the incorporation with the "Embankment" of "York Stairs" is so regarded, viz.—

I would suggest that it should be carried down the river, and erected as a "Water Gate" to that magnificent work of Jones's contempo-

rary, viz., Wren's Greenwich Hospital. The quay and esplanade in front of the hospital would be greatly enhanced by the addition of such a beautiful feature. Moreover, it would be in harmony with the grand Doric colonnade, and give a completeness to the river front which it does not now possess. Here there is no "granite" to clash with the more modest Portland. It might thus occupy even a more honourable position than it ever did; and would be useful as a landing or embarkation-place upon State occasions. Moreover, it would thus exhibit the two greatest architects of England in juxtaposition.

If Her Majesty's Office of Works are really responsible for the proper sustentation and care of this gate, surely this proposal on the face of it would seem a good and convenient one for them; and should they have nothing to do with it, I fancy the undertaking would not prove so very costly to some one of those noblemen who are ready to be found amongst us as *encouragers of art and native artists*. It would reflect much honour upon him, and render the nation obliged.

R. P. W.

THE WEDNESBURY TOWN-HALL COMPETITION.

ABOUT twenty-five designs were sent in, and last week the Board adopted the report of the Building Committee. The sealed envelopes sent in by the various competitors were then opened. The names were as follow:—1st, "Paix," Mr. J. Loxton, Wednesbury; 2nd, "Square and Compasses," Mr. S. Horton, Wednesbury; "Experier," Mr. G. B. Nicholls, West Bromwich. The premium in the first case was 25*l.*; 2nd, 12*l.* 10*s.*; 3rd, 5*l.* The premium in the first case will be merged in the commission. The chairman remarked that Mr. Loxton would have to give up his seat at the Board, as he would be an interested party, and it would not be considered fair for the funds of the Board to be passing through his hands, his design having been accepted. More than one correspondent has remarked that the competitor receiving the first premium is one of the members of the Board; secondly, that the other is a Wednesbury man; and, lastly, that the third is an inhabitant of the nearest place to Wednesbury, adding, "that the whole is the result of local influence."

SIR,—As one of the competitors for the Town-hall, Wednesbury, I beg to inclose a speech made by one of the committee containing his ideas of justice to the unsuccessful competitors which may be useful to the profession:—

"Mr. Hutton, as a member who had not been privileged to examine the designs, was pleased with the proposition of a fortnight's delay that he might form his own opinion and vote with a full knowledge of what he was doing. He inquired if it would be possible to modify the plans which were preferred, and could he then wish any improvement which might be shown in any of the other plans?"

"ONE WHOSE BRAINS MIGHT HAVE BEEN STOLEN."

CAN A JOINER BE A GENTLEMAN?

SIR,—In speaking of "the habits of working men not long ago," Mr. Revellman is reported in the *Builder* to have said:—"It was, so far as my experience went, the common conversation among working men, that the cleverest man was a good drinker, and a good fiddler. All operatives connected with the building trade," in his time, "were connected with drink and degradation." Assuming that this sweeping assertion is true, will you kindly allow me space to glance at a few more habits with respect to "workmen not long ago," and also of the present day. Although they are different from those which Mr. Revellman has spoken of, and which are looked upon as good habits by educated people, yet they are just as degrading to the artisans as either "drinking" or "fiddling." No matter how much the mechanic may know, either in connexion with his trade, the ways of the world, or of those matters which his friends and well-wishers think he ought to know, he is still looked upon as a common mechanic, and expected to look up to, bow down before, and touch his hat to, those who his little knowledge tells him are only men like himself. He is expected to be lavish when he feels that to be respectful ought to be enough. I could name an educated gentleman who wrote to an employer asking what kind of men he sent him, saying they neglected to touch their hats when they met him, or his children, for whom he cared not to him whether their hands were full at the time or not, he expected what he looked upon as his due. I was called to account not long ago for having the audacity to give a double knock at a doctor's hall-door, for whom I was going to work; forcibly reminding me that, no matter how much I knew, I was only a "common carpenter." Although it may appear strange, it is still a noticeable fact, that the cleverest workmen, as a rule, are fond of intoxicating drinks. This may be partly accounted for by the fact that there is no recognition for them on the part of clever people out of their own class or calling. Their minds are hence more tired and more short-tempered than the minds of the dances amongst whom their lot is cast, when

* Although we allow our correspondent to "say his say" without other comment, we think it necessary to dissent from this assertion.—ED.

they are considered intruding if they attempt to make free with those of an equal turn in what is called a higher position in society, it is no wonder they would become peculiar in their ways, and take to fuddling and eccentric habits. Better for them they never went beyond these R. R. ways, along with the low to low down to the lords of the soil, and to give a single knock when they approached an apothecary's residence.

While the barriers that lie in the way of the working man seek to rise in the social scale are allowed to remain, it is useless to invite them forward. There is no recognition, no reward, for those who strive. He who succeeds in advancing a few steps beyond the ordinary standing the language in which it is explained, must be a fair English scholar, and what is more in keeping with the latter word than that of gentleman.

"Where ignorance is bliss,
'Tis folly to be wise."

Before any material good can be effected among the working classes, those above them will have to cede a great deal. As Mr. Hastings said in his late address before the Social Science Association, as reported in the *Builder*, they "must abandon that exclusiveness which in education, as in other things, is too prominent a characteristic of Englishmen." "A common carpenter," who masters half the theory of architecture, or who is capable of understanding the language in which it is explained, must be a fair English scholar, and what is more in keeping with the latter word than that of gentleman.

The very first hardship that presents itself to the mind of an intelligent mechanic is that he is doomed to labour ten hours out of the twenty-four for his day's living, or twelve for that matter, since he has often to exert himself as much as if he were working during meal-hours. He would be as idle indeed who would object to render a reasonable amount of labour in return for his living; but no intelligent man likes to be a drudge. Ten hours slaving, and hammering, and making of joints is the height of drudgery, and severely trying to the mind of any man who has a taste for knowledge. The cry is, We want good artisans; to which the response is, Let us educate them. The knowledge that fits a man to be a good workman also creates a taste for more knowledge, and the consequence is that an aversion to be a drudge is felt, and the operative aspires to a higher position in society than is at present allotted to him. If this position were left open as the reward of those who made themselves clever, the results would be pleasant to contemplate. Those who were only fit to be drudges would be separated from those who had brains, and whose prejudices would soon disappear in the struggle for the reward. A joiner, who would be reckoned master of his business should be conversant with the construction of a building from the foundation to the roof. Those who know the amount of study that would be required before this could be attained would not object to the reform,—the first and most essential—a reduction in the present hours of labour. There is at present in London a movement in contemplation for the attainment of this most desirable reform, which philanthropists and others who seek the elevation of the working man would do well to patronise and assist with their money and their influence. A similar movement was defeated some years ago amid the plaudits of educated (?) people; yet what was the victory, after all, but that of the ignorant? As the mechanic cannot be instructed to properly execute the plans and carry out the ideas of the opulent without creating in him the elements of refinement and a distaste for drudgery, would it not be well if the demands which these feelings stimulate were complied with, and, if for nothing else but his intelligence, look upon him as capable of becoming a gentleman?

A JOURNEYMAN JOINER.

THE STEAM ROLLER, MARYLEBONE.

SIR,—In your last issue, you were kind enough to take notice of my report on the recent steam rolling of roads in this parish, but I regretted to find the name of our vestry clerk inserted instead of mine. As I have for several years recommended and reported in favour of rolling macadamised roads, and, by request, have given opinions thereon to various authorities, you will be doing me a great service, and I shall be much obliged, by the insertion of this in your next publication.

T. GUTHRIE,
Chief Surveyor for Marylebone.

VAULTS UNDER ROADWAYS.

At the last meeting of the St. George's (Hanover-square) Vestry, the Rev. H. Howarth, the rector, in the chair, the Works Committee reported recommending an application for permission to build vaults in Duke-street, Grosvenor-square, to the house 277, Oxford-street, as per modified plan submitted, be refused.

Mr. J. Morris moved the adoption of the report on the ground that the vaults would extend under the roadway beyond the kerb line.

This being seconded, Dr. Appleton moved, as an amendment, that the application be granted. The vaults under the roadway were not likely to be injured by gas or water pipes being laid down.

At his request, the Clerk read a letter from Mr. Rickman, the former surveyor, setting out that it was the custom in St. George's to allow vaults a length of 12 ft. in the clear between the area and head walls, the end wall being at least 1 ft. from the sewer. The Clerk then remarked that the vaults proposed would be 6 ft. from the sewer.

Colonel Knox seconded the amendment.

Mr. J. Morris moved that the vaults would be entirely new. Mr. Pickett remarked the extension contemplated was only a brick thick.

Mr. Sapwell said, in his experience as a builder, he had never heard of kerb frontage dogms before.

Mr. Mitchell asked the vestry to support the wholesome doctrine that the pavement should cover the vaults.

Mr. Atkins submitted that the question was—did these vaults extending under the roadway interfere with any public or parochial rights?

Mr. Vane said if the motion were passed the applicant would retain his vaults, or ask permission of the Metropolitan Board for an extension. The 10th section of the Metropolitan Local Management Act spoke of new vaults; but this was a case of rebuilding. He did not think it fair to refuse the application.

The amendment being put was carried.

NEW INFIRMARY, KENSINGTON
WORKHOUSE.

Sir,—As you, in the early part of this year, inserted the statement of the competition for these buildings, giving the following estimates for the architects:—Snell, 24,857 1/2; Williams, 22,600 1/2; Stanham (stated at 40,000, but should have been) 32,117 1/2; allow me to observe that it was stipulated, on the part of the guardians, that no architect's drawings should be received whose estimate for the works should not be within 10 per cent. of the builder's tender. Now, sir, your late issue shows the estimate of those tenders, the lowest and accepted being that of Mr. Chappell, at 33,333 1/2.—In excess, say, of about 6 per cent. of my estimate, which includes a large amount for machinery, &c. I know it may be said that the drawings for the buildings have been altered and other arrangements provided for; but I also know that the drawings I submitted could have been similarly treated, and that the difference would have been on the side of "deductions." All competitors cannot win in a race; but the rules of the race ought to be observed throughout.

GORDON STANHAM.

SURVEYORS' CHARGES: KENSINGTON
WORKHOUSE INFIRMARY.

Sir,—Seeing in your impression of the 15th October last, a letter on surveyors' charges, I should like to ask you whether the other "rumour" going about is correct, viz. that 3 per cent. has to be paid by the guardians of the above workhouse for the supply of quantities for the present year.

Report says that a firm of surveyors volunteered to the guardians to take off the quantities at 1 per cent.; also that another firm "caught" the builders, and in "connection" with the other surveyors prepared the bills of quantities, charging at end of same 2 1/2 per cent., thus making 3 per cent. as charges for the guardians to pay directly and indirectly. Of course the innocent guardians believe the work to have been done at the 1 per cent. as agreed, if report be true.

Now I am of opinion, as all candid men, whether rate-payers or otherwise, must be that such practices as these will bring the profession into discredit.

A RATEPAYER.

ADDRESS FOR KEYS.

Sir,—The first of "Mitraliens's" wants, as stated in the *Builder*, was anticipated forty years ago, by the late Mr. Charles Chubb. We enclose you a key chain, with the label attached, having our name and address on one side, and the number 7,536 on the other. Each label has a separate number, and we keep a register of the purchaser's name and address. Scarcely a week passes without our having one or more bunches of keys brought in, and we are thus enabled to return them to their rightful owners.

CHUBB & SON.

RESTORATION AT THE BRITISH
MUSEUM.

Sir,—As Mr. Newton may not be aware that persons make use of soap leas in cleaning marble (and being of a burning nature), he had better for the future let well alone, and not attempt to wash a blackamoor white.

W.

TAR PAVEMENTS.

Sir,—My attention having been drawn to the article in the *Builder* on Tar Pavements, by "The Layer of the Pavement," I noticed that Stockholm tar was specified, and would feel obliged if your correspondent or any of your readers would inform me, through your valuable publication, why gas tar would not answer the same purpose.

G. H.

ASPHALTE ROADWAYS.

Sir,—The new pavement laid down in the carriage-way of Cheapside seems likely to get into disrepute from proving very slippery, the number of falls being greatly on the increase in wet weather; not so much, however, from heavy rains, as from slight or partial showers, which moisten the surface without cleansing it. If tried again, I think it might be laid down with a more gritty surface: at present it is too smooth for rapid traffic.

P. N. Row.

FISH AND DRAINAGE.

Sir,—Having read much about outfalls of farm drainage by pipes being conducted into a pond made to collect the waters for use against dry seasons, I would ask, is it in the power of any of your readers to tell me what fish would thrive best therein? I have read that the Dutch always plant water lilies to purify the water, and preserve the fish in such ponds. Could they also be completely aërated as against stagnancy, by an ordinary exhausted syphon fixed at a post? Would the action of the syphon be continuous?

CIVIL LONDONER.

EAST INDIAN RAILWAY.

A DISTRICT ENGINEER in the service of the East Indian Railway Company, writes to an agent as follows:—

"I am of opinion that it is a great piece of presumption on the part of a contractor's agent to attempt to judge as to the ability or experience of a company's engineer."

Now this in itself is ludicrous, but unfortunately there is another phase besides the comic one. The feeling that prompts the expression of such an "opinion" will go far to solve in a great measure the queries as to why the "Chord Line" is not finished and open.

OLD INDIAN.

TAUNTON COLLEGE SCHOOL
BUILDINGS.

The new buildings of the Taunton College School have been opened. The first stone of the new building was laid by Lady Taunton in 1868. The new school is situated on the Chard-road, about a mile from the centre of the town. It is built of West Monkton stone faced with Bath; and stands in fifteen acres of ground. The west front, which faces the high road, affords accommodation for 120 boarders. A lobby divides it into two complete blocks. This lobby is entered from the principal gateway, in which has been placed a marble bust of the late Lord Taunton, presented to the college by Lady Taunton. Each block contains twelve studies, two large boarders' common rooms, and a master's room, while there are two dormitories 80 ft. long, a bath-room, &c., on the upper floor of both, besides a master's bedroom. A high corridor traverses the range, the whole being warmed by Monie's heating apparatus. The common room and dormitories are lighted by sunlights, and ventilated. The educational department includes a school-room, 90 ft. by 30 ft., class-rooms, a day-boys' common room, and a small lavatory. Following the corridor, which runs at right angles to the centre block, we find on the one side the masters' common room and the dining-hall, and on the other the matron's rooms and the sick rooms. The present design also includes a kitchen, scullery, buttery, and larder, with steward's rooms, servants' hall, bedrooms, and offices. It is intended to add to the structure a head-master's house, two more blocks for boarders, and a chapel on the south side; and parallel to these from the centre of the group will be the library, museum, laboratories, and school of art.

A botanical garden is to be laid out on two acres of land adjoining Holway-lane, and near the garden a large swimming-bath will be made. The grounds will also contain a gymnasium, fives and racquet courts, and workshops for the boys.

Certain rooms not at present used have been temporarily fitted up as library, museum, and laboratory; and an iron chapel has been put up until the permanent one shall have been erected.

The building has been carried out from designs by Mr. C. E. Giles, of London. The builder is Mr. Spiller, of Taunton; the carvings are by Mr. Seymour, and the grounds have been laid out by Mr. Dyer, both of Taunton.

DISSENTING CHURCH BUILDING NEWS.

Stone.—A new Congregational chapel has been erected at Stone. The sum of 3,500*l.* is estimated, will be required. The new church is to be erected on a site in Granville-place, given by Mr. Thomas Bostock. The style will be Geometric Gothic. The walls will be brick faced, having stone dressings. The centre of the west or principal front will be gabled, and over the entrance doorway will be a large five-light tracery-headed window. At the south-west angle will be a tower, with spire, rising to the height of 80 ft., and the north side of the west front an octagon staircase wing. The north and south fronts will be divided by buttresses into bays, with two tiers of windows, the lower lighting the ground floor, the upper lighting the gallery of the church. The dimensions of the church will be 65 ft. by 38 ft., and, including the galleries, it will seat about 700. Internally, the roof will be in part open, showing the timber framing as far as the collar-beam. At the rear of the church, but having a south frontage to the Longton-road, will be school buildings, two stories in height, the lower story arranged for vestries, class-rooms, and infant-school, and the upper story as a large school-room, 44 ft. by 27 ft. The architect is Mr. Bidlake, of Wolverhampton. The builder who executed the work necessary for the laying of the foundation-stone was Mr. R. Turner, of Stone; and Mr. Wood prepared and engraved the stone.

North Shields.—The foundation-stone of the new Wesleyan Mission Chapel, Collingwood-street, North Shields, has been laid. The design is by Mr. F. R. N. Haswell, architect, under whose direction the building will be completed. It will be composed of brick, with stone dressings, and will comprise a chapel, with school-room and vestries underneath. The former, with minister's vestry behind, will be 37 ft. 6 in. in length by 54 ft. 6 in. in breadth, and sitting accommodation will be provided for about 390 persons. The school-room, with two vestries, is

37 ft. 6 in. in length, by 38 ft. in breadth. The building, exclusive of the ground, will cost fully 900*l.* The contractor is Mr. Campbell, of North Shields, and the building will be erected under the superintendence of the architect.

Liverpool.—The foundation-stone of the Totteth Tabernacle has been laid by the Rev. C. H. Sprurgeon, in Park-road, Totteth Park. The chapel will be erected from the design of Mr. W. J. Mason, architect. It is in the Italian style, and very plain in treatment. The elevation to Park-road is divided into three spaces corresponding with the lines of the columns and the central nave of the interior. The central portion is 37 ft. wide, projects slightly beyond the line of the main building, and is divided into compartments with pilasters having carved capitals, from which spring three arches, surmounted by an entablature and pediment. The side spaces or wings are repetitions of one bay of the side elevation. The entrance to the chapel is by a flight of steps, 37 ft. wide, on to a platform the full width of the building. The sides of the chapel are divided into six bays by pilasters, and, including the school, will contain three stories of windows variously treated. The work, generally, is to be of the best grey brick, relieved by the introduction of white and blue bricks in the arches, jambs, cornices, bands, &c., the stone dressings being of white Storeton stone. The chapel is 94 ft. long by 70 ft. wide, outside measure, including the vestries. The front and back walls internally are segmental, and in each angle of the building there is a staircase to the gallery. The seats on ground and gallery floors are arranged on the curve, so that each person faces the platform. The chapel will accommodate 1,200 persons. The ceiling is arranged in three divisions, the centre or nave being 38 ft. high from the ground floor, and each side compartment 30 ft. high. The roof is carried on two rows of iron columns with ornamental carved caps. Underneath the chapel is the school-room, 66 ft. by 53 ft., and 13 ft. high, approached by side porches, under the platform of the main-entrance steps to the chapel. There are also on the basement an infants' class-room, tea-room, and chamber for hot-air apparatus. Behind the chapel, on the ground floor, are three vestries. The means of ingress and egress consist of five doorways in front of the chapel and two doorways at the rear, all connected with the ground and gallery floor. The contract for the works, exclusive of excavations already done, also of fittings, seats, &c., is 4,900*l.* The works are being carried out by Messrs. Haigh & Co. under the superintendence of the architect.

Jarrow.—The foundation-stone of a new Wesleyan Methodist Chapel and School, at Jarrow, has been laid. The new chapel will be situated in a triangular plot of ground on the west side of the New-road, where, passing under the railway, the Monkton-lane and Newcastle roads meet. The school and vestry accommodation as well as the chapel-keeper's rooms will be on the basement floor, while the entrance to the ground-floor of the chapel will be on the level of the road at the east side of the site. This entrance will be a large circular-headed door into a lobby, connected with which are the inner lobbies, containing the staircases to the galleries and inner doors into the chapel. The pews will be arranged in three groups on the ground-floor. The pulpit and communion space will be at the west end. Behind the pulpit will be a ministers' vestry, above which will be the organ gallery. The side galleries will have three pews in depth, with a seat in the passages against the walls. The end gallery will be continued over the entrance-lobby, and will have ten pews in depth. The length of the building inside will be 76 ft. (exclusive of organ gallery, 12 ft.), and the width will be 47 ft. The school-room will be 47 ft. by 36 ft.; and of the two vestries, one will be 20 ft. by 15 ft. 6 in., and the other 18 ft. by 10 ft. 6 in. There will be three rooms for the chapel-keeper. The buildings are to be of red brick, with stone dressings; and the style of architecture is to be Italian. The internal fittings are to be of pitch pine; and the heating is to be by hot air. The chapel will accommodate 900, and the cost will be 3,000*l.* The buildings have been designed by Mr. F. R. N. Haswell, North Shields, who has been architect of many chapels for the Wesleyan body in this part of the country.

Boston.—The chief stone of a Wesleyan school chapel has been laid in Fern-street. The new building will occupy the whole of the site of the old school and yard adjoining, as well as an additional plot beyond, which has been pur-

chased, and which adds 10½ lineal yards to the length of the plot. A continental style of Gothic architecture has been adopted, the principal features being confined to the front, extending along Fern-street to the full length of the land available. The main building will be lighted by five windows on each side, and the class-rooms, placed at each end of the structure, will have for those on the ground-floor, two windows each, and three windows each to those on the upper floor. The internal dimensions of the large room are—length, 51 ft.; width, 39 ft. 7 in.; and height, 26 ft. to the ceiling, which, in order to gain additional light, will be formed part way up the roof. There will be two front entrances from Fern-street, opening into vestibules, and having doorways leading into the large room, as well as passage to the class-rooms, extending from the front to the back doors at the north and south ends of the large room respectively. The south entrance, or the nearest Pike's-lane, will give access to the infants' class-room on the left of the passage. Over the infants' class-room, the passage and the vestibule will be placed on a large band-room or class-room, which can be made useful for week-night services, tea meetings, &c. Underneath the infants' class-room there will be a cellar, which will be fitted up with apparatus for preparing tea, and hot-air appliances for heating purposes. All the class-rooms can be used without throwing open or lighting the large room, and *vice versa*; and as the building will be used for chapel as well as school requirements, and consequently occupied for many hours on Sundays, special provision will be made to secure efficient ventilation. The estimated cost is 1,192*l.*, which, however, is reduced 50*l.* by the contractor purchasing the old school as it stood; but that sum does not include the cost of warming and other internal fixtures, nearly all of which have yet to be agreed upon. It is proposed to provide, at low rents to defray current expenses, benches or seats in the large room, sufficient to receive 100 persons. The remaining space will be devoted entirely to school purposes, and there will be accommodation in the large room and class-rooms for about 350 scholars, exclusive of the infants' class-room, which will have a gallery for the benefit of the younger portion, and also exclusive of the large class-room over, which will hold 100 additional children, and may be used, if required, for junior scholars. The large room, when arranged for either service or public meeting, will contain 500 persons. The architect is Mr. Thomas Ormrod, of Bolton; and the contractor for the work, so far as it has been definitely decided upon, is Mr. William Donaldson, builder, Southborough.

Southborough.—The foundation stones of a Wesleyan Chapel have been laid at Southborough. Messrs. Catermole & Ede are the architects, and Aaron Brown the builder.

Long Ashton.—Plans have been prepared for a new Independent Church and School, at Long Ashton, near Bristol, by Messrs. Kennedy & O'Donoghue. The site has been cleared of the present buildings, and it is hoped the funds will soon enable the architects to commence building operations.

Barnard Castle.—The Memorial (Unitarian) Church at Barnard Castle, erected to the memory of the late Mr. George Brown, has been opened. The full cost of the building will be between 1,200*l.* and 1,300*l.*, of which sum upwards of 1,100*l.* have been already subscribed. The cost of the site was 250*l.* Inclusive of these and other expenses, the cost of the new church is estimated at 1,068*l.* The construction of the tower and spire will involve a further expenditure of 135*l.* The new church will seat 200 persons. The ground plan comprises a nave about 35 ft. by 24 ft. inside the walls, and one aisle about 10 ft. in width, a part of which, adjoining the principal street, is divided off, and forms the entrance-porch, and also the lower part of a tower, surmounted by a broach spire, reaching an altitude of about 70 ft. At the opposite end to the entrance an ornamental lectern (to serve as a pulpit) will be placed on a raised platform, which will be partially railed off from the church (for a communion space) with a low ornamental balustrade, and adjoining it will be provided a small vestry for the use of the minister. Adjoining the church is a building of recent construction, intended to be used as a Sunday-school and lecture-room, and occasionally as a part of the church. It is divided from the church by a movable screen, which, besides opening the school-room to the church, will also admit of the organ being used either in the church or the school, as may be desired.

SCHOOL-BUILDING NEWS.

Walton-on-the-Hill (near Liverpool).—The foundation-stone of a new national school has been laid here. This new boys' school will be erected in close proximity to the present girls' and infants' schools, near the church, and is designed to group with these buildings. The bell-turret, rising to a height of 40 ft., will be a conspicuous object as seen from the Aintree and Church roads. The new school buildings will be capable of accommodating 200 boys, and consist of a school-room, 80 ft. long, 20 ft. wide, and 18 ft. from floor to ceiling; two class-rooms, each measuring 15 ft. by 14 ft., and fitted up with a gallery. There will be also a conveniently-situated lavatory and cloak-room. The ceiling of the school-room will be divided into panels by means of moldings of stained wood, and the cornice enriched with carvings. The materials to be used in the elevations are grey bricks, relieved with a few bands of coloured bricks; the window-dressings, gables, panels, buttresses, and bell-turret being carried out in red sandstone. Rolled cathedral glass in large squares will be fitted into the stone window-mullions. The rooms will be lighted at night by means of sun-lights placed in the ceilings. The building committee have contracted with Mr. Henry Sharrock, of Walton, who is to complete the works by the end of March next, and who will be assisted therein by Messrs. J. & R. Kelly, bricklayers; Mr. Roberts, mason; and Messrs. Ayles, slaters. The plans have been prepared, and the works will be superintended by Mr. Edward A. Heffer, architect, of this town, who is also engaged in carrying out the Church of St. Bridget, Waverley, and was architect of the Prince Consort Memorial, Hastings.

Walsall.—St. Peter's New Schools, recently erected in Whitehouse-street, have been opened. They form an important addition to the educational resources of St. Peter's parish, and are from designs by Messrs. Nicholls & Chamberlain, of Walsall; and the work has been carried out by Mr. Adkins, builder, Walsall, the amount of his contract being 1,200*l.* The land cost 250*l.* additional. The schools are intended to accommodate 270 girls and infants, the old school-rooms in John-street being left for the exclusive use of boys. The girls' school-room is a lofty, well-lighted room, 60 ft. long by 20 ft. wide, and having attached to it a commodious class-room. The infants' schoolroom, which includes a gallery, is 48 ft. by 20 ft., and, like the larger room, has an open timber roof. Each school possesses a separate entrance, that for the girls being surmounted by a bell-turret. The whole of the woodwork is varnished. At one end stands a residence for the schoolmistress and the boundary wall, which, in the front, carries a light iron fence, encloses a spacious playground, with all necessary out-offices. The exterior of the building is of red brick, with stone dressings, and bands of coloured brick.

Shoreditch.—The new wings of Shoreditch Industrial Schools have been opened. Originally the schools consisted merely of a range of rooms facing the Brentwood-road, but the accommodation proving greatly inadequate, the guardians determined to erect two large wings, which would materially increase the accommodation. Hence the schools now form three sides of a square, there being a frontage of 192 ft. to the Brentwood-road, while the length of the wings to the extreme rear is 234 ft. The original building is constructed with a facing of red bricks, while the modern portion is built of ordinary ones, relieved with red. The east wing is appropriated to the girls, and the west to the boys. Each contains a school-room, day-room, plunge-baths, lavatories, and class-room. The baths are 18 ft. by 10 ft., with an average depth of 4 ft. The children bathe twice a week, the water in the winter season being warmed by steam. The apartments we have enumerated are all on the ground floor. On the remaining two stories are the dormitories. The original building is now devoted to rooms for the superintendent, matron, and teachers, infants' school, needle-room, and offices. At the east end is an apartment designated the board-room. The large room at the west end is used as a day-room for infants. Walking down the main entrance, on each side are corridors leading to different apartments, mess-rooms for the officers and servants, clothes' store, officers' kitchen, &c., and the end of the passage leads into a dining-hall (which is also used as a chapel). It is 70 ft. by 37 ft., with a height of 36 ft., and is furnished with uniform seats, desks, and tables.

Behind this apartment are different store-rooms, the kitchen, and scullery, and on each side of the dining-hall the large open spaces—being 164 ft. by 56 ft.—lying between that and the wings is paved with York stone, and used respectively by the girls and boys as a playground. The cooking is done by steam. The outbuildings are numerous. About 40 acres of land are connected with the schools, upon part of which vegetables in sufficient quantity to supply the inmates are cultivated; the necessary farm-buildings being erected in suitable places. The architect employed in carrying out these extensive erections was Mr. W. Lee, of London; and the builders were Messrs. Hill, Keddell, & Waldram, of Kingsland-road; clerk of the works, Mr. Jeffrey. The cost has been altogether about 20,000*l.*, and accommodation will be provided for 600 children. The boys are instructed in various trades, and a large number are drafted into regimental bands, having first gone through a course of instruction under the bandmaster. They are also instructed in the rudiments of drill.

Books Received.

The current Number of the *Quarterly* is enriched with an early *précis* of an admirable and most *drop* work, Sir Henry Bulwer's "Life of Lord Palmerston." The war articles, too, are valuable.—We take from the current Number of the *Academy* a paragraph on "Old Timber Churches of Denmark":—"All the earliest churches in Scandinavia were of timber, and in a peculiar style, which may partly have been derived from the old heathen temples, of which only descriptions are extant. The doors, pillars, and windows were ornamented with fine carvings, representing fabulous animals, most of which, however, have long since mouldered away, or been destroyed by fire. A fine specimen of a church door from Iceland, preserved in the Archaeological Museum in Copenhagen, is among the few remains which are left. Norsemens, as well as their nearest kinsmen, the Icelanders, were skilful carvers in wood and walrus. Some of the old Norse 'Stave-Kirke' still exist (Borgum, Hitterdale), but in a tottering or restored state; whereas the Danish are all gone, the last of them having been destroyed about two hundred years ago."

—We have to mention the publication of the 33rd edition of the "New Grammar of French Grammars," by Dr. de Fivas; and the 22nd edition of "Fables et Contes Choisis," by the same author (Lookwood & Co.), both accepted books.—Cassell's Illustrated Almanac for 1871 is a remarkable sixpennyworth.—"Transactions of the Manchester Statistical Society. Session 1869-70." This issue of these Transactions contains an inaugural address on the works of the society in connexion with the questions of the day, by Professor W. S. Jevons, M.A., president of the society; one on some population statistics for sanitary organisation, by Dr. Ramsey; and others on education, and on the cotton exports to India. The inaugural address treats of stagnation of trade, commercial fluctuations, pauperism and the means of decreasing it, and on medical and other charities. On the subject of charities, and the evil lessons of dependence which they teach, Professor Jevons says:—

"The Times not long ago published some very remarkable and complete statistics, compiled by Mr. Hicks, showing that the annual revenue of the established charities of London alone amounted to more than two millions a year. I fear that not only is a large part of this wasted in the excessive costs of management, but that a further large portion really goes to undermine the most valuable qualities of self-reliance, and so form a bribe towards the habits of mendacity and pauperism. At present the result of almost all charitable efforts is to make the poor look upon assistance as a right and natural thing in every contingency of life. If they merely want a little medicine, there is a free dispensary; if they have a bad eye or ear, there are appropriate institutions; if any one is in weak health, he seeks a free order of admission to a Southport or a Buxton Hospital; and when the most natural possible crisis in a poor woman's life approaches, she looks forward to the aid of St. Mary's Hospital. Now, I ask, why should the poorer classes be thus encouraged and instructed to look to the wealthier classes for aid in some of the commonest requirements of life? If they were absolutely unable to provide for themselves, the reason would be a strong and intelligible one; but I do not believe that the people are really in such a hopeless state of poverty."

But there is little use in bewailing an evil unless some mode of remedying it can be found. There is not much difficulty in discovering the only remedy applicable to the mischief of pauperism. No one can seriously think of abolishing those charities; but why should not the working classes be required to contribute towards institutions mainly established for their benefit? Self-supporting dispensaries exist in many places, which afford all requisite

aid to any person subscribing some such small amount as 1d. to 2d. each per week. I have heard that some of the London hospitals have considered the idea of adopting this system, and refusing aid in all minor cases but to their own subscribers. It would not be necessary to render the hospitals self-supporting. Endowments and public contributions would usually enable every hospital or dispensary to give back in medical aid several times the value of what is given in small contributions. The object would be not to raise money as to avoid undermining the prudent habits of the people. Non-contributors might still be relieved, but only on the payment of a fine; and, of course, cases of severe accident, illness, or destitution, would still be relieved gratuitously as at present."

Miscellaneous.

The Cottage Hospital, Bromyard.—At the first annual meeting of this institution, presided over by the Bishop of Hereford, the committee, in their report, expressed their unqualified satisfaction with the success of the undertaking so far. The list of donors and subscribers rapidly filled; and as for patients, while the hospital, after the first fortnight, was never empty, on several occasions the five beds were found to be insufficient. The simplicity of the domestic arrangements, and the comfort of being within easy reach of relatives and friends, together with the home feeling and an amount of liberty which could not exist in larger hospitals, have continued to make this institution very popular with the patients. The whole income of the hospital for the year reached the sum of £131. 16s. 2d., and the expenditure 388l. 15s. 2½d.; but if the hospital is to be maintained in full efficiency, the continued efforts of its supporters will still be needed. The total number of cases treated has been forty, and of those not a few had to undergo severe surgical operations, which have been perfectly successful, and could not have been performed in the homes of the patients. Out of those forty patients only one has died, one only has been discharged incurable, whilst eight have been relieved, and thirty have been cured. Rule No. 8, which requires a small weekly payment from each patient, according to circumstances, has answered well, on the whole.

Free Baths for Derby.—The design for free baths, proposed to be erected by Mr. Bass in the Recreation Ground, have been prepared by Mr. G. Thompson, the borough surveyor. The original idea of a bath or baths upon the banks of the river, similar to those upon the Seine in Paris, has been so far abandoned that the new structure will be entirely independent of the bed of the Derwent, which will only furnish the supply of water and receive the overflow. Two separate enclosures are marked upon the plan which we have inspected, one of which will be devoted to the use of adults, the other (in which the depth will be properly regulated) for youths. Around the former, cast-iron dressing-closets, fitted with doors, will be provided, whilst open stalls will suffice for the toilet business of the boys. Water will be supplied from a level which is above the influx of Derby sewage, and will be conveyed in pipes of 6 in. diameter to the upper end of the baths, and discharged by a natural overflow at the inferior extremity. Each bath will be 100 ft. long and 50 ft. wide, or nearly double the size of the Corporation Baths in Full-street, which have been found quite unsuited in point of capacity to the thousands of lads who wish to gratify their natural propensity for "taking the water." In external appearance, the building will be plain and substantial.

Erection of a Large Gasometer at Reading.—Considerable alterations and improvements have recently been made at the Reading Gasworks. A large gasometer, on land between the rivers Thames and Kennett, is nearly completed. The whole of the work has been designed by Mr. E. Baker, engineer and manager of the gasworks, and carried out by Messrs. Bird & Son, of Lambeth. The gasometer is 104 ft. in diameter; will rise 44 ft. high, and contain 350,000 cubic feet of gas. 500,000 bricks have been used in the masonry, and 1,500,000 tons of water have been pumped from the Thames' springs in the course of the work. The gasometer is supported by twelve cast-iron columns, ft. 6 in. in diameter, and connected at the top with wrought-iron girders. The columns rest on Yorkshire stones, each weighing 3 tons 15 cwt. Five pumps have been in use during the work, and the principal pump was worked by steam. This pump was used in the construction of the Thames Embankment, and will throw up 8,000 tons of water per day.

Mexico.—The *New York Times* has advices from Santa Fe stating that Governor Arzú, the special Indian agent for that territory, has found the Canon de Chelly, which was explored for twenty miles. The party found walls towering perpendicularly to an altitude of from 1,000 ft. to 2,000 ft., the rock strata being as perfect as if laid by the skilled hands of masons, and entirely symmetrical. There were found deserted ruins of ancient Aztec cities, many of which bear the evidences of having been populous to the extent of many thousands of inhabitants. In each place there remained in a state of good preservation a house of stone, about 20 ft. square, containing one bare and gloomy room, and a single human skeleton. A close examination of many of the ruins proved that the builders must have been skilled in the manufacture and use of edged tools, masonry, and other mechanical arts. Some of the ruins are reported to be stone buildings, seven and eight stories in height, being reached by ladders planted against the walls. Round houses, 20 ft. in diameter, built in the most substantial manner, of cut stone, and plastered inside, were also found in excellent preservation. We want better information.

The Newbury Town Sewage Question. The members of the Local Board of Health have met to receive the report of a committee appointed to consider the desirability of purchasing twenty-four acres of land at Greenham, as a site for the disposal of the town sewage. The report of the committee stated that the land is eligible as to situation, if other things be favourable; that although parts of it lie low, and are at times overflowed with water, other parts of it are sufficiently high for any works that may be required. Under all the circumstances, they recommended the favourable consideration of the Board of Health to the purchase of this land. Alderman Hickman said that, looking at the boggy state of the land, it would require draining thoroughly in order to make it suitable for the purpose contemplated. It was finally resolved that the land be purchased for 700l. If drained, perhaps the boggy basis of the land may itself be advantageous as an improved deodoriser of the sewage.

Enlargement of the Birmingham Infirmary Buildings.—A report from Mr. Martin, architect, Birmingham, has been laid before the Executive Committee of the Infirmary, and is to be submitted to a general meeting of governors next month. Mr. Martin's estimate of the probable cost of the alterations he recommends is in blank spaces in the published form of the report. The alterations and improvements comprise proper accommodation for the treatment of out-patients; day and sleeping accommodation for nurses and servants; concentration of wash-house and laundry departments, and their removal from within the building; removal of dead-house and post-mortem room from close proximity to the wards; partial isolation of the water-closets, lavatories, and bath-rooms from the wards; and re-arrangement of the officers' rooms, and minor alterations.

The Albert Embankment.—Last week, by the direction of the Metropolitan Board of Works, the first step towards planting and decorating the Albert Embankment was put in hand, and the works will be pushed forward so as to bring them to a finish before the setting in of winter. Plane-trees will be planted on the embankment at a distance of 30 ft. Two large open spaces will be planted with shrubs and enclosed with handsome iron railings. One of the open spaces near St. Thomas's Hospital, will not be enclosed, as it is intended to devote it to the purposes of a play and recreation ground for children. A new steamboat pier will be constructed on the site of old Lambeth Stairs, the contract for which has just been let to contractors for the sum of 2,500l.

Chairmanship of the Metropolitan Board of Works.—The special committee have reported, advising that the salary of the chairman be fixed at 1,500l. a year; that in the opinion of the committee it is not desirable at the present time that the appointment to the office of chairman of the Board should be a permanent one; and that the chairman of the Board be elected for the period of one year. Mr. Collinson, on the bringing up of the report of the special committee, will move as an amendment, "That the Board do proceed to the election of a chairman, under the 49th section of the 'Local Management Act.'"

Fever in Manchester.—Fever, of the same type as that which prevails in Liverpool, is rapidly spreading amongst the poorer classes of Manchester. It was stated on Thursday, the 20th, by Mr. Leppoc, at the weekly meeting of the Board of Guardians, that on Sunday there were 180 cases, on Monday 183, on Tuesday 188, and on Wednesday several more cases had been added to the list. Various suggestions have been made with the view to check the spread of the fever, which is expected to be specially aggravated by the recent floods in the Irwell. The Board decided, after a discussion that the Sanitary Committee of the Corporation and the Sanitary Association of the city be invited to a conference, so that steps may be immediately taken to confine the spread of the disease.

Gloucester Cathedral Restoration.—Six of the statues by Mr. Redfern, of London, have been placed in position on the south front of the cathedral porch. The two central figures are those of Sts. Peter and Paul, one bearing the keys, the other the sword; on the right are the evangelists Matthew and Mark; on the left Luke and John. The emblems of the evangelists and of the apostles will be carved on the pedestals on which the statues rest. The statues of the Four Doctors of the Church will be placed in other niches; large statues, one of King Osric the other of Abbot Serlo, will be erected on either side of the porch; and hereafter, we understand, a figure of the Saviour will be placed over the inner entrance to the cathedral.

The Institution of Civil Engineers.—A new list of the members of this society, corrected to the last list, has just been published, from which it appears that at the date referred to there were on the register 16 honorary members, 699 members, 994 associates, and 176 students, making a total of 1,885 of all classes. In the last quarter three members and five associates have been removed by death, and one student has resigned. Mr. William Alexander Provis, who was elected a member of this Institution, on the 6th of April, 1819, and whose decease occurred on the 29th ult., has, by his will, bequeathed the sum of 500l. to the Benevolent Fund of the Institution.

Monumental.—A Sicilian marble monument to the memory of the late Dr. Kennion, has lately been erected in the burial-ground of Christ Church, High Harrogate. The designer and executor was Mr. J. Adams-Aston, sculptor. The monument takes the form of a broken column, with drapery, with a medallion portrait of the deceased, under which is the inscription. The whole monument stands about 16 ft. high, upon a block of marble, and three blocks of red and white Pateley marble of various dimensions. The place of its erection is the front of the church, and it is a conspicuous monument in the churchyard.

Exhibition for the Relief of Destitute Widows and Orphans of German Soldiers. Arrangements have been made to keep open this exhibition till November 5th. The eight works executed and contributed by H. R. H. the Crown Princess of Prussia and H. R. H. Princess Louise continue to attract visitors. A first instalment of 1,000l. from the proceeds of the exhibition and the subscription-list connected with it has already been forwarded to the Crown Princess of Prussia, who has undertaken to superintend its distribution.

St. Saviour's Church, Southwark.—Some months ago one of the pinnacles of the tower of St. Saviour's Church, Southwark, was broken during a thunderstorm, and the appearance of the edifice much injured. Other parts of the church were also in great want of repair. The Warden has given orders that the edifice is to be put in repair, and the work has been commenced under a contract entered into with Mr. Downs, a well-known builder in the locality.

The Value of Paris.—The *Economist* estimates the value of Paris as follows:—

Value of buildings	£151,350,000
Value of furniture and other contents of dwellings	77,175,000
Value of stock-in-trade	77,175,000
Total	£305,700,000

This may be taken as the minimum value of private property in Paris destructible in a siege.

Luton Surveyor.—The new surveyor, appointed by the Local Board of Health, in the place of Mr. Nicholson, resigned, is Mr. John Hillman, a son of the sub-contractor employed in constructing the local branch of the Great Northern Railway.

Inauguration of a Workmen's Institute in Great Wyrley.—A Working Men's Institute has been established and opened at Great Wyrley, in the Wolverhampton district, for the use of the residents in that and the adjoining township. The new building has been erected close by the high road leading from Cannock to Walsall. It has been designed and built by Mr. Greenall, and the cost is 200l. the fittings and boundary wall requiring 50l. more. Towards this 207l. have already been promised.

South Kensington Examinations.—A competitor for the gold medal for architectural design complains that an inferior design was preferred to his, and, further, that his plans and sections, necessary for the understanding of his design, were not exhibited. His own statement, however, is scarcely sufficient evidence.

Housemaids' Knees.—India-rubber sponge can be purchased in sheets, and of any desired thickness. If worn as an apron, or even as small knee-caps or pads, it will be found exceedingly soft, warm, non-conductive of cold or damp, and very durable.—R. T.

TENDERS.

For repairs and other works to Swan Hotel, brewery, and premises, at Blackwater, Hants. Mr. E. J. Reynolds, architect:—

Martin, Wells, & Co. £386 0 0
Catepool 321 10 0
Searle 283 4 0

For house and two cottages, Hanley, for Mr. William Harding, Messrs. R. Scrivenor & Son, architects:—

Clivet £1,430 0 0
Bailey 1,418 0 0
Collis & Hudson 1,392 0 0
Harvey 1,330 0 0
Bennett & Cooke 1,305 0 0
Barlow (accepted) 1,230 0 0

For five cottages, Swindon, for Mr. E. Lawrence, Messrs. Lansdown & Shopland, architects:—

Harris £1,055 0 0
Newcombe 1,000 0 0
Joyce 980 15 4 1/2
Foreman 877 15 0
Turvey 860 0 0
Dover 850 0 0

For mill and farm buildings at Somerford Keynes, Wills, Messrs. Lansdown & Shopland, architects:—

Dover & Dover £1,268 0 0
Smith 1,133 9 3
King & Godwin 1,132 0 0
Hinton 1,130 0 0
Newcombe 1,070 0 0
Jones (accepted) 863 10 0

For villa residence at Swindon, Messrs. Lansdown & Shopland, architects:—

Newcombe £1,160 0 0
Dover 1,110 0 0
Barrett (accepted) 1,099 0 0

For New chapel at Swindon, Wills, Messrs. Lansdown & Shopland, architects:—

Original Tenders.	Reduced Tenders.
Dyer £1,330 0 0	—
Dover & Co. 899 0 0	—
Harris 954 7 6	£795 0 0
Smith 948 17 11	787 0 0
Newcombe 901 0 0	750 0 0
J. Dover 830 0 0	710 0 0

* Accepted.

For new parochial schools at Ashton Keynes, Wills, Messrs. Lansdown & Shopland, architects:—

Tenders No. 1.	Tenders No. 2.
Jones £1,411 0 0	£1,146 0 0
Tilling 1,274 5 0	1,112 7 0
Weeks 1,250 10 0	1,130 10 0
King & Godwin 1,225 0 0	1,165 0 0
Newcombe 1,200 0 0	1,060 0 0
Dover & Dover 1,199 0 0	1,169 0 0
Smith 1,118 13 7	—
Hinton 1,143 18 0	1,032 18 0

* Accepted.

For addition to house, near Windsor, Mr. C. H. Howell, architect. Quantities by Mr. J. Scott and Messrs. Widdell & Trollope:—

Thorne £6,723 0 0
Kempall 5,636 0 0
Panson 5,614 0 0
Higgs 5,443 0 0
Holland & Hanson 5,327 0 0

For labour-shed and dead-house, Ratcliff Workhouse, for the Guardians of the Stepney Union, Messrs. Arthur & C. Harston, architects:—

Hopwood (accepted) £220 0 0
Wigmore (Waltham-green, S.W.) £1,610 10 0
Garner (Margate) 1,587 0 0
Hall (Brighton) 1,370 0 0
Paramor (Margate) 1,357 0 0
Osborn (Ramsgate) 1,498 0 0

For the erection of two houses at Winalston, for the Right Hon. Earl Spencer, K.G. Messrs. Beaton, Son, & Breerton, architects. Quantities by Mr. Barnett:—

Myers & Son £3,197 0 0
Parsons & Townsend 3,215 0 0
Perry & Co. 3,205 0 0
Avis & Co. 2,904 0 0
Adamson & Son 2,775 0 0
Easton, Brothers 3,495 0 0
Bracher & Son 3,016 0 0

For the execution of certain work in the erection of six houses at Wylde-green, near Birmingham, for Mrs. Rowley, exclusive of sundry items. Mr. W. T. Foulkes, architect. Quantities by Mr. W. R. Green:—

Street £1,198 0 0
Horsley 3,633 0 0
Briley 3,400 0 0
Nodden 3,337 0 0
Parkers 3,289 0 0
Freese 3,250 0 0
Stafford & Brown 3,200 0 0
Surman 3,149 0 0
Steel (accepted) 3,140 0 0

For the erection of twenty-one villa residences in Nottingham. Messrs. Thos. C. Hine & Son, architects:—

Dennett & Co. £14,122 0 0
Lysam 13,740 0 0
Messom 13,671 0 0
Warr 13,510 0 0
Slum 13,300 0 0
Johnson 13,137 0 0
Bell & Son 12,925 0 0
Hall 12,800 0 0
Stevenson & Weston 12,816 0 0
Wood & Son 12,553 0 0

For twenty-one almshouses, Burton-on-Trent, for the Rev. Mr. Joseph Mitchell, architect. Quantities by Mr. T. T. Green:—

Wade, Brothers £5,698 0 0
Hunt & Bennett 5,138 0 0
Parker & Son 4,705 0 0
Madocks 4,698 0 0
Wileman 4,599 0 0
Bowler & Beck 4,580 0 0
H. Isidell 4,520 0 0
Upton 4,500 0 0
Smith & Chamberlain 4,445 0 0
Tilly 4,443 0 0
Mason 3,950 0 0
Lowe & Sons (accepted) 3,830 0 0

For house and shop at Hoxton, for Mr. A. Heard. Mr. H. T. Gordon, architect:—

Merion (accepted) £263 0 0
For Congregational Church, Croydon:—
Pollard (accepted) £2,649 0 0

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All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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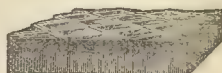
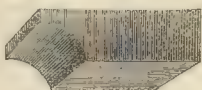
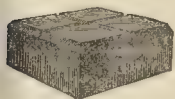
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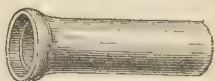
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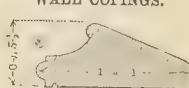
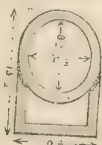
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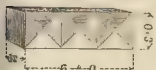
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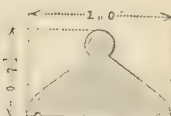
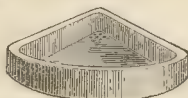
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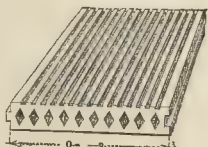
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The Builder.

VOL. XXVIII.—No. 1448.



The War and British Industry.

HAT "history repeats itself," we are forcibly reminded by the appalling incidents occurring at the seat of war, and by the localities in which they have taken place, as viewed by the light of an earlier chapter of French history. The events of to-day recall

those of former times; there are important points of difference, doubtless, in the history that is being repeated, but there are also numerous startling coincidences. One hundred and eighty-five years since in this current month of October, the edict of Nantes was revoked, by Louis XIV., who has been variously designated "Most Christian King," the Great, "the Infamous," "the Cruel," and the Profligate." The revocation effected a *coup d'état*, in which the best men of France were slaughtered, sent to the galleys, or driven into exile. The monarch of that time lost his head,—he had no heart to lose,—inflicted indescribable suffering, and also entailed incalculable loss upon France, by his unwise, cruel, and despotic action. With this self-sufficient and remorseless tyrant originated the well-known arrogant declaration, "*L'état c'est moi*." His ruthless misrule made of France a furnace of affliction, a nation of slaves and profligates, a land in which good and free men could not breathe, a paradise for pimps and parasites. It would be ungenerous to dwell upon the points of resemblance between the elements and influences at work at that time and at the present. How startling it is to recall some of the scenes of suffering then,—Sedan, Metz, Strasbourg, Tours, Charenton, all have their names recorded; from each a large contingent of the best sons and daughters of France were hunted forth into exile, driven from their own land, to aid with their skill the people of other nations. Many of the refugees fled to Switzerland, Holland, England, and not a few to Prussia, in which the "Edict of Potsdam" was passed to give them welcome, and to secure for them equal rights and privileges. The Royal House of Prussia includes in its lineage Huguenot refugees, and the Queen of England has also the blood of the hunted French Protestants in her veins. Many of the soldiers in the hosts now invading France may be believed to be the descendants of the Huguenots. Have they returned to France inspired by Nemesis? Surely they have had vengeance enough, and would better honour their noble ancestry by now seeking the inspiration of the God of mercy!

Sedan, what sufferings it endured then, and

has had to endure again. It was the birthplace of the great Huguenot Marshal Turenne, whose gigantic statue still stands in its market-place. It was until then the seat of a Protestant University, which was suppressed in the attempt to stamp the Huguenots out of existence and of memory. From Strasbourg have come to England, and have escaped to other lands, many able men. Metz, late a stronghold of French warriors, was a stronghold then of the Huguenot soldiers of the Cross. The United Kingdom, Germany, and other nations owe much to the hunted citizens of Metz, who, generations since, found refuge there. From the De Chenevix family of Metz and Lorraine, and from another Huguenot stock, the De la Tranche family, Richard Chenevix Trench, present Archbishop of Dublin, is a direct lineal descendant. Tours, menaced but not yet devastated, what a blow was inflicted upon its industry, its moral, intellectual, and religious life, by the Revocation. To speak of its industries alone, its 40,000 skilled workers in the silk manufacture were reduced to 4,000; its 8,000 looms were reduced to 100; of its 800 mills and works 730 were closed. Tours received a blow then from the effects of which it has never recovered. Fatal, also, was the effect of the Revocation at Lyons, where, out of 12,000 artisans, 9,000 of the best men and cleverest workmen fled. Charming Charenton! situated near the confluence of the rivers Seine and Marne, a few short months since one of the most lovely localities in the neighbourhood of Paris, or in the world indeed, is now a part of the belt of unsightly desert that surrounds the doomed city. The fiercely unholty Iconoclastic decree that went forth in 1685 respecting Charenton, was a much more barbarous ordinance than the order of 1870, to make waste the borders of the city. Mr. Samuel Smiles, in his interesting work on the Huguenots, thus refers to the doings of the destroyers at Charenton and elsewhere:—"The military *jacquerie* at once began. The very day on which the edict of Revocation was registered, steps were taken to destroy the great Protestant Church at Charenton, near Paris. It had been the work of the celebrated architect Debrosses, and was capable of containing 14,000 persons. In five days it was levelled with the ground. The great temple of Quevilly, near Rouen, of nearly equal size, in which the celebrated minister, Jacques Basnage, preached, was in like manner demolished. At Tours, at Nîmes, at Montauban, and all over France, the same scenes were enacted, the mob eagerly joining in the work of demolition with levers and pickaxes. Eight hundred Protestant churches were thus thrown down in a few weeks."

The oppressions of Louis XIV. caused the flight of such of the Huguenots as had the means of escape. Many of these refugees found their way to England, but very few of them ever returned to France. The invasion of France which has resulted from the mistake—to state the matter mildly—of the whilom, or present rulers of the country, has caused a large number of the inhabitants of Paris, and of the provinces, to seek an escape from the horrors of war, and an asylum in neighbouring States. The permanent results, as affecting the industry of the United Kingdom, from the present French exodus, may not be expected to be as extensive or important as those which followed the immigration of the Huguenots. At that time the French were greatly superior to the English, and far ahead of them in various skilled industries.

The refugees, or their descendants, originally established, or greatly improved, some of the most important manufactures prosecuted in the United Kingdom. They introduced the art of paper-making, and erected the first paper-mills of England and Scotland. The descendants of the De Portal family have been for generations,

and continue to be, the makers of the paper upon which the Bank of England notes are printed; the Brothers Fourdrinier, descendants of another refugee family, invented the paper-making machine. Crommelin, and others, established the linen manufacture in the North of Ireland. They introduced the silk manufacture at Spitalfields and other places; the fabrication of fancy textile goods at Norwich; the making of felt hats at Wandsworth; of Gobelin tapestry at Fulham; of crystal and glass at Savoy House, near the Strand; of lace and of silk taffetas, and in various departments of skilled industry greatly enriched the nation which gave them an asylum in their time of need. Their descendants have distinguished themselves, and have achieved the highest honours in the departments of legislation and government, of science, literature, theology, law, and finance. They are to be found now in both Houses of Parliament, in the Government of the country, in her Majesty's Privy Council, in deservedly high places everywhere. Names illustrative of this fact crowd upon the mind. Among the peers, Lords Taunton (Labouchere); Eversley (Shaw-Lefevre); Romilly, and other peers directly descended, or connected by blood relationship, with the refugee stock. Again, the names of Hugeson, Layard, Bouverie, Pusey, Du Cane, and many others suggest themselves. In science, there are, or have been, Papin, Dollond, Roget, Rignand, and others. In historical, polite, religious, and general literature, Abaddie, Jortin, Grote, Romaine, Drelincourt, Faber, Marryatt, Chamier, and a host of others. We have, or have had, Delane, and others, on the press; Fomblaque in statistics; Brassey (Brasseur) and Dargan (Dargent), railway makers; Pigon, as maker of gunpowder; Gillott, of steel pens; Courtland, of silks; and Courage, of beer.

Such an important, varied, and valuable permanent residue is not to be expected from the present flight of the French; but it can scarcely be questioned that it will exercise a lasting influence in this country on some branches of artistic skilled production. The business relations between London and Paris, and England and France, have of late years been very intimate, and the interchange of products very extensive. Many businesses in Paris and elsewhere have been destroyed; many artistic skilled workers, whose products were, for the whole, or the greater part, destined for the London or the English markets, are thrown out of employment, their occupation gone,—for a time at least. There are large houses in the neighbourhood of St. Paul's and Chesham that depended entirely upon Paris for the supply of certain descriptions of goods. The supply has been entirely stopped and the Paris agencies of these houses have been closed. Inasmuch as many of the French people now in London as involuntary exiles have always hitherto been willing workers, and not mere promenaders of the boulevards, it may be supposed that they are unwilling idlers, and that by the exercise of their industry, ingenuity, and activity, they may be enabled to resume production,—which they are already doing, indeed, to a partial extent,—may form new business connexions, and introduce new branches of industry, or extend and improve those already in operation,—and remain permanently amongst us.

The effect that the war will have upon British trade cannot, of course, be known until after its conclusion; it will probably be to stimulate greatly British industry and to increase production. The disturbing effects of the war are but partially indicated by the last returns of Trade and Navigation, published by the Board of Trade, which only come down to the 31st of August last. Some of the entries in the return are significant and interesting. As regards shipping, and the entries at British ports, the following items appear:—

Entries of Shipping at British Ports in August 1868, 1869, and 1870.

Nationality of Vessels.	Mo. ending Aug. 31, '68.	Mo. ending Aug. 31, '69.	Mo. ending Aug. 31, '70.
Entered.	Vessels.	Vessels.	Vessels.
Prussian.....	241	230	69
French.....	211	212	192
Cleared.			
Prussian.....	375	277	11
Hanoverian.....	89	73	1
Mecklenburg.....	99	73	0
French.....	377	318	399
Countries whence arrived.			
Entered from.			
Prussia.....	174	242	193
France.....	688	733	689
Cleared for.			
Prussia.....	360	344	10
Hanover.....	160	103	8
Hanse Towns.....	234	230	60
France.....	1,077	1,067	1,433

The imports of wine from France in the month, and in the eight months, ending respectively August 31st last, were in excess for the month, but show a slight decrease for the eight months. The imports from France of silk manufactures and ribbons show a considerable increase upon the month, and upon the eight months. The exports of coal to France, were 228,274 tons for August last, as against 147,053 tons for August, 1868; and, 1,626,114 tons for the first eight months of this year, as against 1,281,382 tons for the same period in 1868. The export of coal to Prussia was 78,665 tons in August, 1868, and 492 tons in August, 1870. As regards the exports of arms and ammunition, the return stops short of the time of the greatest activity. In August, 1868, there were exported 40,509 small arms, and 1,347,816 lb. of gunpowder; and in August, 1870, the smaller number and quantity of 15,999 arms, and 1,274,563 lb. of gunpowder. The exports of horses to France were 47 in August, 1868, and 603 in August, 1870. The exports of railroad iron to Prussia in the first eight months of 1868, were of the value of 36,564*l.*, and in the same period of 1870, 343,431*l.*; the exports of railroad iron to France were for the latter period of the value of 6,388*l.* The returns down to the end of the year, or of the present month indeed, may be expected to indicate much more serious and disastrous disturbance in our commercial relations with the countries, now unhappily diverted from their pursuit of the arts of peace.

FRENCH ENGINEERING BEFORE THE WAR.

THE science and the practice of the engineer are receiving daily illustration in the course of the present war. The scientific corps of the army have attained an importance which is not undue, but which is certainly unprecedented. Even that great engineer, captain, and legislator, who commenced his career as a lieutenant of artillery in the regiment of La Fère, never contemplated the dominant importance which his favourite arm was to assume in the combinations of the strategist. Everywhere we see the same lesson. In the field the victory remains to the best ordered and best handled artillery. Courage and even tactical genius count for nothing before superior batteries. The tide of war spreads round the great railway lines, overflowing its banks, like the Nile, but still fed by the steady main stream of communication. The relation between the number of days that a fortress can hold out, and the number and calibre of the siege guns, is becoming more clearly than ever a matter of elementary arithmetic. The opinion laid down by no less eminent an authority than Julius Cæsar, that Fortune tells for much in war, must now be checked and modified by the axiom that Science tells for more.

While the progress of war thus taxes the utmost efforts of human skill, it, in some instances, ruthlessly destroys the noblest public works. At a time when so many of the engineering monuments of France are in danger of being swept away, it is unusually instructive to glance at some of the latest triumphs attained by the civil engineers in that country.

In regarding the historic progress of mechanical skill, it is natural to consider that the most simple inventions are those which we owe to the infancy of science. Moreover, complexity, accompanied, it may be, by striking elegance of arrangement, and giving evidence of patient and

exhaustive thought, characterises the greater part of modern improvements in mechanism. But for the primary application of science to practice we must, for the most part, cast our glances back to a period when the human mind, if less full of knowledge than at present, evinced a more perfect mastery over the elements at its command. For the origin of the pendulum, indeed, we can only look back for a comparatively short period of time. But the invention of the pendulum closely accompanied the first sound investigation of the laws of falling bodies. In the same way the invention of the barometer, and the complete mastery of the theory of the pump, accompanied the discovery of the pressure of the atmosphere. A method of raising water, yet more simple than the pump, is associated with the name of Archimedes; and there is no reason to doubt that the problem of the reflexion of light, and the concentration of radiant beams, was practically solved by that great philosopher.

With regard to some of the simple utensils of human art, their origin is lost in obscurity. Some tradition of the earliest use of fire is preserved in the legend of Prometheus; but the form is not such as to make the information which it hides readily intelligible to ourselves. Ancient Samitic history is silent on this grand question; although it refers to the discovery of wine. Among the tools familiar to our hands, while the circular saw is barely a century old, and the ribbon saw not a tenth of that age, the saw itself is of immemorial antiquity. It may be considered that, like the knife, the axe, the arrow-head, and the wedge, it represents a natural subdivision of that series of original sharp flint cutting instruments which we know to have preceded the use of metallic tools. The scissars and the shears, on the contrary, must have been invented after metallurgy had made some advance, and probably after the discovery of iron. The invention of the bellows is probably coeval with that of the forging of metal, and must have preceded any successful attempt at smelting, except in the rudest manner, and from the richest ore. It is not generally known that the wandering tinkers of Italy—men who bear the traces of gipsy blood—make use of a form of bellows entirely different from that common to the Northern European nations. The gipsy bellows consists of a pair of bags of skin, which are closed by two straight pieces of wood. A loop on each of these bars serves for the insertion of the thumb and finger. A wind bag is worked alternately by each hand; the arm being lifted, and the finger and thumb opened, to admit the air, and then the finger and thumb being brought together, the slit is closed, the arm depressed, and the air is thus forced through the left of the blower; who squats on the ground between these primitive implements. The "blast and counter blast" of the smith's forge, referred to by the oracle of Amphiaræus as to the discovery of the grave of Orestes, is far more appropriately referable to this Italian form of bellows than to our Tontonic valved chamber.

If the parent inventions from which all mechanical improvements have sprung are for the most part so ancient and so fruitful, no ordinary degree of merit must attach to any modern discovery which can apply, for the first time in human history, a well-known principle to a well-known want which it is fully competent to supply. A practical step of this nature has been taken by M. Beau de Moulin, an engineer-in-chief of the French Corps of Engineers of Ponts et Chaussées; and we consider it to be one demanding the most serious attention, and deserving the widest fame.

Every engineer and every architect who has had the responsibility of building a large bridge, is aware of the anxiety attendant on the easing and striking of the centres. The need of providing firm reliable points of support on which great weight may be safely brought, but which may be readily moveable at will, is not confined to bridge building. Among the many cases in which it is desirable to resist such a power at command may be mentioned the launching of vessels, and, generally, the dealing with enormous weight. The tendency of our recent practice, in this respect, has been in favour of the use of hydraulic power. This, however, is both costly and cumbersome, and requires an amount of previous preparation which consumes much time, and has interfered with the application of a method, the power obtained by which is no secret.

M. Beau de Moulin has availed himself of one

of the well-known properties of sand,—of that mechanical fluidity of its particles, with which we are all familiar in the hour-glass. So simple and so beautiful is the application, that one hears of it for the first time with a positive blush of shame, that it should have been left to our own time undiscovered.

The method to which we refer is the simple and beautiful plan of throwing the bearings of the ribs of a centre upon sand, contained in iron cylinders, from which it is allowed slowly to escape at will.

Each principal is supported upon round props fitting as pistons into cylinders filled with fine dry sand. These cylinders are of sheet iron, $\frac{3}{4}$ in. thick, 1 ft. high, and 1 ft. in diameter. At 2 in. from the bottom each cylinder is perforated with $\frac{1}{4}$ in. holes, which are stopped by common corks. To ease the centring it is only necessary to remove the corks. The sand immediately flows from each hole, forming a cone outside the cylinder. The formation of this cone arrests the further escape of the sand, and therefore stops the gradual descent of the piston which follows on the escape. As the sand is swept away, the issue recommences, and may be thus continued, or arrested, at will, till the centring is entirely detached from the masonry. By carefully regulating the issue from the holes, the utmost delicacy of movement may be imparted to the centre. It may be eased at the same moment in each part, or either end of any principal may be made to descend with greater or less rapidity. The inventor, indeed, claims the power of graduating movement by millions of an inch; and it is not easy to say what is the practical limit of delicacy attainable by the process. Not the slightest shock is caused by a mode of operation which appears to be not only theoretically, but practically perfect. The idea would have done honour to the most illustrious name in the history of human science.

The use of this admirable method of replacing the man of the carpenter, and the wedges of our early bridge builders, was tested on an arch of very unusual proportions. It was desired to construct a bridge over the Seine, in Paris, to connect the Rue du Louvre with the Rue de Rennes. The bridge had to span one of the locks of the Canal de la Monnaie. The springing of the arch, therefore, had to be clear of the canal walls, while the crown was kept down by the necessity of preserving the level of the roadway. The rise of the arch, thus determined, was about one-eighteenth of its span, or 6 ft. 11 in. in 124 ft.

The architectural harmony of the situation demanded that the new bridge should be constructed of stone. With a wise perception of the fact that it would not do to risk experiments in the midst of Paris, M. Vaudray, the engineer, took the precaution of building an experimental arch, before venturing to throw such an unprecedented piece of masonry over the Canal de la Monnaie.

The spot selected for the experiment was the quarry of the plains at Souppes, six miles from Paris, on the Bourdonnais Railway. One abutment was formed by the natural face of the rock, the other by a block of masonry, 27 ft. high, 49 ft. deep, and of the same width as the arch,—viz., 12 ft. It was built of rubble masonry, well bonded, and laid in Portland cement mortar, one part of cement to three parts of sand. Its construction occupied twenty days. The arch itself was built of seventy-seven voissours of cut stone, the depth of the key stone being 2 ft. 8 in., and the ring gradually increasing in depth to 3 ft. 7 in. at the springing. The beds and joints were carefully dressed and laid in Portland cement mortar, two parts of sand to one of cement. The thickness allowed to each joint was $\frac{1}{2}$ in. The joints next the skewback were not flushed until after the completion of the ring, having been kept open by means of fir wedges.

The arch was allowed to rest for four months on the centring, which was then eased by allowing the sand to escape from the cylinders. The effect which was produced by the slackening of the centres was watched with the utmost attention. In an hour daylight was perceptible between the soffit of the keystone and the lagging. In two hours the centring had entirely left the arch. It was then found that the crown had come down 6-10ths of an inch, and that the joints of the skewback on the built abutment side had opened 7-10ths of an inch. After the lapse of 7-10ths of an inch more, it was then loaded with a weight of 360 tons, disposed over the whole surface of the roadway, an operation which

occupied thirteen days. The crown was brought down by the weight 3-10ths of an inch more.

Since that time nothing has stirred. The arch has been tested by allowing a weight of five tons to fall upon the roadway from a height of 18 in., without causing the slightest injury to the bridge. The triumphant execution of a masonry arch of such unprecedented proportions is a credit to French science and practice. It is unnecessary to insist on the accuracy of workmanship that is requisite for such a structure, or to point out how much the engineers were indebted to the method employed for striking the centres of his arch.

Reports on the great French engineering works have been published under the auspices of the Minister of Agriculture, Commerce, and Public Works. It is to be feared that we have seen the last of these reports that will be issued for a considerable time. An unrivalled collection of models, plans, and specifications, explanatory of bridges, viaducts, reservoirs, docks, and tunnels, illustrates the state and progress of civil engineering in France. It is much to be desired that so good an example should be followed in our own country. The records of our great public works, and the detailed information gained during their progress, should not be left to the enterprise of publishers, or even to the paternal vanity of engineers. The recent public works of London alone, including the Thames Embankment, the main drainage, the river bridges, the metropolitan railways and termini, are such as to entitle Great Britain to an eminent position among engineering nations, and should be recorded with such literary and graphic luxury as befits their historic importance.

The chief works of the Old World during the present quarter of a century are the tunnel under Mont Cenis, and the canal through the Isthmus of Suez. Both these important works owe their origin, if not their entire conduct, to French enterprise. It would be unworthy of the profession of the civil engineer, as carried out in this country, to entertain either jealousy or regret at the great progress which our professional brethren on the Continent have made since the date of the introduction of the railway system into France. Yet it is well that it should be borne in mind how much of this actual advance is due to the impulse, not only intellectual, but financial, of this country. English engineers not only wrought out the railway system in this country, but introduced it on the Continent. Their experience and advice were eagerly sought, and not only so, but the financial support which their names were once accustomed to command, proved to be a *sine qua non* for the start of many of these undertakings, which now form so important a part of the Continental system of communication. In France, indeed, we have been far more fairly dealt with than in other Continental countries. The highly educated and thoroughly organised corps of the engineers of the *Ponts et Chaussées* lost no opportunity of acquainting themselves thoroughly with the best results of our English expenditure. What the civil and mechanical engineers of France have accomplished during the last fifteen years would seem incredible to those who are not practically acquainted with the subject. In the manufacture of iron, the most decided progress has been made. The rails which were supplied from the French *usines* for the Chemin de Fer du Midi were of such a quality that they often snapped beneath the mere weight of the ponderous locomotives that a French house was then beginning to supply. A fitter, with a hammer and a cold chisel, could cut through any one of these rails, with ease, in twenty minutes,—that is to say, an English fitter. And so difficult proved the task of supplying even these inferior rails in adequate quantity, that a number of miles across the Landes of Bordeaux, for which the French factories were under contract to supply the rails, were actually laid with Barlow's rails, sent out from this country, to the great economy of time and increase in durability of way, no less than of safety to the public.

How thoroughly this state of things has been changed it is unnecessary to say. In fact, the only part of the case that now would be thought incredible is the statement of what formerly existed. In other parts of the Continent the normal hunger for English gold has led to frequent applications, down to within a comparatively recent time, for the services of the civil engineers of this country. Too often, however, has the transparency of the device become evident only a little too late, and the men whose opinions were welcomed as oracles while the

subscription list was open, were asked by what right they interfered when all the available funds had been ensured.

While rendering a full meed of tribute to the energy, perseverance, and original constructive genius, that have opened a navigable highway from the Mediterranean to the Red Sea, we must not shut our eyes to the fact that the information which has been given to the public as to the actual procedure of the work has always been carefully filtered, not to say manipulated. It is necessary to bear this in mind, now that all we have of the undertaking is an account of the tonnage of the vessels that make use of it. But we have been given to understand, from very reliable sources, that the anticipations of Mr. Stephenson as to the deposit of sand in Port Said are fully confirmed. The actual differences of depth between two consecutive soundings, taken a few weeks apart, are so great that we do not like to mention them without being at liberty to publish the details of the surveys. To maintain a line of navigable channel, in place of a deep and commodious basin, is, we are told, the only present idea of the administration; and even this will tax the utmost energies of the dredging apparatus. Of course, this statement will be denied; but that will have little effect on the minds of English readers. We believe that it is strictly correct.

With regard to that other main link in the chain which was intended to connect London with Calcutta, English enterprise has not disdained to compete with the owners of the mules so familiar to the Alpine tourist, for the temporary traffic over Mont Cenis. The snows of the Alps have only occasionally arrested the trains of M. Fell, and he has shown himself able to contend with the minor difficulties of inclination and of traction. But the eyes of all the engineering world will be strained to watch what sort of a junction will be effected by the French and Italian engineers in the bowels of the Alps. Of the seven miles and 1007 yards between Modane and Bardonnèche we were told some time since that the Italian half was completed, and that the Italian engineers were straining their efforts to meet their French *confères* as far over the frontier,—or rather as far under the frontier,—as possible. The success of the compressed air machinery has been admirable. We confess that we look with more anxiety to the accuracy of the level than to that of the line. Unless the utmost care has been taken on each face, to take no levels without the precaution of using perfectly even sets, disturbance may have been caused by the varying attractive powers of the different strata, which no means exist for checking. When even it is effected, the meeting of the two halves of the tunnel will be one of the most critical and interesting facts in the entire history of civil engineering.

It is melancholy to see how the rapid progress of our professional brothers in France,—a progress that we have had repeated opportunities of watching with our own eyes, since Mr. Locke first went over to teach Frenchmen how Englishmen made railways,—is arrested by the mailed hand of invasion. Not only must progress in civil works be entirely suspended, but maintenance must in many instances become all but impossible. What can now be the traffic over the Mont Cenis? What the sources of income for French railway shareholders? The unexpected, and, to our mind, extremely improvident, readiness with which a new French loan has been grasped in the City, is no offset to the real depreciation of all property in public works in France. Actual destruction of works, although that may be reckoned by millions, not of francs, but of pounds sterling, is not the most serious evil; for the invaders must, for their own service, substantially repair most of the damage caused in order to arrest their march. While any debatable land exists between France under German power, and France under no power at all, havoc is likely to be made there. But the sudden check to the whole circulation of national and of international traffic is a calamity such as we have never witnessed since the Stephensons first matured the invention that we trusted would peacefully bind together the civilised world in a girdle of iron.

Institution of Surveyors.—The first ordinary general meeting of the session will be held on Monday, November 14th, when the president, Mr. Richard Hall, will open the session with an address.

END OF "THE ARCHITECTURAL EXHIBITION."

THE "Architectural Exhibition" is no more: it died a natural death, hastened by neglect, on Monday night last. The profession for a number of years has been gradually supporting it less and less, and although the council have been endeavouring each year to improve the condition of matters, it was thought at last that it was of no use struggling on any longer. A public meeting was therefore called, that the subscribers should decide as to whether the Exhibition should go on or not, and such was the interest taken in it by the profession, that not a single person attended besides the members of the council; it was therefore decided to stop. The two facts that increased space is promised by the Royal Academy, and that there are to be annual exhibitions of architectural drawings at South Kensington, have doubtless tended to bring about this result. We make the announcement with regret. Although not always particularly well managed, the Exhibition has done much good service in its time.

In the first year of its existence the late Sir Robert Peel, then at the head of the Government, paid a visit to the Exhibition; and while admiring a design for an ornamental brick building, asked one of the honorary secretaries the reason why such structures should not be erected. The secretary took great pains to explain to Sir Robert that it was entirely owing to the duty on bricks, and that if this were taken off we should get them better and, of course, much cheaper, and so we should soon have better buildings. The next session the brick duty was abolished, and it is a tradition in the Society that this conversation had something to do with the abolition. The good that has resulted from that measure, by the way, is, up to this time, very much less than was fairly expected.

We may have something further to say of the late "Architectural Exhibition."

WINTER EXHIBITION IN THE FRENCH GALLERY.

THE French Gallery, No. 120, Pall-mall, is well known to all lovers of pictures, from the central convenience of its site, the comfort of its appointments, and the usual excellence of its contents. The present winter exhibition contains 211 cabinet pictures, by 142 different artists, English as well as foreign, among whose names rank those of Gerome, Goodall, Burgess, Ansell, Cooper, Creswick, T. Faed, Le Jeune, Orchardson, and other favorite artists. The good opinion which the first glance at the walls led us to form, has been backed by the public; for in spite of weather the most adverse to vision, the number of pictures sold on the very first day of general admission was particularly large.

The picture which should head the list is one which can hardly be considered as finished. Painted on an absorbent ground, which gives it something the effect of fresco in miniature, it will, no doubt, by-and-by, receive a coat of vehicle that will bring more clearly out its marvellous and conscientious finish. It is (51), "Pifferari," by J. L. Gerome, two Abruzzese peasant men, and a lad, playing their national air (melody it cannot justly be called), on their pipes. The misty, old-fashioned street in which they stand, looks like that of Rochester, or some equally unmodernised town. The expression of the performers is to the life. Their souls enter into their music, which, in their wanderings in Italy, has a devotional character; as they are accustomed regularly to play before every picture of a saint on the wall. The families who are related to the said saint (whether as proprietors or otherwise) invariably make some return to the Pifferari. The other picture by this artist is no less faithful a national study, (25) "A Baïbi Bazouck." With the deference due to such a master of colour, we should suggest that this very striking portrait suffers from the unusually and inexplicably dark tint of the background. The figure itself, with its barbarically rich attire, might have been taken from the walls of Karnak. It is of the veritable Egyptian type, and its deep bronze would have contrasted well with a desert sunset.

Mr. Goodall sends studies from the same climate, so rich with the finest models for the painter, from which he drew the inspiration for his noble figure of Jochebed, in the last Royal Academy Exhibition. He gives us here (12) "A

Coptic Woman"; (40) "Crossing the Desert," where the vast ungainly height of the camel throws the weary rider high up against the sky; and (76) "An Egyptian Shepherd Boy." Each of these pictures is an ethnological study. There is also a tiny gem by the same artist (62) "Cramer going to the Tower," in which the carefully-drawn figures are painted very much in the tone of colouring used by Rembrandt, though they lack that master's breadth in the masses of shadow.

Mr. Burgess is seeking to appropriate Spain, as Mr. Goodall lingers in Egypt. (95) "A Little Bit of Scandal" is a very effective group of three beautiful Spanish women revelling in some very shocking story—no doubt, the detected misfortune of some intimate friend. The old canon who is coming to share the delight, with folded hands, and "Don't mind me, my daughters," on his face, is in perfect keeping with the scene. No. 195, by the same painter, is a "Portrait of a Spanish Lady," in which her Moorish blood gives richness and freshness to the lips, and shade and velvet to the eyes.

To the "Young Mother," whose attire may also denote a young widow, bending over her sweet sleeping child, is deservedly assigned one of the posts of honour. It is by L. Perrault (184). Another centre picture is "Padre Francisco," by E. Long (138); a heavy and well-fed priest, who has fallen asleep in the sacristy, breviary in hand. His open mouth is suggestive of a deep bass snore. A white-surplised acolyte is taking the liberty to wake his reverence; in the interest of a woman who is entering the confessional in the adjoining church. One can fancy that the penances imposed by Padre Francisco will not be too severe.

Two pictures that might almost be regarded as companions, from size and number of figures, are the "Arrest of Franz Rakocz," Second Prince of Hungary," by Julius Bencau (15), and "Charles I. in Vandek's Studio" (201), by L. Eacossa. In the first, the contrast between the dignified attitude of the Prince, and his air of comfort and protection to his wife,—who half throws herself out of bed in terror as armed men burst into the room,—is very good. In the latter, the artist has not caught the sad dignity of Charles Stuart. His under-lip has too much resemblance to Philip IV. of Spain, and the very broad grin on the faces of the courtiers is beyond the limits of Court manners. It is not a wholly satisfactory picture.

Mr. Orchardson's "Taming the Shrew" (47) lingers on the memory. The room, it may be said, is too large and bare; the attitude of Petruchio, or his pupil, too theatrically careless. Still, it must be remembered, he is acting. But the Catharina is inimitable—that is to say, if golden-haired blondes can go into such a fit of passion as is so truthfully indicated by the twitching fingers, the rosy cheek actually scratched, and the dusty, tumbled dress. A chair overturned on the floor adds its mute witness to the tale of the outburst. It is a very clever picture.

To recover from the fury of the fair shrew, and to escape the burst of tears with which she will break down in two or three minutes, turn to (122) "National Cavalry on the March during the Insurrection in Poland, 1863," by H. Gierymski, where a troop of lancers files across a snowy landscape—a truthful and striking picture. Another snow scene is (156) "Sintram and his Companions," by A. B. Donaldson, who has drunk deep of the mystic wonder of the story. The dreamy look of the fair-haired German boy, and the grim and quaint aspect of his companions, are admirably rendered: the "pilgrim" is more effective than the "little master."

We must not omit to mention (196) "The Sisters," by H. Le Jeune, a very charming pair, very prettily grouped; and "Miss Hardcastle" (211), by J. B. Dicksee, from "She Stoops to Conquer." Such a face is sure to conquer—stop or no. There is a glow, almost Italian in intensity, and a wild drift of cloud, that would have charmed Turner, in (160) "Tide Drift," by W. J. Roffe. M. J. Morgan's "Coast Guard" (145), and "All True" (106), a sailor spinning some enormous yarn to an admiring and intent circle, have great force of expression and of character. The limpid purity of the atmosphere is given well by Jules Ruinat in (69) "Solitude, Baltic Shore," and (71) "Santa Lucia, Naples." But in the latter he has also given a brilliancy and cleanliness to this ill-odorous fish-market, which is purely imaginary. The blue waters of the bay, and the romantic people of Capri in the dis-

lance, are very faithfully given. There is a charming effect of a ray of sunlight on hill and lake in (48) "Easedale Tarn, Westmoreland," by S. R. Percy. The struggle of the green of the vegetation with the stern limestone of the mountains and the reinforcement of the brighter colour by the sunbeam are very happy. We must add a word of greeting for "Little Wasp," by L. Swift; the "Heron and Setter" (35), by R. Ansell, R.A., in which the wounded bird is gallantly confronting the noble dog; and the "Lurking Fox" (7), by Guido Maffei—a most truthful and lifelike fox—we could fancy it to be the very one which, not a week ago, brought trouble to a Wiltshire parsonage, carrying off fifteen chickens: "And what can we do," said the vicar's wife, "for, of course, we cannot shoot a fox?" "The 14th of February" (65), by G. B. O'Neill, and Faed's replica, or first study, "When the Day is done" (70), should also be mentioned.

Our readers will thank us for sending them to spend a very pleasant hour in the French Gallery.

DRAWINGS OF THE HOUSES OF PARLIAMENT.

The meeting of the Royal Institute of British Architects, to consider the decision of the Law Officers of the Crown as to the ownership of the drawings of the Houses of Parliament, of which we gave notice in our last, was held on Monday evening, the 31st ult., the President in the chair. After some discussion resolutions were passed; but as it was a meeting of members only, we must leave the Institute to make them known. We understand the First Commissioner has offered to submit to the Law Officers a case prepared jointly, if Mr. Barry will agree to abide by the result.

ON THE ELECTRO-DEPOSITION OF COPPER AND BRASS.*

It is intended in this paper to put forward the present condition of the electro-deposition of copper and brass, with sufficient reference to the history of the subject, to make comparatively recent improvements well understood, but treating the process in a practical manner, and with reference to some improvements and manipulations that are adopted by the author.

Mr. Alfred Smee, in his "Electro-Metallurgy," dated 1851, gives much attention to electro-deposition of copper from acid solutions as well as from neutral salts, and he alludes to potassium cyanide as a menstruum for dissolving the copper, when articles of iron are to be submitted to the coating process. In mentioning the cyanide electro-coppering solution, Mr. Smee does not notice the fact that hydrogen gas is evolved during the deposition of reguline metal. In reference to the electro-deposition of brass, he has a chapter upon the reduction of alloys, in which he states that zinc and copper have been reduced contemporaneously, and their union afterwards effected by heat. Mr. Smee has evidently not been informed of Professor E. Davy's discoveries in 1830 (see "Phil. Trans.," vol. cxxi, pp. 147-164), nor of the labours of M. de Rouin in 1841, nor of Mr. C. V. Walker in 1845. Certain patented inventions, also referring to electro-brassing at this early date, e.g. Fontaine-morean's invention, No. 10,282 (A.D. 1844); De la Salzedo's process, No. 11,878 (A.D. 1847); Fontaine-morean's plan, No. 12,523 (A.D. 1849); Russell & Woolrich's discoveries, embodied in No. 12,526 (A.D. 1849); and Steele's patent, No. 13,216 (A.D. 1850).

The point of view, the sphere of thought, and the plane of action from which Mr. Smee was led to regard the electro-deposition of metals, were not favourable to the development and classification of facts that were subsequently recognised. He had only studied in detail neutral and acid solutions, and these, in conjunction with the physical laws common to all substances, led him to believe that the evolution of hydrogen gas was an evidence of the existence of the metal in the non-reguline form. Doubtless his admirable researches in relation to his "chemico-mechanical battery," involving as they did only the employment of acid solutions, tended to confirm his views respecting the influence of the evolution of hydrogen gas (during electro-deposition) upon the metal obtained. At the present time, how-

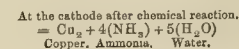
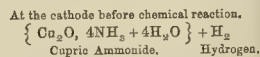
ever, it is well known that there are solutions which will deposit reguline metal during the copious evolution of hydrogen from the cathode; this takes place generally during the electro-deposition of alloys. Many alkaline solutions of single metals also exhibit this peculiarity.

It may be that Mr. Smee's views respecting the evolution of hydrogen from the cathode have unduly biased him in regard to the theoretical views that he puts forward in his chapter upon alloys. These views will not stand the test of experiment and vigorous examination when alkaline solutions are employed. Considerations respecting "the removal of gas" weighed with him, in conjunction with the laws of the conduction of electric force through various media, in the result that he arrived at respecting the electro-deposition of alloys. This result was that alloys might possibly be electro-deposited without the evolution of hydrogen, and by means of an "intense voltaic current." Now that alloys are electro-deposited commercially in a reguline form, the scientific man of the present day can look back to the enunciations of Smee with great respect, but as incomplete. The ordinary accompaniment of this deposition is a copious evolution of hydrogen gas from the cathode; and, although an intense voltaic arrangement is usually employed, it is partially to compensate for the waste induced by the gas evolved, and to save time in the operation of coating. The author's improvements stop the evolution of hydrogen, and enable the electro-motive power to be reduced to that of a single Smee's cell.

Mr. Smee's views have been prominently put forward, because they present a definite standpoint, and because the general knowledge of the subject may be said to date from his able exposition of the position of the science as it was when his work was written.

If first principles are consulted, it will appear that, in alkaline solutions, the proneness to evolve hydrogen gas during deposition arises from the joint action of two causes, one electrical—classified as such by Mr. Smee,—the other chemical. The electrical cause is the small quantity of metal in solution in comparison to the electric power employed. This cause can be lessened or removed by using a solution that contains a greater percentage of metal than that usually employed. The chemical cause is the disposition of the metal of the alkali to go to the negative pole along with the heavy metal or metals, and thus, by being electro-deposited for an infinitely small space of time in contact with them, decomposing the water, thereby getting oxidised, and setting free the hydrogen as a secondary effect. This cause can be eradicated by providing in excess a decomposable compound radicle that will take a certain amount of combined oxygen with it, to the cathode, and thus, when decomposed, will enable the hydrogen that would otherwise be evolved to be oxidised into water.

In the case of brass, a solution containing the cyanides of the component metals dissolved in excess of potassium cyanide possesses the remarkable property of furnishing the copper and zinc to the cathode in such form that, during deposition, they unite and form a true alloy. This tendency to form a true alloy is increased by the presence of a salt of ammonium, for, in connexion with copper (especially as cupric ammonide), the gas that would otherwise be given off is replaced by metal, this result being secondary and, in so far, a chemical reaction. It is usually deemed sufficient to charge the solvent solution (the potassium cyanide and ammoniacal salt solution) with brass by electrolysis; but this will be found on trial to evolve gas, and to be only workable by two Grove's cells. The author finds that it is practically serviceable to add to a solution that is charged with not less than two ounces of brass per gallon, as much of the metallic cyanides as it will take up, and then it will probably take still more of the copper and zinc oxides respectively. Should this treatment not perfectly prevent the evolution of gas, the cupric ammonide is added,—about two or three ounces per gallon. The cupric ammonide may possibly carry the combined oxygen to the cathode; in that case the action may be expressed by the following equation:—



* Read before the British Association, Liverpool meeting, Section B.

Malaguti and Sarzeau's formula for cuprio ammonide being used. That is to say, before decomposition or chemical reaction takes place, the whole of the cuprio ammonide, together with the eliminated hydrogen, goes to the cathode. After the decomposition or chemical reaction has taken place, metallic copper is deposited, ammonia is in solution, and water is formed.

In treating the ordinary cyanide copper solution for the prevention of the evolution of hydrogen, the zinc cyanides and oxides, mentioned in the instance of the brass solution, are left out.

When the evolution of hydrogen gas has been stopped by the means above set forth, a single Smee's cell is sufficient to deposit the alloy; thus showing that an intense voltaic current is not absolutely necessary, but that the process requires a certain condition of solution to give a perfect result.

The author prefers to use a menstruum containing potassic cyanide and neutral ammonium tartrate, in equal parts, and dissolved in five times their weight of water, to dissolve the brass in. This is then treated as explained above, to prevent the evolution of hydrogen. This solution is employed in conjunction with heat, and a single Maynooth cell, or a magneto-electric machine of suitable power. It has been found, with some electro-brassing solutions, difficult to deposit, continuously, a given quality of brass; with this solution the regulation of the proportions of copper and zinc in the alloy is made by altering the heat accordingly. If the solution is kept uniform, as shown by a ready test, it is very easy to deposit a given alloy at all times.

Before entering upon some practical points connected with the electro-deposition of copper and brass, it will be well to remark that acid solutions furnish a spreading deposit matted together, resembling the spreading of mortar by a trowel; whereas alkaline solutions furnish a deposit standing up from the receiving surface at right angles thereto, as the hairs of a brush stand out from the brush itself.

In coating wrought or cast-iron work, it is often desirable to coat with copper prior to electro-brassing; the alkaline bath should be employed above the temperature of the air, sometimes 160° Fahrenheit; this method of working promotes the contact of the coating. The article should be well cleaned, so as to have a metallic appearance, with a pickle of weak sulphuric acid, scrubbed with sharp sand, washed, scrubbed with a portion of the depositing solution, and then placed in the depositing trough. The electrical connexions may then be made, and the coating allowed to form for two hours or more. When a sufficient thickness has been obtained, the article is washed, and dried in hot mashing sawdust.

The tarnishing of the coating increases its beauty, and does not impair the article, for the tarnish is not corrosive rust like the oxide of iron, but is a protective film. Two hours' coating will protect from rust in ordinary indoor work, but the best protection from rust (and this is serviceable even in damp air) is to give two hours' coating in an alkaline bath, and then let the article remain all night in an ordinary acid sulphate of copper bath; this plan utilises the matted coating as well as the vertical deposit. If desired, a brass coating may be given over the last-mentioned copper coating. By suitable mechanical arrangements, the articles in the acid bath, and the dissolving plates therein may be moved—preferably by a to-and-fro movement—during deposition. This treatment shortens the time of the deposit, and makes it (the deposit) uniform.

The roller which is exhibited was treated in this manner; it now weighs 125 lb., having 39 lb. weight of deposit upon it, the coating being $\frac{1}{16}$ in. thick. The other works show various applications of the electro-coppering and electro-brassing. The price of the above-mentioned coatings, when a single Maynooth cell is used, is 2s. 6d. per lb. of metal deposited. When a magneto-electric machine is employed, the cost is much reduced, viz., to 1s. 6d. per lb. of metal deposited.

The coating given by means of the improvements introduced by the author is superior to that given by any other known process. These remarks apply to the economy of the question, to the solidity, perfection, and beauty of the result. In consequence of the non-evolution of hydrogen, the adhesion of the coating to the underneath iron or other metal is insured; also the coating is solid and compact instead of being more or less detached and spongy, as it is when hydrogen gas is allowed to be eliminated.

The ammonium tartrate solution used for electro-brassing, as well as the methods of preventing the evolution of hydrogen during deposition that are mentioned herein, form a part of the subject matter of specifications No. 1,540 (A.D. 1857) and No. 3,930 (A.D. 1868).

The uses to which electro-brassing may be applied have yet to be greatly developed, amongst the rest may be mentioned the prevention of rust, the giving an improved printing surface to type and electrotypes, coating the poles of electro-magnets for the prevention of the "residual charge" therein; covering rams, plungers, piston-rods, rollers, &c., with an adhesive and durable coating; also lining cylinders, pumps, and iron vessels with copper or brass. The application of the processes that have been described to many purposes of ordinary life, such as railings, architectural ornaments, &c., will exemplify the good results to be obtained by the union of the strength of iron with the beauty of copper or brass.

W. H. WALEN, F.C.S.

WORKMEN'S INTERNATIONAL EXHIBITION.

THE Workmen's International Exhibition, at the Agricultural Hall, Islington, and of which her Majesty the Queen was patroness, was closed on Tuesday, by a ceremonial, at which the Right Hon. W. E. Gladstone presided.

The proceedings were commenced by Mr. Paterson, one of the honorary secretaries, who expressed a hope that the union of rank, wealth, and labour by which they had been enabled to carry out this undertaking to a successful issue, so far as its real object was concerned, would in future be the rule and not the exception. The collection, which was about to be dispersed, had been, as an exhibition of works of merit, by workmen, the most successful that had ever been brought before the public. As a school of technical education, he thought such exhibitions could not be prized too highly.

The financial statement showed that there was a deficit of 1,000*l.*, for which it would be necessary to draw upon the guarantors. After various speeches.

Sir Antonio Brady expressed his conviction that the exhibition had been a signal success. As one of the guarantors he must say he had been repaid a hundred times over. He called on them to give a hearty vote of thanks to the Prime Minister who now happily governed this country, and who so worthily presided over the meeting. He complimented Lord Granville for the part he had taken in the foundation of a School of Art in the east-end of London, which was a great step towards technical education for the working man, and he called on the wealthy guilds of the city of London to come forward and contribute liberally from their funds for the reward of those inventors whom the juries had strongly recommended.

Mr. Gladstone then made an address, in the course of which he said,—In an exhibition like this, ladies and gentlemen, we are brought into immediate contact with that serious question,—but, if serious, serious only on account of its magnitude, not on account of its unsatisfactory character,—I mean the relations between this country and foreign lands; and we must all join in the satisfaction with which we have examined the beautiful works that have been sent here by the artisans and the artists of so many European countries, in some cases, like those of Italy and Austria,—countries that but a few years ago seemed to be locked in perpetual and deadly conflict, but have now, as we trust, once and for ever, joined the hands of peace and friendship. Long may they flourish in that career of animated and friendly competition of which we have such samples in this hall! Neither to us nor to foreign countries, ladies and gentlemen, does this free competition bring any subject for fear or apprehension; but it brings many subjects of admonition, of stimulus, and even of warning. It warns those who make an inefficient use of the facilities and facilities with which Providence has gifted them that if they will not turn their gifts to good account they must expect to be distanced by those who make a better use of the benefits of the Almighty. And is not that a very useful warning? If men are lazy, it is well that they should be stimulated. If men are wasteful and careless in production, it is well that they should be made vigilant and economical and thrifty. There is no country that has not, in the benefi-

cent designs by which we are governed, allotted to it its own proper share in the business of production. It is sometimes said that it is now too late to hope—too late to carry on our pursuits in isolation from the rest of the world. It is too late, and thank God it is too late; because the intercourse by commerce of different countries makes not the diminution, but the augmentation of industry and employment; not the diminution, but the augmentation of comfort and of wealth; and that means, ladies and gentlemen, something still better than these—it means the simple, the natural result,—namely, that growth of friendship and goodwill which grows up, which springs and increases continually in the course of the transactions of business, and by an unseen and silent, but certain, process, tends to allay the evil passions of mankind, and to bind in harmony and friendship all the nations of the world. And the purpose of such an exhibition as this is to bear its part in that great and noble work; and that part, we believe, has been borne.

Afterwards referring to the belief that the Exhibition of 1862, compared with that of 1851, showed that in many cases ground had been gained upon us by rivals abroad, the Premier said,—Now, ladies and gentlemen, do not think me to be wholly slack and deficient in patriotism if I say I am not sorry for it. But I confess that is the case with me. My belief about the Englishman, the Briton—if I had a word that would conveniently include our Irish friends and subjects I would use it—my belief is, that in this particular the inhabitants of this island have in them the materials of everything that is great in every walk and province of human excellence, but they require a stimulus; they have not, perhaps, as much abstract love of excellence as you may find occasionally in the natives of other countries. Production in this country requires to be stimulated by competition abroad. You must, I think, throw the Englishman on his metal in order that you may come to know what he can do. I will not enter upon any elaborate proof of this apparently broad and sweeping proposition; but those who recollect what was the condition of some of our manufactures at the time when they were petted and coddled by legislative favour compared with what it is now when they have been brought out for years from the hot-house into the open air, and exposed to all the winds and blasts of heaven, will be able perhaps to judge why it is desirable that to you at least as much as any other country this powerful stimulus of competition should be applied. Nor is it only in a sordid and vulgar view that this competition should be regarded. It is the love of beauty perhaps more than of any other kind of excellence that we have to learn from our rivals in other countries; and that love of beauty applied to art cannot but be regarded as an ennobling and elevating power in its operation upon mankind.

On another occasion care must be taken to start better. We are afraid it cannot be denied that exhibitors have not derived that advantage from public review of their works and merits that under better arrangements might have been had.

THE "OPERA COMIQUE," WITH ENTRANCE FROM THE STRAND.

WE cannot describe the new theatre as in the Strand, because, in truth, it is in Wyeh-street, and if we give that street or Holywell-street, which it also fronts, as its address, the lessees, Messrs. Lealie, Steele, & Norton, may take objection on the ground that the chief entrance is in the Strand. How this occurs by means of a subterranean passage-way under the houses in the last-named thoroughfare and under the roadway of Holywell-street, now called Bookellers'-row, we have already told our readers, with some other matters about the new theatre that scarcely need repeating. The building occupies a portion of the site originally intended for the Strand Hotel, and fills the vacant space which remained when the Globe Theatre was erected on the area of the quadrangle of old Lyon's Inn. The principal doorway, nearly opposite the Strand Theatre, affords an approach to the stalls and boxes by means of a passage, which, furnished with mirrors, will serve the purpose of a conversation-lobby and "ornish-room." There are other entrances from Wyeh-street and Holywell-street, two of which are of considerable width, and would soon empty the house if occasion should arise. The interior of the theatre presents an

elegant appearance. The whole of the space ordinarily assigned to the pit is devoted to rows of stalls, and above these, at an elevation of not more than 4 ft., are the balcony stalls. The tier above is the dress circle, and the upper boxes and amphitheatre rise beyond. On each tier are four private boxes, varying in size. The decorations are described officially as of the Genoese-Italian school. Over the proscenium is a large painting illustrating the story of Sappho; four segmental panels represent allegorical pictures of Morning, Noon, Evening, and Night; and two female figures, in somewhat uncomfortable position, modelled by Mr. Woodington, support the entablature, which is flanked by clustered columns. The ceiling is slightly domed, and in the centre is a "sun-burner," which brilliantly illuminates the house. Around the upper circle are lunettes filled with paintings emblematic of music, art, and the various sciences. The prevailing colours below are white and gold, relieved with some light tints, and enriched by blue draperies. Accommodation is said to be provided for 1,400 visitors, but this seems to us rather an over-calculation. This will be understood better when the proper seats in the stalls and elsewhere, at present not quite finished, are in their places. Careful design is apparent in many parts of the ornamentation, and the form of the house is calculated to enable the audience to see and hear. A little appearance of weakness is given by the circumstance that the uppermost range of columns carrying the ceiling are not over those below, but stand more forward. It is only in appearance, however: the whole framework of the construction is of iron, and doubtless quite equal to all that is required of it.

The theatre has been constructed from the designs and under the superintendence of Mr. F. H. Fowler, architect, by Mr. M. Reid, builder, Hammersmith. The decorations generally are by Mr. E. W. Bradwell. The work in relief, such as that of the proscenium, ceiling, and box fronts, is of *carton pierre* and *pepærsmâch*, by Messrs. White & Co. The figure paintings are by Mr. Ballard; and the furniture and upholstery by Messrs. Villars.

The house was opened on Saturday evening last, with Mlle. Déjazet and artists of her theatre in Paris, the programme being "Un Soir qu'il neigeait;" "Les Près St. Gervais," a two-act comedietta, by M. Victorien Sardou; and, lastly, "Les Forfaits de Piperman;" Déjazet herself; and certainly when it is remembered that this lady was acting in 1815, her performance is remarkable. The critics of the daily press have, however, displayed an amiable weakness in terming it charming, and praising it in the manner they have done. Wonderfully clever, indeed, it is, but to some minds not agreeable, and, unless we are deceived, the laudations have simply prepared a disappointment for the public, who will look for a joyous schoolboy in the *Prince de Conté*, and find a little old gentleman. We shall be glad if it prove otherwise, but we have a strong conviction that the programme and the company must both be strengthened to attain success.

THE WATER SUPPLY AND DRAINAGE OF CIRENCESTER.

THE town of Cirencester has been suffering for the last six months from a severe epidemic of scarlet and typhoid fever. We see, by a report of the sanitary committee, published in the *Wills and Gloucestershire Standard*, that attention has been directed to the dreadful state of the wells in the town, and that "in every case in which typhoid fever had appeared, the water used by the afflicted families was found to be more or less impure." We see also, by an article in the same paper, that the degree of impurity varies from 38 grains of solid residue to the gallon "down to the dreadful well in Dyer-street, with its 102 grains to the gallon, and its yellowish brown fluid, full of various animal and vegetable organisms, and positively putrid." What can the good people of Cirencester be thinking of, to be content to drink this filthy stuff when they are surrounded on all sides by abundant springs of excellent water?—or have the principles of sanitary science not got down to Cirencester yet?—for we see by the report that some of the speakers seemed to think that impure water has no connexion with disease, even in the face of their own sanitary committee's

report. A correspondent, who knows the town well, writes:—

The town has been suffering all the spring and summer from scarlet and typhoid fever. The Professor of Chemistry at the Agricultural College has analysed the water from wells in all parts of the town, and has published a series of letters, showing a most alarming degree of impurity. But as town commissioners will not see that there is any connexion between bad water and illness, some of the speakers advocate drainage rather than water supply.

But even supposing that a better system of drainage were adopted, that would only prevent further contamination of the wells; it would not remove the impurity of the soil, which is saturated with organic matter. The very site of the town is sodden, and it is useless to sink new wells. We ought to get our water from some of the many excellent springs on all sides of us. It seems absurd, then, that we, who have such abundance of excellent water, should be drinking diluted sewage ourselves, whilst the little that we should require would produce so repulsive an effect upon springs that are yielding millions of gallons daily.

If the inhabitants of Cirencester (pleasant old town that it is) do not take up this question of water supply at once, and resolutely follow it up with better drainage, they can scarcely hope to escape serious results. They have had more than one warning.

ARCHITECTURAL ASSOCIATION.

THE opening *Conversazione* of the Association was held at the House in Conduit-street, on Friday, the 28th ult., under the presidency of Mr. T. H. Watson. The reports of the various art classes were read, and the prizes delivered. Afterwards the president, Professor Hayter Lewis, and others, addressed the company. Messrs. Arrowsmith, Gillow, Streeter, and Salvati exhibited some choice displays of goods, and the Museum of Building Appliances was, as usual, open to the visitors.

STATUE OF THE DEAN OF RIPON.

THE admirers of Dr. McNeill, in Liverpool, when he was made Dean of Ripon, subscribed a sum of money, and commissioned Mr. G. G. Adams, the Sculptor, to produce a statue of the reverend Doctor for their town. The statue being finished, it was offered last week to the town council, to be placed in St. George's Hall, and led to a rather unpleasant discussion. Moreover, it seemed the proposal had been made without proper notice, and it was withdrawn for a time.

One of the speakers urged that the statue should be critically inspected as a work of art before it was accepted. We are glad to be able to offer him our assurance that from that point of view no objection whatever is likely to arise. Mr. Adams, as it seems to us, has been particularly successful.

The figure is of heroic size, in Carrara marble, of great pureness. Attired in Doctor's robes, holding a book in one hand, and demonstrating with the other, the figure is dignified, while it suggests the known energy of the individual represented. It is lifelike, and stands well; the bands and robes are exceptionally well wrought, and we may fairly congratulate Mr. Adams on having achieved a fine work.

CAN A JOINER BE A GENTLEMAN?

"A JOURNEYMAN JOINER" who writes under this title must be hard to please. He complains that, engaged to obey directions for hours, he has been expected to spend, say a minute, with his hand touching his hat instead of a chisel or a saw, and that some one wished to spare him the muscular exertion required for knocking twice instead of once at a door.

Some such badinage might fairly be addressed by a friend to the impetuous "J. J.," and, when the sense of humour temporarily extinguished by a not unmanly indignation had reasserted its sway, would probably restore the perception of the relations of things—the true function of humour.

It might, however, seem ungenerous in a stranger to suppose that personal pique has dictated what is, in fact, a condemnation of our social system, and of some points of our national character. We shall probably be none of us eager to apologise for many of the unnamable customs and qualities of which, thanks to an introspection now almost become a national defect, we are for the most part painfully conscious.

The sharp lines dividing our people, allotting them, in the oddest manner, into distinct

classes; the reserve and want of social tact, fostered by habits of life, sometimes even by our individual liberty; the infrequency of binding ties based on better feelings, in which our social strife, called competition, seems necessarily to result;—these, and countless other social and personal defects, strike most of us with amusement or—with regret. Carlyle, Mill, and other social philosophers; Thackeray, and a host of social satirists; preachers and others not a few, have not failed to do justice to their genius and insight, and to write and speak of these matters with a calm rebuke, or bitter indignation.

Should then any one,—a man like "J. J." let us say,—deem himself, and such as he, specially victims of the system,—caught in the iron fetters of a fate that takes the life from their aspirations, and makes them doubt as to that

"All-protecting freedom, which alone sustains the name and dignity of man?"

it would require a rare skill to answer such a question, or even to turn aside the point of it, without using the conventional commonplaces that are the defensive weapons of a comfortable middle-class optimism. Under the influence of a vigorous anger ("one of the passions; he that hath it not hath a maimed soul"), the language of consolation, acquiescence in the inevitable, optimism of any sort, even the argument of the value of self-denial and endurance,—all are dashed aside as almost meaningless.

The only answer of any value seems to lie in the word "Provisional."

We have repeated this word and its sense so often that it ceases at times to appear to us, (what it really is), the most valuable key idea with reference to human affairs. "A pilgrimage," "no continuing city," "states and powers to dissolve," "all the creation of man's wit and will,"—these and other phrases,—till the words, once instinct with life and meaning, are often droning sounds that lull our faculties to sleep.

... Feudalism, dead as a system, but lingering as a fact; a new commercial and manufacturing energy; an old society and the throes of new life; wealth, ease, and luxury; hard toil, penury, abject poverty; incapacity, corruption, the want of rich, fine natural qualities in many captains of our industries; a future with which statesmen do not attempt to grapple because the conditions of their problem would change under their eyes; timid back-glances at the past, rapid change and feverish exertion in the present, the future shrouded in heaviest mists. . . . All provisional!

Then, provisionally—courtesy? Why not? Why not a change in national manners (courteous customs)? The gay, gallant humour that makes the courtesy of equals—with the deference and reverence accorded to women: should they be suspended till they are demanded? "J. J.'s" awkward word "gentleman" (in its best sense) points to nothing more than such a bearing in a man as the fruit of a courteous soul.

Does not the slowness of some Englishmen lead them to shut their eyes to the fact that ready deference is the essence of courtesy?—that equality simply claimed is not the equality that is won by manliness and grace? Probably many might learn the lesson, and many would willingly show that they have learnt it—if they could; but "J. J." would readily own that he knows people who would have to make a beginning.

One cannot help an expression of regret at the "no intelligent man likes to be a drudge," the "distaste for drudgery," that show themselves once or twice in "J. J.'s" letter.

"Who sweeps a room, as for Thy laws, makes it and the action clean."—(George Herbert.)

Or Ferdinand of his labours by Prospero's orders,—

"This my mean task
Would be as heavy to me as odious, but
Quicken what's dead,
And makes my labours pleasures."

(Surely no craftsman need beat a loss to fill in the blank in a worthy way.)

Few can fairly claim to be critics or censors of others, for desiring as much ease and luxury as they can get. Lord Derby (the present Lord) put this neatly when he said that "we are all too much tarred with the same brush;" we must be either silent or priggish. Literature and history step in, however, with higher standards than local and temporary feelings and customs. The simplicity of life, the union of lofty character with Spartan habits,—perhaps a touch of Stoic grandeur, or even of Medieval taste for hardships, may once again astonish and benefit our

world, emasculated by comfort, and blindly, "in securing mere existence, losing sight of the aims of life."

If "J. J." states, as he may well do, that this is hardly an answer to his, "Can a Joiner be a Gentleman?" it may be replied that, as such a question is evidently quite unconventional, one must recur temporarily to the simpler ideas underlying our habits and customs, which those habits and customs at once clothe and shroud.

If, in the future;—if, say "J. J.'s" great-grandchildren are to laugh at such a question, implying to them the existence of a society graduated as might be recognised to be fitting in disturbed dreams, instead of sober daylight;—if we are to perform what some deem our great national programme,—to build up a NATION,—high-spirited and gentle and patient, quick-witted, law-respecting,—with social virtues and domestic affections, all developed freely as the best growths of nature,—ruled over by men who have in fuller measure the qualities wished for by the people for themselves, and ruling not over citizens only, but over their minds and hearts;—if . . . it must be through the manhood, the force of character, the intellect,—in a word, the *virtus* of our people.

It is because some of the best of the working classes in England have such a programme in their minds, that so special an interest is now turned on them as a section of the builders-up of our national future.

S. F. C.

WHAT IS A GENTLEMAN?

It needs not noble birth, as understood,
Nor ancient lordly life and lineage,
True gentleness depends not on the blood,
Nor politeness a mere heritage.
Good breeding, gentle manners, honest aims,
Alike in peasant, peer, and artisan,
Need no side-lunging to "illustrious" names,—
Alone these constitute the gentleman.

O. H. C.

SCHOOLS OF ART AND OF SCIENCE.

Central School of Art for Derby.—A circular respecting the Central School of Science, to be held at the Old Grammar School, St. Peter's churchyard, in connexion with the Science and Art Department of the Committee of Council on Education, at South Kensington, states that the arrangements for the session of 1870-71 include four evening science classes for the study of Theoretical Mechanics, Inorganic Chemistry, Acoustics, Light and Heat, Magnetism and Electricity, under the superintendence of the headmaster, Dr. Davis, principal of the Whitworth School of Science, Cheltenham. The terms are one guinea per session, admitting to all or any of the classes, but artisan and industrial students who compete at the Government examination in May will be admitted on payment of 2s. 6d. per term, and there are three terms in the session. A long list of names of prominent and influential citizens is appended to the circular, as forming the committee; the mayor is the patron, and the classes are pressed upon public attention with the weight of many of the most intelligent in Derby.

The Stroud School of Art.—The annual exhibition of the works of the pupils of this school, with some works from the Gloucester school, have taken place in the Corn-hall. The works were of considerable merit, and showed progressive improvement, the number of oil paintings being in much larger proportion than at previous exhibitions. A public meeting was held in the Corn-hall, when the prizes gained by the students, and also by the students in the science classes established in connexion with the Stroud Institute, were distributed. Mr. Dickinson, M.P., presided. There was a crowded attendance. Addresses were delivered, and many prizes, both local and those given by Government, were distributed.

The Gloucester School of Science.—At a preliminary meeting of students and others intending to join the Science Classes this season, Mr. Jeffery explained the objects of the meeting, which were simply to give some account of last year's work, to distribute the result papers to the successful students, and to enrol members for the new classes. It appears that these classes were originally established at the Free Library three years ago as an essential feature in Mr. Jeffery's management of that institution; they were very fairly successful then, and have continued so since. During the last session, 43 students enrolled themselves as members of the various classes. Of these, 25 continued their studies all through the season, and 21 were

examined; 92 papers were worked by them, out of which 9 first-class and 40 second-class certificates were obtained. Mr. Jeffery alluded to the important changes likely to take place in the future elementary education in this country, showing, by reference to the papers recently read at the Social Science Congress, and to the meetings recently held in London under the presidency of the Lord Mayor, the strong and growing conviction that the people of this country cannot be sufficiently educated while "the Government instruction and aid are limited to the three Rs of the revised code."

Establishment of Science Classes in Reading.—A meeting has been held in the local Council Chamber for the purpose of establishing science classes in connexion with the Museum of Science and Art at South Kensington, and hearing an address on the subject by Mr. J. C. Buckmaster, of London. A large number of people assembled, and an adjournment to the Town Hall was rendered necessary. The Mayor (Mr. P. Spokes) presided, and a committee was appointed to carry out the objects of the meeting.

Chester School of Science and Art.—An exhibition of drawings connected with this school of art has been open some weeks in the Old Palace. At the close of the exhibition, a *conversations* was held in the rooms. It was numerously attended by an appreciative audience. The distribution of prizes to the successful students at the examinations in March and May, 1870, was made by the Dean of Chester.

Burslem and Tunstall School of Art.—The first annual meeting of this institution has been held in the Town-hall, Burslem. Mr. James Bateman, M.A., F.R.S., presided, and was supported on the platform by the chief bailiff of Burslem (Mr. F. Tennant), and other gentlemen. There was a very large attendance, notwithstanding unfavourable weather. Mr. Woodall read the report of the committee, of which we give an abstract:—

"The interest with which the erection of the Wedgwood Institute was locally regarded, gave a special impetus to the opening of the schools last October, in the rooms which had been so carefully designed for their accommodation. But while some advantage was derived from this circumstance, the managers had at the same time the disadvantage of having to deal with a collection of students some of whom were merely attracted by the novelty, and soon withdrew, while many who remained had had no previous training. Due weight being given to these considerations, the committee regard their first year's results as eminently satisfactory, since they compare favourably with some of the highest and most successful schools elsewhere. The committee have no hesitation in attributing these successes mainly to the zealous and intelligent exertions of their headmaster and his three assistants, and they commend Mr. Theaker's report with careful consideration. The elementary art classes have been throughout well attended, and now, in the second session of the school, there are very few vacant places. The advanced art school is becoming increasingly interesting and important. The Committee have, however, to confess to a disappointment in that the female evening class is not well attended, although much has been done for its comfort and advancement. In like manner, but in less degree, there is among ladies, whose means and leisure place the morning class within their reach, a surprising indifference to such an advantage. The Committee are aware that the other district schools have had a similar experience, but they hope to see an increased appreciation of the value of such a branch of education amongst those whose mission it is to elevate and refine our every-day life, and whose innate powers are enhanced by the charms of an accurate judgment and a cultivated taste. In the science classes the Committee are satisfied that a good beginning has been made. The necessity for close and persistent application is much greater in this department than in the art section. In those classes under Mr. Theaker's supervision there is obvious progress, and satisfactory results are confidently anticipated from his careful system of teaching."

In conclusion, the committee earnestly ask for a manifestation of greater personal interest and support from those who occupy positions of influence in the district. Mr. Theaker then read his report, in which, after referring to the difficulties with which he had had to contend in organising the school, he stated that,—

"In April last 573 elementary and eighteen advanced works were sent to London in competition for prizes and for examination, in accordance with the minutes of the Department of Science and Art; nine prizes were awarded, a student of the ladies' morning class obtaining one of them; eighteen works were selected for national competition, and eighteen students were honourably mentioned. In geometry, freehand, modelling, and perspective, fifty-three prizes were obtained, including twelve prizes and one full second-grade certificate. As free students for one year, four were recommended to the Department, those being all that were eligible, and they were all appointed free students. With regard to the science classes, in those subjects which come under this department, namely, building, construction, machine construction and drawing, solid and plane geometry, &c., although there were no prizes, the examination one student in solid and plane geometry, two in plane geometry only, two in building construction, and six in machine drawing, out of those who presented themselves, this was the least satisfactory result in the school. Reason was given for this conclusion; and then Mr. Theaker reported that although the designs sent up for competition for the prizes offered by the Plasterers' Company had not been successful, the principal promoter of those prizes thought

one of the designs so good and suitable for wall decoration that he had purchased it from the student. He concluded by stating that, on the whole, he had every reason to be abundantly satisfied with the assiduity of the students, the quality of their works, and the results generally of the first year's operations."

The Chairman then distributed the prizes to the successful competitors.

The York School of Art.—The annual meeting of this school has been held in the institution, Minster-yard. Mr. W. C. Worsley, of Hovingham, occupied the chair. The committee's report stated that the average number of pupils in attendance on the several classes during the year has been 94, showing a slight increase on that stated in the last report, when it was 83. The results of the Government examinations are as follow:—In the second grade, 27 passed in free-hand drawing, of whom 9 were marked excellent; geometry, 6, of whom 4 were marked excellent; perspective, 3, of whom 2 were marked excellent; 13 received prizes, and 36 passed the ordinary examination. On comparing these results with those of the preceding year, it will be found that in 1868-69, 29 passed and 5 received prizes; giving, therefore, 8 less as receiving prizes, and 7 less as having passed the examination. The examiners' report in reference to the works sent up to South Kensington says that "the machine drawing from actual measurement was the most thorough in workmanship." A vacancy in the mastership of this school has been filled up by Mr. J. S. Dorring, from the Yarmouth School. The committee urgently appeal to the local public for subscriptions. The chairman, in his address, spoke of the ornamentation of the walls of their houses. A person built a house, he remarked, and found that a bare wall was an ugly thing. There was a waste of labour, and therefore something was required to ornament the wall. Hence they had a demand for pictures, paper, cornices, and all those things which made their rooms beautiful. This consequently produced a demand for art,—a demand which, in fact, constituted a field of occupation for students in a school of that description. He thought there had been a very great advance in art of that kind within even the memory of young men, but certainly within the present century. If they went back 100 or 150 years, they would find that there then existed a very dull and cold appreciation of art. Take the example of such a street as Harley-street, in London, where there was a long, straight, and dull monotonous range of buildings, with square windows, dull red bricks, and no attempt made at what could be called beautiful. If, however, they went towards the neighbourhood of that magnificent institution in South Kensington, which was so dear to all the lovers of art, they would find that there was an attempt there to erect beautiful buildings. They were cheery, airy buildings, upon which there had been some attempt made at ornamentation. They were not in every case of the highest class, but there they had evidence of a demand for something beautiful in all they did.

TENDERS FOR THE BRIGHTON SEWERS.

At a special meeting of the Sewers Board, on Monday last, after some little mystification, the following list was given of those contractors who had sent tenders:—

1. Messrs. Crabb & Vaughan, Kingsland.
2. Mr. Matthew Jennings, 3, Adelaide-place, London Bridge.
3. Mr. William Webster, 8, St. Martin's-place.
4. Messrs. Hill, Keddell, & Waldram, 38, Kingsland-road.
5. Messrs. Thrust & Co., Chelsea.
6. Mr. Henry Harrison, Great George-street, Westminster.
7. Messrs. Dickinson & Oliver, Camberwell New road.
8. Messrs. Farnes & Kershaw, Tunbridge Wells.
9. Messrs. Thomas Pearson, Kennington Cross.
10. Mr. Wignmore, Fulham.
11. Mr. Frod, Furness, Havant.
12. Mr. John T. Chappell, Little George-street, Westminster.
13. Messrs. Hiscox & Williams, Lavender-hill, New Waltham.
14. Messrs. John Aird & Sons, Lambeth.
15. Messrs. Cheesman & Co., Brighton.
16. Messrs. Neave & Fry, Mile-end, Portsmouth.
17. Mr. Joseph Phillips, Westminster Chambers.
18. Messrs. W. & J. Pickering, New Bridge-street, Blackfriars.
19. Mr. Geo. Wythes, Buckley Park, Bromley.

It will be noticed that, contrary to customary practice, the amount of the respective tenders is not appended; and, in reply to an inquiry, the Clerk stated that it was not intended that the figures should be made public!

Mr. Cordy Barrows, after explaining that the Board had received nineteen tenders, and that they had had the assistance of Mr. Hawshaw in

the consideration of them, moved a resolution recommending that the offer of Mr. Matthew Jenning to carry out the works for 66,982l., which was, he said, the lowest tender, should be accepted. He said the contractor was well known to Mr. Bazalgette, the engineer, and others, and expressed his gratification, which he felt would be shared in by the town, that the accepted tender was so much less than had been anticipated.

This having been seconded and carried, the sureties of the contractor for the due performance of the work—Messrs. James Stiff, High-street, Lambeth; George Smead, Sittingbourne; and George Loe, 3, Adelaide-place, London,—were approved, and the solicitor was ordered to prepare the necessary agreement and bond.

ERRONEOUS ESTIMATING.

THE following list has been sent us of tenders delivered for alterations and additions to Nos. 3 and 5, Buckingham Palace-road, for Mr. John Gooch. Mr. J. Dale, architect. Quantities supplied:—

Barber & Groome.....	£2,183 0 0
Bellham	1,919 0 0
Richards	1,890 0 0
Shillito	1,850 19 0
J. & C. Whitaker	1,708 0 0
Snowden	1,695 0 0
Perry	1,670 0 0
Cook	1,619 0 0
Parsons & Co.	1,579 0 0
Blackmore & Morley	1,537 0 0
Fanthorpe	1,523 0 0
Baxter	1,440 0 0
Elease	1,443 0 0
Capps & Ritao	1,430 0 0
Lacy	1,410 0 0
G. Cox	1,389 0 0
Luscombe	1,325 0 0
J. Cox	1,245 0 0
Froud	857 10 0
Wagner	830 0 0

The lowest was accepted, and the work is about to be done. It will scarcely be believed that all tendered on the same bill of quantities, but so it was, and this discreditable difference (one builder saying 2,188l., the other 800l.), therefore, arises merely through the prices.

Here is another list, not quite so bad, but still preposterous:—

Tenders for the erection of an Odd Fellows' Hall at Shoreham, for the trustees, Mr. Geo. Tupper, architect. Quantities supplied:—

Blaker	£1,173 0 0
Watson	1,045 0 0
Winnett & Brooker	1,021 0 0
Holloway & Son	1,020 0 0
Blackmore	969 0 0
Hall	970 0 0
Smith	960 0 0
Lockyer	903 0 0
Deans	893 0 0
Architect's estimate	890 0 0
Miles	885 0 0
Curd	883 0 0
Steaming	876 0 0
Burston, S.	864 0 0
Beach & Parish	825 0 0
Chappell	815 0 0
Hammoud	777 0 0
Burston, T.	693 0 0

THE ELECTION OF SCHOOL BOARDS.

THE electoral placards, some of them ungrammatical, and the addresses at loose meetings, at vestry halls, and the nominations of candidates who do not pretend to have paid the special attention requisite to the means needed for the efficient education and training of neglected children, have led the Education Committee of the Association for the Promotion of Social Science to entertain the like apprehensions to those expressed by the Council of the Society of Arts, that if this course be continued and prevail, the new School Board will be an expensive failure.

It should be known on such evidence as that of the Ordinary of Newgate, and experienced school and prison inspectors, that crime has largely recruited its ranks from union workhouse schools, and rate-aided and many State-aided schools, and that this has been unwittingly done by the election of persons as local administrators who have not examined, and do not know, what sort of elementary teaching is indifferent or bad, and what is efficient and good.

It is therefore suggested that the ratepayers should inquire, or get inquiries to be made, of the candidates who have been named, and of those who may yet be named:—(1). Whether they have given any practical attention to the subject, and how long, and what have been their opportunities of observation of the results of

different methods of elementary instruction, and of industrial training, and of their efficiency in rendering children fit for service, and their comparative success or failure, and on their expense in time and in money? (2). Whether they are aware of the experience that physical training by bodily exercises must be combined with mental training for a large proportion of the children of the depressed classes, to impart to them the requisite aptitudes for efficient manual labour and industrial service? (3). What is their knowledge of the defects of existing methods, and their grounds of confidence in ascertained means for amending them? (4). Whether their observations have made them aware of the differences in the classes of children to whom it will be necessary to apply different methods, and are prepared to bring them under consideration?

To ascertain the sense of the electors completely, and comparatively inexpensively, the Social Science Committee recommend, where practicable, the adoption of a preliminary test-ballot by papers, distributed from house to house, and collected either by commissionaires, or by post in the method in use by pension societies in the ballots, for candidates upon descriptive lists. The lists issued might present to the electors, besides the names submitted by a Committee of Selection, the names of any other candidates who chose to offer themselves, and might be willing to abide by that method of ascertaining the wish of all the electors.

STATISTICS OF METROPOLITAN GAS SUPPLY.

THE accounts for 1869 of the thirteen gas companies by which the metropolis is lighted, have been published, in compliance with the several Gas Acts, and "presented pursuant to Act of Parliament." The authorised capital of the thirteen companies is about ten millions and a half sterling. The largest amounts, as regards authorised capital, are those of the Imperial Gaslight and Coke Company, 2,860,000l., of which 1,153,653l. remain to be issued, and called up; and the Gaslight and Coke Company, 2,012,500l., of which 708,464l. remain to be called up and paid. The quantity of gas sold to consumers during this year is very nearly, if not quite, 9,000 millions cubic feet, and the aggregate amount received by the companies for public lighting and for lighting by contract, 222,000l. The companies have taken during the year about 1,250,000 tons of coal. The price at which four-fifths of the gas are supplied is 4s.; the remainder being canal gas, at 5s. 6d. per thousand cubic feet, and the supplies by the South Metropolitan Company, at 3s. 2d. and 3s. 4d., and by the Independent Gas Company at 3s. 4d. The receipts appear to have been ample to enable the companies to pay the maximum dividend of 10 per cent. upon their ordinary stock.

THE MARGATE JETTY JOB.

SIR,—It is difficult to say whether the directors have most astonished the competitors by the alacrity with which they have made their award, or by the extraordinary decision at which they have arrived.

The design selected for the first premium is that signed "Octagon," and is the production of Mr. G. G. Page, of Westminster.

The second premiated design (40l.), "Espérance," is that of Mr. Soul, the clerk to the directors of the company.

The third premium (25l.) was awarded to the design marked "Dolphin," the production of Mr. W. Lane Sear, of Margate.

Four other designs were sent in, and the whole have been submitted to public view at the Droit Office, at Margate, during the last few days.

Conspicuous among the whole for its meagreness, and absence of any claim for admiration on the score of invention or construction, stands the design to which the second premium has been awarded.

Two questions arise:—1st. How comes the clerk of the company into the competition at all? 2nd. What are the merits of his designs, supposing him to be fairly a competitor?

As to the first question. Not quite two years ago the directors of the Margate Pier Company advertised for a clerk, at a salary of 120l. per annum, and Mr. Soul was the gentleman

selected to fill the vacant office. The circular inviting us to this competition is before me, and is signed "W. McNab Soul, chief clerk."

I learn that there was a leaning in the minds of several of the directors, before the designs were sent in, towards an octagonal form of head to the extension plans (indeed, it was a foregone conclusion with them); and that Mr. Soul and some of the directors met Mr. Page in consultation some few weeks ago upon a draught plan which he then submitted, and advised certain alterations therein, which Mr. Page accordingly made, and with the result of gaining the first premium. Thus Mr. Soul obtained an advantage denied to the other competitors, besides that great advantage which would naturally accrue to him in his position of clerk to the directors, present at all their meetings, and entering into their minds. Moreover, viewing Mr. Soul as the chief clerk of the company, probably more than one of us opened our minds more freely to him than if we had known we were speaking to a competitor.

I think, sir, you and others will agree with me that Mr. Soul was not fairly in the competition.

Now, as to the merits of his design. A plain octagonal head, having sides of 80.0 each, and flanks of 107.6 each, is shown on four small unmounted drawings; viz., a small block plan, one elevation, and two deck plans. No section, no perspective, no dimensions of girders, piles, walings, ties, bolts, bracings, or timbers are given, and not a single sheet, nor even a sketch of details of any kind. A short and very flimsy report accompanies the plans, and all are signed boldly "Espérance" in his own handwriting; but it would be rudeness, of course, to suppose that this latter accident was noticed by the directors. All the other designs are by men who can draw, and show sections, construction, and detail. I might point out, dared I trespass, some minor matters that provoke comment; but I dare say you will in all probability be addressed upon the subject by some other

COMPETITOR.

[Seven sets of designs were sent in, including some by Messrs. Moreland, Cubitt, Whittaker, and others.]

LOOK TO THE COIN DEPOSITS.

A SINGULAR theft, it is said, but more plural than singular, we fear, has just been brought to light at Plymouth. On July 28th last the foundation stone of the new guildhall, about to be erected in the town, was laid with great public and municipal éclat. Since that time to the present the work of erection has been going on at a part of the site some distance from the foundation stone, which, in consequence, has remained as it was laid, untouched and unbuild upon. As one of the contractors for the building was surveying the work, he noticed that the foundation stone bore evidence of having been displaced from its socket. This aroused his suspicions as to the coins deposited, and, in order to satisfy himself, he told the men to raise the block. It took four men to do so, the stone being 2 tons in weight. It was then found that every coin had been carried off. As yet no clue has been obtained to the thieves, who must have numbered at least four or five men. Better deposit no coins than leave a distant posterity to suppose us a race of thieves. We have urged care in first stone-laying for years.

OFF STREETS AND OPEN SPACES.

SIR,—How neglected they are! Scavengers never apply their art there. Why, I am unable to fathom. Rates are paid by all parishioners for cleansing the whole parish. If private spots abound, let them be gated or walled up, not remain an open depository for pestilential offal, garbage, ancient fruit, fish-shop clearings, oyster-shells, flock, straw, defunct grimalkins, and house-repairers' rubbish. The effluvia from the greenish puddles is nauseous; though, thank to the boys, the place is ozoned by an occasional bonfire. It is a "Tom Tiddler's ground" to them. If a building exists here it generally is of a very poor order, viz., a cordwainer's manse, a woodchopper's castle, a coal emporium, or a donkey's palace. I maintain that scavengers should ply their anti-fever craft in all open spaces in towns: "prevention is better than cure." Let us have their carte de visite rather than the undertaker's.

R. T.





A CABINET.

Designed by Mr. Talbert; executed by Mr. Forsyth.

A CABINET.

ALTHOUGH the furniture of our houses is of much importance to our comfort and convenience, the preparation of it, except in a few instances, is much neglected, or left to the freaks and fancies of the unskilled in design. A growing change has, however, been manifesting itself of late years. Our principal cabinetmakers feel it their interest to avail themselves of the architect's assistance to meet the improving taste, and desire for change, in their customers; and, though everything that may have come from the pencil of modern architects may not be all that could be desired, still much that is good has been done. The cabinet we have illustrated this week was executed, in ebonized mahogany, in the workshops of Mr. Forsyth, for Mr. E. Hull, of Manchester, Mr. Talbert being the designer. The enrichments consist of two painted panels, on

gold grounds, containing portraits of Mr. Hull's two children, brass grills, fret-work on gold ground, ornamental brass hinges, and carving, incised and in relief, gilt. The general effect is very pleasing, and the execution excellent.

BROOKS'S BANK, MANCHESTER.

THESE premises were occupied by the Bank of England for more than thirty years, but during the last twenty they have been materially added to by the late Mr. Samuel Brooks, and by his son, Mr. William Cunliffe Brooks, M.P., of Lombard-street, London, and of the Old Bank, Blackburn. A portion of the new buildings lately erected is shown by our engraving. The porch is the back entrance to the bank, in Chancery-lane, the lower building being the bank

wall, and the higher giving an idea of the style of a block of offices in connexion with it.

The works have been carried out from the designs, and under the superintendence of Mr. George Truett, architect: the bank work at a cost of about 12,000l., and the offices at a cost of 14,000l. Mr. Watson was the clerk of the works; the masonry was done by Messrs. Patteson, whose carvers, Messrs. Williams & Mooney, have executed their work from the architect's details with great effect and vigour. The ornamental brasswork was done by Messrs. Johnston, Brothers, of London. The ironwork by Messrs. Bellhouse, of Manchester.

The bank is lighted from above, and is fitted up with a Sienna marble dado throughout, gilt columns, elaborate brass screens, and standards; all, however, having a quiet though handsome appearance. Mr. Truett has shown, as usual, much originality in the design.



BROOKS'S BANK, MANCHESTER. — MR. GEORGE TRUEFIT, ARCHITECT.

SOME OBSERVATIONS ON DOORS
AND PARTITIONS.

By a Joiner.

THERE is nothing more disagreeable or unsightly in a well-furnished room than the appearance of an ill-formed, ill-fitting door, and its surrounding architraves, which are usually in keeping in style and workmanship with the door they are supposed to ornament. A few observations on the evils of bad workmanship in our buildings, and some hints for the future prevention of these evils, will not be thrown away. Much of what we may say is generally known to ordinarily good workmen, but experience has convinced us that the knowledge of how to do a thing well is forgotten, or ignored altogether, in the execution of a vast amount of the workmanship in our workshops and buildings. But to the point. The making and framing and finishing of a door and its trimmings is a very simple piece of joinery in these days, and yet how wretched is the execution of the greater part of our ordinary joinery work. Doors or sashes, skirtings or floorings, are seldom or never finished as specified. It would be a miracle to find thicker or better material put in by the contractor than what is specified. This, of course, is not expected; but what is not expected, on the other hand, is found—thinner material, poorer material, needless material! Who is to blame? But let it pass, on another occasion we will cut the bearing string and exhibit the rats' terror at large. Doors, parlour or drawing-room ones, even in the most common class houses, should not be less than $1\frac{1}{2}$ in. thick (full), and the mouldings around their panels ought to exhibit the same appearance to the eye as if struck in the solid. Some people prefer to see the mouldings project above the face of the framing, but, no matter what massiveness or variety the adoption of this method may be made to show, it is not a system to be recommended. The raised panel-work in most of our old British oaken and other doors was seldom raised above the face of the framing. The mouldings round the edge of the framing were in the solid, as were the mouldings round the central squares of the raised panels. Ornamentation around these inner squares was seldom planted on; but if it did happen, it was regulated so that it should not rise above the face of the outer framing of stile and rail. Many of these old doors are to be seen yet in our country and city mansions, and in some of our old public institutions. There are not a few of them centenarian, and older, and many of those that we have examined of eighty and ninety summers are yet strong and serviceable, and are likely to last out the best of our hand-made and present machine-made doors. What was the secret of their good workmanship? It lay in the fact that the timber that composed them was well selected and well seasoned, and not what was lifted from the timber-pond the day previously. Their making also was not a job against time, a sort of hurry-scurry, slap-dash, break-neck "slop-work." Let not our readers smile. The doors in our old public and private dwellings were properly made. Their tenons were cut with exactness, "out of winding;" the shoulders on each side were perfectly square; and it was not left for the framing-craft to make a close joint by extra pressure where ordinary pressure with exact workmanship would be sufficient. The panels of doors should fit their ploughed grooves ordinarily tight, for panels are more or less given to shrink if not well seasoned. Where the mouldings are planted on, and where the mouldings themselves are not of seasoned material, unsightly evidence of shrinkage will soon present themselves at the margin of the mouldings upon the panel. If the stile and rails of doors are not properly "tryed up" square, and out of winding, it is rarely possible to frame them out of winding, *i.e.*, make them perfectly level on the plane of their face, except by unworkmanlike expedients. Even though they may be forced square for a time by a system of wedging and of kerfing, yet they will, after they are hung, go back again into winding. Thus bad door-making produces a series of other evils that interfere ever afterwards with their appearance and usefulness. When a door is out of square on its face it will not hang plumb; one of its edges may, but the other will not. It will be found that if plumb upon the hanging side, it will be out of plumb upon the closing side, where it will not range perpendicularly with its rebate or stop. Often a door of this description will, when closed, touch the stop at the top, while it is half an inch or a quarter of an inch from it at

the bottom, or *vice versa*. The door in these cases has to be "humoured," or accommodated, as the workman would say, and hung a little out of plumb. Sometimes the workman will strive to knock the door-frame, with a large hammer, out of plumb to suit the door, to the injury of the partition and its plaster coating, if finished. If he fail to move the door-frame without resorting to violent expedients or vast labour, he coaxes matters to an agreement in the putting on of the lock. If the door does not exactly close, from the results of bad workmanship, the spring bolt of the lock and its staple or catch will be made, in its arrangement, to polish off the difficulty. Numerous are the unworthy expedients that have to be resorted to by workmen to make bad work assume the appearance of good work; and hours and hours of valuable time are often lost in striving to cure what a little timely precaution would have prevented. In some places what is called a "saddle" is used to raise up the door the necessary length, to allow its passage over the carpet. A saddle may be a piece of wood from three-eighths of an inch to half an inch in thickness, and of a breadth equal to a door-frame, sometimes inclusive of the projection of the architraves each side. A square equal to the thickness of the door is left in the middle, and then the outer breadth is chamfered down to about $\frac{1}{2}$ in. thick, which is rounded on the edge. This, being nailed to the floor, allows the door, when open, perfect freedom over the carpet. Instead, however, of nailing a saddle down upon the floor for this purpose, a better plan would be to have a length of flooring-board under the door three-eighths of an inch thicker than the common flooring-board. Let this piece extend from the outside of the architrave in length, and be in breadth equal to the thickness of the finished partition. It can be chamfered and laid at the same time with the flooring, and it will make a better job than the surface nailed on saddle. The saddle, however, can be dispensed with by hanging the door with hinges with rising joints. There are other expedients that may also be adopted, involving some trouble, by which either the door when opened may be made to rise sufficiently to free the thickest carpet, and when closed to be nearly air-tight at the bottom. Doors should not be hung where there are lath-and-plaster partitions until the plaster coating is pretty dry. The dampness will both affect the door and door-frame, and cause the wood to swell. This will more particularly be the case when the wood in the frame and door is green and unseasoned stuff. It will be often found that though sufficient freedom be left in the fitting and hanging of the door, yet the moisture arising from the wet plaster will cause the stuff to swell considerably, and the door will appear too large for its opening a day or two after first fitting. The door should not be re-fitted again immediately; if it is, it will after a short time be found to have too much freedom, and will look unsightly. It would be always better not to hang a door until the partitions were tolerably dry. Many are the evils in our new buildings resulting from a neglect of these precautions, but they are evils attending on hurried work, where good intentions may exist but circumstances prevent their being carried out. Much time is lost by the workman in fitting and hanging doors, and the system persisted in at present must be condemned. If a door-frame is properly put up, square, straight along the stiles, and out of winding, the workman can square and shoot his door to the required size, and put on the hinges upon the door, without once offering it up, until he is ready to drive in the screws. He can do all at the bench in the building. Let him simply provide himself with a square with a blade sufficiently long to square his door, and a rod or lath of wood to take the height and breadth, allowing for freedom. He can mark the place of his hinges accurately on this rod, and out their place by it on both the door-frame and door-stile. If he but practises this method, he will find that it will save him a great deal of useless labour in lifting the door, propping it up, and marking it along by the edge of the door-frame. If the workman is on piece-work, we would advise him to adopt this method, for certain we are that by so doing he would fit and hang three doors while he would be fumbling over one by the old methods. The wretched appearance of some of the doors and door finishings in our houses is also attributable to ill-constructed partitions. In nine out of every dozen of our dwellings may be seen distorted architraves,

doors either dragging on one end on the floor, or rubbing on the other against the head of the door-frame, the latter often being pressed down an inch or inch and a half out of square. The wall may be seen cracked, the skirting-boards torn from their places, the floors sunk, and the angles between the wall and the ceiling riven asunder. The evil does not rest even here; it is carried up and affects the very roof and outer walls. Bad foundations are not always the cause of this, but badly-constructed partitions. Partitions are placed by some of our architects, as well as our builders, in a manner whereby they do more harm than service. A timber partition requires a good support, as well as a wall requires a good foundation; but how often do we not see them carried from floor to floor one over another, or perhaps a little on one side of another, and all this accumulated weight has to be supported by the floors and outer walls. A dwarf wall should have at least formed their first foundation and support in the basement story. In many of our dwelling-houses, timber or one-brick thick partitions, with studding at intervals, are put up with utter want of thought and carelessness. Many times we have seen them put up on the common flooring, with no other support underneath but what the common joist or joists afforded. If a partition, timber or composite (timber and brick), be put up, and if it range with the line of joists, the joists above which they are raised should be double the thickness of the common joists or more, or two common joists should be bolted together. If they are set upon a floor without any wall or pillar support from below, the partition should be well framed and properly trussed. In all framed and trussed partitions, or in common ones, the principle of the arch should be considered and adhered to relieve both the floors and outer walls. Some people foolishly consider that if the floor is partly relieved, the wall can be made to bear the rest, or rather they sometimes aim at throwing all the thrust against the wall. If they succeed, which they do not always, they are not to be complimented for their sagacity. Partitions, instead of being a dead weight upon a floor or floors, ought to be made to conduce to the whole stability of the building from base to roof-tree. The exigencies of house-room, want of increased accommodation, and also false economy have been allowed to interfere violently with the principles of construction. Architects have to please their clients in the same manner as parents have to please their children. They are obliged sometimes to provide a room here, and a closet there, to suit the peculiar whims of people who do not know their own mind a minute. From these causes evils arise, and a lasting deformity, or an eventual crash, is the consequence. All timber partitions that are not framed or trussed should be well bridged at least with a double or treble row of herring-bone bridging, according to the height.

Where large halls are required on second or higher floors, and where numerous small rooms and closets are required to be partitioned off, above those halls,—in this case, the architect has to exert his powers, and exercise his judgment. He can raise no support in the hall, column, or otherwise, without partly spoiling the effect, or occupying needed space. A girder must be hit upon in this case to get over the difficulty of supporting the depth and width for the span, trussed with queen-posts, and a horizontal tie, with the addition of good struts, the difficulty may be got over nicely. Suspension-rods might be also used in this case from the roof. This plan, however, ought to be only used in connexion with a strong, well-framed roof. Badly-constructed partitions are the cause of badly-fitting doors, undulating and creaking floors, open joints in mouldings and trimmings, cracked ceilings, and a host of other eyesores and evils.

Returning to the subject of doors, their hanging and finishing, we will say a few words more about their furniture. Mortise locks are the best for all inside doors aiming at any respectability, but mortise locks much smaller and better than what are at present used. We have often wondered how it was the large old mortise locks so common in our buildings have been retained so long. In the putting of them on both the stile and middle rail of the door are considerably weakened, at a place where they require strength. Unless the door was an uncommonly thick one, the old-fashioned mortise locks nearly destroyed the stile and tenons of the lock, or middle rail. Rim locks are not to be recommended, no matter where they are to be used.

On common closet doors and bedroom doors, even at the top of the house, they are not serviceable. Being on the face of the door, they are unsightly, and, together with their projecting key, box staples, and sharp rim edges, are liable to catch in people's clothes and articles of dress. Those who require self-shutting doors in a house can have them; but we think it is better to dispense with these contrivances for inside parlour or drawing-room doors. An inside door is not like a hall door or a shop door. A parlour or drawing-room door can be closed better and more carefully by the hand that opens it than by mechanical contrivances; besides, no necessity exists, as far as we can see, for door-opening and door-closing contrivances in parlours and drawing-rooms. With public offices, of course, under some conditions, a porter can be dispensed with; but when we can do without our servants altogether we may think of adopting more advanced methods of indulging our laziness, and getting ourselves fed by machinery, as well as waited upon. A few more remarks to workmen may not be out of place. Every young apprentice workman thinks he can fit and hang a door. It is such a common task, he thinks it is impossible he can do it badly. Yet let us say there is a little skill and taste required in the proper fitting and hanging of doors. We are sometimes astounded to see so many frightful examples of bad door fitting, and hanging, and finishing exhibited in our dwelling-houses. It would appear to us that the more easily a thing can be performed, it happens as a consequence that it is performed badly. We have known workmen to hang a door in half an hour, while other men spent over a similar task half a day; and if they were to spend a week, it would not at the end of that time be properly done. Practical workmen who read these remarks will understand us. Nothing is more unworkmanlike than to leave the hinge of a door badly fitted, its bed cut too large for it, and bits of wedges or pieces of stuff glued in to fill up gaping wounds—everything trusting to the dab of paint to cure the eyesore. Sometimes it is a lump of putty the architect, builder, clerk of works, or foreman will find is pressed into service for making a close joint or fit. Putty is peradventure betimes the salvation, but more often the death of the botch. Putty is useful in its way—it is useful for glazing, or for stopping up a nail-hole, but it ought to be discarded from the appliances of the good workman.

The surest test of good workmanship in building is that neither workman nor employer shall feel afraid to have it examined before it gets even one coat of priming colour. But how often is it not the case that both builder and workmen are in a sputter when they hear the architect or owner is coming, to hide the evidence of their neglect or guilt. Haste all hands too: corruption and foulness are bridged over, or plastered in, and wounds and rottenness are plucked and painted over.

DINNER FOR BUILDERS' BENEVOLENT INSTITUTION.

The twenty-third anniversary festival in aid of this charity took place on Thursday, the 27th ult., at Willis's Rooms, King-street, St. James's, the President (Mr. Alfred J. Mansfield) in the chair, supported by a large number of the leading builders and building material factors of the metropolis.

The usual loyal and patriotic toasts having been duly honoured (Mr. Stirling replying on behalf of the Volunteers to that of "The Army, Navy, and Volunteers," with which his name had been coupled).—

The Chairman proposed the toast of the evening,—"The Builders' Benevolent Institution—may prosperity attend it!" He had very great pleasure in seeing so large an attendance that evening in the interests of the Institution, which was founded twenty-three years ago, and it gave him further pleasure in seeing its founder (Mr. Cozens) among the company. The Institution was established for the relief of any members of the building trade, or of the trades connected therewith, who might, from adverse vicissitudes of fortune, become reduced in circumstances. The Institution had since its establishment gone on satisfactorily and prosperously. It had, however, sustained a misfortune this year. The directors had made a mistake; they had, unfortunately, elected a very inefficient president. He hoped, however, that the members would most zealously aid the directors in averting any

loss to the Institution that blunder may have entailed; and if they would only be so kind as to overlook his shortcomings, he should feel very greatly indebted to them. He felt a great interest in the Institution, and he would do all he could to further its prosperity. There were now 44 pensioners in receipt of annuities from the Institution—22 men and 22 women. The males each received an annuity of 24*l.*, the females each 20*l.* He should be very glad to see these annuities increased—those of the men to 30*l.*, and those of the women to 25*l.*, and he was sure that one and all of the gentlemen there present would also be very glad to see that result attained. He therefore asked them to endeavour to effect that object, and to aid the Institution by increasing, if possible, their annual subscriptions, and by publicly making known the good that the Institution effected. The number of persons who had received aid in the shape of annuities from the Institution since its establishment was 108. These figures showed how much good had been done—how much distress had been alleviated, by the operations of the Institution. He asked the company to invite further subscriptions: if they could not obtain guineas, let them take half-guineas. There were many builders and many persons connected with the building trade who had made large fortunes, and there were many, doubtless, who were making larger fortunes now; but, alas! there were many also who, supposing themselves to be in the right groove to prosperity, had suddenly glided backwards into poverty. These it was the object of the Institution to relieve; and therefore he asked them to drink most cordially and enthusiastically to the prosperity of the Builders' Benevolent Institution.

Mr. Benjamin Hannen, in proposing the next toast, said that the task he had to perform was a very agreeable one, viz., he had to ask them to drink to the health of their worthy President, the Chairman of the evening. He was sorry to say that he had not been able, up to the present time, to invent any way of getting over the difficulties of praising a gentleman to his face. If his friend Mr. Mansfield had not been present, he (Mr. Hannen) should have reminded the company that this was not the first generation of the Mansfields who had done honour to the building trade. Having had the pleasure of knowing the Chairman, he (the speaker) should be able to say to his friend in the chair that he was quite certain that he was following in the steps of his father, and that he was likely very much indeed to increase the credit of that name, and the respect in which it was held. He was quite certain that there were none present who were acquainted with him who did not know that there did not exist in the trade a more straightforward man of business. If they were to consult a man with a clear head, guided by strict integrity, they could not do better than go to him, and he (the speaker) might say that there was no one in the building trade whom he was prouder to call his friend than the gentleman who then filled the chair. He should have added, but for a circumstance which had occurred that evening, that they could not have had a more charitable man than Mr. Mansfield as president, but in face of the gross libel which the Chairman had put forth concerning the present President he had nothing to say to that whatever.

The Chairman having briefly replied, he proposed "The Patrons, Vice-presidents, and Trustees."

Mr. Robinson, in reply, said he regretted exceedingly that none of the trustees were present. He might say, on their behalf, however, that they had the interests of the Institution deeply at heart, the duties they had to perform in connexion with it being a source of sincere pleasure and a labour of love to them. In this respect, he thanked the company for the manner in which the toast had been responded to.

Mr. George Pucknell, in returning thanks, as treasurer, said he naturally took a great interest in the institution, with which he had been connected for several years. He was desirous to see it prosperous, and he wished it was in his power to do more than he did for it. His office as treasurer brought the affairs of the institution before him in a prominent manner, and he could testify that they were managed by a most excellent committee, who took the greatest possible interest in the expenditure and in all matters relating to the property of the Society. He took that opportunity of bearing his humble testimony to their exertions, which, on his part, he was always happy to second. He was glad to see their excellent chairman taking his post, and feeling that, while looking out for his own prosperity, he was glad to give his time in trying to provide for those less fortunate than himself. He also begged to thank Mr. Hannen, whom they all remembered two years ago taking the chair for the Institution, and doing so much for its benefit. He was sure they were all proud to have a man of his ability in connexion with the Society. But in a special time of the prosperity of the Institution, he must notice its drawbacks, which he wished he could urge upon all present and all connected with the trade. It was a very hard thing, but some six or eight poor people were turned away from the Institute every year because it had not quite enough to provide for them. When those poor people came to the Institution, they were far stricken in years, and two or three years' delay was a very great time to them; and he regretted the short period they had to live. He felt the more concerned at this because there was a vast number of men belonging to the trade who did not subscribe to the Institution. The greatest possible credit was due to the large employers of labour. A glance at the subscription lists would show the large sums they had for years contributed to the Institution. But it was not so with a very large proportion of builders, and it was to be regretted that out of the money they doubtless spent carelessly every year, they did not send their half-guineas or guineas to the Institution. If they sent a small portion of the men he referred to were to come forward they would be able to provide for all those applicants now

turned away, and have abundance of funds. He hoped, therefore, that all present would, as they had opportunity, bring the claims of the Institution prominently forward. An appeal had already been made to the class of men referred to, but with a very unsatisfactory result. They did not mean to let it rest, however, as they had already seen the Institution make great progress, and he hoped he should live to see the time when the Institution would be in a position to relieve the wants of all its applicants.

Mr. A. G. Harris, the secretary, then read a list of subscriptions, amounting in the aggregate to upwards of 370*l.*, a slight advance upon former years. This announcement was received with great applause.

The Chairman next proposed "The Architects and Surveyors." Without the architects the building trade would indeed be in a sorry plight. The builders were much indebted to them. Walking through the streets of the metropolis or of any provincial town, he thought they might be justly proud of the productions of the architects of this generation, and he thought these productions, whether in ecclesiastical, municipal, or domestic architecture, might vie with the modern architecture of foreign countries. The builders were also very much indebted to the gentlemen of the other branch of the profession—the surveyors. Without the surveyors the building trade could not get on. They (the company) thanked them very much indeed for all the aid and assistance that they continually gave. With the toast he begged to couple the name of Mr. Young.

Mr. Young, in responding, said he was afraid the architects and surveyors had a very unworthy representative in him, but no one could respond to the toast with more sincerity than he did. He was very much indebted to both architects and builders. He knew many architects personally, and he was sure, seeing their specifications as he had, that the company, at a body of builders, must have very great confidence in them. There was no doubt that their specifications were very stringent, and if they were not the honourable set of men they were, no body of men with the capital that the builders had engaged in their trade would act under them. He had often felt this, and he knew solicitors had as well. On behalf of "The Architects and Surveyors," he thanked the company most heartily for the way in which they had received the toast.

The Chairman said that the last toast he had to propose was that of "The Directors and Stewards." He coupled with that toast the name of Mr. Cozens, the founder of the Institution, and it not been for that estimable gentleman the Society would not have been in existence. He had ever watched over its progress, and had devoted his time to its interests. The directors, also, they were very much indebted to for the undivided attention they had given to its interests. He had also particularly to thank the stewards that evening for their kind co-operation in augmenting the number of the subscriptions.

Mr. Cozens briefly replied, and expressed his gratification in finding such a respectable and numerous company present to acknowledge the fact that he had been instrumental in doing some good. By their exertions they would not only help the unfortunate, but incite others to do the same.

The company then broke up.

MISTAKEN CRITICISM.

SIR,—Ought not the professional critic in pictorial art to understand something of architecture? My reason for asking is, because the writer of a notice on the Old Bond-street Gallery, in the *Pall-mall Gazette* of October 17th, has been misled, through an error in the catalogue of that exhibition, into a display of curious architectural ignorance. A picture therein, called "The Florence Market" is obviously a misprint for "Flower Market." In the first place, the architecture in the picture is Belgian or Dutch; and, in the second place, there is no flower-market (the subject of the picture) in Florence, where all the trade in flowers is carried on independently of a fixed market, by flower-girls. The *Pall-mall Gazette* critic, who speaks of his picture as a "vignette," and who speaks of the picture as a "vignette," has been following the critic of the *Graphic* of October 28th, who calls the same picture a "carefully painted" one of "the market-place at Florence." By their own criticisms whose observations I have not been so fortunate as to read, have been equally careful to be inaccurate in what would be a trifle, if their remarks did not indicate that neither their eyes nor their intelligence are brought into very active play at a press picture view.

UNA FIORAIA.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SIR,—In a leading article which appears in a contemporary last week, commenting on the present management and future prospects of the Institute, the following passage occurs:—

"A rendezvous for members is a thing which we cannot help believing is very much required,—apart, that is to say, from the mere ordinary meetings." How this could be accomplished we do not profess to say; but at present an incidental visit to the rooms of the Institute on any of the above business is enough to give one the horrors, whilst the idea of a member dropping in when passing, to inquire the news, is quite out of the question. Whether the official persons whom one sees at work are equally devoid of liveliness or other human elasticity when off duty it is impossible to say; but the melancholy of solitude which appears to pervade them and all their surroundings when in harness, reminds one of a theatre by daylight more than anything else, with funeral carpenters acting the sad scenes."

Will you kindly allow me, through the medium of your columns, to ask the writer of this caustic, but no doubt well-intentioned article, what is the precise amount of liveliness and elasticity which he expects from the "official persons" referred to? Whether he thinks that their duties should be discharged by a happy combination of the pleasures of business with the "business of pleasure" that they should be bound to entertain him with anecdote when he calls in Conduit-street, or to celebrate his visit in bumpers of champagne?

Does he consider that it would be desirable to engage the services of a few gentlemen from the *Punch* office, who might help to make the secretary's minutes of proceedings more amusing? In order to dissipate the "melancholy of solitude," that a German band should be engaged, and instructed to perform, at intervals, in the library?

No doubt a few suggestions on such points would receive immediate attention from the Institute authorities, and would at the same time enlighten many members as to the extent of reform proposed in this direction.

"DULCE EST DESPERARE IN LOCO."

CHARGE OF DEFRAUDING A BUILDER.

At the Hammersmith Police-court, John Fordham Apps, an agent, was charged with obtaining a cheque for 20*l.* by false representations.

Mr. Thomas Hussey, builder, of Kensington, said that on Thursday last the prisoner came to him, representing that he had fallen over some timber in the street where his wife was building, and had broken his arm; that he had been to St. George's Hospital, where it was dressed, and that he had come to him for compensation. Witness had not heard of any accident from his watchman, and he had later on told the prisoner to wait away. He came again on Monday night and asked witness to settle with him, at the same time urging that it would be very expensive if solicitors were employed. Witness asked him what he considered a settlement, and he said about 20*l.* He took the prisoner's name and address, and promised to make inquiries. The prisoner came on the following night by appointment, and gave him a cheque for 20*l.* He immediately charged him with obtaining it by false representations, as he had found that he had been to several other builders and attempted to defraud them.

The prisoner, who carried his left arm in a sling, wished to know what the false pretences were.

Mr. Dayman said, representing he had broken his arm by falling over some timber.

Mr. John Walter Hamilton, manager of Messrs. Colls & Sons, builders, Moorgate-street and Camberwell, was called as a witness in Mr. Hussey's case. He said that on Friday last a letter was received from the prisoner claiming compensation for breaking his arm on the Thursday previously by falling over a block of stone at St. Philip's Church, Queens-road, Battersea. An answer was sent, and the prisoner had since called at witness's office, but he was out at the time.

Patrick Donovan, Mr. Hussey's watchman, said he was on duty on the night of Thursday last, but he did not see the prisoner. He also denied that any timber was lying about the road.

Mr. Dayman decided upon remanding the prisoner.

THE REFUSE OF TOWNS.

SIR,—Your very able article on Sewage Irrigation, in your issue of the 22nd ult., appears to me to go a little too far in descending all processes except irrigation for the disposal of the refuse of towns.

Wherever irrigation has been adopted, the necessity for extracting the solids, to prepare the fluid for that operation, has become apparent; they must therefore be got rid of by some other process in conjunction with the former, and, if used for manure, as they ought to be, must either be carried to and used on the arable land at once, or stored out on the marshes. There are also many towns for which irrigation could only be adopted at a ruinous outlay, where, in fact, irrigation is practically impossible and consequently where processes must be established in substitution thereof.

You seem to hold that no contrivance yet extant will answer for this purpose, and experience would appear to substantiate your conclusion. The reason is, in opinion, that the want of success in the best-known processes of precipitation and filtration, is that in all of them the solid matter remaining mixed with the fluid is thereby in great measure dissolved, and tends to saturate the fluid with its soluble parts before either precipitation or filtration has commenced; and, whatever opinion our chemists may inculcate with regard to their richness in fertilising but noxious elements of the fluid, and the poverty, on the contrary, of the solid parts of siltage,—practice demonstrates that the first are very easily decomposed into harmless matter, whilst the solution of the two combined is very refractory. When, however, the solids are extracted in their normal state, much fertilising matter is retained in them, and the fluid, by means of combined precipitation and filtration, is readily rendered innocuous.

The second Rivers Pollution Commission informs us that the effluent siltage of London, which contains all the soluble parts of the solids, is sufficiently decomposed in its passage through a certain proportionate mass of sand, to admit of its flowing at once into the nearest watercourse. If such is the case, there is surely no great effort of science in constructing a filter with an equivalent medium for the fluid elements only, especially if, in conjunction therewith, proper precipitants are employed. Four years' experience has so convinced me of practicability of such a process that I have often wished that my own cost the necessary works for purifying the effluent water from the sewers of four towns on the Thames, reserving the repayment of my outlay until their efficacy has been demonstrated to the satisfaction of the drainage conservators.

The sums demanded in the event of success contrast most favourably with the estimates for carrying out all other schemes proposed, and yet the commissioners all select the "refractory" double-bottom compartments as most likely during a long period demurred and continue to hesitate to accept my proposals, alleging in one case as a reason for not at once accepting my offer, that an act may be passed next session to cause them to lay out all their means in establishing a much more costly system of sewerage.

I venture further to make one comment on the very comprehensive leading article in your last issue on "The Settlement of the Sewage Question." This, with the former article, is so exhaustive of its subject that little remains to be added to make them a complete review of the present state of the question.

In this article you uphold the "separate system;"

that is to say, that the siltage and the rainwater should be conveyed by separate sets of sewers to different destinations,—the siltage or refuse to the land, and the rainwater to the water-courses. If this system effected all that was absolutely necessary, and got rid entirely of all polluting matters from cities, a great many of the difficulties and expenses met with in carrying out their sewerage works, as the overflow, but unfortunately the surface refuse is thereby unprovided for in the sewers, and is consequently carried off by the surface drains to pollute and cause sickness in the water-courses.

No part of the refuse of towns is so noxious as its road-dirt; and as long as this element of pollution is allowed to escape into the water-courses, the entire purification of our rivers will not be effected.

In all well-arranged systems of sewerage the area of the gully-grates communicating with the sewers is limited in such manner as only to admit during heavy storms the first scourgings of the streets and houses, leaving the surplus rain to flow away through surface drains or along superficial channels.

There is no doubt that in almost all cases deep drainage should not be neglected, and should be effected by means of channels constructed under the bed of the impervious sewers.

CHARLES E. AUSTIN.

A NEW PHASE IN COMPETITION.

SIR,—It is proposed to erect a new church at Putney, Surrey. A committee was appointed, who invited six architects to send in designs in competition. The designs have been sent in, and to the surprise, I should think, of all the competitors, there are two designs sent in by two architects, members still of the committee.

A COMPETITOR.

PERVIOUS ROOF TILES.

SIR,—Could any of your readers recommend something to apply to roofing tiles to prevent their absorbing so much water?

I have a house covered with tiles, and requiring a good supply of rain water, have provided a large underground tank, but am disappointed that the tiles yield so little water in showery weather, as they absorb so much. If some effective varnish or chlorless paint, that would not injure the water, and would come moderate in price, could be brushed over them, it would check this. A tile appears to weigh 3 or 4 oz. more when wet than when dry.

Is it not a desideratum in building that some tiles should be made free from the before-mentioned objection?

RAIN WATER.

TAR PAVEMENT.

THE pavement your correspondent, Thos. H. Methven, mentions can only be fit for footpaths, and he appears not to have made any foundation for it. It is usual for every kind of paving to have some good hard dry stuff to lay it upon. The tar pavement I have had laid has lasted many years. Mr. William Wright, of Victoria-road, Deptford, has laid a large quantity of it, and I believe still takes contracts for it.

THE LATER OF THE PAVEMENT.

THE COMPLETION OF ALL SAINTS', CAMBRIDGE.

CONSIDERABLE progress has been made during the past year towards the completion of this edifice. It has been consecrated six years, and from the extreme severity of the architecture, and its very unfinished state, it was subjected to much adverse criticism. For lack of funds, the most striking feature in the design was omitted, nothing but the foundation and the arches for supporting the tower being completed at the time of consecration. By a liberal offer from a parishioner, the vicar was induced to form a committee and make an effort to provide for Cambridge what was so greatly missed, especially in a distant view of the town, a lofty and beautiful spire. The spire proper has been completed, and the vane, the gift of the Chancellor of the University, was fixed by the vicar and his churchwarden, Mr. Bulstrode; but there still remains to be built a parapet on the tower, and a spirelet of an ornamental character, about 24 ft. high, at the N.E. angle to the staircase. The total height of the spire from the ground is about 185 ft. The plain mullions have been removed from the north windows of the nave, and the heads filled with rich tracery. A new stone wall with iron gates has replaced the erection which so long disfigured the church. The whole of these works, from designs by Mr. Bodley, of London, have been carried out by Mr. Loveday, of Kibworth, contractor. Within the building progress has also been made towards its completion. The work of decoration has been begun. The roof of the nave has been decorated with black monograms, and varied scroll-work in red colour on the plaster ground. A tall inscription in old English character shows the dedication of the fabric in honour of All Saints, by rehearsing the eight beatitudes. Mr. F. R. Leach, of Cambridge, is carrying out these works. The nave roof has been decorated by Mr. Leach, at his own cost. The whole scheme of decoration and designs is under the superintendence of Mr. C. E. Kempe, of London.

THE NEW HARTLEY WINTNEY UNION WORKHOUSE, ODIHAM.

THE new Hartley Wintney Union Workhouse is now in course of erection at Winchfield Hurst by Messrs. Joseph Bull & Sons, of Southampton, contractors (who have carried out various works in Hampshire and the adjoining counties), from designs by Mr. Edmund Woodthorpe, of London, architect. The members of the Board lately visited the new edifice in procession to complete a tablet which has been erected there containing a list of their names. They were met at the entrance of the building by Mr. Woodthorpe, Mr. H. W. Ball (the senior partner in the firm of Bull & Sons), the clerk of the works (Mr. H. Sanders), two of the architect's staff, the foreman of the works, and others, and the large party were then conducted over the new workhouse. In the main entrance are the male and female tramp wards, and then comes the courtyard, which brings one to the entrance of the main block, where are the board-rooms, dining-hall, kitchen, offices, &c. On the left are work-sheds and landfills, with spacious courtyards leading to the infirmary, which is very nearly completed, as are also the fever wards, the latter being in a forward state. The building is in five blocks, somewhat similar to those at the Southampton Workhouse, and the three in the rear are rapidly approaching completion. The main block and other parts are also roofed in and slated. The house is designed to meet every requirement and regulation of the Poor-law Board. The contract is 10,000*l.* The chairman called the workmen around him, and ordered that they should be supplied with refreshment. The party afterwards partook of a *déjeuner* at the George Hotel, at the invitation of Messrs. Bull & Sons.

THE AURORA BOREALIS.

WITHOUT laying any stress on the "gigantic figure, with bare arms and hands, which were extended upwards as in prayer," and on the belief that the destruction of the world can be foreshadowed by a demonstration of a sign arising from the effect of an aurora borealis, which can be scientifically accounted for by, and referred to, natural causes,—still there sometimes occur coincidences not altogether uninteresting or unworthy of being recorded.

In "Joyce's Scientific Dialogues," mention is made of an aurora borealis which occurred on Monday, October 23, 1804; it was as remarkable as that seen on Monday, October 24, last. Now, by referring to a chronological table of remarkable events, we find that, in 1804, Napoleon I. was proclaimed Emperor, and in the following year, 1805, on October 21, the battle of Trafalgar and the death of Nelson took place. Still, as Ovid says:—

"Nature knows
No steadfast station, but ebb and flows;
Ever in motion; she destroys her work,
And casts new figures in another mould;"

and Lucretius tells us that "the world itself is ever young, but its transitory scenes pass swiftly by. Men come, men go, eager as in a race; each stretches forth his hand to seize the torch of life." So much for the perpetual flux as ordained.

It would no doubt be interesting to prepare a table setting forth each most remarkable aurora borealis, with the meteorological observations of the following winter and the events, if any, in connexion.

W. F. GRIFFITH.

CHURCH-BUILDING NEWS.

Meerbrook.—St. Matthew's Church, Meerbrook, has had a memorial tower and chancel erected to the memory of the Condylife family, the expense, about 1,100*l.*, having been borne by Miss Catherine Condylife, the only survivor of the family. The church now wants a new nave to correspond.

Kearsley Moor.—The memorial stone of the new church of St. Stephen, which is now in course of erection at Kearsley Moor, near Farnworth, has been laid. This church has been projected for several years, but difficulties, mainly connected with the site, have until recently delayed the execution of the scheme. The site has been given by Mr. Starkie, and lies between the National School and the Manchester and Bolton turnpike road. Since the foundations were laid, the building has progressed rapidly, and in some parts is nearly ready for

the roof. There will be accommodation for about 510 persons, and the cost will be somewhere about 3,200l. The design for this church was chosen in competition some years since. It is in the Decorated Gothic style.

Watford.—The new chapel erected for the use of the inmates of the Union Workhouse has been opened by the Bishop of Rochester. The new structure is at the south side of the Union House, and it stands on ground that was formerly occupied as the kitchen garden. It is in the Gothic style of architecture, and built of brick, with Bath stone dressings. The principal door is on the north side, and at the west end there is a bell turret. The walls in the interior are of plain brick, relieved by some courses of a darker colour. Accommodation is provided in the nave for 273 persons, the length being 70 ft., the width, 25 ft., and the height to the ridge, 37 ft. The roof is of open work of stained deal; the open seats and other fittings are also of the same material. The chancel is distinguished from the nave by a light screen, on two slender pillars supporting the roof. At the entrance are the reading-desks and pulpit, occupying respectively the south and north sides. A wall on either side, from the east wall, encloses the altar, and the spaces outside will be occupied, that on the north side as an organ-chamber, and the other as a vestry. The floor is laid with Godwin's Hereford encaustic tiles of various colours, worked in patterns. The east window is partially filled with stained glass. In the centre is a small group, "Christ blessing little children." Above are figures, one in each light, symbolical of Faith, Hope, and Charity, and each of the lights has an ornamental border. For the reredos there is a small arch, within which is a marble cross on a ground composed of different marbles, having a peculiar effect. Mr. W. J. Hopkins, of Worcester, is the architect; and the work has been carried out by Mr. G. Warner, builder, of Malvern Link, Worcestershire. The contract was taken for 820l., and the sum in hand for the purposes of the building amounts to 1,077l. The building is still in an unfinished state, there being no glass in the windows; advantage was, however, taken of the presence of the Bishop in the neighbourhood to open the chapel.

Hereford.—St. Andrew's Church has lately received an addition in the shape of a memorial window of stained glass, which has just been placed in the south transept of the church by Mr. P. Longmore. It has two lights: in one is a representation of Christ blessing little children; in the second, the miracle of the loaves and fishes. In the triforium, at the top of the window, is a king, crowned. The window was supplied by Messrs. Lavers & Barrand, of Bloomsbury.

Amble.—The consecration of St. Cathbert's Church, Amble, has taken place. The church has been built from designs by Messrs. Austin & Johnson, of Newcastle, architects. It is in the Early Decorated style, parallelogram in form, and will seat about 360 persons. Mr. Carse, of Amble, was the contractor for the mason's work; Mr. Gilby, of Warkworth, for the carpenter's work; Mr. Fortune, of North Sunderland, for the tiler's work; Mr. King, of Morpeth, for the plumber's work and gasfittings; and Mr. Bowman, of Morpeth, supplied the glass for the windows.

Bristol.—St. Peter's Church has been reopened for public worship. Last year the stonework of the building was restored, at a cost of 250l.; and within the past few weeks about 600l. have been spent in cleaning the building and improving and augmenting the accommodation. Amongst the principal alterations and improvements may be mentioned the removal of the high pews and the substitution of open benches with carved ends. The organ-screen over the chief entrance has been taken away, and the space thus acquired, with the re-pewing in modern style, has given 200 additional sittings. The organ is to have 200l. spent upon it, and is now in the hands of Mr. Voyles, for renovation and improvement. In the chancel, which has been remodelled, oak stalls have been substituted for the reading-desk and churchwardens' seats. The old pulpit has been removed and a new one of freestone, with alabaster shafts, erected in its place. In the chancel, also, have been placed two brass gas-standards.

Starston (Suffolk).—The church of the village of Starston has been restored, and enlarged, and re-opened for divine service. Until this year the church consisted of a nave and chancel, south porch, and west tower. Its erection is of various dates. The walls of the nave are of late Norman

work, having been since filled in with windows of the Decorated period. The roof of this part, the whole of the chancel, west tower, and porch are in the Perpendicular style, or about the commencement of the fifteenth century. The nave roof is very good in detail, and has been illustrated in Brandon's work on "Open Timber Roofs." It has been restored and re-loaded; all the old parts which would from their soundness permit of being preserved being retained, and the necessary new work has been made similar in size and form to the old. The church was, about twelve years ago, benched in oak; but the rector, the Ven. Archdeacon Hopper, has for some time felt that the accommodation was not sufficient. He, therefore, determined to enlarge it, and called in the assistance of Mr. R. M. Phipson, the architect. Mr. Phipson suggested that the additional room required would be best obtained by throwing out a north aisle, and that the organ-gallery which still remained might be dispensed with, and a new organ-chamber built at the east end of this aisle, opening with stone arches into it and the chancel. This has been accordingly done. Three stone piers and arches in the Decorated style are introduced where the north wall stood, and the windows which were in this wall are re-fixed in the new aisles, the west window being new, of similar character. The roof of this part is made of pitch pine, moulded and carved, and covered with lead. When pulling down the north wall, in about the centre of it, and within 2 ft. of the ground, a niche was discovered. It was about 4 ft. wide and the same in height, measuring to the top of the arch, and had evidently been bricked up for some centuries. It was about 1 ft. deep, and on he wall at the back of it was painted, in very brilliant colours, a scene representing the death of the Virgin Mary. The colour shook off like dust, but a drawing of it has been made, and will form one of the illustrations of the *Archæological Journal*. The additional seating is of the same character as that put up twelve years ago. The church is heated by Gidney's underground stove, and the whole of the work has been done by Mr. Grimwood, of Weybread, the cost, including every expense, being a little under 1,000l.

Hitchclere.—In the beginning of last year, Lord Carnarvon instructed Mr. Gilbert Scott with the preparation of designs for Hitchclere Church. The works were begun early in June of the same year, and in July, the principal stone was laid by the Countess of Carnarvon. The works are rapidly approaching completion, and it is expected the consecration will take place in the last week of November. The church is situated just below Close Lodge, on the road from the park to the village, and forms a prominent feature in the landscape, when seen from the Andover road. The style is Early English, of the fourteenth century. The church is built of flint stone, having all dressings of Bath stone. The plan is in the form of a Latin cross, and of course stands east and west. From the approach from the village, the west elevation and the west gable are first seen, flanked with buttresses, their weatherings terminating in a trefoil coping; between and round the buttresses is a projecting string, over which is a two-light window, having projecting labels, terminating in carved bosses. The two-light window is surmounted by a circular window having eight cusps, and a label and bosses richly carved. On the north elevation is the main entrance door, with a moulded arch, with label and carved bosses. Further on are two two-light windows, having irregularly shaped quoins and arch stones; beyond this lies the tower, flanked on every side by stout buttresses; in both angles are projections for the doors to the vestry and ringing-roofs, the projection for the admission of the turret stairs having the stone weathering finishing in a carved cross. The tower measures 54 ft. in height, being surmounted by a spire, estimated at about 48 ft., the height thus being 102 ft. to the top of the spire, without counting the vane. The tower is perforated with many lights and openings, and the spire has four projecting dormers, filled up with louvre boarding. Beyond the tower are the windows to the chancel, having moulded arches, projecting labels, and bosses to the same, carved in the natural foliage of the country. We now come to the east elevation, the most richly carved and decorated portion of the building externally. The gable is supported on the front by four buttresses, flanked by others at the angles. The main feature is an arcading, consisting of four arches, supported on shafting.

These form niches. In the centre of each is a carved corbel (presumably, these corbels are intended to receive statues of the four evangelists). Over this is a wheel window, richly moulded, having carved spandrels, with carved label, terminating in carved bosses. The gable terminates in a cross. The south elevation consists of a series of windows, throwing light into the chancel and aisle. These are much similar to those already described. The whole of the roofing is covered with ornamental red tiles, set in patterns, and the east end of the nave is surmounted with a stone cross. On entering the church, the first thing that attracts the attention is the nave arcade, consisting of a series of octagon stone shafting, resting on carved and moulded bases, and surmounted by carved caps. From these spring the moulded arches, having labels projecting and terminating in bosses, representing female heads in a devotional attitude. The corbels on the responds of the nave arcade are carved, representing male and female heads crowned with thorns. The windows in the nave and aisle have stone sills, coars, and rear arches, springing out on the jambs. The responds of the chancel arch are supported by shafting having carved caps. The chancel arch contains richly arranged mouldings, the centre one being carved in a dog's tooth carving. The corbels from which the chancel inner arch springs are carved, representing male and female heads "piously expressive;" these are surmounted and crowned with flowers and foliage conventionally treated. The tower arch is formed to contain the organ, and on the south side of the altar is a two-light window, forming two seats. The most notable thing in the chancel is the reredos just over the altar: it is composed of coloured marble shafting, having bases and arches of Caen stone, with carved medallions in the spandrels: it is partly crowned with cresting and crocketing, carved. The floor of the sanctuary is laid with encaustic tiles of a variegated pattern, which, we understand, was designed by the Rev. Lord A. Compton. The chancel is laid with glazed Minton tiles, artistically arranged. There are three stone steps ascending to the altar-rail. The choir stalls are ranged along each side of the chancel and close to these is the door of the vestry, which is situated under the tower. The floors of the nave and aisle are laid in black and red tiles, in different patterns, and the church is seated for 250 sittings. The monuments are a notable feature in the church. Much expense must have been required to remove these from the old church and restore and fix them here, especially the Kingsmill monument, which was done by artists from London, and forms a prominent feature near the door. Quaint inscriptions on some of the tablets are worthy of notice. Among others we noticed a statue by Koubilliac, which is not a common thing in a country parish church. The roofing in the chancel aisle and nave is an open one, and is of stained and varnished wood. We understand several memorial windows are at once to be inserted. The church is to be heated with Garney stores, and thirteen of Moore's ventilators have well provided for the ventilation. Messrs. Jackson & Shaw, of London, are the contractors for the works; Messrs. Farmer & Brindley were selected by Mr. Scott as the artists for the carving; Ravenor, Brothers, executed the decorations; and Mr. Blackie is clerk of the works.

Clapton Park.—The foundation stone of All Saints New District Church was laid on Saturday last, the 29th of October, by Mr. A. J. B. Beresford, M.P. The Rev. J. F. Stammers, the incumbent designate, assisted by several of the local clergy, officiated. The Church, which will accommodate upwards of 800 worshippers, will consist of a nave, lighted by a clearstory, aisles, chancel, and south aisle, with vestries and organ-chamber on the north side of the chancel. The walls will be faced externally with Kentish rag, and internally with red brick, relieved by coloured bands. The tower and spire, to be hereafter added, will be erected at the west end of the south aisle of the nave. The style of architecture adopted is the Geometrical of the end of the thirteenth century. The architect under whose supervision the above works are being carried out is Mr. Francis T. Dollman. The contractors are Messrs. Dove Brothers.

Hereford.—Canon Pyon Church has been reopened, after restoration, under the superintendence of Mr. Ward, architect. The roof of the nave is the chief feature of the restoration, and was begun some years ago, but delayed from

want of funds. Mr. Chick dealt with the chancel and Mr. Haddon with the chancel screen and stalls.

Books Received.

THE *Rectangular Review* for the current quarter sustains our good opinion of it as a well-conducted periodical, notwithstanding its somewhat crotchety and unfortunate name, which certainly stands in its way as a successful quarterly, of general interest to the public. The present issue contains papers on "Our Scholastic Institutions," "Ancient Mottos," "Opera and Drama," "Bismarck and the Bismarcks," with portraits of the Count and his wife, a view of his home in Pomerania, and a sketch of his coat of arms. There are also papers on "Analogies of Music and Painting;" on "Freemasonry: its Use and Abuse;" on "Incometion v. Intermittent and Undertakers;" on "Beauty and Cosmetics;" and others. — *Fraser's Magazine* for November contains a paper on "Modern Italian Art," from which we may quote a passage or two:—

Italian art of to-day, like its literature, is too much a reflection of the past. The former especially is kept in existence rather by its traditions and erudition than by an understanding of the life of to-day. Government considers it a duty to foster art by means of academies, competitive exhibitions, free lectures, and the annual purchase of certain works of art, like other education, being made a pensioner of the State, as might be expected, the public assumes no responsibility in the matter, except under official pressure or professional clap-net, when some personal interest is at stake. There are no Italian buyers of works of art to speak of. Works purchased by the Government are usually put where they are little seen. In general they are not worthy of exhibition. Unless Italy ceases as entirely to live in her old æsthetic as in her effete ecclesiastical and political training, the promise of a future in art commensurate to her ancient renown is absolutely nothing. New Italy has to make its gods in its own image. A nation, like an individual, can make a genuine character for itself only by strenuous exertions in harmony with its specific conditions. Now, the clever artists of Italy look two ways at once for guidance—one are turned on antiquity, and the other to the Imperial French school, which is as bad a guide in refoundering their national art as are Napoleonic ideas in remodelling their government."

—A specimen of "A Dictionary of Technical Terms relating to Iron;" in French, German, and English," in course of preparation, by Alex. Tolbausen, Ph.D., Translator to the Patent Office, has been published as a supplement to the *Engineer* of 14th October, 1870.

Miscellaneous.

The Truck System in the Black Country. The *Birmingham Daily Gazette* has sent a special commissioner into the Black Country to inquire into the working of the "Truck" or "Tommy" system. The first of his letters, which appeared on the 31st ult., brings to light an amount of misery among the nailmaking trade in Dudley perfectly heartrending. He says,—"The houses of nailers are generally to be found in the lowest part of a town or hamlet, in filthy courts and back slums. Take, for instance, those in Dudley. We find them in Badger's-square, in a disgusting court in Tower-street, at the Belpers, and the Barracks. So pinched with poverty are the tenants of the dens and holes here situated, that the small rent demanded cannot be regularly paid. Consequently, landlords can ill afford to lay out money in repairs, or in sanitary operations. Tenants thus become the victims of disease. Upon a recent visit to the barracks, in Dudley, we found the houses in a miserably dilapidated condition, and some of them not fit for occupation. The out-houses (within two yards of the back-doors) were running over with filth, and the adjoining ashpits topful. In close proximity to these places are the workshops of the nailers. It will not be surprising, then, that fever should be raging in the locality."

Site of Market for Foreign Cattle.—The Corporation of London, as it appears by the report of the last meeting of Common Council, have under their consideration the adoption of a suitable site for the intended new market for foreign cattle. Deptford dockyard, it is now said, might be utilised for this purpose; and the markets committee are about to inspect and report upon its suitability.

St. Paul's Cathedral.—According to the *City Press*, the Girdlers' Company have voted the sum of twenty guineas towards the fund being raised for the completion of the interior of St. Paul's. Eleven of the City companies have recently subscribed to this great work.

Locomotive Street Vehicles.—In originating the modern velocipede movement, as we not long since showed, the *Builder* suggested the use of various motive powers to be applied to velocipedes, Bath chairs, cabs, and even omnibuses; and, amongst others, india-rubber "accumulators" of power. This, we observe, is now being done in America. The *New Orleans Republican*, in an article entitled "An Omnibus moved by Clockwork," describes a new self-acting omnibus which has recently been tried in that city:—"Underneath the carriage is what seems an enlargement of an American clock-spring made of india-rubber. There is a strong platform on which the car is to rest, and to this platform is attached the by no means complicated combination of cogs and wheels, which, when acted upon by the elastic power of india-rubber, moves the car with steady motion at almost any given rate of speed. In front, beneath the platform, there is a large wheel, called in the specification of the patent the power pulley, among mechanics known as the master-wheel. It acts like the drum on which is wound the mainspring of a watch. By means of a circular lever, exactly like the horizontal wheel to regulate the breaks in ordinary cars, the master-wheel is turned, and the india-rubber wound round it until that remaining on the pulleys acquires extreme tension. When wound up, the contractile power of the india-rubber bands will give the requisite motion to the machinery for the propulsion of the car. The propelling machinery of the car is provided with a means of reversing its motion, which is acted upon by a lever adapted to the foot; by this means the car can be made to run backward as well as forward with equal facility. There is no necessity to stop the car in order to wind up the machinery. It can be wound up while at full speed with as much facility as a Lepine watch can be wound up while going.

New Bridge at Bathampton.—The new bridge over the Aron, at Bathampton, which will afford a convenient means of communication between that village and Bathaston, has been opened for traffic. It has been erected at a cost of about 2,500*l.*, by Mr. Edwin Hill, of Bath. It is a stone structure, built in eight Gothic arches, the three principal ones being in the water, while the other five are land arches. The span of the main arches is 30 ft. each, and the height of the roadway from high-water mark is about 14 ft. The roadway on the Bathampton side begins at the turn which the old ferry-road makes just before coming to the mill, and is about 120 yards in length. It is raised, and enclosed with wooden railings on either side. The length of the bridge is 200 ft., and its width about 25 ft. The parapet on either side is pierced with trefoil perforations, and ornamental caps are fixed at the head of the main buttresses. A toll-house has been built, in the Gothic style, near the brewery on the Bathaston side.

Bradford Corporation and Manningham Park.—The corporation of Bradford some months since accepted an offer from Mr. Samuel Cunliffe Lister to sell to them Manningham Park, at the price of 40,000*l.* The park is situated within the borough of Bradford, and is in the centre of its most sylvan township, Manningham; is beautifully adorned with fine timber; and commands wide and extensive prospects of the hills which inclose the valleys of Shipley and the Aire. The estimated value of the estate is 65,000*l.*, but Mr. Lister consented to accept 40,000*l.*, on condition that at least not fewer than forty acres of the park should be dedicated for ever to the use of the inhabitants of the borough. The purchase having been effected, after some necessary delay, the mayor and the corporation of Bradford recently entered into formal possession of the estate.

Steel.—The exports of unwrought steel from the United Kingdom in August amounted to 3,138 tons, against 2,712 tons in August, 1869, and 2,444 tons in August, 1868. The exports to France to August 31st this year, amounted to 2,112 tons, against 1,950 tons in the corresponding period of 1869, and 1,667 tons in the corresponding period of 1868. This branch of our exports would appear to be steadily extending.

The Institution of Civil Engineers.—At the opening meeting of the members of this Corporation for the session 1870-71, on Tuesday next, the 8th inst., a paper, by Mr. Thos. D. Ridley, descriptive of the "Cofferdams used in the execution of No. 2 Contract of the Thames Embankment" will be read and discussed.

The Architectural and Archaeological Society of Durham.—The Architectural and Archaeological Society of Durham and Northumberland held its last meeting for the season on Monday, at Tynemouth and Seaton Delaval. The day was tolerably fine for the season, and there was a good attendance of members. They met at Tynemouth, at eleven o'clock, and proceeded to the Priory, which was examined. At noon the company went by the Blyth and Tyne train to Seaton Delaval, where the hall and church were visited. At 2:49 they returned to Calleroate, and viewed the Monk's Stone at Monk House. The members dined together in the evening.

Alterations of the Guildhall, Swansea. Seven tenders were received in reply to advertisement. Mr. Phipps, the architect, estimated the cost of the work at about 2,800*l.* or 2,900*l.* The tenders were:—Mr. David Morgan (Swansea), 3,750*l.*; Mr. Wm. Williams (Swansea), 3,507*l.*; Mr. Thos. Rees (Swansea), 3,189*l.*; Messrs. Thomas, Watkins, & Jenkins (Swansea), 3,100*l.*; Mr. Joseph C. Rees (Neath), 2,945*l.*; Mr. Thos. White (Swansea), 2,750*l.*; and Mr. John Everall (Great Malvern), 2,672*l.* The tender of Mr. Everall, being the lowest, was accepted, and the work has been commenced.

Revival of Trade.—At the quarterly meeting of the Manchester Chamber of Commerce the Chairman stated that there had been an enormous increase of business at home, principally due to the war, and particularly in the shipping trade. The railway companies at their Manchester centre had been so overwhelmed with goods of all kinds during August, September, and October, that it had been with the greatest difficulty they could get through their traffic. They had had to work night and day in order to deal with the immense quantity of goods that were poured in upon them.

Covent Garden Opera.—Those who provide the public at this time of the year with good pictures or good music, are entitled to thanks. We have elsewhere spoken of some of the former now accessible in London; let us add an intimation that Mr. Mapleson has commenced a series of operatic performances at the Royal Italian Opera House with a stronger company than can usually be looked for in the winter, including the admirable Mdle. Titiens, Madame Sinico, Madame Trebelli, Mdle. Ilma di Muraska, Signor Cotogni, and Signor Fancelli. *Lucresia Borgia* was given on Tuesday evening with completeness and effect.

Rupert-street Improvement.—We have to congratulate the Vestry of St. James's, and we might say the whole of the West-end of London, on the decision now come to with reference to the opening of this communication between Oxford-street and the South. It has been the work of eight years, and the result of divers regular pitched battles and many skirmishes. The Metropolitan Board of Works also deserve acknowledgment for prompt recognition of the recent special opportunities for negotiations, which will result in the happy accomplishment of the long-wanted improvement.

Monument to a Welsh Bard.—Progress is being made by Mr. A. H. James, sculptor, of Newport, Monmouthshire, with the monument to be erected at Groeswen, near Caerphilly, by public subscription, to the memory of Caledfry, who, during his life, was one of the most popular bards of Wales. An immense block of Radyr granite has been laid on the vault as the foundation of the monument, which will be composed of polished red granite, standing upwards of 9 ft. high, the base being 9 ft. square. In one of the panels of the die will be placed a bronze medallion of the deceased bard.

St. David's Cathedral.—Messrs. Wood & Sons, having completed a contract to restore (under the direction of Mr. Scott), the eastern portion of this cathedral, the choir, and the towers, have now received orders to proceed with further works in the restoration of the nave and aisles, together with their roofs (which are all covered with lead), and also the requisite timber ceiling of the former.

The City Library and Museum.—We learn from the daily papers that the first stone of the intended New Library and Museum for the City of London, and of which we gave a view and plans not long ago, was laid on Thursday, the 27th ult.

B. snor. 5na ex. 22nd October. 1854.

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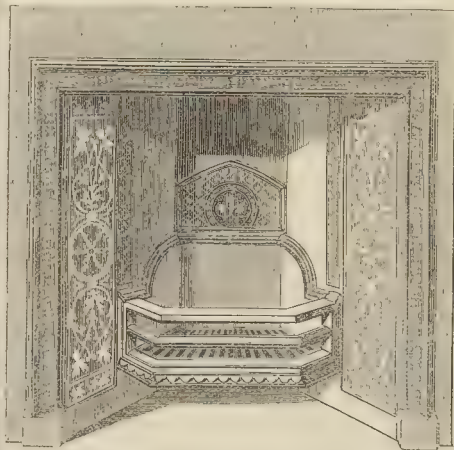
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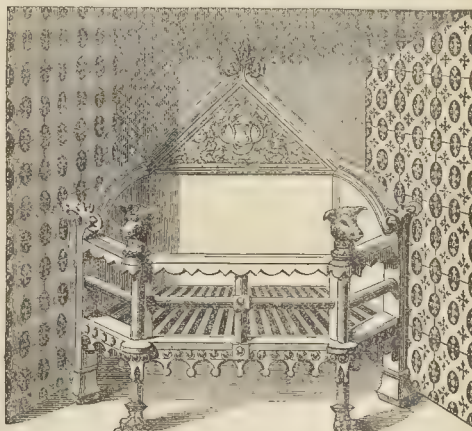
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The Builder.

VOL. XXVIII.—No. 1449.

A Review of Architectural Progress.



T the opening meeting of the Royal Institute of British Architects, held on Monday evening last, the president, Mr. T. H. Wyatt, delivered an interesting and valuable address.

With the exception of the introductory portion, referring to the progress and condition of the Institute, we print the whole of it:—

At this moment there are, I believe, in existence no less than eight societies, all more or less associated with objects connected with architecture and kindred to our own:—

1. The Institute.
2. The Architectural Association.
3. The Architectural Alliance.
4. The Architectural Museum.
5. The Architectural Exhibition.
6. The Architectural Benevolent Institution.
7. The Architectural Publication Society.
8. Architectural Art Classes.

Now, if subdivision weakens; if a stream diverted into half a dozen different channels takes from the power of the original current; and if "union is strength," would it not be wiser and probably more successful if all these societies, working for ends tending to advance and benefit one profession, could be united and worked, if not under one management, at least, as one society, one powerful body? I am not the first of your presidents who has felt that some effort might be made in this direction with advantage; and though I am probably treading on delicate ground, I cannot help feeling that it would only require time, patience, and tact to realise a good deal of the object I have in view.

When a benevolent society was sought to be established by the Institution of Civil Engineers, it was not left to the individual action of one or two zealous and kind-hearted members only, as it was with ours. The matter was taken up by the council of the Institution, and a sum of 23,000*l.* was raised in a few weeks, and its funds are administered by a committee of seven subscribers, of whom the president and two members of council are *ex-officio* members.

I am ashamed to confess that I do not know whether any attempts have hitherto been made to realise these objects, beyond those alluded to by Mr. Beresford Hope, with reference to the "Architectural Museum," but I cannot think there should be any serious obstacle to the union of three societies like the Institute, the Architectural Association, and the Architectural Alliance, whose objects are so similar, if the union were approached in a spirit of conciliation and mutual trust. This junction being realised, and suitable premises being obtained, the five societies thus named might naturally find their home under one roof.

The Institute, consisting of 624 members, was founded "for the general advancement of civil architecture, and for promoting and facilitating the acquirement of the knowledge of the various arts and sciences connected therewith."

The Architectural Association consists of 550 members, engaged professionally in the study or practice of architecture, and of those interested in the various arts and sciences connected therewith, the Association dwelling specially on the importance and necessity of a more complete and systematic education of architectural students.

The objects of the Architectural Alliance, established about 1862, are to promote unity of action and good feeling throughout the country

at large, and to aid in improving all matters connected with professional practice, such as competitions, unity of professional charges, contracts and agreements with builders, &c. The Alliance now includes nine or ten other metropolitan and country societies, and appears to be in full action.

Here then are objects, surely, most closely united,—the "Association" devoting its great and careful energies principally to the education of the students of architecture; and how successful their energies have been, and how deep an interest is taken by the younger members of our profession, by our assistants, and by the pupils of London offices, is shown by the fact that, in the last year, 103 new members have joined the "Association."

Whilst on the subject of "unity of action," let me say a few words on the desirableness of that unity in the most comprehensive way and in all that affects our professional action: we have established a code of charges which is accepted generally by the profession throughout the kingdom as equitable and as its guide, and which has been recognised by some of the courts of law as fairly binding on employers and employed. Why should we not lay down one to be our guide in all matters of competition (since competitions, in spite of their many inconsistent and unjust results, will probably still be reverted to)? Why not seek to aid, by the power and influence of the Institute, the laudable exertions which have for some time past been made in this direction by the Architectural Alliance? Why not seek to form amongst ourselves a court of appeal for all questions of professional etiquette and conduct? Why not agree to certain general conditions of contract which may be recommended to the profession by the Institute as proving an equitable basis of contract between our employers and the builders engaged in their works? Your council has had frequent meetings and discussions with the committee of the Builders' Society, and has agreed upon certain general headings for conditions of contract between employers and employed, which it thinks equitable and which will shortly be submitted to a general meeting of the Institute for approval and adoption. They have been approved by the committee of the Builders' Society, and I am informed that all the tenders lately submitted for the great work at the Government Offices, were made on the understanding that these general conditions formed the basis of their contract. I am glad to find that my predecessor, Sir William Tite, sanctioned with his experience the equity of having a reference or appeal from the decision of the architect on some points, though not, of course, on questions affecting the quality of the work or of the materials. The absolute power often claimed by some engineers and architects, of deciding all questions connected with the contract, and its intentions even, appears to me contrary to every principle of equity; and though some may still cling to such powers, we have abundant proofs how painfully, and yet how ineffectually, such powers work. We can all remember the lingering years of litigation and expense connected with the great case of *Mackintosh v. The Great Western Railway Company*, in which Mr. Brunel's decisions were disputed. The case of *Smith & Knight v. Penarth Dock Company* has been for years before the courts, and is now hung up in Chancery in spite of Mr. Hawkins's powers under the contract, and Mr. McClean has been equally powerless to enforce his award in the case of *Hill v. The South Staffordshire Railway*, though his powers of decision appeared unlimited: this case has now been fourteen years in litigation. I believe that many engineers of the highest position are now in the habit of introducing arbitration clauses in their contracts, and that it is by no means unusual to nominate the president of the Institution of Civil Engineers for the time being as the arbitrator between the engineer and contractor engaged on the work, or leaving it to him to nominate the arbitrator, an arrangement sanctioned by the solicitors of the various public bodies interested.

And, may I ask why there should not be one General Building Act applicable to all towns in England with a certain population (and with powers to enforce the provision of the Act), instead of having upwards of 200 corporations and local boards to introduce varied and conflicting regulations, involving much uncertainty, and sometimes unnecessary trouble to the architect practising much in the country? The Town Council of Liverpool has postponed any amendment in its local Act, in the hope that Government may introduce one general Act. It surely

would not be impossible to arrange one Building Act which should be sufficiently broad and comprehensive to meet the various conditions of materials and local customs, and sufficiently elastic to admit of the introduction of novel materials or of improved modes of construction.

If the vision I have indulged in of a real alliance amongst all those bodies is too visionary and hopeless, then, at least, let us have mutual sympathy and respect, and, as far as possible, co-operation. The success of any one of these bodies must aid in the great work we have all in view. The education and advancement of the architectural student and pupil is an object of as great moment to the architect as it must be to the interests of society. The formation of a student class by the Institute itself; the institution of Architectural Professorships at King's College and the London University; the various classes and courses instituted by the Architectural Association; the establishment of a voluntary architectural examination; the Soane Medallion; the Travelling Studentship of the Royal Academy; the Pagin Travelling Studentship; all offer benefits to the architectural student and pupil of the present day to which we of a passing generation were strangers. They are to be largely congratulated on such advantages, and I trust there is little doubt that the future of our profession will proportionately bring forth fruit. What such opportunities are doing for the professional student, for him who will hereafter have to earn his bread by his own hand and head, the establishment of the Fine Art Professorships at Oxford and Cambridge will, I hope, do for those studying in the Universities, and who from wealth and position naturally form the principal class of the architect's future employers. Hitherto, the region of art in any shape was, if not repudiated in the Universities, at least ignored; and I am sure there are many who will bear me out in the assertion that some of our greatest professional difficulties and discouragements have arisen from a want of knowledge and sympathy with architecture itself, or with the other arts so intimately bound up with it amongst some of our employers. How, then, is this drawback to be met? Not by attempting to teach the non-professional world the details of design and construction, but by inducing all teachers to make the study of architectural history in its general features a portion of all liberal education. The history of the growth of architecture, like that of the other arts, is, in fact, an essential element in the history of civilisation and enlightenment, and is necessary to the formation of the thoroughly educated mind. The creation of each architectural style or period has been the result of the religious, political, and social ideas, and of the mechanical appliances of the period which gave it birth. In every age which has produced a true style of its own, the principles of this creation have been the same, though the details and constructive forms may have differed, and it is just the knowledge of these principles of sound art, whether of architecture, painting, or sculpture, which it is desirable to teach the employer—the non-professional student. The study of architectural forms is thus a necessary element in the study of the history of the most civilised races of the world. The study of the literature of any nation is only one element in the acquisition of a knowledge of its real life, and to the study of its literature should be added the study of its arts as the expression of that life in visible forms. This, I venture to believe, would be the cure for the apathy and ignorance of some employers in matters of art, and it is as practical as it is urgent.

It may, indeed, be regretted that such studies did not form part of the education of that body of seven noblemen and gentlemen of the highest position in the country, who formed a commission, but a few years ago, to inquire into the deficiencies of the Royal Academy (a society formed to promote the three sister arts of painting, sculpture, and architecture), and who, after sitting for months and hearing abundant evidence of the want of aid or instruction to the architectural pupil, made an elaborate report and various suggestions, but without giving the shortcomings affecting our profession "one single word of notice or allusion." A very distinguished member of that Academy called attention to this fact "as a proof of the little consideration which architecture received in this country at the hands of those from whom it had a right to expect the very highest consideration."

If the Royal Academy, as a body, do not feel the importance of the study of architecture, we

have, at least, on record, the wise and living words of their late president, Sir C. Eastlake, who said,—“Viewed only as an academical study, no pursuit connected with the objects of taste can more fitly recommend itself as an adjunct to a liberal education than a correct knowledge of architecture, and a power of forming a sound judgment on the works of the architect;” but the Royal Academy, like all other public bodies, sooner or later, follows the current of public opinion. Only last week a new school was opened in the rooms of the Royal Academy, specially devoted to the study of architecture. I believe the members of the Academy deserve our thanks for this concession, tardy though it may be; and I think the architectural members of the Academy (with whom, I imagine, the appointment rested) merit special praise for having selected, as the future master, or director, of this school, our member, Mr. Spiers, whose early career has been so brilliant, and who, from education, power, and zeal, is most admirably qualified to aid and direct the future students. The establishment of these classes ought to be universally known amongst our metropolitan students. Printed regulations and instructions will soon be issued, and I trust that every advantage may be taken of this boon, thus adding another to the several existing opportunities which the architectural student of the present day possesses for perfecting himself in the study of his profession.

Whilst on this subject, it is not easy for an English architect to avoid dwelling on the little encouragement given in this country by its Government to the development and advancement of his profession, or (I was going to say) to the honour of its professors; but I have to remember that lately two of our body have been selected for such honour as the Crown confers on art, and that another member will, it is stated, be similarly complimented.

It has been asked, “Is Imperialism necessary for this?” I do not know that it is, but I do know that under Imperial rule in France, in Austria, and in Russia even, far more is done towards such ends than in England, with all its boasted wealth and energy. What marvellous progress has been made in France under the strong will and ambition of its late ruler! an ambition to hand down to posterity his name in connexion with the grandeur and beauty of his metropolis, with the embellishment of the great cities, and the restoration of the great historic monuments of his country; and, though misfortune and reverse are sitting heavily on his later years, his name will, in history, be held in honour for the encouragement he has given to the architecture and art of his great country.

Of the great public buildings in the metropolis now in progress or recently finished, I presume that the following may be classed as “National Works” undertaken by the Government and paid for by the country, viz:—

1. The Foreign Office (the India Office being paid for from Indian funds) and the Home and Colonial Offices, for which tenders have been lately submitted.

2. The London University Building, in Burlington-gardens.

3. The completion of the South Kensington Buildings, commenced by Captain Fowke.

4. The Rooms for the Learned Societies, in Piccadilly.

The “Albert Memorial,” for which so large an amount has been raised by the subscription of individuals, from our Queen downwards; and the “Hall of Arts and Science,” which may fairly be classed as a joint-stock undertaking—important and costly works as they may be—can hardly be classed as “national works, undertaken by the Government and paid for by the country.”

The “Law Courts,” when realised, may, perhaps, come under that denomination, for they have shared the usual fate of Government works—procrastination and indecision, and have been bandied about from one commission or commissioner to another, from site to site, and from architect to architect; but, inasmuch as they will mainly be paid for by a fund which has accumulated from the suitors, I can hardly give Government credit for great liberality or energy in this matter. It has been truly said elsewhere, “This affair of the Law Courts is discredit to Government. It is an illustration of that special characteristic of British officialism, which puts off everything until public opinion will wait no longer, and then comes forward with crude and shallow propositions, trusting to Providence to bring them to a happy issue, perhaps believing in

competitions as a sort of providential arrangement for the development of *unknown genius*.” Happily we may at last believe that the site, the plans, and the architect, have been finally decided on, and that in the early spring we shall have evidence of more energetic action than is at present apparent. Let us seek to dismiss from our minds all questions of past dispute or delay. I have no doubt that the proper site has been at last fixed on, and as little, that this great work is in the hands of an accomplished and able artist, from whom we may fairly anticipate a result that will do honour to his name and credit to our profession.

That part of the Government Offices comprising the Foreign and Indian Offices is at last complete, and a new contract has lately been entered into for the completion of another portion, the Home and Colonial Offices. In this great work timidity and indecision seem to have largely prevailed. The prize block plan for laying out the Government Offices (in the competition originated by Sir Benjamin Hall) has been disregarded, the new buildings seem to have no connexion with the other public offices as regards style or position; they have been done piecemeal instead of dealing boldly and at once with the whole group, wasting money in the tenancy and occupation of inconvenient and detached offices now rented at heavy rates, and giving increased value to adjoining properties, which will ultimately have to be purchased.

The London University, in Burlington-gardens, has happily passed out of the category of “unfinished works.” I am glad to have this opportunity of expressing my admiration of the way in which Mr. Pennethorne has carried out this work, where parsimony does not seem to have fettered its author, and where he has wisely and liberally brought to his aid the labour of the sculptor. The Institute, by its presentation of a Special Gold Medal to Mr. Pennethorne for his work at Somerset House, has already sought to do him honour. I feel sure there are none who have not heard with pleasure that it is in contemplation by the Sovereign to add to his honours, and thus to mark the sense entertained by Government of the long and faithful services of this gentleman. May he live long to enjoy his repose and his laurels! his professional brethren will not forget the ready aid and courtesy that he always held at their disposal.

The South Kensington buildings and the group in Piccadilly are now making considerable progress, and it will only be right to wait for their completion before offering an opinion as to the result. Few of the passers-by through Piccadilly can be aware of the fact, that within the block of buildings that surround the old court of Burlington House, on three sides there will be housed six important literary and scientific societies and a central post-office,—the Royal, Geological, Chemical, Linnean, Astronomical, and Antiquarian Societies; all will be accommodated, a sort of *multum in parvo*; and if the distinguished architects who have had to arrange their plans succeed in satisfying all these bodies, they will have accomplished a Herculean task. In two years from this time we may hope to see the completion of this important work, and I trust that the new tenants and the present occupants of Burlington House may long dwell together as a “happy united family.”

There seems to be an indifference and apathy on the part of our rulers and our Parliament to aid in adorning the metropolis, or to do for our profession that to which the rulers of Continental States attach such importance. Almost all is left to individual energy and liberality, and a spirit of parsimony reigns over the art administration of this country, as it seems to be doing in many other departments, and yet some allowance should be made for the Government of this representative and independent country. Here, London is but a spot in the political horizon,—a mere atom of the wealth and energy of the kingdom. Manchester, Liverpool, Glasgow, Bolton, and Leeds, all claim their share in the power and government of the State. Not as in France, where Paris is the sun round which all their cities revolve and worship, and for the adornment and glory of which every Frenchman is (or rather was) prepared to make any sacrifice. I cannot better illustrate the difficulty the Chancellor of the Exchequer must feel in dealing with public funds for the adornment of London than in reading an extract from the letter of an accomplished and influential architect practising in one of our largest towns. I had applied to him for aid towards the funds for the restoration

of St. Paul's Cathedral. He writes thus:—“I hope the fund for the cathedral will be raised, but Parliament has done so much for London at the cost of the country, that there is not much disposition in the provinces to subscribe for London objects, even when, as in this case, one of national interest. The remark frequently made is, the nation provides Libraries, whilst in Manchester, Liverpool, and other large country towns we have to find them for ourselves. Let the ratepayers of London do as much for themselves as we have to do for ourselves.”

If this feeling exists in the mind of an accomplished and educated architect, fully alive to the beauty and influence of architecture, how much stronger must it be in the mere Parliamentary representative, whose popularity is frequently in the inverse ratio to his intelligence and liberality, and with whom the Chancellor of the Exchequer has principally to deal. Thanks, however, to the strong will and generosity of individuals, our generation may, I think, be proud of what it has done and is now doing.

In our metropolis we have, at last, seen realised by the Metropolitan Board of Works a goodly instalment of that grand embankment scheme suggested by Sir Christopher Wren after the fire of 1666. His plan was actually ordered to be carried out by Act of Parliament, 22nd Charles II.; and, though scheme upon scheme, and committee upon committee have advocated and urged its being carried out, it was not until 1862 that it took a definite form, and the Act of the 25th and 26th Victoria has realised that which the Act of 22nd Charles II. failed to do. How ably Mr. Bazalgette has conducted this undertaking needs no praise from me. He has given us a noble work in which beauty and utility go hand in hand. Let us hope that the various vexed questions of “approaches and distribution of vacant spaces” connected with this embankment, may be as successfully dealt with as has been the main work, and that the great pedestals, so evidently left for sculpture, may ere long be properly tenanted.

The Metropolitan Board of Works deserve also the thanks of all who care for the improvement of London, for having accomplished a work much needed, and which has been urged for twenty years, viz.—the removal of Middle-row. In 1805, an Act was obtained, and we are able now to appreciate this boon. Nor has the city of London been backward in the good works of improvement and utility. They have lately realised an admirable meat-market, that has always formed part of the scheme for removing Smithfield. Plans had been prepared at various times, but it was not until 1865 that the design was finally approved, and the present City architect enabled to carry out a work which will associate his name with the history of that corporation which he serves so well.

That body have further taken in hand, and brought to a successful issue, the internal decoration of their Guildhall; they have now in progress, on an important scale worthy of the City, a Museum and Library adjoining the hall, works on which their architect has to be complimented; but the great undertaking of the City authorities, that which has removed a standing disgrace to the City, and added a great beauty to its public ways, is the realisation of the Holborn Viaduct. One of the first advocates of this improvement was Mr. William Gellier, an early member of this Institute, and the author of the design that gained the first prize in the competition for the Royal Exchange. In 1833 he submitted a plan and model; various plans were subsequently submitted by others. In 1848 a scheme was prepared for the City by Mr. Bunning, and in 1859 one by Mr. Marshall was authorised by the Metropolitan Board of Works. If “in a multitude of counsellors there is wisdom,” then must the City be held very blameable for having allowed so many plans to drop, and so many years to pass before they ventured on this important work. At last, in 1863, a competition for plans was decided on, and the works were entrusted to the care of the Surveyor of City Sewers, Mr. Heywood. They were commenced in 1863, and completed in 1869, when the Viaduct was opened by the Queen. As most are aware, questions of a delicate nature have arisen as to the equity of that competition, and others even as to the stability of some part of that structure. I will, therefore, only say that we should be thankful for what we have got,—a grand approach to the City, of the merit and stability of which I have, individually, no doubt.

The railway companies have contributed their share in the erection of the two large hotels at Charing Cross and Cannon-street by our member, Mr. Edward Barry; and though last, not least, the Midland Railway Company have called to their aid the services of another distinguished member of our body, and a noble pile of buildings is making rapid progress. I know no instance in this country in which the services of the engineer and architect appear to have been so thoroughly associated or to have realised such a happy result; it is refreshing to see a case in which that almost universal bugbear, economy, has not been allowed to interfere with and mar the whole; and this remark applies also to another great metropolitan work now near completion, certainly the largest and most important hospital that has been built in London on the pavilion principle. It is, I think, a fortunate thing for the importance and improvement of the metropolis that St. Thomas's Hospital has found a resting-place immediately opposite the Houses of Parliament, and that instead of that large river frontage being left to the mercy and the usual independent action of individual builders, or to the uncertainty, which once prevailed, attending the vacant ground adjoining the Northern Embankment, a public building of vast extent and importance, with varied outline and considerable architectural effect, has been realised,—one on which our member, Mr. Curry, has to be congratulated.

If, under the provisions of the "Metropolitan Asylum District Act" the various hospitals and infirmaries building by that Board, and paid for by a rate on the metropolis, cannot in justice to the ratepayers lay claim to much architectural pretension or ornament, their arrangements and details will, I trust, be considered satisfactory, and as a proof of the greater care and consideration given in the present day to the wants and sittings of our poorer neighbours. At any rate, it is something for one capital to have built in less than three years two large asylums for the insane poor, each accommodating 1,620 patients, and four hospitals for fever and small-pox cases, capable of treating from 5,000 to 6,000 cases annually, at a cost of nearly half a million of money, all paid for the ratepayers of the metropolis.

If the metropolis has been thus busy for the last few years on works of great public benefit and improvement, it cannot be said that the country has been idle. In Glasgow, we have in hand a great university group, not added to bit by bit, but started *ab initio* with unity of plan and purpose, and with such architectural pretensions and importance as its educational purposes legitimately call for. In Oxford, there has been of late and still exists much architectural vitality. In the Exeter College Chapel, the new works at Balliol and at Christ Church, the restoration of the Cathedral, the new Keble College, and the churches of St. Philip and St. James, and of St. Barnabas, all bear testimony to the spirit of manliness of their promoters; and if opinion is divided as to the relative or general merit of all these works, I will venture to say without fear of contradiction, that in each will be found points of beauty and originality well calculated to sustain the high reputation of the eminent men who have been working on them.

In Cambridge, the chapel at St. John's, and the new wing to the library, by Mr. Scott; the new court at Caius, and the new buildings at Jesus College, by Mr. Waterhouse; the important Whewell buildings at Trinity College, with the museum and library by Mr. Salvin, and the contemplated enlargement of Pembroke College, all prove that Cambridge is not behind her sister university in such work.

If the great universities have felt the value and teaching of beautiful and appropriate public structures, the authorities of some of our great public schools have not been backward in the improvement and adornment of their buildings. The governors of Dulwich College have boldly grappled with the heavy task of erecting an entirely new pile of school building; those who administer the affairs of the Charterhouse have not been less courageous, and a great school establishment of much architectural merit is rapidly making progress at Godalming. At Eton a new chemical theatre and laboratory has been lately erected, showing what progress is making in the due appreciation of a scientific education.

The great seats of commerce and industry have followed in their appreciation of great public buildings. In Manchester a new town-hall on a grand scale and of great architectural

importance is just begun, and a new exchange is in progress. In Liverpool a new town-hall and an exchange, with a large pile of public offices, have just been completed. In Rochdale, Bradford, and Belfast new town-halls of great importance are in progress, and at Chester a building of similar purpose has lately been completed.

I fear I have already taxed your patience with allusions even to the few buildings I have mentioned, important as they are, but they are but as drops in the great sea of architectural works now in progress in this country. I have said nothing of the numerous public halls of companies or societies, such as those of the Drapers' Company, the Haberdashers' Company, and the Inner Temple, in London; or of the public buildings undertaken by corporations or counties, such as the public baths at Newcastle, the Philosophical Institution and Library at Bristol, the Assize Courts at Durham, the County Lunatic Asylums building in Berkshire, Lancashire, Yorkshire, Cheshire, and Herefordshire, or of those for boroughs at Ipswich, Leicester, and Beverley; and the Guildhall and municipal buildings at Plymouth.

I have made no allusion to the numerous private mansions of great importance now in progress in various parts of England, or to the great churches spread and spreading broadcast over the land, though there are many of such great merit and novelty as to demand special attention if time did but permit; or to the chapels, monasteries, convents, and synagogues, which are hardly less numerous; or to the schools in towns and rural districts; but I may remind members and those interested in the preservation of our great national treasures, the cathedrals of England and Wales, that at this moment there are very few that have not received, or are not receiving, careful and tender restoration or reparation, for which, within the last few years, several hundred thousand pounds have been liberally subscribed. At this moment no less than fourteen English and three Welsh cathedrals are intrusted to the care of one (our levithian) member, Mr. Scott, in many of which important works are actually in progress, in others merely in contemplation, viz., Westminster and its Chapter-house, Salisbury, Gloucester, Chester, Exeter, Lichfield, Peterborough, Hereford, Ely, Oxford, Bath, Chichester, Ripon, and Worcester as regards its choir, St. David's, St. Asaph, and Bangor, in Wales. It would be marvellous, indeed, if with such a list of works requiring deep thought and study the world was unanimous in approval of all that had been done. There is possibly no race of living men (or women) so difficult to satisfy as ecclesiologists or archaeologists, or whose views are less controlled by any fixed rules or data; but I beg to bear my testimony to the great care (I might almost say tender faithfulness) with which Mr. Scott has dealt with those restorations which it has been my good fortune to see, and I have heard those who are good judges of the peculiar characteristics of Welsh architecture, speak with great pleasure of the truthful care he has given to the three Welsh churches. I believe that the works at Chester, Bangor, and St. David's are of the most interesting and instructive kind, and that in each of them many features long lost to view have been discovered and laid bare.

These few works must evidently leave Mr. Scott with so much time on his hands, that the council can have little hesitation in expressing the hope that at no very distant date he may give us a description of some of these recent discoveries and peculiarities.

The work at Bristol Cathedral, under Mr. Street, promises to be as interesting as it is important. It is not an every-day task to build the nave of a cathedral, and we can only hope that in a city and county of such wealth there may be no lack of funds. Lincoln Cathedral has been entrusted to the care of Mr. Pearson, and, in whatever works may be undertaken there, I venture to believe that even archaeologists will be unanimous in their approval.

If the public buildings are thus multiplying in number and improving in design, it cannot be said that the street and shop architecture of the metropolis is neglected. In the Balgravin district and in other parts private houses have lately risen with considerable architectural pretensions and adornment, and I think that the thanks of such a body as our Institute of Architects should be tendered to one who, like the late Lord Westminster, determined to rebuild and beautify a large district of the metropolis at the cost much income to himself.

This hurried list of works, either actually in progress or but recently finished, is, I think, full of interest for the architect, and of pride for the citizen of a country where such great efforts are attributable almost entirely to the individual zeal, energy, and wealth of its inhabitants. I could have extended it largely if time had permitted, and there are several other matters of deep interest for our profession which press on my mind, and which I would gladly have referred to, but in the incomplete condition of some of them, in the delicate nature of others, and in the fact that if health and life are spared me, it will be my duty, in the natural order of things here, to trespass on your patience again next year, it will be better that I bring this crude paper to a close.

It would ill become me, however, as the president of an English body of architects, to refrain from expressing, what I am sure all here and all in our ranks elsewhere must feel deeply, our sympathy and sorrow for the architects of those two great European countries now engaged in such a deadly war, but especially for those of France, trodden down and almost devastated as that country is by the presence of an enemy in her fair fields and in her cities and strongholds. We have no less than forty-four French and German architects members of our body, and three of these have received the honourable distinction of our Queen's Gold Medal. It is not for me, holding the quasi official position I have the honour of doing, to attempt to apportion the blame of this bitter struggle (for blame undoubtedly there must be in these "*soi-disant*" days of civilisation and Christianity, when two of the foremost nations of Europe are seeking how most readily to destroy the other and undo all the labour of years in art and progress). Individually, I can have no doubt of the deep blame and responsibility. Unluckily, all that we can do is to hope for a speedy termination to such misery, and to be thankful that a similar visitation has not fallen on our own land,—a visitation from which France, with all her energy and talent and vitality, will not recover for many toilsome years.

And now a parting word. One of my predecessors in this chair has said:—"The architect is he who, with pencil and compass, with a mind full of deep things, under God's providence, and with his brave heart, creates all this, and toils or unheeded, often misunderstood, frequently blamed, and rarely encouraged, except by his own bright star of hope and faith. Let us work on then with the consciousness of something within us which may, sooner or later, before or when in the grave, be at length understood, admired, and honoured by our fellow men."

I quote these touching words from the address of one whom I am thankful to see still amongst us (a past president and our Honorary Secretary for Foreign Correspondence). I quote them as a true picture of the architect's position, which should appeal to all our feelings. I quote them specially as being descriptive of our friend's own position, for he is understood, admired, and honoured "before the grave" by all who know him best; and as being prophetic of the memory in which he will be held by his professional brethren when "in the grave." He will then be "understood" as an ardent untiring lover of his profession and its high calling; "admired" as a genuine warm-hearted friend and cultivated gentleman; and "honoured" for his unselfish life,—an example which we should all do well to follow.*

FIFTEENTH ANNUAL EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

THE private view, on the 8th instant, of the Exhibition of the Photographic Society, at No. 9, Conduit-street, enables us to congratulate all those concerned on the high standard of excellence displayed. We do not limit our remarks to portraiture, or to any distinct branch of photographic art. There has been an advance along the whole line. In size, in clearness of definition, in rapidity of execution, in tint, in tone, and in permanent durability, we can cite distinct instances of success not previously reached. Nor can we omit to call attention to the fact that science, as well as art, has attained a new organon by the introduction of the actinic

* Professor Donaldson, Mr. F. Marrable, Mr. Godwin, and Mr. B. Ferrey commented briefly on portions of the address, and a warm vote of thanks to the president was carried by acclamation.

processes of delineation. Their value and ready applicability are as yet far from being fully appreciated. In the case of the office-work of the architect, the engineer, the surveyor, or the hydrographer, it very seldom occurs that a drawing is made of which it is not desirable to keep a copy. Two or three copies are, in very many instances, absolutely necessary, and would be always made, as a rule, if cost were no object. Each copy, if made with sufficient accuracy, and neither traced nor pricked through, involves an amount of labour nearly equal to that of the original. All this will be saved hereafter,—may be saved at this moment,—by photography. The heliotype process will produce, in little time, and at small cost, absolute *fac similes* in ink of any drawings of the kind. Not only the lines themselves, but written dimensions, notes, or signatures upon the drawings are at once reproducible; and the expense of triplicate copies will fall short of that of a single, and far less accurate, copying by hand. Should the golden time of Parliamentary deposits and parish plans ever return, the boon thus given to the hard-worked engineer will be found to be immense.

Among the most striking portraits on the walls, we call attention to those by Mr. Warwick Brookes, of Manchester, especially to 160, called "A Study,"—a veritable study for transparent depth of tone,—and 158, "A Portrait." Col. Stuart Wortley has sent a series of heads, about seven-eighths the size of life, produced with a vigour and a delicacy that seem to leave little to desire. Among these, "My Queen" (106), deserves the title,—an exquisite likeness of a very lovely face. "The Sibyl" and "Jealousy," close by, are valuable pathognomonic studies. Mrs. J. M. Cameron has sent a screenful of her well-known shadowy portraits taken slightly out of focus. Among these the first place must be awarded to "Beatrice Cenci," a magnificent admiration of a beautiful and physiognomically noble face, in the pose and drapery of the well-known Italian sufferer,—one of the most favourite and often reproduced subjects in the whole range of portraiture. While we are far from saying that this sun-picture is free from fault, the light which bounds the left cheek, for instance, being far from happy (as it is not discernible whether it represents hair or drapery), yet the imaginative effect of the head and face, and the mode in which they seem to look out, as if by magic, not from a surface but from a transparent depth, are such as to show that we may yet obtain from the aid and service of the sun examples of a more subtle portraiture than can be limned by human fingers. We think that "My Queen" and "Mag" are the first photographic portraits that justify this opinion.

In admirable contrast, both as to size and sharpness of definition, to Mr. Cameron's charming gallery, are the "Instantaneous Photographs" of Mr. R. Faulkner. No. 87 gives us four-and-twenty children—the very counterfeit presentment of life. There is one little creature, to the left, laughing at the spectator, perhaps the most inimitable; but the excellence of all is of the first order. It is clear that the production of these lovely and life-like portraits there has demanded much more than the mere manipulation of the camera and the bath. Thoroughly sound artistic taste, and tact and knowledge of the disposition of children, must have been combined with perfect apparatus, pure and well-applied chemicals, and complete mastery of manipulation. We have never seen children (with rare exceptions), quite satisfactorily photographed before, and we shall be conferring a great benefit on all parents who seek to preserve, not only the features, but the fleeting graces, of the fairy tribes of the nursery, by sending them to see Mr. Faulkner's portraits. His "Studies" (88) are also admirable; but the children are unique.

Among landscapes the most important in size, and one of the most excellent in all respects, is (14) "The Lledr Valley Moel Seabod under a Mist," by F. C. Earl,—a veritable peep into Wales. Mr. Ruesel Manners Gordon gives specimens of six different processes, demanding the attentive comparative study of the artist. "On the Thames, Richmond," by the Tanpenot process, is, perhaps, the best. Colonel Stuart Wortley contributes some of his powerful sea-side pieces,—with the waves breaking into spray. Mr. Stephen Thompson's Venetian palaces, Mr. Vernon Heath's English forest scenery, Messrs. Robinson & Chevrill's "Turn of the Tide" (66) and "First Hour of Night" (68), and some Indian architectural photographs, are among

the most beautiful contents of this department of the Exhibition.

We should not omit the fine portraits by V. Blanchard, especially the "Studies" (23 and 24), or a portrait (18) by Robinson & Thompson. The series of photographs (299) illustrating the last performance of the passion play at Ober-Ammergau, by Captain Bedford Pim, R.N., is also extremely interesting.

In a very different walk of art the plain enamels, called photo-ceramic, of Mr. A. L. Henderson, are very fine. With them rank the enlarged portraits on opal, by Bullock, Brothers (205—207). The photo water-marks, by Woodbury's process, and the Woodbury-type transparencies, which, we are informed, are literally printed on glass, are all suggestive of appliances of photography as yet unattempted.

Very valuable for educational purposes, and even for higher physiological study, are the micro-photographs, illustrating entomological subjects, diatomaceæ, &c., by Messrs. Robinson and Thompson (370). They render microscopical information permanently accessible to every observer at a glance, and cannot fail to be appreciated by the physiologist. For illustrations of lectures and class teaching of natural history, they are invaluable. The *infusoria* are magnified to the extent of 800 diameters. The sting of the bee, the tongue of the cricket, the spider, the grass-fly, and other entomological dissections, show the infinitely delicate detail of the workmanship of the great Master Workman.

The Albert type, of which we have heard so much, is poorly represented by the "Paraditz Hunt" (403). The Woodbury type is very admirably illustrated. See Nos. 414 to 420. The Heliotypes, printed in printer's ink in a printing-press, by Messrs. Edwards & Kidd, fill a dozen frames (397-399). Among these we notice four highly-imaginative landscapes by an artist who makes his appearance for the first time on these walls, and whose mode of treatment is admirably rendered by heliotype printing. The album of *fac-simile* reproductions of Albert Dürer's and Van Leyden's works, printed in carbon by Edward's process, is a treasury of art which no student should be content until he has purchased. Mr. J. C. Bolton's "Matt Paper Prints" from Titian's drawings (430-431) are simply magnificent. We confess that we have used language which may appear unbalanced or even exaggerated to those who have not studied the admirable works which we have selected as the best where almost all are good. But the verdict is that of impartial criticism; and we are not disposed to attenuate expressions of admiration which are fully merited by the objects described. After all, in most instances, it is to the grasping, by actinic chemistry, of the subtle graces of Nature herself, that these triumphs of the photographer owe their highest charms. The reproductions of artistic creations, excellent as they are, fall short of such forgeries upon nature as the "Beatrice Cenci."

THE ARCHITECTURAL ASSOCIATION.

On the 4th, the annual meeting of the Architectural Association was held in the House, in Conduit-street, when the president delivered an address, and the business of the session was commenced. The prizes offered last year have been thus awarded:—

Association prize of two guineas and a half to members, for the best essay on either of the following subjects: viz., 1. A monograph of the architect, Inigo Jones, and his works; 2. An essay on the causes that influenced the development of Mediæval architecture. Prize, Mr. John Slater.

Association prize of two guineas and a half to members of the Class of Design, for the best set of sketches; and a prize of one guinea and a half (also given by the Association) for the second-best series: first, to Mr. W. L. Spiers; second, to Mr. A. Webb; honourable mention, Mr. Clarke.

Mr. Jowers's prize for the best series of detail drawings submitted in the Class of Design, to Mr. W. L. Spiers; the extra prize to Mr. J. T. Newman.

Association prize of one guinea and a half to members of the Elementary Class of Design, for the best series of studies submitted during the session, Mr. J. A. Reeve; honourable mention, Mr. Yates.

Association prize of 2 guineas, to members of Class of Construction, for the best summary

of subjects treated at the meetings of the class: Mr. J. Tulman, jun.

Sir William Tite's prize of 5 guineas, to members of the Association, for the best design for a middle-class school: Mr. E. Clarke. The design by Mr. J. Hinton Bryan was declared by the judges to be next in order of merit.

The Architectural Union Company's prize of 5*l.*, to members of the Association, for the best series of measured drawings from existing buildings in England, erected previously to the eighteenth century: Mr. Robert Fearsall. Second prize of 2*l.* 10*s.*, offered by the Association: Mr. Alexander H. Kersey. Honourable mention: Mr. J. A. Reeve.

On the 18th inst., Mr. Edmund Sharpe will lecture "On the Use of Colour in Diagrams illustrating the History of Architecture." Other arrangements include:—

December 2nd, Prize Essay. "On the Nineteenth Century," by Mr. J. W. Rhodes.

December 16th, "The Arrangement and Ventilation of Hospitals," by Mr. S. Salter.

December 30th, "Architectural Treatment of Rubbish," by Mr. G. R. Redgrave.

January 13th, 1871, "Colour Decoration," by Mr. J. D. Craze.

January 27th, "London as a Field of Study for an Architect," by Mr. T. R. Smith.

February 10th, Members' Soirée.

February 24th, "Notes on the Recent Works at All Hallows Church, Lombard-street, with Remarks on Sir Christopher Wren's Churches," by Mr. F. J. Francis.

March 10th, "Christian Symbolism," by Mr. G. H. Birch.

March 24th, "Ironwork of the Middle Ages," by Mr. C. Bailey.

April 21st, "Treatment of Terra-cotta," by Mr. J. T. Perry.

May 5th, "Canterbury," by Mr. E. C. Leo.

May 19th, "Put Yourself in his Place," by Mr. E. J. Tarver.

June 2nd, "On the External Architectural Treatment of Portland Cement," by Mr. R. Plumbo.

June 18th, "Architectural Decoration," by Mr. C. Aldridge.

June 30th, "General Strength of Materials," by Mr. G. Aitchison.

The Report just now issued by the Association is a very interesting document, and shows how many facilities are at this time afforded to students who really desire to master their profession. We invite all the young men now in architects' offices to obtain and consider it.

We would especially point to the Art Classes and the Class of Construction. The latter class was formed in order to assist the members in obtaining a knowledge of the practical part of their profession, by means of an organised system of mutual study. Attention is directed to subjects immediately connected with the practice of architecture, on which each member is expected to acquire information for himself, to be afterwards shared in common with his fellow students. Questions bearing upon the subject to be treated are issued with the Report, and a certain number are allotted to each evening on which the class meets, and the members are required to furnish replies in writing, systematically worked out, to as many as possible.

The questions are, for the most part, well set, although they exhibit a little slip or two. For example, when the student is asked under the heading, "Building Act," to "give drawing of chimney for furnaces 20-horse power in accordance with the Building Act," he is asked to do what cannot be done, the Building Act containing no instructions on the subject.

Students in the country, who cannot join the Association, would find the careful answering of these questions a most useful exercise.

The Association begins the new campaign with a good programme.

Explosion at the Westminster Palace Hotel.

While one of the waiters was in the act of lighting the gas in a sitting-room on the third floor, an explosion took place. He was thrown a distance of several feet, and was frightfully burnt about the hands, neck, and face. A chambermaid was thrown down, several of her ribs were fractured, and she was very much burnt about the body. Nearly every article of furniture in the room was broken, and the window and sashes were blown out into Victoria-street. While they were falling, part of the window-frame struck the head of a porter, who was delivering coals at the hotel. He was fearfully cut about the head.

MENDELSSOHN'S "MIDSUMMER NIGHT'S DREAM."

WHEN we consider, if it be only for a moment, of the amount of labour and painstaking which have been expended in the endeavour to illustrate the life-doings of Shakespeare, we shall not, or ought not, to complain of the attempt, however small it may be, to complete, if possible, all the illustration it may be capable of. Even vague theory may be useful, for it may lead to truth, or point the way to it. In our former notes on the musical arrangements of our present gaffs,—the direct successors, as our theory is, of the theatre of Shakespeare,—it was affirmed that the mode of rendering music in them differed essentially from its practice in all other places of theatrical amusement; and that by the simple method of so subordinating the musical accompaniment to the uttered words as not in any way to interfere with their distinct hearing and understanding. If our readers have followed us so far, they are half-way on their journey from Covent Garden to the "Globe." Before we go further, there is one other thing to be noted which space forbade in our last, and it is a very singular and important one, indeed, quite unique, and out of the common theatrical or musical category of things. It is this, that in the resources of pure gaff music there is yet one thing more of, as we take it, very singular beauty,—viz., the announcement or foreboding of a coming stage event, even should such event be delayed to the next act, the curtain falling between the indication and the actual event,—by the playing at smaller or greater length some bars of music dramatically descriptive or indicative of such coming events, and as indicative of the character of the performer, and the part he is to act as the plot develops itself. It would be very difficult to devise anything more ingenious and subtle, or one better fitted to increase the interest of a well-told tale, if illustrated at all by a musical accompaniment. It is not a little singular that so beautiful a thing should have suggested itself, or found an abiding place in so humble a temple, and one may well wonder where it came from, and when first employed. It can hardly be thought that in the performances in the old Globe any such work was possible, for the instruments would seem hardly to have admitted of it; neither could the music of the Globe have attained the necessary degrees of refinement, for in all probability it never went much beyond the mere announcement of the coming on of a performer, and the adding to the noise and confusion of a stage battle. In opera, as we have endeavoured to show, the musical accompaniment is always so overpowering as almost always to drown the words, or, at all events, to make them of secondary importance; and the ear of the audience is taxed, and even pained to find out what the play is about, and a book is in most cases necessary to enable the hearer to discover what the words are, and what the performer or singer is uttering. Indeed, the whole play or drama becomes a song, and the performer rises or falls, whichever it may be, from an actor to a singer. But in the gaff, as we have said, all this inconvenience is obviated by the peculiar character and subdued nature of the musical accompaniment. It is too low to drown the words, and so really admits, which opera would not do, of a certain emphasis being given to a coming event by its preliminary strain of music indicative of its character and importance, and even foreshadowing, as it sometimes does, the master plot of the coming play. What would not such an idea become in the hands of a great master? We are led thus to enlarge a little on this interesting theme, on which certainly a book might be not a little usefully written, from the fact of Shakespeare and one of the greatest of musical composers having come together in a somewhat strange way. Shakespeare and Mendelssohn! Mendelssohn, as is so well known, set the "Midsummer Night's Dream" to music, and as it is now being performed in certainly a very appropriate place, the Queen's Theatre—Hullah's Music Hall that was of yore,—very many readers may have heard what he has done, and know well what it is like. Of course, it needs not be said what a very beautiful work it is, and how charmingly the great composer has caught the magic spirit of the Dream, and heightened and deepened its interest by the weird music he has wedded to it. Be it observed, in passing, that Mendelssohn never wrote an opera, symphonies, overtures, and oratorios alike, and, as it has been well said, claimed the exercise of his noble imagination

and elegant fancy, of his pure taste and profound scholarship." In one style only his power was unproved, though not altogether untried. Mendelssohn never attempted opera, but, as it were, met it half-way in this very setting of the "Midsummer Night's Dream,"—nay, we should almost have imagined that he had indeed, and in veritable fact, gone into and borrowed some passing strains from a penny gaff, but from the fact—the unfortunate fact—that he has utterly missed the idea, and as utterly failed to invent anything better, or as well and good. Let us be understood: it is worth a few lines of even indifferent talk. Shakespeare and Mendelssohn, opera and gaff. Mendelssohn has not attempted to perform the feat of converting the weird "Dream" into an opera, as "Faust" has been exalted or debased into one; his evident intention was to help the idea of the great poet by adding the charm and mystery of music to his words. But how has he performed the magic feat? Not, as we have said, by operatic means, elaborate and word-crushing as that is, though so captivating,—not certainly through the simple gaff mode of creating an atmosphere of sound through which the words are distinctly heard and "visible;" but in the most awkward and even stupid way which it is well possible to imagine. We say nothing of the wonderfully beautiful "overture," whose only fault is its shortness; for nothing more expressive of the dream or "idle fancy" of the immortal poet could be conceived; and it shows how thoroughly well Mendelssohn could have accomplished his work, could he but have hit on the right way to do it. He had all the "notes" and the right key, and the words were there for him to do what he liked with them; but he knew nothing of what to do with his magic wand, or how or when to wield it. Oh, that he had condescended to drop into a penny house to get an idea and the cue. But how has Mendelssohn accomplished the task he had before him? Why, shortly thus: after,—we repeat the word after,—each little sentence of dialogue or otherwise, more or less explanatory and descriptive of the story of the "Dream," Mendelssohn has written a few bars of delightful music, with the idea, apparently, of emphasising such words; so that large portions of the play are cut up into little bits, with long full stops between them; thus almost totally to destroy the connexion and sequence of them; and he has done this without the advantage which the gaff system of doing things has of indicating beforehand what is to come, or of adding to the strength of it while it is being uttered. It would be difficult to hit on a mode of enlivening music into the service of verse more awkward or more wasteful of musical power. But more than this, so totally does Mendelssohn seem to have been at a loss what to do,—and we may suppose, too, in the endeavour to avoid actually sliding into opera,—that he has written long and solemn passages to fill up time during the mere shifting of scenes; or, in other words, not having the idea as in opera to accompany the words, and go along with the words and action of the play Dream, he has simply and shortly put all his fine music where the full stops are, and where the necessary mechanical changes and consequent pauses interrupt the continuous action of the beautiful and idle fancy. Contrast this with pure opera, where the music accompanies and goes along with the words, and so often, unfortunately, smotherers them; or with the "gaff" idea, wherein the music, as in pure opera, goes along with the words and intensifies them, but, unlike opera, does not smother them or prevent their being heard. What a lesson is here, from the very highest to the very lowest of human and artistic things,—from Belgravia and its "sustained splendours" to the gutters. Mendelssohn met them both half-way. It has been said that he could not, even had he wished, have written an opera: he certainly would not, had he been asked, have written music for the "Demon Barron," or the "Slave Ship;" but he tried to write music for Shakespeare's "Dream." Would that he had done so; but, instead of it, he has done but little else than fill in the full stops and time of scene-shifting in it with musical notes. Never was there such a chance before and power of accomplishing a triumphant musical feat; for it is only just possible to imagine what Mendelssohn's "Dream" might have been had he but bethought himself of the beautiful idea of going along and keeping pace with the story of the "Dream" with a continuous strain of his lovely and weird music, ever flowing with it, not hiding or interrupting it; and thus to share with the

great poet himself the supreme glory of be witching the world's ear! But this artistic feat was to be accomplished in one of two ways,—he must have invented the way of work himself, or he must have condescended to the low things of this human life, and in the obscure corners of a gaff, and among its rough and ragged audience, even in this little island, so full of wealth for the foreign artist, he might have found the way to a throne by the side of the author of "the Dream"—but that way only in a gaff!

MEMORIAL WINDOWS IN THE CITY.

Guildhall.—The Court of Common Council on the 29th of April, 1869, ordered that the west window of the Guildhall should be filled with stained glass in the highest style of art, in memory of the many virtues and the high and spotless character of the late Prince Consort. It was thought right that both foreign and British artists should have opportunities of competing for the work, and advertisements were inserted inviting designs and estimates. Twenty designs were received by the committee, who, after a very careful consideration, selected six, which were submitted to Her Majesty for selection through Sir Thomas Biddulph. These were soon afterwards returned, the Queen intimating her approval of two of them more particularly. One of these—that sent in by Messrs. Ward & Hughes—was unanimously accepted by the Committee, they considering that the most effective window would be produced from that design. In that choice they afterwards received an expression of Her Majesty's entire concurrence. They consequently made the necessary arrangements for its production, at an expense of 1,000*l.* The glass, as most persons have heard, is now set up in its place. The window is one of five lights, with a transom, the lower tier double-pannelled, so that the number of divisions is fifteen; there are also two side wings, occupied by four figures representing Wisdom, Prudence, Justice, and Fortitude.

The design, though of the nineteenth century, is intended to harmonise with the architecture of the hall, and is in accordance with the principle of treatment observed in the best examples of the fifteenth and sixteenth centuries. The lower tier is occupied by five subjects, the representation of each filling two panels, thus:—

1. Agriculture. (1) The shepherd tending his flock, and the ploughman his plough; and (2) a harvest scene.
2. Industry. (1) Women spinning, &c.; and (2) Bleaching cloth.
3. Trades. (1) A blacksmith and a goldsmith at work; (2) A mason, a builder, and an architect.
4. The Institutions in which His Royal Highness took so great an interest. (1) Education; (2) Orphanage.
5. Commerce. (1) Ships loading and unloading; (2) Merchants on 'change.

The upper row contains representations of (1) Music, poetry, and history; (2) Peace, purity, religion, and home prosperity; (3) Architecture, painting, and sculpture; (4) Science and the learned bodies. In the centre of these is a figure of the Prince, seated in an attitude of meditation, book in hand. In the background are two figures unveiling the first Crystal Palace, or Exhibition of 1851.

The work is described as a mosaic in the strictest sense, and "there are as many as 590 pieces of glass in one square of 30 superficial feet. The leads forming the outline are not observable, the affectation of broken leading being studiously avoided." The entire design, together with the execution, is that of Mr. Hughes. The window, we are inclined to think, has not yet been seen properly, in its position, by any one. We have visited the Guildhall twice purposely, but it was shrouded in gloom on both occasions, so that we could form no opinion upon it whatever. We shall catch a gleam of sunshine upon it one day.

St. Paul's Cathedral.—The Cotton Memorial window has been set up at the east end of the south chancel aisle. Like others recently erected in the cathedral, it was executed by Munich glass-painters, and is a picture-window. It occupies about two-thirds of the opening in height, and has frame-work around it, which includes at the bottom the arms of the see of London on one side, and those of the person memorialised on the other. The subject chosen is the Stoning of Stephen, with the adjuration "Jesus, receive my soul" above, and a Latin inscription below, in memory of Mr. William Cotton. It appears to be set up within an existing window, with its bars, and has besides a wire-guard, which, altogether,—the colour of the window being, for the most part, thin,—has a somewhat confusing effect. Looked at from its own point of view, and not now reopening the question as to the best mode of decorating glass, the painting is a successful work, and is certainly more agreeable to look at, and more satisfying to

the mind, than some of the sprawling and expressionless saints put up under cover of the better system. The head of the martyr is finely expressive of piety and resignation.

THE CORPORATION SLAUGHTER-HOUSES, SALFORD.

The site of the new slaughter-houses, which are six in number, is at the north-west corner of the plot of land recently acquired for the extension of the cattle-market in Cross-lane. Mr. J. Bowden, the surveyor to the corporation is the architect. Each building contains a slaughter-house proper and a carcass-room, the one being 21 ft. long by 18 ft. 6 in. broad, and the other 36 ft. long by 9 ft. 6 in. broad. The slaughter-houses are provided with the usual apparatus for raising the animal after it is killed, and by an ingenious application of pulleys, and the hanging rails, the carcasses, after it is dressed, can be cut in two, and deposited in the carcass-room, without being taken off the hooks. By this arrangement the slaughter-house can be quickly cleared for the reception of other animals. The carcass-rooms are a new feature in the construction of slaughter-houses. Neither in Edinburgh nor Glasgow have they been adopted.

The walls of three of the buildings are lined to the height of about 5 ft. with enamelled brick, and those of the remaining three with enamelled slate. The object of the variety in the lining is to test the durability of the two kinds of material. The floors are laid with cement flagging, to prevent the absorption of blood or other refuse likely to decay or become offensive. In each of the slaughter-houses the sewers are fitted with one of Newton's patent gulleys or traps, which can be emptied at pleasure of the sediment and objectionable matter which they intercept. Each room is provided with one of Kennedy's self-acting taps, to prevent the waste of water. A range of louvre ventilators runs along the top of the entire buildings, while in the slaughter-houses there are windows, one on each side, of similar construction, about 10 ft. from the ground. These are in addition to the ordinary windows, which are not placed so high. There is also accommodation provided for cattle or sheep about to be slaughtered. In the rear, and adjoining each slaughter-house, there is a roofed pen, 19 ft. by 14 ft., devoted to that purpose. This is exclusive of a building, 150 ft. long by 25 ft. broad, which has been erected for the accommodation of cattle coming to the market from a distance and arriving the night before. It is fitted with Musgrave's patent iron stalls, and will hold about 100 head. The builders were Messrs. Warburton, Brothers, of Salford. The cost was about 2,800l.

THE LEICESTERSHIRE GRANITES.

The attention of the public has of late been directed to the question of the best materials for paving streets and roads, and many interesting experiments have been tried with a variety of articles; but, up to the present time, it may be doubted whether anything has been discovered that is likely to supersede the old-fashioned granite setts.

In this article a brief account is given of one of the largest sources from which these granite setts and other road materials are obtained, viz., the quarries scattered over the granitic and syenitic formations of Leicestershire; and among these igneous rocks of interest to the architect, engineer, and surveyor may be mentioned those obtained from the quarries of Mount Sorrel, Markfield, Bardon Hill, Groby, and Sheepshod, or Charnwood, as being the principal works in this country, and all of which are within a radius of twelve miles from the flourishing town of Leicester.

The first of these, "The Mount Sorrel," is by far the largest granite quarry in the United Kingdom. It is situated upon the Loughborough and Leicester road, and distant some seven miles or so from the latter town, and is worked by a private firm of very old standing under the style of "The Mount Sorrel Granite Company." The works have their own line of railway, which joins the Midland between Barrow-on-Soar and Sileby, and they have also a wharf on the Leicester and Loughborough Canal.

As some indication of the extent of these works, and the business transacted, it may be stated that constant employment is given to

from 500 to 600 men and lads, under the able management of Mr. C. H. B. Hamby. This granite is found varying in colour from a rich grey to a dark red, and when polished has a fine appearance. It is a substantial and durable stone, and is employed in mostly all the purposes for which granites are suitable. It is, however, chiefly manufactured into kerbs, setts, and macadam, for which purposes its toughness and enduring qualities render it valuable.

The working of the several Leicestershire quarries being very similar, a short account of the methods employed at Mount Sorrel will be sufficient for all. The "getting," as it is termed by the workmen,—that is, bringing down the rock from its 100 ft. face to the floor of the quarry,—is accomplished solely by blasting.

Holes are drilled into the solid rock, varying in diameter from 1 in. to 3 in., and in depth from 2 ft. to 30 ft. The drillers work in gangs of three. One man turns the drill, and the others strike. The quantity of powder used in these blasting operations varies with the magnitude of the holes and the amount of rock intended to be detached. The masses of rock, after being thrown down are further blasted into smaller lumps, and these again are "blocked" into the required sizes by heavy (28 lb.) hammers.

The hewn rough blocks thus obtained are next split into "setts" or other articles by blunt chisel-faced hammers. Those irregularly-shaped pieces of rock, unsuitable for conversion into the more valued "setts," &c., are broken up by hand for "macadam," or are passed through the "mill," where, by machinery, a like result is attained.

The "mill" is fitted up with two of Blake's patent breakers, in which the stone is crushed in passing through, and then sifted, by revolving screens, into macadam, chippings, and gravel, the two latter being largely used on carriage-drives, garden-walks, and footpaths; their dark red colour, due to ferric oxide, rendering them pleasing to the eye, and the sharp, angular edges of each piece allowing the whole to bind firmly together, forming a capital walk.

Also considerable quantities of kerbs, mill-stones, and other articles of masonry are prepared upon these works.

The Markfield and Bardon Hill Quarries are situated upon the Leicester and Ashby-de-la-Zouch road, and are distant, respectively, seven and ten miles from Leicester.

The Markfield stone is a fine dark green syenite, with a good cleavage, and cuts readily. It has a somewhat higher specific weight than the Mount Sorrel granite, and a large percentage of hornblende renders it more slippery in paved works after the first roughness has worn off.

This stone is cut up into paving setts and kerbs, and broken into macadam for roads, for which latter purpose its toughness and high resistance to crushing weights make it a very proper material. These quarries are worked by the Messrs. Ellis & Everard, who also own those at Bardon Hill.

The Bardon Hill rock is a trap or greenstone, and having no cubical cleavage it cannot be readily cut into setts, kerbs, or similar articles, as in the other quarries; it is therefore entirely employed in macadamising, and the Messrs. Ellis & Everard have erected powerful machinery, consisting of toothed rollers and suitable riddles, for preparing this material.

The specific weight of this rock is about the same as Markfield; but it is not perhaps always considered quite so good a material as that syenite for roads. There is no doubt that this Bardon stone would prove a very valuable article for paving, and wear well and not slippery; but its splintery and non-cubical cleavage appears thus far to preclude its adoption.

The quarries of Groby are also situated upon the Ashby road, and distant some five miles from Leicester. They are now being worked by a newly-formed company, styled the "Groby Granite Company, Limited." This stone, like the Markfield, is a dark green syenite, which it much resembles, and has likewise a ready cleavage.

The beautiful deep green tint of these rocks, frequently mingled with crystals of pink felspar, ought to ensure their demand for polished work in architectural and monumental designs, if they could be obtained in large blocks. But from some cause they do not appear at present to have been called into requisition with this object; probably they are expensive to work, from hardness; and owing to the presence of small particles of a soft material—perhaps

decomposed hornblende—the polished work will have a pitted appearance.

There are yet, however, many positions in which these syenites would form a pleasing contrast with the commoner and more sober shades of the red and grey granites.

The Groby Company have one of Blake's machines for breaking macadam, and further prepare paving setts and kerbs.

A very dense syenitic greenstone is quarried by Mr. Lowe, near Sheepshod, about four miles from Loughborough. It is cut into setts in the usual manner, and broken by hand into macadam. Its much higher specific weight is a disadvantage in competing with the other rocks before mentioned.

The granites that are described in this article being in very extensive and increasing demand for public works, a series of experiments have been made upon a sufficient number of samples to determine the specific weight of each.

The results are annexed in a tabulated form, and will probably be found useful to members of the professions, and also to contractors, builders, and paviors.

It only remains to add that the stones employed in these trials were very carefully selected from the quarries as being fair and average specimens of their respective kinds.

Results of Experiments.

TABLE I. shows the actual specific gravity of each sample, and mean specific gravity of all the samples of each quarry. This will be found convenient for general purposes, and from it are deduced the remaining tables:—

	No. 1. Mount Sorrel Granite.	No. 2. Groby Syenite.	No. 3. Bardon Hill Greenstone.	No. 4. Markfield Syenite.	No. 5. Charnwood or Sheepshod Syenite Greenstone.
2-613	2-764	2-879	2-839	2-915	2-915
2-663	2-811	2-815	2-835	2-917	2-917
2-774	2-774	2-814	2-834	2-915	2-915
2-659	2-770	2-811	2-825	2-919	2-919
	2-787	2-800	2-829	2-920	2-920
	2-763	2-801	2-823	2-940	2-940
Average...	2-659	2-775	2-827	2-931	2-935

TABLE II. shows the weight per cubic foot of each kind of stone, and will be handy in calculating the weight of masses of material, as in columns, piers, and other solid structures:—

No. 1. Mount Sorrel Granite.	No. 2. Groby Syenite.	No. 3. Bardon Hill Greenstone.	No. 4. Markfield Syenite.	No. 5. Charnwood or Sheepshod Syenite Greenstone.
169-19	173-44	176-69	176-94	183-44

TABLE III. shows in cubic feet the bulk of each class of rock that is necessary for the weight of one ton:—

No. 1. Mount Sorrel Granite.	No. 2. Groby Syenite.	No. 3. Bardon Hill Greenstone.	No. 4. Markfield Syenite.	No. 5. Charnwood or Sheepshod Syenite Greenstone.
13-45	12-91	12-67	12-65	12-51

TABLE IV. shows a comparative statement of the quantities of each description of stone required to pave with setts or coat with macadam an equal area. Thus, assuming that setts 3 in. wide and 4 in. deep will cover 500 square yards of roadway, then the undermentioned quantities of the products of each quarry will be necessary.

	Tons, cwt. qrs.
No. 1. Mount Sorrel.....	160 0 0
No. 2. Groby Syenite.....	104 7 1
No. 3. Bardon Hill Greenstone.....	106 0 1
No. 4. Markfield Syenite.....	108 9 2
No. 5. Charnwood or Sheepshod Syenite Greenstone.....	110 7 2

The Diamonds of South Africa.—We are told that Mr. Streeter, the jeweller, in conjunction with one or two other gentlemen, has organised an expedition to the South African diamond-fields; and they will take with them Mr. T. W. Tobin, secretary of the Polytechnic Institution. On Mr. Tobin's return, the public will, of course, have a full and particular account of the locality and its products, in the shape of an illustrated lecture at the Polytechnic.

ARCHITECTS UNDER THE OFFICE OF WORKS.

The following is a copy of the "Memorandum of the Terms of Appointment of Architects for Public Buildings," which has been issued by the Office of Works. Mr. Street and Mr. Waterhouse are understood to have signed it; Professor Scott and Mr. E. M. Barry, we are told, still hesitate:—

1. The architect will by a given time prepare and deliver to the commissioners at their office sketch plans, elevations, and sections of the intended building, having a report regard to the proposed cost, so that in the event of the approval of the design a contract might be made with a responsible builder to execute the building, including fixtures and fittings, warming, ventilating, lighting, bounties, lodges, and every other work necessary to render the building fit for occupation for the intended purpose, excepting only furniture, for a sum not exceeding the amount of the proposed maximum expenditure.

2. If the commissioners or Government should abandon the intention of erecting the proposed building, the architect shall be entitled to a sum to be fixed beforehand, and to the return of his sketches.

3. If and when the sketches shall be approved by the commissioners, with or without modifications, and the commissioners shall desire to proceed with the building, the architect shall, on or before a day to be named, prepare and deliver to the commissioners at their office working drawings and specifications of the works, in accordance with the approved sketches, for the purpose of being submitted to the builders for tender, either by limited or open competition.

4. The drawings and specification to be so submitted shall be complete in every respect, so as to enable the commissioners to enter into a contract thereupon with a responsible builder for the erection and completion of the entire building.

5. If the amount of the most approved tender shall exceed the maximum amount of the proposed expenditure, the architect shall, as required by the commissioners, revise his plans and drawings so as to bring the expenditure within the limits prescribed.

6. The plans, drawings, specifications, and other documents relating to the works, whether actually referred to in the contract or not, shall be the property of the commissioners, and shall be deposited with the Office of Works; and the architect shall, at his own expense, make all tracings and copies of plans, drawings, and other documents which may be necessary for the conduct of the works.

7. The architect shall convey the instructions of the commissioners to the builder; he shall superintend the execution of the works, and time to time certify the amounts due to the builder under the contract.

8. The architect shall also perform, or cause to be performed, all other services necessarily or ordinarily rendered by an architect, or his assistants, with reference to the works, to their final completion, but he will have the assistance of a clerk of the works, whose salary shall be paid by the commissioners.

9. The architect shall be at liberty to vary architectural details, provided such variations do not involve extra cost, but he shall not otherwise give any instructions to the builder at variance with the contract, and shall on no account incur any increase of expenditure, without the sanction, in writing, of the commissioners.

10. In case any additional or substituted works shall become necessary, during the execution of the contract, the architect shall furnish the additional plans, drawings, and specifications at the earliest possible time after the necessity has first arisen, so as to afford sufficient time for obtaining tenders and contracts for the execution of such additional or substituted works, without incurring delay in the execution of the contract works.

11. The remuneration of the architect shall be a fixed sum, to be agreed on beforehand.

One-third part of the said sum shall be paid to the architect immediately after the execution of the contract.

One other third part of the same sum shall be paid to the architect as soon as one-half of the contract sum has been paid to the builder.

And the remaining one-third part of the said sum shall be paid to the architect after the final payment to the builder.

12. If, after the working drawings complete for the execution of the entire work have been made, the commissioners should fail to invite tenders or make a contract, and proceed with the works, the architect shall be entitled to be paid a certain fixed sum, to be agreed on beforehand, and the plans, drawings, and specifications shall belong to the commissioners; or, if the commissioners shall desire to proceed with a part only of the works, the architect shall be entitled to a proportionate part of the remuneration mentioned in article 11, for the works to be executed, in addition to a proportionate part of the sum mentioned in this article in respect of the works intended to be abandoned.

13. Except in the case of alterations or additions, made with the written authority of the commissioners, the architect shall not be entitled to any remuneration for his services beyond the sums herebefore stated.

14. In case of any additions or alterations to the original design, made by the direction or with the sanction of the commissioners, the architect shall be entitled to an increased remuneration as may be agreed on, or, in the absence of agreement, shall be determined by arbitration in manner hereinafter provided.

15. In case of the architect becoming incapacitated or dying, he or his representatives shall hand over to the commissioners, or to whomsoever they may direct, all plans, drawings, and papers relating to the works which may have been in his possession previous to his death, or his incapacity, or his death, or his representatives shall only be entitled to such equitable proportion of the unpaid part of the said remuneration as may be agreed upon.

16. In case of any dispute or question between the architect and the commissioners shall be referred to an arbitrator, appointed by the Treasury, who shall have such powers of authority as the Treasury shall think fit to give him, in addition to the ordinary powers of an arbitrator.

17. No rules of the Royal Institute of British Architects or any other society shall be held binding upon the commissioners in reference to the works or matters herein referred to.

I, the undersigned of _____, hereby accept the appointment of architect to the proposed building of _____ at _____, subject to the terms of the annexed memorandum, with the following special provisions; that is to say:—

a. The maximum amount proposed to be expended referred to in Article 1 is the sum of £ _____.

b. The time for delivery of sketch-plans, &c., as mentioned in Article 1, shall be _____.

c. The remuneration referred to in Article 2 for the event therein stated shall be the sum of £ _____.

d. The day for the delivery of the working drawings, and specifications, as mentioned in Article 3, shall be _____, or within _____ of the notification by the Commissioners of their approval of the sketches and intention to proceed with the building.

e. The architect's remuneration referred to in Article 11 shall be the sum of £ _____.

f. The architect's remuneration referred to in Article 12, in the event of the works not being proceeded with, shall be the sum of £ _____.

ARCHITECTS, SURVEYORS, AND THE OFFICE OF WORKS.

Sir,—At a time when Mr. Ayrton seems disposed to make the position of Government architects as unpleasant as possible, and to offer a public affront to the Institute, may I ask if it is true that, when tenders were delivered the other day for the new Home and Colonial Offices, all the builders tendering rejected as unfair the conditions sought to be imposed upon them by the Office of Works, and substituted an offer to undertake the work on the conditions of contract lately put forth as model conditions by the same much-abused "Royal Institute of British Architects?"

It would be interesting to know if the rejected conditions were drawn up by the same hand as the terms now to be imposed on architects, who, it may be found, have already proved to be more easy to conquer in detail than the builders.

I do not suppose, in these days of beating down professional charges, that it can really be true that the wary surveyor to the Board has allowed such a payment of 6,000*l.*, as was named, to be paid for quantities to the surveyors, though one of them is his own son. It is, however, remarkable that no denial of this statement has (as far as I know) yet appeared. Certainly, if such fees can be so earned, it is better to be a surveyor than an architect.

CUSTOS.

THE MARGATE JETTY COMPETITION.

We have received two other letters precisely similar in effect to the one we printed last week. No advantage could be expected from printing them. *Kable's Gazette* gives some particulars of the designs:—

The first premiated design, that of Mr. G. G. Page, shows an extension of the present jetty head northwards in the form of a regular octagon, each side of which will be 120 ft. long, and seven sides of which will be available for the landing and embarkation of passengers. The designer proposes a central building, or tower, in the Alhambra style, with restaurant below, above which it is proposed to form a stand for the promenade band, covered with a wrought-iron sounding-tower, and a look-out house on the top. His scheme may be described as a concentric hexagonal, the promenade to intersect at the centre by four radial arms, or, as they are termed upon the plan, bridges, the angle-posts being open to the sea, and not covered with the deck, as shown in the other plans. This promenade will be 25 ft. wide and one-sixth of a mile in circumference. It is proposed that there shall be three landing-stages below, of 12 ft. wide, and eight kiosks at the angles, which will be occupied as shops for the sale of fancy goods of different kinds. Screens of plate glass and seats are proposed to be erected, somewhat after the style of the pier at Brighton; and it is proposed to carry up a tower at each corner of the present Jetty-head, and make a floor above the same, to be used as a smoking-lounge, in case of need, and thus to create a large sheltered place for the use of visitors in case of sudden showers. Altogether the design has about it a considerable amount of originality of style: the drawings by which it is illustrated are executed in a masterly manner. The second premiated design, that of Mr. MacNab Son, clerk to the Pier Company, is of the same form as that of Mr. Page, but considerably smaller, showing but a comparatively limited area of landing-stages. He also proposes an octagonal building in the centre, with raised band stand, and a verandah running round; but otherwise his drawings do not enter into any details.

The third premiated design, by Mr. W. Lane Sear, is illustrated by seven drawings, worked out in very careful detail, showing every pier, pile, and brace in its construction. It is also of an octagonal shape, and provides refreshment and reading rooms, seats for 800 people, and a promenade that would accommodate 3,500 persons at one time. He proposes to remove entirely the present timber head, and to bridge the space occupied thereby with an extension of the present iron structure. His drawings show three landing-stages very similar in construction to those suggested by Mr. Page, but his design is not on so ambitious a scale, although in it there is evidence of a large amount of painstaking; and the report by which it is accompanied has been considered to be the best of any of those sent in. The design marked "Experience" (Mr. Cubitt, of Westminster), has deservedly attracted notice. He proposes to throw out a projection on either side of the present Jetty-head, and his design has thus somewhat the appearance of a butterfly, the feet being the present Jetty-head, and the wings the proposed extension thereof. His plan presents a landing-place, 370 ft. long on the sea side, while upon the south side two floating stages or large pontoons would rise and fall with the tide, and thus accommodate themselves to every requirement. All the premiated plans are based upon the octagon. All of them are to be carried on iron piles sunk deep into the solid chalk, and there is no doubt that any one of them would be a great improvement indeed on the present bald and insufficient accommodation which the Jetty now affords. The estimates are in all cases somewhat below the sum limited by the directors (11,000*l.*), with the exception of that signed "Experience," which the author states would cost about 13,000*l.*

PRUSSIAN ARMY SANITARY DEFECTS AT THE SEAT OF WAR.

The warnings and advice of the *Builder*, given on the declaration of war, as to the need there would be for special care of sick and wounded, and as to modes by which such care might best be administered, do not seem to have been of much avail. The present condition of the Prussian armies in France is said, by some of the war correspondents, to be as bad as the worst state of the British army in the Crimea, 1854-55. Hunger-Typhus is named as prevailing at Metz; 20 per cent. of the men in the field are said to be sick. It is reported that there have been for some time in the Prussian armies not fewer than 2,000 burials per day. We are told that amputated men are sent away without necessary clothing, that sick are crowded for days on damp straw in fetid atmospheres, and that amputated patients lie on the floors amidst blood and impurities sufficient to destroy all chances of recovery.

Scorbutus, dysentery, and fever rage so that for Prussia the sword of disease is the most deadly danger to her armies. Count Bismarck declines, or makes impossible, an armistice, and well he may, as at the present rate of loss the Prussian soldiers are so fast perishing of disease, that the twenty-five days' delay proposed would mean, unless we are gravely misinformed, a loss of 50,000 soldiers. When will statesmen learn and practise the lessons sanitary science teaches?

LIVERPOOL MASTER BUILDERS' ASSOCIATION.

The annual dinner of this Association has been held at the Adelphi Hotel. It was attended by about eighty members and several invited guests. Mr. E. Hughes, president of the Association, occupied the chair. After the loyal and patriotic toasts, the chairman proposed "The Liverpool Master Builders' Association."

Mr. S. W. Holme, in responding, said that during the short career of the Association it had always been their happiness to point, on these annual occasions of festivity, to good work that had been done during the past year. The year 1870 had not been an exception to this. A settlement had been made with regard to the carpenters' and joiners' trade rules. The carpenters and joiners were by far the largest body of operatives in Liverpool, and the Association was to be congratulated that, after much consideration, it had introduced a code of rules which had proved satisfactory alike to the employers and the operatives. The year had also

witnessed the introduction of the hour system into a portion of the building trade in Liverpool. The slaters and plasterers had still to incorporate this system in their code of rules. The question of arbitration had been before the public within the last few weeks. Arbitration had been introduced into all their trade rules, and it would be adopted whenever occasion required; but a scheme was brought forward by the operatives in a novel and complicated manner, and, although the committee had given it careful consideration, they had not yet seen their way to co-operate in it.

In proposing "The General Builders' Association," the chairman stated that it had emancipated the trade from many abuses. He associated the toast with the name of Mr. Johnson, of Manchester, who had his life threatened, his premises burnt down, and his property destroyed by trade unionists. Mr. Johnson compared the position of the trade now with that of two years ago, to show what the General Builders' Association had done. Bad as Liverpool was two years since, Manchester was worse, in regard to the tyranny of the trade societies. In Manchester they were not allowed to make bricks by machinery, and if they were made nobody would set them. He employed 120 bricklayers four years, and was allowed one apprentice. Although he had had his life threatened, and his property destroyed, even if he were single-handed he would put down the Brickmakers' Union, and make a million of bricks a week until the Union came to terms. His house was still guarded by a policeman every night, and that was how he lived, in a state of siege. In conclusion, he advocated an equalisation of the summer and winter wages. Several other toasts of a complimentary nature were heartily responded to.

KENSINGTON IMPROVEMENTS.

Great changes have been made in Kensington in the neighbourhood of the parish church. It seems to us, however, regrettable that the main road was not made wider while the authorities were about it. Opposite the vestry-hall it is certainly too narrow. It suggests the old complaint of spoiling the ship for a barrel of tar. Some good houses have been erected on the new line of road, and our remark, we fear, can have no practical effect in this immediate case. Still, it may lead to consideration in others, and so not be without value. All the new thoroughfares in the metropolis and its neighbourhood should be kept as wide as possible, within the limit of say 100 ft.

SCHOOLS OF ART AND OF SCIENCE.

The Reading School of Art.—The annual distribution of prizes to the successful pupils of this school took place in the town-hall. The chair was occupied by the president, Mr. Higford Barr, of Aldermaston Court. A large audience assembled, and the pupils of the school occupied the front seats. Some of the drawings of the pupils, and of the master (Mr. Havell), were exhibited in the council-chamber. The prizes awarded in the evening were also exhibited. The chairman was supported by Mr. H. Cole, C.B., who distributed the prizes and addressed the meeting.

The report of the committee expressed pleasure in recording that the various classes have been maintained in their usual efficiency. The number of pupils attending the art school has been eighty-seven. Of these seventy-five presented themselves for examination in March last, in the second grade. Forty-three were successful, and received certificates of merit. Thirteen were awarded prizes by the Department. Works for the third grade were sent to South Kensington by thirty-eight students. Thirty-seven were accepted, as showing the pupils had been satisfactorily taught. Five received prizes. The committee have formed science classes in geometry, machine drawing, and drawing, and building construction. In the first of these, three were examined, but did not pass; in the second, four were examined and two passed; in the third, four were examined, two passed, and one gained a prize. With a view to the further development of the science classes, the committee have determined to increase the number of members, and at a meeting held on the 20th inst. it was resolved that to the subjects previously taught, inorganic chemistry, animal physiology and botany, and theoretical and applied mechanics should be added.

The Chairman said that he should have taken the chair with the greater satisfaction that evening if the report had led them to believe that the number of pupils attending the school of art had increased. He was sorry there had been a falling off in the numbers, and he hoped that the loss would be made up during the ensuing year. In introducing Mr. Cole, the chairman said this gentleman had been endeavouring to revive the art of building in terra-

cotta. In some parts of England there were erected beautiful houses of terra-cotta, and there was one at Sutton-place, Guildford. There were no stones in these buildings; they were composed of baked earth, the Italian words terra-cotta simply meaning baked earth. These houses were built in 1521, and yet the ornamentation was as sharp and perfect now as on the day when they were built. This was a subject of considerable importance, because in some counties stone was scarce. There was no building stone to be had in Berkshire, and if they possessed the art of building in terra-cotta, beautiful houses might be erected. He was only sorry that his own residence at Aldermaston had not been built in terra-cotta.

The Oxford School of Science and Art.—A crowded public meeting has been held in the townhall, for the purpose of witnessing the distribution of prizes to the successful students in this school. A collection of the drawings and paintings of the students and others had been on view in the hall. The visitors were numerous on each day. The public distribution of prizes was announced for eight o'clock, when the hall was filled, and many were unable to gain admission. Mr. W. Vernon Harcourt, M.P., occupied the chair, and distributed the prizes, and the hon. gentleman was accompanied on the platform by the Very Rev. the Vice-Chancellor, the Mayor of Oxford, and other gentlemen. In alluding to the progress of the school, the chairman explained that the nation gave a certain number of prizes to be competed for by the whole of England, and the results of that competition were the drawings which now for the first time were exhibited in the townhall. Among these prizes there were eight gold and twenty-two silver medals, and of the latter Oxford had gained one. There were fifty-seven bronze medals, and one had come to Oxford; there were eighty-seven book prizes, of which this city had secured two. Altogether there were 104 of these schools in the country, out of which only thirty-nine obtained the 10l. prizes, and of these Oxford was one. The Government grant was gradually increasing; the number of students here was 192, and there were only seven schools in England that had a greater number. The total number of students in the day schools was 301, and there were only fourteen schools in England that had more. They would therefore think that, considering its population, and the conditions, Oxford might feel proud of its position, and hope that it would improve in the future. Professor Smith spoke of the success of the science side of the school. The number of pupils, he said, was seventy-six, and the prizes gained by them had been most satisfactory. That argued well for the pains which the pupils had taken, as well as for the skill of the several teachers.

The Belfast School of Art.—This school, which has recently been established, has just commenced the business of the first session, under circumstances which augur well for its future success. The school is situated in College-square North, and is likely to give a great impetus to art education in Belfast, where hitherto it has been too much neglected. The pupils enrolled during the day were as follows:—Ladies' class, 11; gentlemen's class, 5; schoolgirls' class, 30; schoolboys' class, 20; workmen's (evening) class, 79. In the evening, the head-master (Mr. Lindray) delivered his inaugural lecture to the workmen's class in the male lecture-room, the walls of which were decorated with drawings illustrating the various stages of art education imparted in Government Schools. There was a large attendance of the members, and also some gentlemen interested in the project. Mr. W. Girdwood presided.

The Coventry School of Art.—The annual meeting of this school has been held in St. Mary's Hall, under the presidency of Lord Leigh. Among those present were the Mayor, several aldermen and councillors. The audience was a large one, and included many of the leading families of the city and neighbourhood. The hon. secretary, Alderman Gulson, read the report, the first part of which was as follows:—

"The committee of the school of art have again to report that they consider the position of the school to be very satisfactory.

In the national competition four medals and two Queen's prizes, the same number as last year, have been obtained, with this difference, however, that last year we had a silver medal.

Five book prizes have been awarded in the third grade section, and eighteen works were selected for national competition. Of these four obtained bronze medals, and two Queen's prizes. Six free studentships (the same number as last year) were also awarded by the Department.

In recognition of the merits of the head-master, a bonus of 10l. has been presented to him by the Department, as well as a grant to enable him to visit South Kensington and other art institutions of the metropolis.

An increased number of students have attended the school during the past session, the numbers being 194, against 180 last year. Notwithstanding this, however, the number who passed the March examinations in freehand, model, geometrical, perspective, and mechanical drawing is only twenty-seven, and the successful papers thirty-one, against fifty last year. This falling off—which seriously, though somewhat unfairly, affects the standing of the school—arises from the facilities for holding examinations which are now given to preliminary schools, many pupils passing them before entering the School of Art. To meet this difficulty, the committee have thought it expedient to pass a resolution that those pupils only who present themselves for examination at the School of Art shall be allowed to compete for its local prizes."

The Burslem School of Science and Art.—A preliminary meeting in connexion with the science classes of this school has been held at the Wedgwood Institute. There was a good attendance, and an able address was delivered by Mr. A. L. Sparkes, the newly-appointed master.

Mr. Sparkes said he was glad to meet so large a number of students at this preliminary meeting. He was especially pleased to see some working men among those present, and he believed sincerely that the necessity for a knowledge of science was becoming every day more and more apparent to the working classes. They began now to feel that the fate of our English manufactures, and especially that of the pottery manufacture, depended upon the application of scientific principles in its production. It was chiefly this that made English pottery superior to that produced in other countries; and unless we kept up our superiority in this respect we must expect that in a few years our neighbours would supersede us. He hoped that many more working men would come forward to join these classes, for it was principally for their benefit that the committee had invited him to come to the Potteries. Mr. Sparkes then proceeded to give some learned and valuable hints as to the best methods of studying science.

BOYS' SCHOOL FOR THE ROYAL COMMISSION OF THE PATRIOTIC FUND. COMPETITION.

It having been determined by the members of this Commission to erect a building upon their land at Wandsworth, for the accommodation of 200 boys, in lieu of the present temporary erections, designs were invited from the following architects, viz.,—Messrs. Blomfield, Dawson, Giles & Biven, Saxon Snell, and Tasker.

The design submitted by Mr. Snell has been accepted, and he has accordingly received instructions to prepare the necessary working drawings and estimates for the erection of the building, which is calculated by him to cost 15,000l., exclusive of engineering work, drainage, and fittings.

THE AGED PILGRIMS' ASYLUM.

THE building of which we here give an illustration is being erected on a site adjoining the New Islington Workhouse, at Hornsey-rise, by the Aged Pilgrims' Friend Society, and is for an extension of operations now carried on at the society's present Asylum at Camberwell. It is intended for the reception of aged and comparatively destitute members of Christian churches of all denominations.

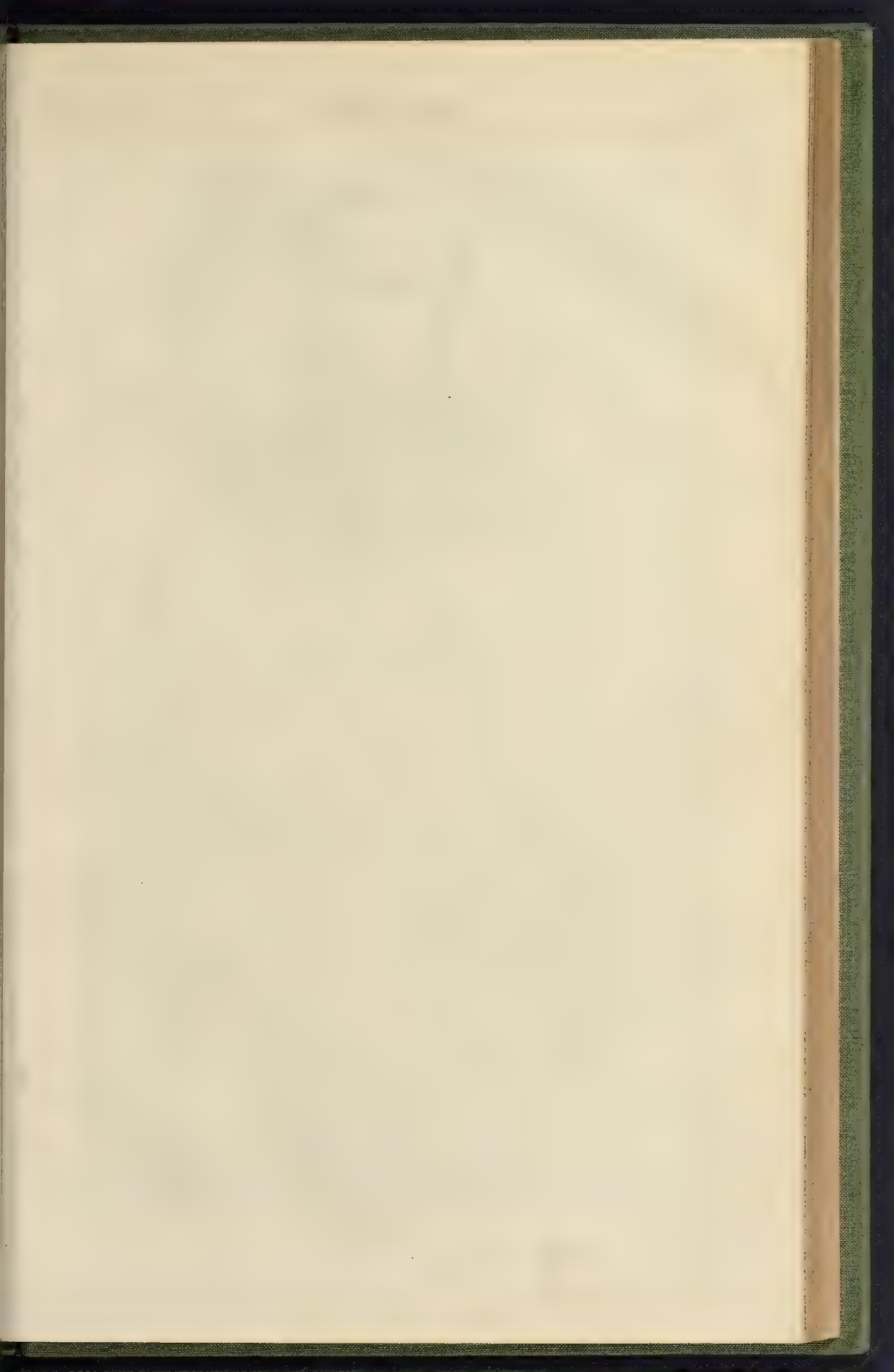
The nature of the site, it being on the side of a hill, suggested the terraces, which materially aid in giving whatever effect the building may have.

The new asylum provides accommodation for eighty pensioners, and has besides a chapel, reached by covered ways, warden's and matron's apartments, committee and other official rooms.

The design combines the corridor and cottage systems, the wings being devoted to the former. All the corridors and staircases are fireproof. The Dennett arch is used for the upper corridors.

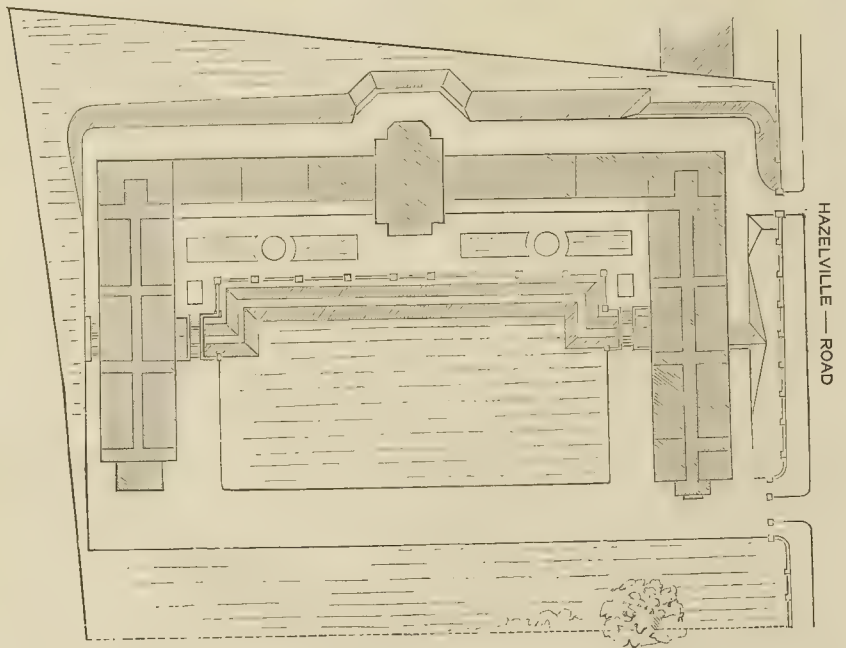
The materials employed are stock bricks, picked for the facings, with a struck joint, and with dressings of Box stone. The annexed block plan shows the general arrangements. The contract has been taken for 9,345l. by Messrs. Hill & Sons, of Islington, by whom the works are being carried out, under the personal superintendence of the architect, Mr. F. Braham.*

* In part of our impression the Institution is accidentally described, under the view, as being in Hampstead, instead of Hornsey-rise.





MR. P. C. HARDWICK, *Architect of Lincoln's Inn Hall.*



THE AGED PILGRIMS' HOME.
Block Plan.



THE AGED PILGRIMS' HOME, HORNSEY-RISE.—MR. F. BOREHAM, ARCHITECT.

THE QUEEN'S THEATRE, MANCHESTER.

On the site of a building in Bridge-street, Manchester, long known as the Amphitheatre, a new theatre has been built under the superintendence of Mr. E. Salomons, architect, capable of accommodating a large number of persons. There are three entrances, all from Bridge-street,—one being to the dress tier, another to the pit, and the other to the gallery. Access to the pit is obtained through an entrance, 20 ft. wide, in which there are two doorways. Both doors will be thrown open as the means of exit; only one, however, is intended as an entrance to this department of the theatre. The pit will accommodate about 1,300 persons, it is stated. We hope it is better adapted for seeing than the pit in some of our new London theatres is. The pit audience, excepting those who desire to stand in the promenade, will be seated on benches. The dress tiers are placed next above the pit, and will be furnished with chairs for the use of 250 visitors; and in the promenade at the back there is standing room for 150 more,—a questionable arrangement. A staircase, 6 ft. wide, gives access to a gallery, capable of accommodating about 800 persons.

Viewed from the stage, the sides gradually slope inwards towards the stage, and branch off from a considerable breadth of front seats. The tiers and gallery are fronted by ornamental scroll-work, gilt and coloured, and upon crimson satin ground. The proscenium is 30 ft. square. The stage is 42 ft. deep from the footlights to the wall, and 75 ft. wide. The theatrical appliances will be best observed when the theatre has been got into working order. Messrs. Neill & Sons are the contractors for the building, and the decorations have been carried out by Messrs. Edmondson & Pollitt.

THE CHAIRMANSHIP OF THE METROPOLITAN BOARD OF WORKS.

The Metropolitan Board have now discussed the question of appointing a chairman, and have ultimately resolved to elect one for twelve months only. An amendment, for the election for an indefinite period, was lost by a majority of 21 to 17. One for the election for three years was lost by a majority of 20 to 4. The motion for the election for one year only was then put and agreed to in the form of an amendment thus worded:—

"That, in view of all the circumstances, it is not desirable at the present time that the permanent appointment of chairman should be made, and that the chairman of the Board be elected for one year only."

It was arranged that the election should take place on Friday, the 18th inst.; that the same mode of election should be followed as on the former occasion; that the candidates should not be confined to the members of the Board; and that a candidate might be proposed and seconded on the day of election.

OPERA AND "GAFFS."

SIR,—Your last article on this subject seems to raise a question as to the principles on which music should be employed in heightening and giving point to dramatic performance, which is of some importance. The tone of the article seems rather to imply a certain disparagement of opera, intellectually, as a style of performance in which the music overrides the meaning, and where it is of less consequence *what* is sung than *how* it is sung. That this is practically so in a large number of popular operas, and that the majority of opera audiences, so far as they can be said to consider the subject at all, look at it in this way, is probably true enough; but there is no necessity in the nature of things that it should be so. The distinction between drama and opera must be kept in mind. The former is a display of the working of human intellects, under the influence of various passions, and exhibiting the result in words and actions; the latter is rather the embodiment and illustration, through the medium of music, of the passions themselves, by which human beings, placed in certain situations, may be supposed to be possessed. The situations being broadly sketched out, the music develops the feelings of those who form part of them; whereas in drama a great part of the interest consists in the gradual evolving of the situations and characters as the play goes on. In short, drama appeals more to the intellect; opera more to the feelings, by the aid of resources of sound which are denied to the

dramatist. The two arts must therefore be judged from different points of view; and the involved turns of thought and reflection, or the elaborations of repartee, which form a main part of what is called "legitimate drama," would be an impertinence in opera, as interfering with the real object of the latter, viz., the expression of feeling through the medium of music. The same thing may be remarked in regard to song-writing generally: verse of an elaborated or philosophic nature is not suitable for setting to music; what the musician wants is a broad idea given him in simple though dignified language, which he can lay hold of and express through his own medium.

To say this, is not to make opera an inferior art, but only a different art from drama. It is as necessary to understand the plot and situation of a good opera, in order thoroughly to enter into it, as of a drama; but the same minuteness and elaboration of language is not necessary, because the object is totally different. With regard to the use of the orchestra alluded to in your article as marking the entrance of a character, it may be worth remarking that something very like this has been done in opera by Weber, who labels the false-tongued female intriguer in his "Euryanthe," with a peculiar serpentine phrase for the violins, which constantly heralds her entry. The idea of descriptive music accompanying a spoken scene was also tried by Mendelssohn in his "Athalia," and has proved, in my opinion, a signal failure; the natural speaking tone of the human voice never blending at all with the instrumental accompaniment. The parts of the cantata where this occurs are always endured with a kind of exemplary fortitude by the audience, and in a recent performance of the work by a provincial musical society, the "recitations" were omitted altogether, to the relief, it is believed, of every one present.

H. H. S.

SALE OF LAND, BRIGHTON.

THE surplus of the land which the corporation of Brighton purchased for widening North-road, and a portion of that which they have acquired for improving Pimlico, by opening a street at that point running from Church-street to North-road, has been sold.

Lot 1 consisted of a corner plot of freehold building land, adjoining on the west the business premises of Mr. Balcombe, grocer, having frontage to North-road of 17 ft. 8 in., and to Pimlico of 43 ft., and brought 215*l*.

Lot 2 was a plot of freehold building land adjoining Lot 1 on the south, with a frontage to Pimlico of 16 ft. 5 in., having a mean depth of 34 ft. 8 in., 105*l*.

Lot 3, adjoining the last on the south side, having a frontage into Pimlico of 15 ft. 7 in., and a mean depth of 35 ft. 5 in., 95*l*.

Lot 5 was a corner plot of freehold building land, having a frontage to North-road of 17 ft., and to Pimlico (the opposite corner of Pimlico to Lot 1) of 55 ft. 6 in., 325*l*.

Lot 6 was a plot adjoining the last lot on the west, having a frontage to North-road of 16 ft. 6 in. This lot was purchased for 230*l*.

Lot 8, adjoining the last three lots on the west, but having a frontage of 17 ft. in North-road, and of 49 ft. 2 in. in Bread-street, being a corner plot, realised 25*l*. more, namely, 255*l*.

NEW CHURCH, NOTTING-HILL.

ST. MICHAEL AND ALL SAINTS.

THE increase of houses at Notting-hill is something to marvel at, especially in that part which adjoins the Metropolitan Railway Station, and is known as Ladbroke Grove-road. Last week the foundation-stone of a new church was laid here, named after St. Michael and All Saints. As regards the style of the building, the architects have adopted the Romanesque of the Rhine, as far as that style can be applied to a brick church without aisles. The plan consists of a nave, 99 ft. long, exclusive of chancel and western apse, by 43 ft. wide, roofed in one span, with an eastern, western, and southern apse, leaving a northern apse to be added when the ground can be obtained for the purpose. An endeavour is also being made to obtain an extension of the chancel, which, without doubt, will be required eventually.

The material is brick, with Forest of Dean and Red Mansfield stone introduced, and terra cotta, red and buff, for the cornices and arcades, Pether's patent moulded and ornamental bricks

will be largely used. The contract is taken for 4,300*l*. by Mr. Cowland, of Notting-hill (exclusive of upper part of tower and fittings), and the architects are Messrs. Edmondson, of Town-court, Old Broad-street, City. The plot of land, 130 ft. by 60 ft., and a plot for the vicarage are the gift of Messrs. Blake and Parsons, the freeholders.

ARCHITECTURAL EXHIBITION.

SIR,—Although this exhibition has ceased to exist as a separate institution, there seems to be no good reason why it should entirely fall to the ground. I would suggest that the committee of the Architectural Museum should now take the matter up, and admit architectural drawings of new buildings either in course of erection or about to be commenced. There is no need to attempt to make a picture gallery of it, which appears to have been one of the mistakes of the late exhibition; that can be left to the Academy, where only fine drawings are admissible. What should be aimed at in a true architectural exhibition is the obtaining complete sets of working drawings, with details of ornamental and structural parts on an enlarged scale. These would be far more instructive and useful to students, as well as to full-grown architects, who would all learn something from the works of each other.

As very little expense need be incurred in carrying out this suggestion, I hope the committee of the Museum in Westminster will take it into consideration. E. W. T.

NORTHERN ARCHITECTURAL STUDENTS' SOCIETY.

THE second winter session of this society was commenced on the 1st inst., by an exhibition of sketches, drawings, and photographs of architectural and kindred subjects. The meeting was held in the ante-room of the Literary and Philosophical Society of Newcastle-upon-Tyne. One of the rules of the Northern Architectural Students' Society requires each of the members to contribute an original sketch once a year at least, and the most interesting feature of the opening exhibition was the series of drawings executed by the members in compliance with this regulation. The series included perspective views or measured drawings of various buildings. The exhibition was of an interesting nature, and augurs well for the coming session of the society.

DEATH OF AN ARCHITECT FROM OVERWORK.

ON the 3rd inst., Mr. Bedford, the coroner, held an inquest at St. Martin's Vestry-hall, Charing-cross, touching the death of James Adolphus Carter, aged thirty-three years, an architect, who was found dead at his residence, 20, John-street, Adelphi, on Wednesday, the 2nd inst. It appeared from the evidence that deceased was a very studious, hardworking person, and on Wednesday morning, upon his servant going to his room, she discovered him lying on his back on the floor quite dead. He had a pen in his hand, and upon a desk lay some drawings which he had evidently been executing just before he died. He was in the habit of remaining up all night to work. Dr. Watkin, of King William-street, Strand, said that deceased must have died instantaneously from apoplexy, produced by the excessive amount of work which he accomplished. The jury returned a verdict of "Death from natural causes."

THE PAINTINGS IN THE TUILERIES.

IT is not generally known that when the danger of the pictures in the Tuileries from the impending bombardment of Paris became apparent, Mr. Edwin Chadwick, with the concurrence of some members of the Council of the Society, wrote a letter to M. Michel Chevalier, suggesting that the pictures might be sent over to this country for security, and publicly exhibited for the benefit of the French sick and wounded. It was mentioned that her Majesty had allowed her paintings and objects of art to be lent for exhibitions for public purposes, and that such an exhibition of the paintings of France (of which the Society of Arts would undertake the responsibility) might not be deemed inappropriate, even under ordinary circumstances. An answer has only been recently received from M. Michel

Chevalier, in which he states that he had submitted the suggestion to the authorities who had charge of the *Musee*, but that they had already taken their measures. They charged him, however, to convey to the Council of the Society of Arts, and to Mr. Chadwick, their deep acknowledgments for the suggestion.

COUNTRY PATHS.

SIR.—In a letter to the *Builder*, Mr. G. R. Jesse recommends that our public footpaths and byways should be clearly indicated in the Ordnance maps, with the view of securing the right of way. This would, no doubt, conduce very much to the end proposed; but can any one suggest a means for preserving their "pleasantness?" The landholders now, where they do not attempt to stop our thoroughfares altogether, have an unfortunate habit of replacing the mossy banks and flowing hedges of green country lanes with dead stone walls, some 7 ft. high or more, on either side. Any one may see to advantage the effect produced throughout the Undercliff by this kind of improvement; indeed, such is the rage for innovation that one almost fears even to look at any morsel of natural beauty left in that once lovely district, lest you should draw attention to the spot, and thereby insure its destruction. VECTIS.

HONOUR TO KING ALFRED.

SIR.—Last October the 23th was the 970th anniversary of King Alfred's death. According to Asser, this worthy and illustrious Saxon prince breathed his last on the 26th of October, the week preceding Allhallows Mass day, at Wilton, the place of his first interment, according to the *Chronicon*, vol. xiv, page 119, and was buried in the Saxon runny in that town, upon the site of his own palace, in the year 900. Here he lay two years, and was then removed to Winchester Cathedral; he lay there but one year, then in the year 903 Archbishop Remund took up his body once more, and laying it in a royal porphyry monument, bore it to the new minster in the same cathedral close, built by King Edward the Elder, his son, who paid a golden Marcus for every foot of land upon which it stood, where it remained for a period of 200 years. This brings us to the year 1112, when, according to *Ashburnton's History of England*, "the new minster was taken down and re-erected just outside the city walls of Winchester, at a spot of ground then called Hyde Abbey, because the Beadclerk gave the monks, of whom there were twenty-four appointed to sing a whole hyde of land in a pleasant meadow surrounded by rows of willows, and also by four clear running streams of water. The Norman king gave them ample revenues and liberal charters for good government and their grants of land in the county of Hants, for their own maintenance. So the Abbey of Hyde being finished in the short space of two years, and decorated with increased magnificence and becoming splendour, and by a splendid jewelled cross which Countess gave to the new minster, to be placed before the high altar, valued by Dugdale at no less than 4,894, 13s. 4d., in order to show his respect for the monastery in which the good King was to be last buried, King Henry I., with his queen and courtiers, assisted by Bishop Gifford, of Winchester, and all his clergy in white, carrying crucifixes and palm branches in their hands, went in a grand procession to take up the bodies of King Alfred, his queen, Alwilda, and her two sons (Edward the Elder, also their youngest son), and laying them in new coffins of lead, wood, and stone, they bore them from the cathedral close to the walls of the new minster being all levelled now, to Hyde meadow, where in the year 1112 they lowered them into royal vaults prepared for them in the Abbey choir, before the high altar, and here in this latter Abbey Church they reposed for no less than 686 years in peace. But in the year 1798, a Mr. Page rifled the tombs of all valuables, leaving these royal skeletons in the bottom of the vault, at a depth of 6 ft., coffinless and dishonoured, selling the lead from the coffins; and here just where Mr. Page left them, they were found by Mr. John Mellor in 1858, with part of the royal sceptre in the vault, also an ermine from the royal cape. The bones of this good Saxon king are now lying with those of his pious queen and two sons, in a little brick vault, in St. Bartholomew's chapel-yard, Hyde-street, Winchester, where the late has come to London in order to take steps and see if some national monument may not be raised to this good king's memory, for these are, certainly the bones of Alfred and no other. Will any one help him?"

ANTIQUARY.

SURVEYOR'S CHARGE, KENSINGTON WORKHOUSE INFIRMARY.

SIR.—Referring to a letter in the *Builder* headed as above (p. 871, ante), in justice to ourselves as the surveyors appointed by the guardians, to prepare the quantities for them, we trust you will allow us to contradict the rumour your correspondent alludes to, if it does not, at any rate, in its exaggerated state, emanate from his own fertile brain.

1st. It is not true the guardians will pay directly or indirectly anything like the sum named for preparing the quantities.

2nd. It is untrue that any charge for preparing the quantities, or for any expense connected therewith, was included in the bills of quantities at all.

Our own charges are made direct to the guardians, and the builders made their own arrangements for the payment of their surveyors.

After we were nominated by the guardians, we were informed by the architect that the builders had appointed a firm of surveyors to meet us, on their behalf.

We had, and have, no interest, directly or indirectly, in their appointment.

Whatever their charge be, and we are assured that it is less than one per cent. on the gross contract sum, we have no hesitation in saying that it has been more than compensated for to the interest of the residents, and the competition among the builders, this being one of the eldest competed for works, for its size, reported in your columns, the three lowest tenders varying less than 230l. in a total of over 35,000l., all of them from well-known men, who have carried out satisfactorily similar large contracts.

We cannot help thinking that your correspondent should have ascertained the facts, which, as a ratepayer, he could readily have done, before making such an unwarrantable innuendo against us.

GEORGE LANSBOWY & POLLARD.

P.S.—Your impression of October 18th, p. 804, shows the general feeling of builders as to the desirability of appointing two surveyors in these cases.

. The writer of the letter, signed "Ratepayer," to whom the above has been submitted, declines to accept it as an answer to the "rumour" he referred to. He considers it certain that whether the charges for quantities appeared in the bills or not, the parish, of course, will pay it in one shape or another, and it is this misapprehension that he objects to. He asks why the builders' surveyors have not enlightened the public on the subject, and what they are to receive, and whether they did or did not tell competitors, some if not all, that they were to add such and such a sum to their tenders for the surveyors' charges. The whole system of estimate-making and tender-giving requires overhauling.

FROM BLACKFRIARS BRIDGE TO THE PROBATE OFFICE.

SIR.—Here is a pretty wilderness, or worse! The contract for this work, a work which might have been knocked off in a fortnight, or three weeks at the outside, was, it seems, settled in the month of last June; for on the 1st day of July we find that the Metropolitan Board of Works, on receiving from their Works and General Purposes Committee a report, recommending "That the portion of the footways and carriage-ways of Queen Victoria-street, between Chatham-place and the Probate Office, a distance of about 300 yards, be at once formed, at an estimated cost of about 3,300l., and that the works be executed by Mr. Webster, under the schedule of prices attached to the Thames Embankment Contract No. 1 (which he was executing), at once agreed to the recommendation. Now, this is four months ago. Whose fault is the delay? I know not, but certainly not the Metropolitan Board of Works; for their line does not run under the part of the street in question, except under the eastern half of it, and this was sufficiently finished by the Company before.

JASPER.

BRICKMAKING.

At the Norfolk County Court the case William Cully, brickmaker, v. Robert Burton, gentleman, North Walsham, has been tried. This was an action to recover 27l. 16s. 8d. for having found four clamps of bricks on the premises of the defendant, who paid as much into Court as left 17l. 16s. 8d. in dispute. The hearing occupied a prodigious length of time, partly from the number of witnesses on both sides, and from other causes; but the facts were simple, and the points of interest very limited. The first clamp having been mostly tested, the Deputy-Judge said it was not open for the defendant to dispute their quality; the second clamp was not found fault with; the third clamp was "shaky," while the fourth clamp had not been delivered, although what that means would seem a little difficult to be understood by the uninitiated, seeing that the bricks were made, as stated, on the defendant's own premises. (On behalf of the plaintiff, several witnesses (one of them Mr. James Applegate, brickburner, at Blickling, to the Downgate Marcelline of Lothian), spoke to the bricks made by Mr. Cully as being a very fair sample of clamp bricks; while, unless there was an agreement to the contrary, it was the invariable custom for the person ordering the bricks, and not the brickmaker, to deliver them at his own expense. For the defendant there were also several witnesses of intelligence and respectability, some of whom spoke to the bricks made by the plaintiff as being sufficiently good in quality; and on the same side, Mr. Robinson Cornish, a builder in a large way of business, said that if he ordered 10,000 bricks, he would expect 100,000 bricks that were fit for use, and that he considered he would have a right of set-off against the maker for any that were not capable of being used, although he had no objection to the bricks made by the plaintiff as being no part of a brickburner's duty. The Deputy-Judge said he was satisfied that in the original contract there was no agreement by the plaintiff to deliver, but that it formed part of a subsequent contract, and which was shown by the fact that he had made a charge for unloading the first three clamps. As, therefore, he had not delivered the fourth clamp, and the defendant was entitled to make a deduction for the unused bricks of the first and third clamps, his judgment would be for the defendant, with costs—a decision which seemed to cause the greatest surprise amongst the audience, who had assembled in large numbers to hear the case. The Deputy-Judge, addressing the defendant, said that as the plaintiff must be involved in considerable expense, he hoped that he would deal as fairly as he could with him in regard to the fourth clamp, and allow him for the good bricks, when counting, were found in it.—Mr. Burton assured the Deputy-Judge that he would do anything and everything that was reasonable in the circumstances.

A CHEAP SCHOOL AND RESIDENCE.

THE Vicar of Wysall, Nottingham, writes a letter to the Suffragan Bishop of Nottingham, thus describing a little school and little residence which have been built opposite the church there—

"The school contains accommodation for fifty children, being 25 ft. 3 in. long and 16 ft. 6 in. wide inside. The walls are 11 ft. high. There are four windows 5 ft. high by 4 ft. wide. The porch and chimney, from their workmanship, may fairly be considered ornamental. The residence, which is attached to the school, contains two lower rooms, front room and kitchen. The front room is 12 ft. 6 in. by

11 ft. The kitchen, 11 ft. by 6 ft. 1 in. There are two bed-rooms—front and back; the former, 13 ft. by 11 ft., with bath recess in addition; the latter, 8 ft. by 9 ft. There is also a small pantry under the staircase with lattice window. The outer walls of the whole building are 14 in. thick and built of Broughton bricks, thoroughly well put together. The roof is covered with Staffordshire fancy tiles, placed in tiers after the most approved fashion. There are approved offices to be built. Now for the cost. The school, residence, and offices are built and all materials found, and proper painting done, for an actual outlay of 160l. I give the site out of glebe land in the centre of the parish. The parishoners do the carrying of materials. The work is done by contract by Mr. Wm. Bryane, of Wysall, a most respectable man of good means, who is willing to erect a similar structure for the same sum in any parish within a circuit of twenty miles. The plan might, of course be extended or otherwise, according to agreement."

One is tempted to ask why it was not done before. The money was raised without the least difficulty. It is to be hoped this school will not be found too narrow to admit all in the neighbourhood who require teaching.

"THE CAPTAIN."

SEPTEMBER 7th.

THE low sun shrinks before the sight,

For sorrow cometh on the sea;

As low denseth down the night,—

Waves quiver at the sight.

Cries shall be other than the wind,

Whose fitful gusts are eddying round;

As if the very tempest pined

This night its strength should be unbanned.

The deep-breathed sighs of drowning men

Shall echo in the ocean roar.

With all heart-lifted bends, as by tradition,

A silence sadder than before!

The watch is set; and now they say,

"By morn to-morrow we shall tell

How turret-ships the storm can stay,—

The Captain's safe to do it well!"

Ah me! the midnight hour has dawned,

While fiercer grows the angry billow;

The strong sup'ers bend, as by tradition,

And wild waves o'er its grave have pass'd.

Oh! gallant hearts that cross those seas,

Breathe ye for them this earnest prayer,—

"God rest their souls in His deep peace,

Who that night sank for ever there!"

And if as swift a doom should whelm,—

As short a call for should sound,

Brave men like them, at watch and helm,

May every one of us be found!"

M. Y. F.

THE CHANCEL GATES IN ST. MARY'S CHURCH, TAUNTON.

JUDGMENT has been given by the Rev. Dr. Wallis on this question in the Consistorial Court at Wells, and is as follows:—"The application in this case is for a faculty to erect and set up, between the chancel and nave of the parish church of Saint Mary Magdalene, in Taunton, two gates framed of iron and ornamented with brass, between the north and south portions of the chancel screen. The objections alleged seem to resolve themselves into this—that such gates are intended to effect an excommunication, either actual or 'symbolical,' of the laity from the chancel—an excommunication which, of course, could not be legally justified. The Court considers that it will be obviating this objection, and at the same time effecting the legitimate purpose of the application, by decreeing, as it now does, that the gates be erected as an architectural ornament on condition only that no bolt, bar, lock, or other fastening shall be attached to them, by which to fasten them, to the excommunication of any person at any time, if closed; and that during the time of Divine service they shall always be kept open."

METROPOLITAN MUNICIPAL ASSOCIATION.

ON Monday afternoon a general meeting of the members of this association was held at their offices, Piccadilly, to consider the course to be taken during the ensuing session of Parliament, consequent upon an intimation received from the Government, to the effect that they would not be able to introduce a Bill next year respecting the improved government of the metropolis. Among the gentlemen present were Mr. Chas. Buxton, M.P., who presided; Mr. Thos. Hughes, M.P.; Mr. Edwards, Mr. C. H. Elt, Mr. Dresser Rogers, Dr. Pearce, Mr. J. Beal, and Mr. J. Carr. In a communication received from the Home Secretary, in reply to an inquiry made, it was stated that in consequence of the enormous mass of other important business demanding more immediate attention, the question of the government of the metropolis could not be dealt with next session, but it was hinted that it was very likely the question would be taken up the session after.

In consequence of this definite communication from the Government it was decided not to give the usual notice for legislation next session. The question of the gas and water supplies of the metropolis underwent a good deal of discussion. It was resolved to urge upon the Government the propriety of giving effect to the recommendations made by the Royal Commission on water supplies in 1869, and to secure a uniformity of gas legislation throughout the metropolis by a general measure to that effect. Confidence was expressed in the present Government dealing with these subjects in a truly liberal spirit, and the prospect of a satisfactory settlement of them being near at hand justified the association in congratulating themselves that their efforts had been so far as fruitful as they could expect, considering the many serious prejudices and difficulties that had to be encountered. Mr. J. Beal gave a short sketch of the operations of the association since its commencement, and pointed out that although they were disappointed at the Government not being able to take the matter in hand next session, they had much cause for congratulation.

OXFORD ARCHITECTURAL AND HISTORICAL SOCIETY.

It has been decided to continue the series of walks and excursions of this society commenced in the Lent Term. On account of the shortness of the days at this season of the year, it is thought advisable to restrict the walks to Oxford itself, as it is thought that many members may be glad to take this opportunity for visiting some of the antiquities of the University and city. The following is taken from the list just issued by the local secretaries:—

"XII.—Saturday, November 12, at 2.15 p.m.
THE CATHEDRAL AND CHRIST CHURCH.

Mr. J. H. Parker will conduct the party over the cathedral, pointing out the chief objects of interest, and the architectural discoveries made during the recent work of restoration. The party will then (by permission) visit the Chapter-house and hall, and, if time permit, also the library.

XIII.—Saturday, Nov. 19, at 2.15 p.m.

ST. MARY'S CHURCH AND ALL SOULS' COLLEGE.

The members will be met by the Rev. G. W. Kitchen. At All Souls' College the original drawings of Sir Christopher Wren, and other objects of interest in the library, will be exhibited.

XIV.—Saturday, Nov. 26, at 2.15 p.m.

NEW COLLEGE.

The party will be met by the Rev. C. Adams, Fellow of New College. From the hall they will proceed to the gardens, to inspect the old city walls, with their bastions, thence to the kitchen, of the time of William of Wykeham, thence to the 'Slips,' or ancient city ditch. Thence to the Monument Tower and Library, where some ancient MSS. of great interest will be exhibited. Finally, to the chapel and cloisters."

A WAIL FROM WEYMOUTH.

Poor but pleasant Weymouth is to be pitted at this moment, if ever a town was to be pitted. Its unfortunate Town Council have been for some months in a state of chronic *delirium tremens*, in consequence of the issue of a writ of *elegit* being threatened by certain bankers in Dorchester, who loaned the Council, a considerable time ago, a sum of money to carry out town improvements. The Treasury was memorialised for help, as the income of the Pile Pier is insufficient to pay 5 per cent. interest upon the bonds already issued. Thinking a new rate, or rates, would be dangerous work in the present temper of the towns, and it having been feared, some weeks ago, that the chairs and tables of the Council-room, with other articles, ran the chance of seizure, one of the members supposed that the maces and chains would follow, and ironically hinted that the worthy aldermen might throw in their gowns into the bargain. Another member was so good as to inform the Council that he had warned them twenty years ago, of their bankrupt state; yet it seems things have gone on since without any energetic attempt being made.

A new mayor is spoken of to be elected this month, and we hope that something more will be done towards putting this pleasant watering-

place in a sanitary condition. We would point to the spot known as the Backwater and its surroundings, and would earnestly advise an immediate reclamation of those dismal swamps, and the utilisation of the deep valley of mud and sewage.

It is no fallacy to say that Weymouth, with all the advantages of a beautiful bay, and pleasant environs, is twenty years behind much inferior towns, considering their positions. To effect necessary improvements in the new gardens, and in laying out the Nothe, money is required, and the Treasury will have to be appealed to for 8,000l. or 10,000l., with what chance of success we cannot say. Of course the corporation properties will have to be further pledged and mortgaged. There are several back streets and lanes in a filthy condition. For a contrast we might instance the Esplanade and the old immemorial "Granny Dunn's Lane," the former dry and pleasing, the latter impassable in rough weather. Once more let us urge upon the local authorities, the shameful condition of the Backwater, and the many feculent sewers emptying themselves there upon already accumulated crusted mud and filth.

There is a mine of wealth in Weymouth that can be worked with profit, if her local council will only put their shoulders to the wheel. It is the same with a corporation as with an individual who lives beyond his income, both must work if they would pay off their debts. The town council of Weymouth have, however, ways for helping them in the endeavour, and if they at once set to work resolutely, we shall soon cease to hear of any wail from Weymouth.

ACTION FOR ARCHITECT'S DRAWINGS.

EDWIN D. M'GOWAN.

This case (in Court of Exchequer, November 4th) raised in a new form the question whether an architect is entitled to retain possession of the plans he prepares for a building as against his employer. The plaintiff brought the action against the defendant, a clergyman, for his claim for making plans for a parsonage-house, to be erected at Holmside, in the county of Durham, and at the trial before the Lord Chief Baron, at Guildhall, the jury found a verdict for the plaintiff, damages 106l.

Mr. Aspinall, Q.C., now moved, by leave reserved, for a rule to show cause why the damages should not be reduced by 97l. 1s. The plaintiff prepared the plans, but the house was not erected, and the evidence as to custom was that an architect was paid by commission of 5 per cent. on the actual cost of the building if constructed, and of 3 per cent. on the estimated cost if it was not. Some difference having arisen with regard to the terms of payment, the defendant wrote to the plaintiff that he would send a cheque for his charges, if he forwarded the plans; but he objected to do that, on the ground that it was contrary to the rules of the profession.

The Lord Chief Baron said this was a question of great importance, and possibly of some difficulty, and he was not prepared to say it was not one of law; but he left it to the jury to consider whether, in a contract of this nature, the building not having been constructed, the architect was entitled to retain his plans, and it must be taken from their verdict that they found he was. On one side, it might be said that if an architect was obliged to give up his plans, they might be placed in incompetent hands, and discredit be brought upon his reputation; and also that he would be deprived of the increased remuneration to which he would be entitled when the building was proceeded with. On the other hand, if the defendant paid the 3 per cent., he got nothing in return if the architect kept the plans.

Mr. Baron Bramwell.—If an architect be employed to make plans of a building, and be paid, it seems preposterous, almost childish, to say that he shall retain them. How is the building to be constructed? If parties employ him on the understanding that he is to superintend the erection, and then dismiss him after the plans are prepared, and before the building is completed, he can bring an action for improper dismissal or the loss he has sustained.

The Court granted a rule nisi.

The Royal Architectural Museum.

The Marquis of Bute has become a Vice-President of the Museum, and has sent a donation for its building fund.

FRENCH CASEMENTS.

SIR,—I have carefully read the letters of your correspondents on the above subject, and have observed that while they have entered into a variety of ways of hanging sashes, not one of them has grappled with my question.

You in your editorial note said that the French windows did not suit this climate, and one of your correspondents said they had been tried, but had failed; but none of them have entered into a practical or philosophical reason why sashes are preferred to the French plan.

As regards climate, I am utterly at a loss to understand that objection, but suppose it is assumed that the French windows would not suit this cold climate. Now I am an old house-keeper, of more than forty years' standing, and have lived in various houses in England, Scotland, Ireland, and Wales, and am not without experience in the construction of windows. The last house I lived in, in Islington, had sashes, where the cords were often broken, and they shook so on a windy night that they were obliged to be wedged or I could not have slept.

The windows of my present house are hung on the French plan, and are:—1. Easily opened, even by a child; 2. They are easily and safely cleaned; 3. There are no cords to break; 4. They do not rattle or shake; and, 5. The ventilation is perfect and unobjectionable.

In your editorial note you said there was an advantage in the sash, as the upper sash only could be opened for ventilation, whereas on the French plan the whole window must be opened. But I venture to say that you cannot open the upper sash without a down-draught, but you can open the right half of the French window, and throw the wind into the left side of the room, and you can sit behind the half so opened, and feel no draught, and *vice versa*. I do not speak theoretically, but practically; and with all these objections to the sash, and all these advantages in the French window, I should be glad to know why we retain the clumsy, dangerous, rattling sash in preference to the French plan.

I may also say that my present windows fit closer and are warmer than any sashes I have met with during the last forty years. M. H.

STAINED GLASS.

Redditch Church.—The large west window of this Church has recently been filled with stained glass by public subscription, to the memory of the late Baroness Windsor. The principal subjects illustrated are Feeding the Hungry, Giving Drink to the Thirsty, Clothing the Naked, Visiting the Sick. The cost was 200l. The window was designed and executed by Mr. Preedy, architect, who has also executed other memorial windows, having in view the same object, in two new churches in the adjoining parishes, erected from his designs. The one church, at Webbhead, was erected entirely at the expense of the late Baroness Windsor; the other, at Headless Cross, was materially assisted by liberal contributions from the same source.

Carlton Church.—An east window has recently been erected in this church to the memory of Mr. A. J. Wright. The window, which is the work of Messrs. Wailes, of Newcastle, consists of three lights; the central portion representing the Crucifixion, that on the north side the Entombment, and that on the south side the Resurrection. Under the Crucifixion is Christ healing the sick. Above the centre light is a quatrefoil containing the Agnus Dei, and on either side is a trefoil containing an angel holding a scroll, on which is inscribed, "Worthy is the Lamb that was slain."

Girencester Church.—Two stained windows have recently been added to this church; one to commemorate the ministry of the Rev. Canon Powell, and the other in memory of the late Mr. Robert Croome and his family. The first-named of these windows is placed in the north-west corner of the church. It consists chiefly of four figures, the first representing Melchizedek as a type of the old priesthood, with the bread and wine in his hands, and at his feet is a scroll bearing the words, "I will raise me up a faithful priest." The next figure is that of Aaron, in his high-priest's robes, carrying the rod that budded, underneath which is the text, "Let thy priests be clothed with righteousness." St. John the Baptist is represented in the third figure, in his robe of camel's hair, holding a lamb in his arms, near to which are the Latin words for "Behold

the Lamb," while at the feet of this figure also is an inscription,—"To give knowledge of salvation unto his people." In the fourth, and last light is a representation of St. Timothy, dressed as an early Christian bishop, underneath him being the words, "Who hath saved us, and called us with a holy calling." Each of these figures forms a light in itself, and the whole is surmounted by canopies containing six winged cherubim. The expense of the window will amount to about 250*l*. The window to the memory of the Croome family is of a lighter character than the other, and is placed immediately over the chancel arch. It is composed of seven lights, the centre one of which represents our Lord seated in majesty, crowned as King of heaven and earth; and in each of the lights adjoining on either side are the figures of three cherubim, rising one above another. The next figure to the left is that of St. Michael, clad in armour, and holding his sword; while the outer light on the same side represents the angel Gabriel with an olive branch, symbolical of peace. Next to the cherubim on the right side is Raphael, carrying a fish in his hand; and in the last light on this side is represented the Angel of Prayer, with his censor, offering up incense. The figures in this window also are surmounted by six winged cherubim in canopies, which harmonise generally with the other windows of the building. Mr. Hardman, of Birmingham, supplied the windows.

Whitnash Church.—A memorial window to the late Rev. J. W. Kitto, formerly curate of Whitnash, has been placed in the parish church. The work has been executed by Mr. Wm. Holland, of Warwick. It consists of two lights, with tracery in the upper part. Above is the mystic dove "that is covered with silver wings, and her feathers like gold," and below are two baptismal subjects. Nearest to the font is a representation of the baptism by St. Paul of the jailor and his family at Philippi (Acts xvi. 25-34). One of the attendants holds a torch, which throws a ruddy glow on the principal figures. On the ground is a vessel full of water, copied from one in the possession of the rector, which was modelled from a *terra* of the age of Augustus Cæsar, being part of the plate of the Roman army under Varus, which was routed and utterly destroyed by Arminius, or, as he is called by the Germans, Hermann. It seems that the Romans, when sore pressed in the defiles of the Thuringian forest, buried their valuables in the ground, with the intention of returning the following year. These articles were found in the year 1868, when Prussian engineers were making excavations for the fortifications of Hildersheim. Beneath is inscribed the exclamation of the jailor, on his conversion, "What must I do to be saved?" The other subject is the baptism of the treasurer of Queen Candace by St. Philip the Deacon (Acts viii. 27-40). The chariot and attendants are in the background; the Ethiopian, with his dark skin and richly jewelled dress, stands in the water, in an attitude of prayer; while St. Philip pours the water on his head. Beneath are the words (verse 36), "What doth hinder me to be baptized?" The cost of the window has been defrayed, within a small sum, by subscriptions paid before its erection.

Chippenhams Church.—A stained glass window has just been completed in the south aisle of this church, the offering of Mrs. Elizabeth Lewis, of this town, to the memory of her husband, Mr. William Lewis (late a tradesman in Chippenhams), and W. H. Lewis, their only child. The window consists of four lights, and the subjects are—1st, Hannah bringing Samuel to Eli; 2nd, our Saviour conversing with the Doctors in the Temple; 3rd, our Saviour working at his trade; and, 4th, little children being brought to Christ. In the lower part of each light are represented two of the Apostles; the other six,—that is, including St. Paul and St. Barnabas,—are inserted in the six larger openings in the head of the window. The subjects in each light are surmounted by a perpendicular canopy. The artists were Messrs. Lavers, Barrand, & Westlake, of London. We understand that it is in contemplation to endeavour to raise a sufficient sum to build a new north aisle to the church, and also to restore the edifice.

The Parliament House, Edinburgh.—Among the improvements and embellishments effected on the Parliament House during the recess of the Court of Session not the least important has been the substitution of stained glass for the ordinary common glass in the four windows lighting the hall. The hall being lighted mainly by these windows, considerable difficulty was

experienced in the proper execution of the work. One result, a serious one, of darkening the room, would have been to completely spoil the effect of the many specimens of sculpture in the room, as well as of numerous paintings with which the walls are hung. This, and the inconvenience which would result to members of the Bar from an obscurely-lighted room, were difficulties that had to be contended against. The windows are each divided into two lights, terminating in four tracery shapes. There are a large central shield and four smaller ones, enriched with crest, helmet, mantling, &c., in each light, and a crest in each of the tracery compartments. These display a variety of detail and colour, and are placed upon a white groundwork of rough crystalline glass, cut up in various designs of lead-work. The stained glass has been put in by the representatives and friends of distinguished members of the Faculty of Advocates. The first window, or that next the great window at the end of the hall, where are already placed coats of arms of Lords President of the Court of Session up to the present date—is devoted exclusively to the armorial bearings of Lords Justice-Clerk. At the foot of the first light is the following inscription:—

"In memory of Robert Macqueen, of Brasfield, advocate, these shields of Lords Justice-Clerk, of which that of Lord Brasfield, his grandfather, is the central, are placed in this window by E. Anne Macqueen, his widow."

That on the second light runs thus:—

"Dedicated to John Hope, Lord Justice-Clerk, by his son William and his widow."

The second window is devoted to the great legal writers of the Faculty of Advocates, and has the following inscription:—

"Commenced 1569, James Moncrieff, Dean; completed 1870, E. S. Gordon, Dean."

The third window, that of the Deans of Faculty, is inscribed thus:—

"These heraldic memorials of Deans of the Faculty of Advocates have been placed in this window in remembrance of Francis Jeffrey, not the least illustrious of their number, by the trustees appointed to erect a monument to his memory—Sir John McNeill, James Gibson-Craig, and Cosmo Innes, 1870."

The first light of the fourth window—that of Lords Advocate—bears the following inscription:—

"Dedicated to the memory of the Right Honourable Sir William Rae, Bart., Lord Advocate, by his Niece, Eliza Colt Rae; "

and in the second light are the words:—

"Dedicated to the memory of the Right Honourable Andrew Rutherford, Lord Advocate, by his nephews, Andrew Rutherford and Andrew Rutherford Cark, advocates."

We understand that the whole question of treating the stained glass in these windows was submitted to Sir George Harvey, P.R.S.A., who recommended the present treatment, and who also gave his assistance in superintending the designs and colouring. The whole of the work has been executed by Messrs. Ballantine & Son.

Great Yarmouth Church.—A painted window, to the memory of Mr. Paget, father of Mr. Jas. Paget, surgeon extraordinary to her Majesty, has just been placed in the south aisle of the parish church, next to the memorial window to the late Charles Cory, for eighteen years town clerk of Yarmouth. The three Prophets, Elijah, Elisha, and Isaiah, are represented in the Paget window.

Birstal.—The restoration of the parish church has just been completed by the opening of a new organ built by Mr. Hopkinson, of Birstal, at a cost of upwards of 400*l*. The organ is said to be a very complete and fine-toned instrument. This church has recently been enriched by the addition of two stained-glass windows, furnished by Messrs. O'Connor, of London. The east window of the south chapel has been provided by the present churchwarden of the parish, Mr. John Greenwood, of Birstal, as a memorial of his two sons, and has for its subject "Christ blessing Little Children." In the first light are groups of women and children, kneeling and standing, and a figure of St. John the Divine; in the second, a further group of mothers and children; in the third, a figure of our Lord seated, as if commanding the children to be brought to Him; the fourth, a figure of St. Peter, behind whom stands a mother with her child. The whole is framed in rich canopies, and with delicate bases of grisaille and grisaille tracery. The east window of the north chapel has been put in at the cost of Mrs. Eyres, of Birstal, in memory of her husband. Its subject is the "Call of St. Matthew." In the first light are figures of St. Peter, St. James, and St. John; in the second, a figure

of our Lord beckoning to St. Matthew; in the third, St. Matthew is seen emerging from the custom-house, and advancing to meet the Saviour; and in the fourth are figures of a receiver of revenues and of a peasant who is transacting business. The canopies and tracery are equally elaborate with those in the Greenwood window; the bases are of an architectural design, with crown and palm-branch in each.

CHURCH-BUILDING NEWS.

Desborough.—The parish church of St. Giles, Desborough, near Kettering, has been re-opened for divine service, after having been closed for about four months for partial restoration. The edifice was in a very dilapidated,—in fact, in almost a ruinous condition. The work has been commenced, but the resources of the parish are small, and the work is, therefore, one of considerable difficulty. In order to meet the circumstances of the case, the restoration has been divided into three sections, the first of which has just been completed, under the direction and from the plans of Mr. E. F. Law, of Northampton, architect. A west gallery has been taken down, and a west arch has been opened, admitting to view a tower window, which was given to the church more than twenty years ago, by Mr. Biggs, but which was so lost to sight that many persons were unaware of its existence. The sum required for a restoration of the church, exclusive of the chancel, was 1,600*l*., and the first portion of the work has been done at a cost of 530*l*. The roof of the nave was restored some years since, but new roofs have been put to the aisles and transepts. The work already done has been executed by Mr. Kightly, of Northampton, builder.

Stony Stratford.—The foundation-stone of a new chapel has been laid at St. Paul's, Stony Stratford. The new chapel will be erected on the plan of the collegiate churches of the universities, and will combine the usual features of ante-chapel, choir, and sacristy, with the addition of transepts on either side of the chancel, to accommodate the servants of the college, and for the organ-chamber and vestry. The materials used will be the local stone, of a warm tint, with quoins and dressings of red brick, in uniformity with the existing collegiate buildings. Internally, the arches, strings, and other architectural features will be of red brick, grey granite being used for the chancel-arch piers; the capitals and other sculptured work being executed in Bath stone. The entrance to the ante-chapel will be by a deeply-recessed and moulded door, divided by a central pier supporting a stone carved cross, which will fill the tympanum. Another, but less ornate, doorway will lead from the ante-chapel into the choir. There will be benches for the scholars arranged choirwise, and stalls for the clergy in the chancel. The floors throughout will be laid with encaustic tiles of appropriate design. The roof will be of wagon form, ribbed at intervals, and with moulded cornice tie-beams and shafted king-posts, dividing the space into four bays. This, and the ceiling of the chancel will eventually be decorated in colour. The windows are lofty coupled lancets, under a combining arch, with a circular light in the head. A lofty flight of steps will lead into the chancel, which is to contain an altar of oak and marble combined, and the sacristy will terminate in a semi-circular apse. There will be windows in this portion of the church, as the walls will eventually be decorated with frescoes representing the life of St. Paul. Above the chancel will rise a lofty spirelet, which will be glazed with toned glass, to throw a softened light upon the altar. The dimensions will be 100 ft. for the total length, and 30 ft. wide, with an internal length of 41 ft. The architects who have been commissioned by the Rev. Walter M. Hatch, the Warden, with this work, are Messrs. Goldie & Child, of London, and its execution from the plans and under the direction of this firm, has been undertaken by Mr. Aveline, builder, Stony Stratford.

Kirby-le-Soken.—The parish church here has been restored and reopened. The work of restoration was commenced in August last, and after the roof of the chancel had been removed the south wall was discovered to be in such a very dilapidated condition that it was found necessary to rebuild it. While in course of being pulled down, a double piscina, in a good state of preservation, with portions of a single-light window above, and in addition the remains of a stone arch, which originally formed the

entrance to a Lady Chapel, were discovered, and have been preserved and refixed in their original positions. The plastering of the external walls has been removed, and the whole refaced with stone rubble. The new open-timbered roof of the chancel is of fir, stained and varnished, and the boarding is covered with felt and plain tiles, surmounted with a crested ridge, the east gable having a moulded stone coping and foliated cross. The two windows on the north side are worked in Bath stone to match the original, and have been filled with cathedral glass. The east window is entirely new. The stained glass is by Messrs. Francis, of London, and the window is the gift of Mr. R. Blanchard, in memory of his wife. The floor of the chancel is paved with Maw's encaustic tiles; and new stone steps to chancel and communion are provided. The benches and book fronts are of oak. The old wooden girder separating the chancel from the nave has been substituted by a moulded arch and jambs in Bath stone. Four new windows, filled with cathedral glass, have also been erected in the nave, and the upper portion of the western arch has been thrown open. The whole of the works have been carried out by Mr. Joseph Grimes, of Colchester, from designs by Mr. Henry Stone, of London, architect.

York.—The church of St. Mary, Castlegate, which is the oldest and most interesting in this city in an historical point of view, has been reopened for divine service, after undergoing restoration, at a cost of about 4,000*l.*, undertaken by the dean on his own responsibility. In recognition of the liberality of the dean, the three-light east window of the chancel has been filled, at the expense of the parishioners and others, with stained glass, by Mr. Gibbs, of London, the nativity of our Lord at Bethlehem being represented in the centre light, and the adoration of the shepherds in the two side lights. All the seats in the church are free. Besides the lowering of the churchyard, a brick wall and railing, which concealed the church, have been replaced by an open railing on the level of the pavement, which allows of the church being seen down to its base.

Wexham.—It has been decided to restore All Saints' Church. Some months ago the parish vestry passed a resolution affirming the desirability of the restoration, and Mr. Freedy having been requested to report on the condition and requirements of the fabric, he has now done so, and it appears therefrom that the walls have been undermined by vaults and graves till they have become greatly out of the perpendicular. This necessitates their being to a considerable extent rebuilt. Much of the roofing, too, is in a dangerous state, and the architect points out several inconveniences and deficiencies in the present state of the church which he proposes to remedy, such as the widening of the chancel and providing a vestry-room; he also recommends a new rood. The heating of the church is to be by hot water. Estimated cost of the whole work, 4,500*l.*

Thornton.—The memorial-stone of St. James's Church, Thornton, has been laid with full Masonic honours, by the Earl de Grey and Ripon, K.G., Grand Master of England, in his character of Provincial Grand Master of West Yorkshire. The new building is to take the place of that in which the congregation of St. James's, Thornton, now worship, and will stand opposite to it on the Bradford-road. The total cost of the building will be about 5,000*l.*, which sum is being raised by subscription. In the design, which was prepared by Messrs. T. H. & F. Healey, a spire is shown, but this would entail a cost of 1,000*l.* additional. The land for the church has been presented gratuitously by Mr. John Foster, of Hornby Castle. It is worth observing that the Rev. P. Brontë, father of the celebrated authoress, held the curacy of Thornton from 1815 to 1820, when he removed to Haworth. The church has been already built on the east and north sides to a height of 12 ft., and the memorial stone is at the south-west corner of the chancel.

Bolton.—The memorial-stone of a new church to be dedicated to St. Stephen, Kersey Moor, has been laid. So long ago as 1860, a new church was projected in this locality by the late Mr. Harrison Blair, of Peel Hall; but owing to difficulties mainly connected with its site, its erection was unavoidably delayed. In the early part of this year, when there was a prospect of his object being accomplished, Mr. Blair was suddenly cut off by death. His elder brother, Mr. Stephen Blair, of Mill Hill House, however, generously took up the work which had been inaugurated under such difficulties, and as he

was then the Provincial Grand Master of the Order of Freemasons for East Lancashire, it had been arranged that he should lay the corner stone with Masonic honours. But this again was prevented from being carried out, for Mr. Stephen Blair died in a few months afterwards. The necessary funds, however, having been provided, it was decided that the works should proceed. Miss Blair having expressed the mortar, the stone was lowered into position, and Miss Florence Blair then struck it upon the four corners with the mallet, Miss Ellen Jane Blair applied the square to it, and Miss Frances Blair manipulated the level. All four afterwards declared the stone to be laid, in the following terms:—"In the faith of Jesus Christ, we lay this corner stone of a church, to bear the name of St. Stephen, in the name of the Father, and of the Son, and of the Holy Ghost. Amen." As the young ladies were all daughters of the late Mr. Harrison Blair, the handle of the trowel, as well as all the other implements, were constructed of ebony.

Doulting (near Shapton Mallet).—The parish church of Doulting is being restored. Major Paget, M.P., the lord of the manor, has given 1,000*l.*, and the Rev. Prebendary Horner, of Mells, the rector, has undertaken the restoration of the chancel at his sole cost, besides subscribing 1,000*l.* towards the nave and transepts. The farmers of the parish have also contributed liberally, and the masons working in the village (working overtime) have done the west window, the cost of their work being 40*l.*

Cumbrieth.—The newly-built church, dedicated to St. Peter, and erected at the expense of Mrs. Jeffery, widow of the late rector of the adjoining parish of Otterhampton, has been consecrated. The work has been in progress for nearly three years. The builder has been Mr. Squibbs, and the architect Mr. C. Knowles, both of Bridgewater. The edifice, which has a spire, will accommodate about 240 persons. The whole of the sittings will be free and unappropriated. There are several stained-glass windows, the largest of these being the memorial window to the late Dr. Jeffery. The building cost about 2,000*l.*

Hargrave.—The parish church of Hargrave has been re-opened, after a restoration. The church consists of tower and spire, nave, north and south aisles, north transept, chancel, and south porch. The edifice has been restored from the plans, and under the direction, of Mr. W. Lewis Baker, of London, architect, the brother of the rector, by Mr. Henson, of Finedon. The lead work, glazing, and painting, were done by Mr. Downing, of Finedon, and the joiners' work in connexion with the seats, roofs, rood screen, &c., was executed by Mr. Knibbs, of Finedon, and Mr. Coleman, of Tilbrook. The tower and spire, which were in a dangerous state, have been taken down and rebuilt. A new vestry has been attached to the chancel, and the old south porch, which covered up a part of the church door, has been replaced with a new porch, erected by Mrs. Baker and her eight children to the memory of the late rector, the Rev. W. L. Baker. The low roofs in the chancel have been replaced with high-pitched roofs, and new seats have been provided in the nave, the old material having been used so far as it would go. The old screen has been retained, but has been decorated. The painting was restored from traces which remained of the original colouring, aided by advice kindly given by Mr. Butterfield, architect, and Mr. Brandon. The chancel has been newly tiled, and a new plain east window has been put in. The old communion-table remains, but there is a new rood. There are new seats in the chancel. The west arch has been opened out. The seats, cresting of the screen, pulpit-steps, altar-table, re-table, and other portions of the church, have been carved by the rector, by whom also the remaining portion of the carving will be done as he finds time. The work has been in progress about three years, and in the course of it several stone coffins were found lying in the direction of east and west, near the porch. It was always known, from documents, that a still more ancient church existed before the present one, and this was corroborated by the finding of numbers of interments under and within the present walls. The work of the architect has been without pecuniary remuneration.

Wednesday Town-hall Competition.—It is objected that the name of the authors of the selected design, "Loxton Brothers," was written on the drawings; further, that one of the firm is a member of the selecting committee.

DISSENTING CHURCH BUILDING NEWS.

Longton.—The new Unitarian chapel and school building at Longton, the foundation-stone of which was laid by Mr. George Melly, M.P., in February last, has been opened. The building is capable of accommodating about 200, a spacious schoolroom being also provided. It has been erected from the plans and under the superintendence of Mr. James Rigby, on a piece of ground on the Stone-road, leased for ninety-nine years by the Duke of Sutherland. The building has cost about 700*l.*, towards which there remain to be obtained about 200*l.*

Wolverhampton.—The United Presbyterians have put up a new church in Wolverhampton. The site is at the corner of the Meridale-road, near to Chapel Ash. Here for more than seven years past the denomination have had a lecture-room, in which public worship has been conducted. Consequent upon the form of the site, the contract is 2,846*l.* The builder is Mr. Cockerill, of Wolverhampton; and the architect from whose designs and under whose superintendence the whole of the works have been carried out, is Mr. Bidlake, of Wolverhampton. The contract is exclusive of the gas-fittings, the pewing, the palisading, and outer gate. The land has yet to be paid for; but the lecture-hall, which cost the congregation 400*l.*, is without burden.

Grantham.—The Congregational church, St. Peter's Hill, Grantham, has been formally opened for public worship. The church occupies a central site at the junction of Avenue-road and Castlegate with St. Peter's Hill, and is adjacent to the new town-hall. The style of architecture adopted is the English Gothic of thirteenth century, the material used for the walling being Ancaster stone, lined with bricks. The church consists, on plan, of a nave and side aisles, divided by two rows of columns and arches. The columns have cast-iron shafts and stone caps and bases, the caps being carved with conventional foliage. The arches are 22 in. thick; they are of brick, plastered; and, together with the iron shafts, are decorated in colour, in a style suited to the material. The diameter of the shafts is 11 in., and there being no side galleries, the entire height of the columns, including the capitals and bases, is not more than 10 ft. There is a gallery at the end of the church opposite the pulpit, and a transeptal projection of the north bay of the east aisle forms a recess for the organ. Behind the pulpit is an arched recess, the jambs of which are ornamented with detached shafts with carved caps and moulded bands and bases. The upper part of the wall at the back of this recess is filled by five lancet windows with trefoil cusping in the heads, the mullions between them having engaged shafts with moulded caps and bases, and the lower part with ornamental gabled and geometrical tracery panelling of pitch pine. The pulpit is low, and of the platform type. It is of red deal, and ornamented with flat geometrical tracery and attached shafts. The windows behind the pulpit are to be filled with stained glass, and the panels below them with illuminated ornament and inscriptions. The front gable of the church, which faces towards Avenue-road has a five-light geometrical tracery window and three lancet lights below it, and is flanked on the east side by a gabled entrance porch. The front next Castlegate is divided into four bays each, including a two-light geometrical tracery window, finished with a parapet of open arading. The north bay has a high-pitched transeptal gable. At the south-west angle of the building is a turret, 70 ft. high, with lancet openings, having engaged shafts and moulded arches, the upper part of the spire being crocketed and finished with a wrought-iron cross. The entrance doorways have moulded arches and jambs, the latter having detached shafts with moulded caps and bases. The church seats 600 persons, and there are two vestries at the north end. Beyond the vestries is a school or lecture-room capable of accommodating 250 adults, and adjoining and communicating with it by folding doors are three class-rooms, each seating 20 persons. An infant class-room for 30 infants, kitchen accommodation, and other conveniences are also provided. A minister's house, containing three sitting-rooms, kitchens, and seven bed-rooms, has also been erected on the site. The cost of the church, schools, and manse, including all charges, exclusive of the cost of the site, will be under 4,000*l.* The work generally has been executed by Messrs. Rudd & Son, the plumber and glazier's work by Mr. Lincoln, the carving

by Mr. Matthews, and the painters and decorator's work by Mr. Green, all of Grantham. The church is heated by Blake's patent hot-air apparatus. The architect was Mr. James Tait, of Leicester.

Liverpool.—The foundation-stone of a new Congregational Chapel, to be erected at the corner of Ullet-road and Aigburth-road, Prince's Park, has been laid by Mr. Wm. Crofield, J.P. The chapel has been designed with special reference to the site it is to occupy. The ground-plan consists of a nave and transepts, with deeply-recessed organ-chancel, deacons' and minister's vestries, and lavatories. At the angle formed by the junction of the two roads there are to be a lofty tower and spire, about 160 ft. to the summit of the finial. In the base of the tower there is an archway, which forms the entrance to the north gallery, and also to the body of the church. There are two other entrances at the north end of the building,—one in the centre, which opens into a corridor which leads right and left to the aisle doors; and the other by a porch on the east side of the main front, which communicates with the aisle doors. There are two other entrances at the south end of the church, folding doors to keep out draughts being fixed to each of the entrances. The main front to Ullet-road rises with a gable in the centre to a height of about 60 ft., and has a traceried window in the upper part, 20 ft. high and 10 ft. wide, the tracery being of geometrical character, and belonging to the Middle Pointed period of English architecture. There is an arcade of windows at a lower level to light the entrance corridor, also having geometrical tracery, with shafts and carved capitals dividing the arcade into triplets; one at each side of the central entrance doorway, and the three front doorways have deep moulded pillars, with carved capitals. The tower and spire form the leading features of the front. The whole of the exterior is constructed in Burnley parpinto on cased courses, with yellow Stourton plinth groins and other dressings, and lined with brick-work inside, the spire being cased entirely of yellow Stourton stone. The gables and summit of the spire will be finished with metallic crosses and finials from the architect's designs. The interior will give sitting for about 800 persons. The benches will be open, of pitch pine, stained and varnished, and a lining of pitch-pine timber, with carved cresting, will run round the inner walls of the church below the eills of the windows. The roof is to be open-timbered, stained, and varnished, with space between the spars to ensure an equable temperature both in summer and winter. The windows will be glazed with cathedral glass, worked into a Gothic pattern in quarries or diamonds of several tints of colour. The apse will have a coved and arched ceiling, with shafts, panels, and other enrichments. The church will be heated by hot-water apparatus. The design for this church was selected out of about twenty designs in competition. The architect is Mr. H. H. Vale, of Liverpool. Mr. Crawley is the clerk of the works. The contractors are Messrs. Wisbart & Irving, of Southport, builders; Mr. Greenwood, of Southport, is the sub-contractor for the masonry; Mr. Burnard, of Southport, for the plumbing, staining, and glazing; Mr. Bimson for the brickwork; and Mr. Rogerson, of Liverpool, is the carver.

Throckley (Newcastle-upon-Tyne).—The new Wesleyan Methodist Chapel at Throckley, which was commenced about twelve months ago, has now been opened. This building occupies a site on the north side of the turnpike-road from Newcastle to Corbridge, &c., and forms a prominent object for some distance. The chapel consists of a nave and east aisle: at the south end of the latter is placed the porch with the bell-turret. Part of the aisle is screened off for a vestry. The nave, 58 ft. long by 23 ft. wide, presents a gable 38 ft. high towards the road, in the lower part of which are three lancet lights, with a circular six-foil window over them. The turret is placed at the south corner of the nave; it is upwards of 60 ft. from the ground to the top of the nave. The spire is slated, and finished by a wrought-iron finial and gilded vane. The north end of the nave is apsidal, and surrounded externally by a wrought-iron cross with three lancet lights (which are intended to be filled with stained glass); these windows are more ornamental than those at the side, as befitting the Communion end of the chapel. The roof has a wagon-headed ceiling, lined with wood, with oak-moulded tie-beams, ring-post and moulded ribs. The aisle, 10 ft. wide, is separated from the nave by an arcade of metal columns,

with wood-arched braces supporting the beam carrying the end of the tie-beams. The roof over this part is a lean-to one. The pulpit is placed near the west wall on the chord of the apse, and the seats are arranged on each side of a central aisle, the east aisle being devoted to Sunday-school children and the choir. A considerable number of the seats are free, though no difference is made in their appearance from those which are intended to be appropriated. Sittings are provided in the nave for 186 adults, and in the aisle for 19 singers and 40 children,—total, 245, which, by the use of chairs, could be raised to accommodate 280 persons. The building has been constructed by Messrs. Hunter (mason); Barn (joiner); Walker & Co., of Percy Works, Newcastle, (ironfounders); Patton (plumber); Wilkinson (plasterer); Dawber (slater); Richardson (painter and glazier), all of Newcastle. Mr. F. R. N. Haswell, of North Shields, was the architect. The entire cost has been 1,000*l.*, defrayed by Mr. William Stephenson, of Throckley House, in conjunction with his sons, Mr. William Haswell Stephenson, Mr. Hugh Stephenson, and Mr. Chas. Stephenson.

Books Received.

The Proverbs of Solomon, classified and arranged as Maxims for Conduct and a Guide through Life. London: HAMILTON, ADAMS, & Co.; Liverpool: WALMSLEY.

In this little book we have a successful attempt to classify and bring together the Proverbs of Solomon. These are given under twenty-seven heads, such as, "Wisdom and Knowledge," "Education," "Strife and Contention," "Industry and Idleness," and so on; and a mine of wisdom they present. The idea was an excellent one, and it has been well carried out. The initials to the preface, J. A. P., will be recognised by many more of our readers than those who dwell in Liverpool. The binding, although simple, is very elegant in design.

The Post-Office Directory of the Building Trades: comprising every Trade and Profession in any way connected with the Architectural and Building Trades throughout England, Scotland, and Wales. London: Kelly & Co. 1870.

An advertisement of this work in our pages a few weeks ago will serve to show the number of professions and trades included in it. The index of towns and places mentioned occupies twelve pages of the work. Architects may object, and with some reason, to being included without distinction amongst the "Building Trades;" however, that is a matter of taste, and does not interfere with the fact that the book contains a large amount of information, in its own direction, and will be found very valuable by many. Lists are given of the Metropolitan Board of Works, Metropolitan Vestries, District Boards of Works, and of the Borough and County Surveyors.

VARIORUM.

A WRITER in the current number of the *Art Journal*, in the course of an article headed "Rome the Capital of the World of Art," says,— "Italy floods to Rome. Sites are already demanded for ministries, for manufactures, for commercial establishments. A new life is thought to await the Eternal City,—a third period of European empire. We shall be asked to send some of the money now accumulating in our banks to give an impetus to Roman regeneration. We have only one word to say on that subject. We hope that regenerated Italy,—to date, let us say, from the 2nd of October, 1870,—will abandon that bad practice of Naples, of Sardinia, and of other integral portions of *Italia Una*,—of sucking the orange, and then throwing away the skin. Let our artists, our engineers, and our capitalists, remember the story of the Brindisi Railway, of the canalisation of the Po, and of other works carried on for the exclusive benefit of the Italians by money found in this country, and see that for any aid they may render their rights are largely and indisputably secured. Otherwise, even for the unveiling of the Rome of Augustus, or of the treasures hidden by the Tiber, let us suggest that, for the very first time in her history, since the age of Odoacer, *Italia farsa da se.*"—The Registrar-General, in his last "Quarterly Return," writes,— "The sewage question has made such progress that towns are no longer excusable for neglecting to deal with it. It is agreed that the excreta

should no longer be thrown into rivers, but be rapidly restored to the earth; and this can be done by the dry or wet method, according to the circumstances of each case. What is wanted in human habitations is sweetness and cleanliness. Then follow, as the next great social work of the age, improved dwellings for the industrious classes, and the demolition of all the fever-dens of the land. This is a European question; and while it is the unhappiness of two great nations on the Continent to be engaged, at the expense of millions of treasure, in deadly struggles for the destruction of each other's lives, it will well become England to open the better way, and to employ the powers science and wealth have placed in her hands for healing men, and for developing the physical and the diviner faculties of the English race. Should her example excite emulation in other countries, we shall see, besides the great struggles for the supremacy of races, common efforts to improve the conditions of life, to diffuse knowledge, to mitigate human suffering, to increase virtue, to elevate intelligence, and thus to conquer the standing armies of disease and death; works of vaster amplitude and greater difficulty than the capture of cities, the subjugation of nations, or the destruction of armies."

Miscellanea.

Bothouse Ventilation.—Mr. Ormson, at the last exhibition of the Royal Horticultural Society at Oxford, exhibited the model of an improved house, in which provision was made for winter ventilation by arranging that the air should be duly warmed before its admission. The form of pipe employed is that of a hollow cylinder, possessing a heating surface equal to four 4-in. pipes, or more, if necessary. The external air is admitted through a tube, nicely adjusted to valves in the front wall, and connected to the interior of these cylinders, where, as a matter of course, it becomes rarified, and consequently forced out through openings provided in the cylinders into the house, by the denser air which is constantly pressing in. Such a stream of warmed air rushing into either a bothouse or apartment will keep the air of such places constantly moving, through the displacement of the cooler particles by the warmer, and *vice versa*, so long as a portion can find escape; and this Mr. Ormson has provided for by hollow rafters having zinc panels, perforated on their lower side, and a valve at the top of each rafter communicating with the chamber shown at the top of the back wall, through which it escapes by iron gratings in the face of the wall above the glass roof. This plan of heating may be used in public and other buildings where large masses of people congregate together, as the vitiated air constantly passes away, and its place is supplied by fresh warmed air, which, unlike the cold draughts usually admitted by windows, would neither chill tender plants nor give cold to individuals. The bothouses themselves are rendered light in appearance by the use of very large glass of great thickness, and the plan of glazing is such that no putty is exposed to the destructive influence of the atmosphere.

The Society of Arts.—The session will commence on Wednesday, November 16th, when the opening address will be delivered by Lord Henry G. Lennox, and when the Prince Consort's prize, awarded at the last examinations to Mr. Edward Turner Sims, as well as the medals awarded for papers read during the past session, will be presented. Amongst the papers arranged for we find,—November 30th, "On Peat and its Profitable Utilisation," by R. M. Alloway, M.A.; December 7th, "On the American System of Associated Dairies, and its bearing on Co-operative Farming," by Mr. H. M. Jenkins; December 14th, "On the Study of Economic Botany," by Mr. James Collins; December 21st, "On a Method of Lighting Towns, Factories, or Private Houses by means of Vegetable or Mineral Oils," by Mr. Albert Silber. The first course of Cantor Lectures for the ensuing session will be "On Artists' Colours and Pigments," by Mr. Frederick S. Barff. It will consist of five lectures, to be delivered on Monday evenings, November 21st and 28th, and December 5th, 12th, and 19th, at eight o'clock. These lectures will treat of, "The Nature of Colour," "Chemistry and Manufacture of Colours and Pigments," "Vehicles and Media used in Painting," "Fresco and Silicious Painting," "Destructive Influences on Colours," &c.

Arbitration in Trade Dispute.—Mr. T. W. Saunders, the recorder of Bath, to whom was referred the dispute between the master carpenters and joiners of the city of Bath and their workmen, has made his award. The operatives demanded the Saturday half-holiday, and an advance in their wages of a farthing per hour. The employers were willing to concede the half-holiday, but resisted the claim for higher wages. In his award, Mr. Saunders says:—"I am of opinion, 1st. That the operatives, in seeking a reduction of two working hours on the Saturday afternoon are seeking for what is very desirable in a national point of view, and is daily gaining the support and adoption of the public at large; 2nd. That the rate of wages does not admit of the operatives giving up what will amount to 1s. per week; 3rd. That the proposed reduction of two working hours upon each Saturday while the masters pay the same amount to their workmen will not sensibly affect them, inasmuch as any small increase to their customers in the price of work, as much increase of wages will entail, will be almost wholly unperceived and felt. Taking these views into consideration, and believing that a concession of the demands will greatly tend to elevate the character of the operatives, improve their school, and cement that respect and regard for their employers, which I have reason to know they sincerely and worthily entertain, I award and determine that two hours be deducted from the present working hours on each Saturday afternoon, and that the rate of wages be increased by one farthing per hour for every working hour throughout the week, it being the intention of this award that the two provisions shall operate upon each other, and that the mere one of wages shall continue so long only as the operatives choose to avail themselves of the reduction of hours."

Fitting Locks.—The fitting of locks to trunks and boxes, although a very handy and useful art, is one which frequently puzzles the household mechanic; and this not because it is in the least degree more difficult than many other operations which he performs with facility, but because it requires a little knack. The mistake generally made is that of fitting the lock and key on together, instead of first securing the lock and fitting the key to it. The first proceeding should be to cut away the wood inside the box sufficiently to allow for the body of the lock. When this is done, the plate upon the upper surface should be let into the edge of the box, so as to be quite level with it. The keyhole should then be cut; and if the key passes freely the lock may then be screwed into its place. The key should next be placed in its proper position in the lock, and the key turned as it would be if the box were locked, and the lid brought down with a smart blow upon it. In most staples or hasps there are two projecting pins left which will enter the wood of the lid, and secure the hasp while the key is unturned; when, if the lid be raised, the hasp will be found in the exact position required. The lid should then be marked round the edge of the staple plate, which should be let into it to the required depth, and fixed with screws. If this operation be carefully performed, there will be no difficulty in making the lock work well at the first trial. —From "Cassell's Household Guide."

The Perpetuum Mobile.—The search for perpetual motion is itself a perpetual motion: there is no putting a stop to it; they are still at it, and in long-headed Scotland too. A new invention by Mr. J. Miller, of Dalry, "consists of obtaining and transmitting motive power by a novel arrangement of mechanism, consisting of levers on which the motive force as weights or pressure acts through small toothed wheels, acting and rolling in and on the teeth of an internal rim, fixed or stationary disc or segment thereof;" and in an invention of Mr. J. S. Johnstone, of Ayr, "the mechanism consists, under one modification, of a series of weighted levers arranged in a framework, each lever being connected with a spring balance. By means of suitable mechanism the levers are raised in succession through a certain height, from which they are allowed to fall, and in falling they act upon the spring balance in such a way as to depress it; the surplus force above referred to is transmitted so as to lift or raise corresponding levers, and also to act upon stop-wheels for driving a revolving shaft." It is just the old story over again: the perpetual motion moves in a circle in more senses than one.

Monumental.—The Thorneycroft equestrian bronze statue of the Queen, which has been erected on the Esplanade, in front of St. George's Hall, Liverpool, has been unveiled. The cost was 5,000l., like that of the late Prince Consort, which is its companion statue. It was cast in bronze by Messrs. Elkington & Co., at their works in Birmingham. The statue is about 14 ft. 6 in. in height, from the top of the pedestal, and 14 ft. from the head of the horse to its tail. Her Majesty is represented as attired in a riding-habit, which reaches almost to the base of the figure, and wearing a round hat adorned with a plume of feathers. The statue weighs upwards of 4 tons, and stands upon a metal plinth, which is embedded in the granite pedestal. —A movement, which will have the support of all who appreciate the services rendered to musical art in this country by the late Mr. Balfe, is on foot for the purpose of placing a monumental tablet to his memory in Westminster Abbey. —It is proposed by a number of captains, as a token of their esteem for their deceased brother officers Coles and Bergoyne, that every captain on the active list shall subscribe one guinea to erect a private memorial, the style of which and the place of erection to be hereafter settled.

The Ashmolean Museum.—On the 26th ult., Mr. J. H. Parker gave an inaugural lecture on the history, the present state, and the future prospects of the Ashmolean Museum, as now proposed to be used for the assistance of the students of history and archaeology. It was addressed to the members of the Oxford Architectural and Historical Society. He said that he hoped to give new life to the museum and to the society by combining them together. The contents of the museum, with the addition of the large collection of 2,000 historical photographs now being arranged in it, would afford an ample supply of subjects for study, and illustrations of them. The different members of the society could study them, each taking up and following out his own branch, and when he had mastered it, giving a lecture or a paper upon it, for the benefit of the other members who had not had the same opportunity of studying it.

Moulding Metals.—Messrs. W. & R. Mushet, Dalketh, first prepare a "pattern" or pattern plate of the article to be cast from in either iron, wood, or any other suitable material in the following manner:—The pattern is placed upon a suitable plate or board set upon a solid bed of sand. A moulding-box, about 6 in. larger than the pattern every way, is then placed upon the plate or board; the pattern or patterns being set fair in the middle, it is rammed up and turned over on another solid bed of sand; the board is then removed, and the parting carefully made. The top part of the box is then put on to the part already rammed up, which is the drag; the gate-pins are put in suitable places, and this also is rammed up. The two parts are then separated, and a frame of wood, about $\frac{1}{2}$ in. thick and $\frac{1}{2}$ in. broad, is placed on the parting, keeping the pattern fair in the middle.

Tile-cutting Machine.—The invention of Mr. O. F. Monfort, of Dearborn, U.S., relates to improvements in machines for cutting the tile as it issues from the tile-machine in continuous form into short sections, and consists in the application to the carrying-table between two endless belts of a fine wire or steel-plate cutter, stretched between an arm and a shaft, by which the arm is revolved so as to be revolved around the shaft and forced through the tile while moving along, the cutter being arranged to move with the tile while cutting, and back again after cutting, and the arm which supports the swinging end of the cutter being arranged to pass between the cut sections. The invention also comprises a carrying-table for passing the cut pieces beyond the arm which supports the cutter suspended on the shaft, and held in position by a weight, so that the arm which carries the cutter may pass around it.

Town-hall for Dorking.—We are informed that a company is in process of formation, having for its object the purchase of the West Square Buildings, in West-street, to convert the same into a town-hall. The property belongs to Mr. Cubitt, M.P., who has expressed his desire to facilitate the matter in every way. A meeting of gentlemen taking an interest in the subject has recently been held, and we believe a prospectus of the company will be issued.

Drainage of the Fen Country.—The safety of the fen country is again under consideration. Mr. Hawkshaw considers that the capacity of the siphons, sixteen in number, is not enough to take off the water in an extraordinary flood, and if siphons were to be used ten more would be required, which would cost 14,600l. He also recommended an engine and boiler, at a cost of 1,300l. Regarding the question of a sluice being better than siphons, Mr. Hawkshaw states that a sluice will effectually discharge the waters of the greatest floods without any aid from the siphons. The cost of the sluice and new cut would be 50,000l. The commissioners were decidedly of opinion that siphons should be used if any provision were made, as at present funds would not admit of a large outlay.

Opening of Glasgow University Buildings.—The new University Buildings at Gilmorehill, Glasgow, the foundation stone of which was laid in October, 1868, by the Prince of Wales, were opened on the 7th instant. The buildings have been constructed from plans prepared by Mr. Gilbert Scott, and will cost, including the common hall and University hospital, which have not yet been built, a sum of nearly half a million. The hospital is not an essential part of the University scheme, and will be partly of a public character. The opening proceedings took place in the lower hall of the new Hunterian Museum, which is capable of accommodating about 2,500 persons. As we have illustrations of the buildings in preparation, we postpone particulars.

The Old Brick Houses, St. George's-place, Hyde Park.—The public will be glad to learn that these houses, nearly a century and a half old, are at length to be demolished, and two mansions erected on their site. They will be remembered as having been long the disfigurement of one of the finest spots in this locality. One of the houses was the residence of Liston, the comedian, for some years.

The Foreign Market Site.—At a special meeting of the Court of Common Council, at which a report respecting the proposed Foreign Cattle Market was brought up by the Markets' Committee, it was recommended that the building should be constructed upon the site of the late Deptford Dockyard, which was to be purchased by the Corporation for 91,500l. The result of a long discussion was the adoption of the report by a large majority.

Closing of the Derby Fine Arts Exhibition.—This successful exhibition, after having been open for six months, is now closed. It has been visited by 150,000 persons, and a profit of 1,350l. has been realised, for behoof of the funds of the local volunteers, as intended. Throughout the exhibition no one article was injured or abstracted, and not even a pocket picked.

Inventors at the Annual International Exhibitions.—The Commissioners for the Exhibition of 1881 notify that an Act intitled "The Protection of Inventions Act, 1870," 33 & 34 Vict., cap. 27, has been passed for the protection, amongst other things, of the exhibitors at the Annual International Exhibitions. It contains provisions similar in character to those which were effectual for the protection of inventors at the Exhibition of 1862.

Strike in Edinburgh.—Between 200 and 300 stonemasons have struck work in Edinburgh in consequence of a proposal having been made to reduce their wages from 6½d. to 6d. per hour, equal to about 2s. 4d. per week. The reason given for the proposed reduction is dulness in the building trade.

Honour to Artists.—Mr. Louis Desanges, the painter of the Victoria Cross Gallery, has been elected a member of the Royal Academy of Lisbon, in succession to the late Sir Charles Eastlake. The election has received the Royal approval, and the diploma has been forwarded to the newly-appointed member.

Election of School Boards.—Special orders have been issued by the Education Department for the immediate election of School Boards in twenty-one boroughs in England and Wales. These include Liverpool, Manchester, Birmingham, Leeds, and Sheffield.

Digwall.—The foundation stone of a new public hall, which is being erected by the Fingal Lodge of Freemasons at Digwall, has been laid with Masonic honours.

The Portraits.—The portrait in our present number was prepared from a photograph by Mr. John Watkins, of Parliament-street, as also was that of Professor Hayter Lewis, in a recent issue.

TENDERS.

For house at Hendon, for Mr. F. F. Baillon. Mr. Thor. W. Willis, architect. Quantities supplied by Mr. L. C. Riddett:—

Crabb & Vaughan	£4,484 0 0
Gammam & Sons	4,192 0 0
Henshaw	4,374 0 0
Deards	4,106 0 0
Capps & Ritso	4,070 0 0
Adamson & Sons	3,883 0 0
Scrivenner & White	3,883 0 0
Sharpton & Cole	3,877 0 0
Hawkes (withdrawn)	3,470 0 0

Alternative Design.

Gammam & Sons	£3,475 0 0
Scrivenner & White	3,363 0 0
Crabb & Vaughan	3,363 0 0
Henshaw	3,210 0 0
Sharpton & Cole	3,234 0 0
Deards	3,210 0 0
Adamson & Sons	3,141 0 0
Capps & Ritso	3,100 0 0
Hawkes (withdrawn)	2,413 0 0

For a new church at Newark, exclusive of foundations. Mr. R. Evans, architect:—

Ward	£3,505 0 0
Conquest	3,448 0 0
Rudd	3,350 0 0
Halliday	3,315 0 0
Fretwell & Henderson	3,141 0 0
Young	2,985 0 0
Johnson	2,930 0 0
Hodson & Co. (accepted)	2,767 0 0

For five houses, Cavendish Road, Balham, for Mr. J. De Manche. Messrs. Lander & Bedells, architects. Quantities supplied:—

Wells	£6,490 0 0
Tarrant	6,296 0 0
Macfarlane & Vance	6,226 0 0
Adamson & Sons	4,893 0 0
Everidge	4,870 0 0
Beaves	4,776 0 0
Lagran	4,136 0 0
Grover	4,069 0 0

For building new "Old Women's Ward" at the work-house for the Gt. London Union, Blenheim, Surrey. Mr. Alex. H. Stoddart, architect:—

Strangé	£1,149 0 0
Walls	1,111 0 0
Peckett & Taylor	1,063 0 0
Cooke & Greene	979 0 0
Marcy	978 0 0
Ellis	950 0 0
Bolt	931 0 0
Cook	924 0 0
Nightingale	929 0 0
Harrison & Sons	892 0 0
Bayes & Ramage	889 0 0
Emmett	875 0 0
Dover & Co.	870 0 0
Woodward	867 0 0
Morris	850 0 0
Blackmore & Morley	840 0 0
Daniel	837 0 0
Battley	834 0 0
London Building Company	824 0 0
Wright, Bros., & Goodchild	821 0 0
Galley	785 0 0
Bish	780 0 0
Farens & Telling	751 0 0
Gregory	748 0 0

For additions to St. Matthew's Workhouse, Bethnal-green. Mr. W. Mundy, architect:—

Liddard	£6,374 0 0
George	5,617 0 0
Marlett & Burroughs	5,641 0 0
Hearle	5,575 0 0
Nightingale	5,855 0 0
Emmett	5,485 0 0
Blackmore & Morley	5,480 0 0
Perry & Co.	5,420 0 0
Wigmore	5,387 0 0
Brown & Sons	5,299 0 0
Tully	5,296 0 0
Mortimer	5,224 0 0
King & Sons	5,159 0 0
Wood, Bros.	5,150 0 0
Capps & Ritso	5,133 0 0
Eaton & Chapman	5,109 0 0
Bleas	4,974 0 0
Langmead & Way	4,880 0 0
Hill, Keddell, & Waldram	4,973 0 0
Hurst	4,869 0 0
Wright, Bros., & Goodchild	4,840 0 0
W. & F. Crocker (accepted)	4,817 15 0

For making up, &c., Osborne-road, Acton, Middlesex. Mr. E. Monson, jun., surveyor:—

Blackmore	£639 0 0
Hare	451 0 0
Pizer	375 0 0
Chalker	354 0 0
Porter	336 0 0
Simpson (accepted)	295 0 0

For finishing four houses at Herne-hill. Mr. Joseph Gibson, architect:—

Evans	£280 0 0
Russell	775 0 0
Bray	150 0 0
Robson	719 0 0

For part of excavator's work for nine warehouses, Monkwell-street. Mr. Herbert Ford, architect:—

Peacock	£527 0 0
Maycock	369 12 6
Hobman	339 17 8
Jay	336 0 8
Slater	280 1 0
Wilson	248 15 0
Pooley	283 0 0
Hopkins	280 11 0
Parkins	273 5 4
Perlick	266 7 0
Reddin	246 12 8
Crane (accepted)	241 19 5

New Post-office, Maidstone.—The tender of Mr. J. G. Naylar, builder and contractor, Rochester, having been accepted after considerable delay caused by the estimates being in excess of the sum granted, the works are now to proceed; amount of tender, 3,147l.

Tenders for the Supply of Glass Cases and Plate Glass to be used at the International Exhibition of 1871.—As the list of tenders contained in the Builder of the 5th inst. is calculated to convey a wrong impression, and to do me serious injury, I must request the insertion of the following in your next issue:—My tender, 1,769l. 15s., included not merely the "frames," but also all the plate glass and glazing. My separate tenders for the "frames," only amounted to 1,173l. 15s.—JOHN DREW.

* Our list was official.

TO CORRESPONDENTS.

Mr. Gowans's address in type—J. K. (ditto)—T. E. K. (ditto)—E. T. B. (blank)—H. S. (ditto)—B. A. (some of the bishops will not condescend to be noticed)—W. T. H. W. F. C.—W. G. D.—P. G. S.—J. C. C. A. H. R. T.—Miss L. H. B.—C. S. C.—C. H. C.—Col. S.—R. M. T. & Co.—E. W. T.—M. Y. F.—J. K. J.—H. B.—J. H. L.—A. B. K.—A. H. G.—R. Y.—J. D. E. F.—G. O.—L. M.—S. D.—J. N. C.—W. J. L.—H. F.—J. T.—W. W. R.—T. W. R.—D. T.—T.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles and papers read at public meetings, rests, of course, with the authors.

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The Builder.

VOL. XXVIII.—No. 1450.

The Water Supply of the Country.

THE supply of water requisite for the growth of the crops throughout the United Kingdom has a subject which has been scandalously neglected. It is one of the utmost economic importance. Taken in connexion with those provisions for artificial harvesting to which we have, on former occasions, directed the attention of our readers, it is a matter that may make all the difference between plenty and famine. Our incredible national neglect of a branch of natural engineering that was practised, with abundant returns, more than 4,000 years ago, has been punished, in the present year, by the loss of a large

portion of our green crops. We helplessly look up to the sky for the precious showers which we know to be uncertain in their distribution, at the time when, by a due employment of the means which science places at our disposal, we might render a large portion of our pastoral acreage independent of the caprices of the seasons.

There are few subjects of such ever-fresh interest to the Englishman as the weather. Abroad, indeed, it is said of us, that the changes to which our climate is so unusually liable form the sole topic of our ordinary conversation. There is, further, this grave peculiarity attendant on the investigation; that in no branch of study are the prime laws and master-facts so simple, while the details, by their extreme multiplicity, have as yet entirely mocked every effort to reduce them to order. Not only are more direct observations taken, by special and ingenious instruments,—as to the barometric pressure, the hygro-metric charge, the thermometric condition, of the atmosphere, the prevailing currents of the winds, the form of the clouds, and the actual amount of rainfall at determined stations,—than are devoted to almost every other scientific inquiry, but the attention of the most patient observer, and the most clear-sighted discoverer has been turned, from the earliest recorded period of history, to the subject of pre-indications of the weather.

In spite of all this thought and observation, prediction of the change, or the permanency, of weather remains pretty much what it has been from the earliest times. In one respect, indeed, we have obtained a very valuable advance. The all-but instantaneous means of communicating intelligence afforded by the electric telegraph, by furnishing us with particulars of atmospheric pressure at widely different points, enables us to foretell meteoric movements, within certain limits, with considerable accuracy. This is,

indeed, a species of prediction; but it is that kind of fore-knowledge which consists only in the certitude of what is actually taking place at some distance, the course and sequence of which is comparatively certain.

While the knowledge of scientific men is so limited that but one single ray of light, to which we may hereafter refer, has yet been thrown on the future of the question, it is not surprising how prodigious is the amount of ignorance which persons by no means uneducated are not ashamed to own, and even to cherish, as "weather-wisdom." The function of the barometer, simple as it is, is for the most part altogether misunderstood. We cannot recall the title of a single work that is altogether satisfactory on this subject. Thus people will consult "the glass" with a blind faith that its rise and fall have a certain message for them; nor are they taught, by constant disappointment, that local indications of barometric pressure form but one, out of many, of the series of elements that have to be taken into account in forecasting the state of the weather even for a quarter of a day.

Again, the known connexion of the syzygies and oppositions of the moon, with the tidal phenomena of the ocean of water that surrounds the earth, has led many to fancy they can take a short cut to the knowledge of the unknown influences of this planet on the aerial tides and currents. Tabulated observations, indeed, show that no coincidence has been detected between the arrival of the moon at her "quarters," and the changes of the weather. But the theory is convenient, and therefore, with many adherents, it is waste of time to demonstrate that it is false.

Astrologers have also set themselves to predict the weather. It is, very likely, a matter much to be regretted that the heroic and incredible ignorance, as to positive science, of most of those who seek to read the cypher of the stars, has deterred really scientific men from any examination of the important physical facts which are obscured by astrological jargon. The view of the solar system as an arrangement of celestial electro magnets, the relative position of each of which affects for the moment the condition of every other, is one of which it is impossible to deny the propriety. In a careful study of the effect of the several aspects of those closely inter-related bodies may yet be detected some clue to the great question.

But could laws of observation, or even of prediction, be thus arrived at, the grand difficulty of local difference would still remain. The causes of weather seem to be capriciously local. Astronomic influence, if such there be, is to be regarded as affecting the entire planet, or at least its great geographical divisions. But what does the inhabitant of the valley of the Severn or of the Mersey care, comparatively speaking, for the state of the weather at Greenwich?

The main laws affecting the general rainfall of our country are, as we have said, few and simple. The tendency of warm air to ascend, and of cold air to descend, is one. The power of air to hold water in invisible suspension, in proportion to temperature, is another. On this, and on the radiant nature of heat, depends the phenomenon of the dew. The rotation of the earth on its axis, and the deflexion produced, on a northward or southward current of air or of water, by the constantly decreasing rotary velocity of the surface over which it passes, is a third. Gravitation, as modified by the relative positions of the sun, the earth, and the moon (the gravitative disturbance affected by the other planets is almost inappreciable), has a powerful effect on the sea, and has an undetermined effect on the air.

Beyond all these known forces there are abundant indications of the existence of one that is as yet unknown, and, for the most part, unsuspected. It would seem to be a species of

terrestrial electro-magnetism. The existence of this force, on the proper appreciation of which we hold that a true comprehension of meteoric phenomena must depend, is indicated by two very distinct sets of signs. These are to be found in the province of physics, and in that of organic life. The action of the barometer, and the habit of many animal tribes, point to a telluric impulse being the origin of atmospheric change.

We have spoken with discontent of the teaching of scientific books on the subject of the barometer. As to that part of the theory of this instrument which we owe to its great inventor, the admirable Pascal, there is no room for doubt. The function of the varying column of mercury in denoting the actual pressure per square inch on the exposed surface of the fluid metal, is undoubted. But the point to which we refer is this. The mean gravity of the earth, and the variation of its action from the pole to the equator, is known. The difference between the lengths of the pendulum vibrating seconds at the equator and at the pole is 2.38 French lines, or rather more than the two-hundredth part of the mean length. Slight local variations may be caused by the greater or less density of subjacent strata, but they are inconsiderable in proportion to that due to the spheroidal form of the planet. And the permanent and unvarying character of terrestrial gravity, measured by the length of the pendulum, is further proved (if need be), by the comparison of the rate of chronometers timed by pendulum, with those timed by springs.

How comes it to pass, then, that the weight of the atmosphere, as measured by the barometric column, varies to the extent of 10 per cent. and upwards? A movement of the quicksilver from 28.5 in. to 31.0 in., in the same locality, is within the limits of observation. A movement of $\frac{1}{2}$ in. in a few hours,—indicating an increase or diminution of the force with which the atmosphere presses on the earth at that spot by one-sixtieth part, or more than $1\frac{1}{2}$ per cent.,—is far from uncommon. To the current answer to this question, that "the difference of pressure is due to the weight of vapour in the air," no reply is necessary; the less so because the mercurial column is generally highest in fine bright weather, and neither wet, fog, nor extraordinary heat, involving a corresponding degree of suspension of vapour, are directly indicated by the delicate balance.

The true explanation is, that for the pressure of the atmosphere on the earth, there is a cause other than a physical one,—a cause of that nature which, in default of better definition, we call electric, or magnetic. This cause we may speak of as the varying electro-magnetic attraction of the earth. In connexion with the import of this universally-observed phenomenon we may mention the abundance with which sparks are struck from flints on the road by the shoes of horses, by the nailed boots of rustics, or by an iron-shod staff, on the approach of rain.

A curious disturbance in the aerial perspective of distant objects, such as islands and promontories, giving the effect of a mushroom supported on a stem to the former, and of a projecting, overhanging nose to the latter, has been observed in the Baltic and in the Mediterranean, as preceding a storm by some thirty hours.

The habits of animals often afford sure prognostics of weather. Virgil mentions the activity of the ant before rain, a circumstance to which the numerous encampments of various species of ants in Italy call attention. The care of the spider in setting her gins, and the high or low flight of birds, have also been referred to as weather prognostics. The latter, however, often considerably varies in a very short period of time.

The only place in Europe inhabited by any of

the monkey tribe is the Rock of Gibraltar. The troops of Barbary apes that yet remain in that ancient haunt of their race are accustomed to change the side of the hill on which they congregate six hours before a change of wind. As this change is a matter of great importance to vessels striving to enter or to leave the Mediterranean, this prediction is eagerly watched for.

In Devonshire a habit similar to that of the Gibraltar apes has been observed in the roosting of pheasants.

Leaving, with this indication of the path in which we think further light may be collected, this portion of our subject, we wish to note that, according to the careful deductions of Lieutenant (now Admiral) Maury, the water which descends on the surface of Great Britain is evaporated, by the heat of the sun, from the equatorial ocean. In the pages of that interesting writer, the course of the clouds may be traced, till they shed down on our soil a rainfall varying from 24 in. to 60 in. in depth in the course of a year. The evaporation which supplies the rain for the temperate zone is calculated to be not less than 16 ft. depth of water per annum. At Calcutta an evaporation of 15 ft. has been measured. At a latitude of between 10 deg. and 20 deg., in the Bay of Bengal, an inch is said to be evaporated daily. On the Khasia mountains, in Bengal, the flood that is wrung out from the passing clouds, as from a sponge, is said to furnish the enormous depth of 600 in., or more than 8 fathoms of water. The rapid floods that fill the Atbara, and bring wealth to Egypt, have a similar origin.

On the fifty-seven millions of statute acres of Great Britain, if we take the average rainfall at 36 in. in the year, there descend in that time two hundred thousand millions of metric tons of water. This is what nature affords us on the average. The season must be altogether unusual that does not provide us with a third of that unimaginable quantity. What do we do with it?

The answer is very simple. We get rid of it as fast as possible. In the first place, every house, with the exception of those thatched cottages that are rapidly disappearing from the face of the country, has a special provision for collecting rainfall, and not for storing it for use, but for turning it, in the shortest and most ignominious way, into the nearest river. Instead of collecting it for the service of the farmer, or even of turning it, as used to be the case in many a country town and village, through a bright open course, where it bubbles as it runs along, and from which lead off many a grip and rough to gladden the adjoining fields, we get it underground as rapidly as we can, and there so deal with it that first it dilutes our valuable sewage to an extent which renders it both worthless and unmanageable, and then it goes on to poison our rivers, to kill the fish, and to spread the germs of disease through the country. That is what we do with our rainfall.

Every drop of water that we use in England (except salt-water baths) comes direct from heaven. Nature has given us certain reservoirs, of which we make use without observing their extent, or taking any of the steps which would so well repay the cost proper for providing auxiliary storage. On every porous soil, of sandy or gravelly nature, the rainfall penetrates till it is arrested by the first impervious stratum lying below. On this bed the water accumulates. If the clay forms a basin, the water forms a subterranean lake. It accumulates till the basin is full; then it runs off at the lowest places on the rim. These escapes are what we call springs. They often occur not far from the summit of a hill. Climb Skiddaw, or ascend Stanmore-hill. In each instance you will find the summit dry. It consists of a light, porous soil. A little way down either highland, however, you find bog, or wet clay, or out-soak of some nature. Why is the ground at once so damp and so elevated? Simply because the rain collected over the whole top of the hill there runs over the edge of the clay which keeps it back. In chalk the case is somewhat different. Water seems to pass through chalk in a broken subterranean river, the level of the underground stream dipping rapidly as it approaches the natural outfall. The principle is the same as in more perfectly porous soils, but that modified form of gravitation which we call capillary, or possibly chemical affinities not distinctly understood, affect the level of springs in the chalk.

To our habitual waste of the gift of heaven, that careless stupidity which allows the rain to fall where it will, and takes no heed for the

drought of to-morrow, we have one exception. We practise, where it can be done without expense, the most barbarous mode of irrigation yet known in the world. We know that for the supply of vegetation we require an intermittent supply of water. Roots may be drowned, no less easily than fish may be drowned, by the improper supply of that element on which their life depends. We know by the world-old experience of Egypt that even the intermission which takes the form of a flood, and covers the face of the soil with a rich transported mud, has a wonderfully fertilising power. We also know that semi-aquatic plants—reeds, rushes, bog-beans, and water soldiers—that grow in permanently wet, marshy situations, are useless to the farmer. With this knowledge in our possession we irrigate thus. Through a valley, which with a little aid from the engineer might be made a very garden of Eden, we lead the rain, or rather let it lead itself, in parallel channels. We bar any efficient draining by water-mills and weirs; we occupy from a fifth upwards of the whole area of the valley with water-channels. We sometimes put down a wooden sluice or two, and we keep the whole soil, while grass ought to be freely growing, in a perpetual sop. As we do not cover all the ground with water we obtain abundant crops from about half the acreage; flags, reeds, coarse rushy grass, and water-courses, occupy the remainder.

Unirrigated England presents a noble field for the beneficial activity of the engineer. What we have already done in the way of deep draining, and of steam ploughing, is enough to teach us how much more may thus be effected. But to these important parts of farm engineering should be added a comprehensive and adequate system of dealing with our abundant rainfall. Lakes and reservoirs, open or subterranean, where available, fair channels for the conduct of the surface water, and for its distribution wherever gravity would allow, steam power for the service of those districts where it might be requisite, or at all events that use of the windmill to which, in our few districts, we have recourse for getting rid of superfluous water, should be applied to raising supplies for irrigation. If this were combined with proper arrangements for watering, and not draining the land; for the intermittent supply of the precious element, and for its reception unaltered by ill use, into rivers abounding in fish—we should add a money value to a large portion of our twelve million acres of permanent pasture, to say nothing of our sixteen million acres under cereals, green crops, and artificial grasses, that would be equal to the present fee simple.

The individual farmer in England may be hindered by a thousand obstacles from either perfectly irrigating or properly draining his land. But let us look a little wider than individuals; let us look at districts of country, grouped according to water-sheds and water-courses. Considering the rainfall on which we can with certainty calculate, it is the fault of the owners and farmers of each such district if they suffer long from drought.

ARCHITECTURAL DRAWINGS.

Our object under the present heading is not, we hasten to inform the sensitive professional reader, *à la médium renouveau de l'œuvre*, to renew at the present instant the irritating questions concerning the legal ownership and value of architectural drawings, recently so much debated, and still, in a sense, devoid of a satisfactory and definitive settlement. But the debate on that ground suggests also some consideration as to the architectural value of drawings as a medium in carrying out a building, the extent to which they are or may be used or abused, the degree of importance to be attached to them, and the amount of time and trouble which may be reasonably bestowed on them; considerations which are not without their bearing upon the everyday routine of professional practice, in regard to matters wherein we are all too liable to run in a groove, without sufficiently estimating the practical value of some of the work on which much time and Indian ink are consumed in many hundreds of offices.

In the columns of the *Daily Jupiter*, as we know, it hath been duly laid down that an architectural drawing or design is a thing of nought; that the design only can be said to exist who bricks or stones have been superimposed, and drawing is superseded by the result which it

only foreshadowed in a partial and (to amateurs) incomprehensible manner. Nor are there wanting professedly architectural critics who openly avow a somewhat similar heresy. We are told that the builders of our cathedrals needed not drawings; they were always on the spot, architect and mason being then one and indivisible, and the materials evidently fell together as naturally as possible, without any drawing or measuring beforehand; we have even an instance of a modern architect (not English) pointed out as the nearest modern approach to the excellence of the Medieval builders, on the strength of the fact that he could neither write nor draw, and nevertheless did in some way contrive and build a domed church for his native town. Modern practice is usually in very much the opposite direction. Drawing is the first thing the architectural student learns, and for a length of time, in many cases at least, the only thing he learns. And with the majority of architects, excepting those whose name and fame have brought them into the position of consulting architects rather than ordinary practitioners, the greater part of the working time is spent over a drawing-board and T-square, personally and by proxy; and every detail appears on paper in its proper place before it is carried out in the actual building.

We might say that the *juste milieu* lay between these two extremes, did we believe that the former, the supposed Medieval habit of building by the rule of thumb without any drawings at all, had ever existed, at least in connexion with anything worth calling architecture. The discovery of the Cologne Cathedral drawing, and several others, indeed, should have been a finishing stroke for this theory. But putting this aside, is it in any way conceivable that such Masonic problems as were involved in the building of a Gothic vault upon Gothic piers, the proper curving and mitring of the moulded *voussoirs*, and the placing of a group of arch mouldings in correct and artistic relation to the pier sections beneath, could have been accomplished without a great deal of careful "setting out" first, by some descriptive medium or other? Are we to suppose, again, that the builders, or "architects" (may we say?), of the Lincoln presbytery, when permission was obtained to break through the city wall in order to carry out the design, had really not laid down first, in some manner, the proportions and dimensions of that splendid piece of work? or that the plan of a large cathedral or conventual establishment could be properly arranged, and the respective buildings proportioned to one another, without some degree of drawing being undertaken first, that at least men might have some notion of what they were going to build? We say nothing as to the manner and material of the delineation; the Medieval architects may not have employed "architectural colourists," at fancy prices, or kept a "rapid perspective hand" in regular employ; but that such buildings came not but by much previous thought and consideration, not to be carried on without some sort of outward symbols and figures, is contrary to all analogy and common sense. On the other hand, it can hardly be questioned that modern architectural practice takes too much the form of mere drawing-board exercise, and that many details are designed at the office desk, and never afterwards seen by the architect until finally completed and fixed, which would probably have been carried out with much better results had they been invented, and modified when necessary, by the architect at the building, with the position before his eyes, and worked out under his direction, with only so much of rough sketching as would suffice to render his ideas intelligible to the workman.

For with regard to all architectural design it should be borne in mind that the drawing is, after all, merely the means of conveying to the craftsman the idea of the architect. This has been so far overlooked, that architectural draughtsmanship has arrived at the importance of a separate calling; we can scarcely call it an art, but rather a handicraft, for it may, with certain limitations, be successfully practised, and even carried to a high degree of elaboration, by persons possessing little education or feeling for architecture as an art. The draughtsman (whose name is legion) are likely to be rather shocked at any view of the subject whereby their craft is in danger to be set at naught; nor do we wish unduly to disparage the efforts of a very hard-working and not over-paid body of men, or to say that there is no real value to be

placed on their work. On the contrary, there is something extremely pleasing and satisfactory in the aspect of a well-finished and clear architectural drawing, with its hard firm lines, and carefully-touched conventional shadows, everything subordinated to the main object of showing the architectural detail clearly, but with sparkle and effect. There are certain cases in which it is desirable that this should be well done, as well as possible; in an exhibition of architectural designs, for instance, when the aspect of a number of rough or slovenly drawings would be disagreeable to the eye, as well as an obstacle to the ready study of the various designs; and there is something in the sight of a drawing executed with care merely for its own sake, which is, in a way, pleasant and satisfactory. But in ordinary architectural practice this sort of thing may be, and constantly is, carried too far, both as to the degree of finish bestowed on drawings, and the amount of drawing considered necessary in order to carry out a building. While neatness is always desirable, it may be said that no greater waste of time can be made than in elaborating flourishing titles, scales, &c., to ordinary working drawings. Then with regard to the drawings themselves, an absurd amount of labour is often bestowed, in proportion to what is really necessary. There are offices where it is a regular habit to get up ordinary elevations and details with the most elaborate pen and ink shading, executed painfully with the aid of a ruler; a process which is not only an absurd waste of time, but injuriously fatiguing to all but very strong sight. We have seen such a ridiculous piece of affectation as the production by an architect, on exhibiting the elevations of a building, of a large magnifying lens (such as are often in use in picture galleries), that the spectator might be rendered properly alive to the minuteness of the drawing. Drawings which have to be looked at in this way will commonly be found to be merely drawings, and nothing else; for the time that should be taken up in designing, in the proper sense of the word, is here given to merely mechanical work; the means put before the end. Then, again, as to the extent of drawing required for carrying out a building, a great diversity of opinion and practice prevails. Giving too little drawing is certainly a mistake, and perhaps the worse mistake of the two, with regard to plans and practical details; puzzling to the builder and workman, and embarrassing to the quantity-taker, who has to apply to the architect constantly for further and clearer information. Some architects, on the other hand, have made a practice of exhibiting in their several working drawings all the joiners' details, such as skirtings, architraves, stair balusters, &c., on a minute scale, a double waste of time, as these things, if the architect takes them into his hands completely, must be detailed afterwards a larger size; and in every building these parts of the work are liable to all kinds of modifications from unforeseen causes. It is needless, too, to hamper a workman with drawings of practical features that he must be perfectly *au fait* at if he knows his trade at all,—such things as window casings, shutters, boxes, &c. Unless there be any unusual contrivance to be explained, a joiner may be trusted with these, or he is not fit to be trusted with anything, and had better not be employed. Where ornamental details are to be given full size, it is unnecessary labour to show them minutely on the general drawing, especially as such points ought always to receive careful special consideration as the building proceeds; and with regard to ornament, again, it may be observed that, when really clever art-workmen are employed, a sketch giving the architect's general idea will often serve their purpose and his better than a finished drawing which ties the carver down to minute detail, and leaves no room for freedom of treatment and execution on his part. It is with regard, indeed, to the detail of a building that the greatest misuse of architectural drawing is made, as we have already hinted. Where it is possible, the presence of the architect on the spot, and the trial of the effect of ornament *in situ* by rough models or chalk sketches, might often do more to put life into the design, and preserve the best proportions and relation of detail in detail, than any amount of detail drawing carefully made up at the desk would accomplish; indeed, in regard to the size of parts, the most experienced eye may often be deceived on paper, and ornament which looked very well in a drawing may turn out, when carved, in its position in the building, to be too large and coarse for

refinement, or too small for effect, to a degree not at all suspected previously. Besides this, the effect of sunshine and shadow is sometimes so different from what is conceived as the result when designing the ornament; and especially in the case of a small feature often repeated, some peculiar turn, so to speak, of shadow, may give an effect quite remote from what was imagined and intended. When, owing to distance, frequent visits to a building are impossible, one of the safest ways of studying and working out the details is to draw out an outline of the elevation to a tolerably large scale (1 in., or thereabouts, according to circumstances), sketch the various details full size, then reduce them carefully by scale, and draw them in pencil on the test-elevation; by this means their proportion to each other and to the whole design can be observed and modified where necessary. This method, which is a really intelligent use of architectural drawing, was constantly employed by a late celebrated architect; and though "5 per cent." will not pay for working out a design in this way, the architect may get some return for it in his future reputation.

As to method and manner of getting up architects' drawings, there have been, we need not say, a variety of fashions, sometimes rather absurd. There was the old style of fine outline drawing, in which our fathers excelled; now completely disused, and which had the disadvantage of being so very conventional in manner and effect as to convey, less than any other style, any notion of the real aspect of the proposed building to the eyes of a client. Those were the days, too, when the picturesque of masonry or brickwork was a thing ignored, and elevations were drawn as if they were intended to be hewn out of a single block. With all this there were merits: great decision and fineness of line, and very careful laying down of everything precisely to scale.* We have had a good many other styles since, the opposite extreme being what may be termed the "blotting-paper" style (chiefly indulged in by architects of the type of "John the son of Smith"), where the object is to be as rough and unintelligible as possible. Even where comparative neatness is practised, a habit of absurdly thick lines was introduced some time since, and is still adhered to a good deal; in some plans drawn in this style it is impossible properly to apply measurement by scale, for a wall may be 9 in. or 14 in. according as the inside or outside of the defining "lines" are measured to. A line, according to Euclid, is "length without breadth," a definition which draughtsmen should remember. Oddly enough, the same school of architects who brought the system of thick and coarse lines into vogue, and even some of the same individuals, have more recently taken up an opposite habit, and are practising remarkably fine and laborious drawing. For practical purposes, the best style of drawing is that which employs strong and decisive, but not thick, lines. A workman or clerk of works likes to see a line, and not to have to strain his eyes over hair-like marks; moreover, very fine drawing is unsuitable for plans which have to be knocked about a good deal, and be fingered and pulled about by the "hard hand of labour." The old system of "dark lining," so far as plans are concerned, is now almost entirely abandoned. It only occasioned confusion as to sizes and measurements. Plans should always be figured, at all events in their principal dimensions. It saves a great deal of time in setting out work, and ensures accuracy. If architects who neglect this were to look at the kind of tool which a bricklayers' foreman complacently accepts as "a pair of dividers," and which he applies himself to scale a drawing by, they would not be surprised at little inaccuracies creeping in under this system. In drawings of carpentry, construction, &c., it is a good system to mark on the drawings the scantlings of the various pieces, and any information that can be put on a drawing as to the method of construction and material to be employed. This is a much shorter way than specifying, and has the additional advantage that the workman has only one paper to look at instead of two. Colour is much more employed in showing distinction of material

than formerly, especially in plans, and is probably the best and simplest method of doing this; but it should not be over-done, especially in washes put over floors and walls for distinction of stone, brick, tiles, &c., which is sometimes done so coarsely, and in such glaring tints, as to threaten one with ophthalmia, and impair instead of helping the clearness of the drawing. In elevations an indication of the character of the masonry to be employed will never be omitted by a true architect; and a very good and characteristic effect can often be given to a drawing with little trouble, by a slight but well-judged indication of the jointing of the stones; but a feeling for the picturesque of masonry is curiously rare among draughtsmen, who sometimes employ a long time in doing laboriously and ineffectively what a few happy touches would have accomplished in one-fourth the time. In regard to perspective, it is a pity that the system of etching with ink, as recently exhibited, for instance, in various masterly drawings for the Law Courts and other buildings, is not more employed. It is a method of execution peculiarly suited to architectural subjects, while it does not impose on the architect the use of any other materials or instruments than such as he is always in the habit of using; he may thus often save the disproportionate expense which would be incurred for coloured perspective views, the first-class execution of which is almost an art of itself; and the etching, when done with real feeling, is in some respects a better means of representing the building, especially in the fact that the etcher has under his complete command the smallest points and incidents of shadow on the minutest features of his building. The power of "cooking" the aspect of a building is certainly much more limited in etching than in colouring, which may be one reason why it is less employed; but every system which tends to make the architect his own workman rather than the mere employer of the labour of others is so far to be recommended, if on no other grounds. But whether the object of a drawing be the practical information of the contractor, or the enlightenment of a committee, let it be borne in mind that the drawing is, after all, but a means to an end, and that, except in some special cases (as in exhibitions), it is not worth while to waste time over its elaboration, which might be better employed in work of more permanent value. We have spoken of drawings "rough or slovenly," but the two words are by no means convertible terms; and it is quite possible for a drawing to be in one sense roughly executed, and yet to fulfil all its practical objects, and produce a pleasing effect on the eye in addition.

THE TENURE OF LAND.

THE INSTITUTION OF SURVEYORS.

At the opening meeting on the 14th instant, the president, Mr. Richard Hall, made an address, which he mainly devoted to a full exposition of the Irish Land Act. At the close he said,—

"Throughout the Act, the tenant is most carefully protected, and, with the Ulster custom legalised, and his tenancy secured from disturbance, he, in fact, possesses, as it were, a joint interest in the property with his landlord. This cannot fail to exercise a considerable effect on the value of property, in addition to the revolution it must bring about in the relation between landlord and tenant. It is to be feared that the Act will provoke much litigation on the claims of tenants for improvements, which, after the lapse of time it will be difficult for the landlord to disprove, the presumption being in their favour.

Where the Ulster and other customs do not obtain, landlords will be likely to endeavour to avoid tenancies under 50l., in order that they may contract with their tenants to be relieved from the provisions of the measure. The clauses enabling the Government to advance money are very important, and may prove advantageous to the country by affording means for the reclamation of waste land; they will, however, encourage sales to tenants, and it is difficult at present to predict the effect which will be produced by the consequent subdivision of estates.

The consideration of this question almost naturally leads us to that of the relations of landlord and tenant in this country, a subject which would appear to be, at this juncture, prominently worthy of discussion by the members of this Institution.

* Of the minute directions sometimes given by the older architects of the Renaissance period in England an instance is furnished by the working drawings for the rebuilding of Lyme Hall, in Cheshire (the seat of the Gresham family), about the close of the seventeenth century. The architect's front elevation, which with other drawings is preserved by the family, shows all the joints of the ashlar-work carefully divided out, and the length of each stone figured upon it.

It is true that the excellent paper by Mr. Squarey, and the discussion that followed, have nearly exhausted that part of the subject relating to the cultivation of the soil; but the important question of the advantages or disadvantages of leases, and the principles to be adopted in dealing with what are termed permanent improvements, still remain to be considered.

A lease, no doubt, secures to the tenant the advantage of being able to lay out his capital and make the most of his farm, with the knowledge that he will have time to repay himself with interest. It, however, sometimes proves a clog even to him, and it hardly affords such a security to the landlord, in the event of his lessee failing to carry out its provisions in their integrity. I am somewhat inclined to prefer the principle of shorter tenancies, provided that the agreement is framed with a due regard to the interests of both landlord and tenant, and includes some system by which the latter may be compensated for outlay, the benefit of which he has not fully reaped. The important axiom laid down by Mr. Huskinson, in his remarks on Mr. Squarey's paper, should, however, be kept in view,—namely, that tangible and visible results only should be paid for. I was not surprised to learn from him that the average farming of Scotland, where leases almost universally prevail, hardly equals that of Lincolnshire, with its tenant-right custom.

The question as to what part, if any, of the outlay for permanent improvements should be incurred by the tenant, is also one which may be considered with advantage. In this term are included those improvements which tend to enhance the productiveness of the land and increase its value permanently, such as the erection of buildings, drainage, water supply and storage, fencing, road-making, and the reclamation of waste.

I am disposed to think that works of this character should fall entirely within the province of the landlord, and that the tenant should pay prices. The tenant rather than contribute the whole, or any part of their cost. The facilities for borrowing the necessary capital of which the landlord can avail himself, very considerably diminish the difficulties in his way; but we have occasionally to deal with owners who cannot, or will not, perform even works of necessity, and in cases of this kind the tenant must often bear expenses in self-defence.

The comparative advantages of large and small farms, is another branch of this subject which affords important matter for consideration. The practice of throwing farms together, and thus getting rid of small occupations, is increasing; and by diminishing the extent of building necessary for the occupation of the land is of considerable advantage to the landowner. Large holdings, tenanted by men of capital, encourage a high system of cultivation and afford ample scope for the use of steam-power, but have a tendency to lessen the amount of labour employed. This practice, however, would perhaps be of doubtful expediency for the general interest of the community, if small occupations could be maintained in their full productiveness. The difficulty experienced, is to be found in the want of the capital necessary to enable the small occupier to obtain the greatest possible return from the land, and at the same time preserve it in condition. If this and adequate skill were forthcoming, no doubt the general supply of produce would be increased.

ON EARLY WOOD-ENGRAVING IN CONNEXION WITH PLAYING-CARDS.

The recent publication of two very beautiful volumes, "The Arts in the Middle Ages," translated from the French of M. Paul Lacroix, and "The Wonders of Engraving," from the French of M. George Duplessis, has interested me greatly, by the information and observations they contain respecting the arts of typography and xylography, which have recently given rise to a fresh controversy conducted with too much of that acrimony which usually characterizes literary disputations. How strange that where the sole object is, or ought to be, the attainment of truth, the following it by different paths should cause so much irritation and acerbity!

Harking back nearly a hundred years, we find the literati of France, Germany, and England intent upon discovering the origin of printing. They settled it somehow or other, or they tired of the pursuit, and left any one who had wind and strength enough to outrun them to

settle it himself after his own fancy. But who ever discovered the origin of anything? When he who has been accounted the wisest of men affirmed that there was nothing new under the sun, how is originality to be established? Were the Babylonians, the Egyptians, the Chinese ignorant of the arts of engraving and printing in some form or other? We know not,—may never know,—what they knew, or from whom they learned what they knew. But antiquaries are, generally speaking, no logicians. They ferret out a date or an assertion, and commence a discussion or found a theory upon it, without first ascertaining that the date is correct or the assertion trustworthy. They argue without "settling their premises," and wander away into the wilds of imagination, more like enthusiastic poets than matter-of-fact critical archaeologists.

The point at issue, I take it, was and is how and at what precise time printing with movable type by means of a printing-press and with printer's ink was first invented in or introduced to Europe. The astonishment created by the appearance of the first books that issued from the press of Gutenberg and Fust; the narrow escape of the latter from the death of a sorcerer; and the visit of Nicholas Jenson to Mayence, by command of Louis XI. of France, in 1462, to investigate and report on the new method of producing books "without the aid of the pen," and to "carry off surreptitiously the invention, and introduce it into France," are undisputed matters of history. The mysterious law-suit at Strasbourg between the Ditzchen family and Gutenberg, in 1439; the deed of partnership between Gutenberg and Fust, in 1450; and the association of Peter Schoeffer, or Scheffer, in 1452, are, if these dates can at all be depended upon, collateral proofs that typography was for full twelve years struggling into birth, and reached perfection only in the early months of 1456, when the first great Bible was ready for sale, and copies disposed of as MSS. at very high prices. The secret evaporating, Fust and Schoeffer, having previously dissolved partnership with Gutenberg, printed the "Psalmorum Codex," the earliest book bearing their names, and which fixed in a manner, for the first time, a date for the new art they had so much improved, the colophon announcing that the book was executed "without the help of the pen by an ingenious process in the year of our Lord 1457."

Such are the most important particulars collected by the latest writers on the subject of printing, and I have stated them in the briefest form, so as not to encumber us with details irrelevant to my purpose, which is simply, without any partisanship or assumption of authority in matters of art, to assist to the best of my ability in the detection of error and the development of truth. It has been the received opinion for nearly a century, that the engraving of playing-cards on wood preceded and suggested the block-books of the fifteenth century, which in their turn led to the invention of movable types. The "brief-malers," or card-painters of Germany, are said not only to have made and sold all sorts of playing-cards, but stamped and illuminated various images of saints; and M. Breitkopf, in his "Treatise on Engraving on Wood," supposes that the impressions of these saints preceded that of the playing-cards; but, at all events, to one or the other, we are told, succeeded subjects of sacred history, accompanied by explanations cut in wood, which was the origin of books printed with blocks of wood, and from this practice Gutenberg obtained his first idea of the typographical art. This very probable theory remained unquestioned till 1869, when the observations of Mr. Henry Holt, on the Fairford windows, at the annual congress of the British Archaeological Association, at Cirencester, in illustration of which he produced a copy of the *Nuremberg Chronicle*, and specimens of early wood-engraving, led to his propounding a new hypothesis completely the reverse of the old one. Mr. Holt has asserted that printing with movable type preceded engraving on wood; that the block-books were cheap substitutes for the highly-priced productions of the printing-press; and boldly challenged the literary world to prove the existence of any block-book or wood-engraving in a national or private library previously to the middle of the fifteenth century.

After a careful inspection of the celebrated St. Christopher, in Earl Spencer's library at Althorp, he contends that the date 1423 is not that of the engraving, but of the legend beneath it, which had been copied by the engraver, and

has reference to the jubilee year of the saint. That it has been printed by a press, and with printer's ink, and, what is more important, upon paper which exhibits the well-known watermark of the bull or heifer's head, which was used by Fust, and supposed to have been made for him. He has shown that the discovery of this supposed early engraving instigated the fabrication of several similar, which were stained with coffee, to give them the appearance of age; and more recently some have been found with still earlier dates, 1416 and 1406, the authenticity of which he is prepared to dispute as stubbornly as he has that of the celebrated St. Christopher. All this has naturally aroused a host of antagonists, who have more or less courteously contradicted without convincing him by the production of any incontrovertible fact which would refute the evidence he adduces in support of his arguments. Alone and undismayed, he still gallantly defies all comers. Hitherto it has been a war of opinion only. Mr. Holt has given his reasons for the faith that is in him, and puts the onus of proof very cleverly upon the shoulders of his opponents. There can be no dispute about the period when Gutenberg produced his Bible. What is required, then, is positive evidence of a wood-engraving or block-book of a date prior, let us say, to 1450. There are grave doubts at least, it must be admitted, about the long-vaunted St. Christopher, and there is nothing but the date attached to the legend to set against the suspicious features of it. There is nothing in the dress of the personage represented to assist the argument on one side or the other. It is simply conventional as regards the holy personages, and the two small figures of peasants present us with no article of clothing peculiar to any time previous to 1423. Even if they did, it would only mark the date of the original design, and not that of its execution on the wood; for there can be no doubt many of the sacred subjects cut by the formschneiders of the fifteenth century were copied from miniatures in the older illuminated MSS. fresco paintings on the walls of churches or other available sources. But how about the playing-cards? Did they originate the engravings of saints and the block-books, according to the old theory, or did they succeed them, as Breitkopf suggests, but yet precede the invention of typography? Upon this point alone I beg, in all humility, to offer a few remarks, strictly confining them to the subject of costume, a test which I have never known applied in vain when called to the assistance of the critical inquirer.

The mention by M. Menestrier of an entry in a book of accounts, of the time of Charles VI. of France, of a payment to a certain painter, named Jacquemin-Gringonneur, of fifty-six sols of Paris for three *jeux de cartes*, gilds and coloured, of various devices, to be delivered to the king for his amusement, gave rise to the belief that cards were invented at that period (1392), for the especial advantage of his melancholy majesty. The chronicle of Petit Jean de Saintré was subsequently cited to show that cards were known in the reign of Charles V., to whom Jean was a page; but Mr. Gough, in his paper on playing-cards, communicated to the Society of Antiquaries (*Archæologia*, vol. viii.), observes that the work itself is, at least, a hundred years later than the date of the presumed allusion, as Jean's epitaph in it is dated 1458, and, at all events, the mention of cards in a work of the latter half of the fifteenth century does not prove their existence in the fourteenth. A still earlier instance was adduced by a foreign antiquary, who quoted the statutes of the order of the Band, instituted by Alphonso XI., king of Castile, A.D. 1332; but Mr. Gough demolished this evidence as ruthlessly as he did the former, by showing that no mention of cards occurs in the original statutes, or any copies of them written or printed previously to the edition of Dr. Grierney's translation of them, published in 1558, at which time cards had become common throughout Europe.

It is unnecessary for me to enumerate all the confident assertions and the equally confident contradictions that are to be found in essays on this subject, from Dr. Stukely to the Rev. E. Taylor, from M.M. Sainte Foix and Bellot to M.M. Paul Lacroix and Duplessis. There is plenty of evidence to prove that cards drawn, painted, and gilded by the hand, like those of Jacquemin-Gringonneur, and to which the name has been given of "Tarot cards," found their way into Europe from the East in the fourteenth century, or perhaps earlier; but they had nothing

whatever in common with those to which we are accustomed, although they might have suggested them, and the fact in nowise affects the present question, which is one of printing by means of wood blocks only. The seventeen preserved in the Bibliothèque at Paris, supposed to be a portion of those painted by Gringonneur are now allowed to be of a much later date, but are very valuable, as they enable us to distinguish the Tarot cards from the playing-cards that succeeded them. There are no pips nor suits in them; no king, queen, or knave, as in the later packs. The subjects are emblematical, mythological, and scriptural; *cartes de fantaisie*, as M. Leber describes them. There are personifications of Justice, with her sword and scales; Cupids shooting at lovers; astronomers gazing at the moon; death on the pale horse; a pope, an emperor, knights, squires, fools, and the Day of Judgment!

That some game might be played with them is very probable. That they were used for fortune-telling, as our modern cards are, I have no doubt, and hence, probably, their prohibition in various countries; but, I repeat, however curious in themselves, they have no bearing on the point in dispute. Amongst the many official documents quoted to prove the earlier existence of printed playing-cards, one only calls for attention. It is a prohibitory order said to have been obtained by the master card-makers of Venice, in 1441, to prevent the importation of the large quantities of painted and printed cards, which were introduced into the city to the great detriment of their art. Before any argument is based upon this statement, we ought to be satisfied that the date given is strictly correct, and that verification can only be arrived at by a minute inspection of the original order in manuscript. But admitting for the moment that it is so. The word which has been translated "printed" is "stampide" (*"Carte e figure depinte e stampide"*), and the question arises as to the meaning of that word in 1441. "Stampere," according to Florio, signifies "to print, to presse, to stampe, to form, to figure," and "stampere" in like manner, besides a print or impression, is said to be "a make, a shape, a figure." The word existed before printing in its modern sense had been heard of, and the natural application of it to the new art does not in the least determine the question of when that art was invented. Stampide, in 1441, might simply mean formed, figured, or shaped by the means of the stencil, a process which, we know, was adopted at that period, and which, being much more rapid than drawing and colouring entirely by hand, would doubtless affect very seriously the art of the card-illustrator similarly as photography at the present day has the art of the miniature-painter. For instance, we have seen that Gringonneur was paid for the cards drawn and painted for Charles VI. in 1302, fifty-six years before Paris, which is calculated to be about 71.1s. 8d. of our present money, and a single pack of tarots, admirably painted about 1415, by Marziano, secretary to the Duke of Milan, cost the enormous sum of 1,500 golden crowns (about 625*l.*); but in 1454 (twenty-nine years later) a pack of cards intended for the Dauphin of France cost only five sous of Tours, about 11*s.* or 12*s.* M. Lacroix, to whom we are indebted for the collection of this information, observes, "In the interval between 1392 and 1454 means had been discovered of making playing-cards at a cheap rate, and of converting them into an object of trade;" but he does not seem to have noticed how these facts militate against the hypothesis he propounds only a few lines previously, where, speaking of a pack of cards which he refers to the reign of Charles VII. of France, he says, "They were probably executed between 1420 and 1440, that is to say, prior to most of the known *xylographic* productions. Playing-cards therefore served as a kind of introduction or prelude to printing from engraved blocks, an invention which considerably preceded the printing from movable characters" (page 137). Now as typography was undoubtedly invented before 1456, the date of the publication of the Mayence Bible, if printing from wooden blocks "considerably preceded" that art, and was itself suggested by the engraving and printing of playing-cards, which "served as a kind of introduction and prelude" (the old theory, in fact), we must certainly go back to very nearly the beginning of the fifteenth century for the first appearance of printed playing-cards, and give some precedence to the story of Adrian Junius—half-believed by M. Lacroix himself—that both typography and xylography had been practised at Haarlem by Lawrence Coster as early as 1422. Let us see,

therefore, if we can find any undoubtedly of that date. The same writer has just told us, only three lines higher on the same page, that "These cards, which bore all the characteristics of the reign of Charles VII., must be looked upon as the first attempt at wood-engraving and at printing by means of engraved blocks." From the costume which he describes (for unfortunately he has not given us an illustration of them), and the inspection of some engraved for Mr. Taylor, which may be the same, I should be willing to admit that they may be of the time of Charles VII., but certainly not earlier than the appearance of typography in 1456. Charles came to the throne in 1422 and died in 1461, and "the plumed flat cap" and other peculiarities, point clearly to the end, and not the beginning, of his reign; and if these are really to be considered "the first attempts at wood engraving," and a prelude to printing from wooden blocks, what becomes of the boasted discovery of M. Delaborde, of two prints dated 1406, or the story of Adrian Junius above mentioned? These cards, however, of which there are two packs, though still partaking of the tarot character in design, are the earliest specimens extant of the transition into the playing-cards of the following century. They present us with king, queen, and knave, and one of them with the well-known four suits, clubs, hearts, diamonds, and spades, the other displaying crescents instead of diamonds. The only engraved tarot cards at present known of, are Italian, invented, according to M. Lacroix, about 1460, and I should assign those of the time of Charles VII. to close upon that date. I have, in short, met with none that could safely be accounted earlier, judging by what I consider the infallible test of costume and armour, in conjunction with which must not be forgotten remarkable fashions of hair and beard. During the first half of the fifteenth century the hair was worn short and the face was closely shaven at the sides by all men, some retaining a moustache, with or without a forked beard; but the generality shaved entirely. After that date the hair gradually lengthened, and in the latter portion of it, from the reign of Louis XI. in France, and Edward IV. in England, covered the ears and finally fell upon the shoulders, the doublets being worn as low in the neck almost as the dress of the women. Where there may be some doubt about the costume these marks will frequently decide the question. Mr. Chatto (page 214) observes that "Conclusions drawn from the costume displayed on cards are not of much weight in the determination of a date, seeing that persons supposed to be well acquainted with the subject of costume have not been able to determine the date of any old drawing, even within fifty years;" and Mr. Taylor agrees with him that such speculations as regards dates "are very often fallacious, as any type, once become conventional, might continue in circulation for a considerable period, and this, too, in different countries" (page 115). To these remarks I answer that persons who could not determine on the date of a costume within fifty years would never have been supposed by me to be well acquainted with the subject; and that, though I quite agree with Mr. Taylor as to the perpetuation of an ancient type, I am surprised that he does not appear to see how that fact assists the new theory; as, supposing an engraving can be found displaying a costume undeniably of the fourteenth or even thirteenth century, the stickler for a later date would be justified in denouncing it as a copy of an older type, as in our present court cards we still find king, queen, and knave represented in the costume of Henry VII.; and it so happens that I can instance a case exactly in point. Amongst the many beautiful illustrations of his valuable volume, M. Lacroix has given copies of some engraved cards, one of which represents "a knight" in the civil costume of the close of the fourteenth century, the edges of his garments being curiously cut into the shape of leaves—a fashion commented on by the chroniclers, and prohibited by sumptuary laws to persons of inferior degree. And yet it is acknowledged to be one of a set engraved by an artist only known as "the Master of 1466," and was, no doubt, copied by him from a "tarot" pack drawn and painted in the reign of Charles VI., very nearly a hundred years earlier. At the same time, it must be obvious that, though I might, if the card had not been engraved, have referred it to the period when so peculiar a fashion of dress prevailed, I should

never have assigned it to a time when that fashion had not been invented. It consequently follows that cards presenting us with the costume of the latter half of the fifteenth century, although they might have been engraved much later, could not, by any possibility, have been manufactured earlier. With the exception of those by the Master of 1466, and a set of tarots called the Mantegna Cards, on one of which is the date 1483, all the specimens of printed playing-cards that I have met with display the unmistakable character of the fashions of Germany, France, and England during the latter half of the fifteenth century, and the greater portion those of the very latest part.—Louis XI., Charles VIII., of France; Edward IV. and Henry VII., of England; and Maximilian I., Emperor of Germany. The curious cards formerly in the possession of my old and kind friend, Mr. Francis Douce, some of which have been engraved by Mr. Otley and Mr. Strutt, are believed to have been the work of the famous Martin Schöen, or Schongauer, who died in 1486, and his contemporary, Israel van Meckeln. The earliest representations of persons playing at cards that has yet been discovered is a miniature in a MS. French copy of St. Augustine's "Civitas Dei." It was engraved for Mr. Thos. Wright's "History of Domestic Manners and Sentiments," p. 223, and exhibits two ladies, with the steeple head-dresses of 1467, and a gentleman, with the small cap and long hair of the same period, playing at a round table, with cards, of which the pips are visible. The illustration on the opposite page, copied from a miniature in "the Roman de Roi Meliadus," British Museum, Add. 12,228, and stated to be of the fourteenth century, is of no authority, the original drawing not being contemporary with the MSS. (in which there is no mention of, or allusion to, cards), and one of the latest and worst of those drawn and left unfinished by very inferior artists. The pips discernible in the cards sufficiently indicate a date about coeval with the other "card-party" anterior to which I have as yet been unable to discover any printed playing-card.

I offer no opinion of my own; I simply state the result of such examinations as I have had time and opportunity to make of the statements, arguments, and evidence of others better qualified than myself to discuss the subject. It is one of so much importance, affecting, as it does, the history of art, that I believe it worthy of a calmer and more careful reconsideration than it has yet received. Mr. Holt may be mistaken,—his enthusiastic nature may have caused him to jump to conclusions too hastily; but ill-concealed contempt for his judgment, or violent denials of his assertions, are as idle as they are unworthy. Truth is great, and will prevail, and I would not do Mr. Holt so much injustice as to believe that he would not feel obliged to any one who could establish the fact, whether it be for him or against him. J. R. FRANCIS.

GLASTONBURY.

TAKE a sheet of note-paper; draw down through the middle of it a line—you need not be so very particular about its being straight; one-third the distance from the bottom draw a line at about right angles, one-third the length of the first line; call the point of intersection the Market Cross, and call the line Magdalene-street; from the Market Cross to the bottom of the paper call the line Benedict-street; from the Market Cross on the other side of the first line draw another line, at about right angles, and call that North Load, a rather singular name, but never mind—"what's in a name?" Nearly at the top of the paper draw another line, at about right angles, and call that Chilkwell-street; and from that draw a line so as to intercept Magdalene-street, and call that Berolane; prolong the line, and call that Weary-all Hill; come back to the first line, where you commenced drawing Chilkwell-street, and draw a short line to the left: call that the Wells-road. Consider that Magdalene-street is, near the Market Cross, from 100 ft. to 200 ft. wide; Benedict-street (which is the road to the railway station) a dirty little lane, of 16 ft. or 17 ft.; High-street a well-favoured street, with good pavements on each side, and of a width from house to house of about 50 ft. North Load the same width as St. Benedict-street, but still dirtier; Chilkwell-street, the Wells-road, Berolane, and Weary-all Hill of a width of perhaps from 20 ft. to 30 ft. Turn the paper so that the Market Cross may be north, and Magdalene-street south; give a gentle

inclination to the paper westwards; turn up the paper above Chalkwell-street, and consider that a hill; and consider Weary-all Hill a conical lump of dirt;—and you have a rough idea of Glastonbury, or Glastonbury, a town of 3,500 inhabitants, and filling an area of about 7,100 acres, in the county of Somerset.

Four or five years ago, this town had an awful visitation of cholera; in a short time there were seventeen or eighteen deaths. Last July some sporadic cases of scarlatina appeared; in August it became an epidemic, and in fifty days there were fifty deaths, about forty of which were from scarlatina. It was confined to a street or two at first; at last it spread all over the place like seed coming from a thistle-top. How came such anguish,—the anguish of death,—upon so many in such a terribly short time? How came such trouble on the town? It is well situated, it is warm, has a fair supply of water, and its streets, if dirty, are on the whole above the average width. If a farmer had a field well situated, and he allowed its crops to be stifled and destroyed for want of drainage; and he allowed dirty corners in his field, full of thistles, that would blow about, and scatter their seed in every direction, would he be considered a good farmer? No. Then it is just that at Glastonbury: the people are destroyed like badly-managed crops, simply for want of good farming. First as to sewers. The only street in Glastonbury that can be considered properly sewered is High-street; the other streets have all sorts and sizes of drains to depend on; they run here and there, lose themselves, and get choked, how, where, when, no one seems to know; yet no town could be drained much more easily or more effectually. Let the streets be drained on a system, with pipes, and conduct the sewage, which could be easily done by means of gravitation, not into open ditches, and a horrible cesspool, but upon land, and use it for irrigation. There would soon be a generous return in health, in comfort, ay, and even in money, if the irrigation were managed properly; and towards that end we recommend the authorities to study, for it is well worth study, "Practical Suggestions, by Robert Rawlinson, C.B., in reference to Sewerage, Drainage, and Water Supply of Lunatic Asylums issued by the Commissioners in Lunacy."

The greater part of the sewage now empties itself in open ditches in Paradise Field (fine ironical talents the owners must have had to give the place such a name), and it finds its way to a cesspool not far from the railway station.

The cesspool, or reservoir of poison, is more than a quarter of a mile from the Market Cross, yet we were told the smell from it and from the ditches could be easily discovered in the town, when the wind was in a westerly direction—and westerly winds are the prevailing winds at Glastonbury.

The houses of the poorer inhabitants are characterised by a want of back premises; it is no uncommon thing for the *garde-robe* to be under the same roof as the dwelling. In the pit are stored all garbage and refuse until it is full; then, and not until then, it is cleared out. We saw a pit being cleared out in Chalkwell-street; it was immediately outside the back door, and against the wall of the dwelling-house (there was a back door in this case). The pit would hold about three loads of stuff, and the smell, the appearance of the stuff, and the appearance of the pit were horrible. Fancy this horrid pit being gradually filled up, matter added to decomposing matter, to decompose day after day, week after week; and we presume this is not an unusual instance. Is it any wonder that Nature rebels so fiercely, and sends sickness, with its accompaniments of wretchedness and woe? Then washing-water is flung into the gutters outside these houses, making the town look still more dirty, and adding to the offensive smell. Take two or three of these houses, fill them as full as they can be of human beings, and put them all upon a short allowance of water, and you have the worst thistle-bed in Glastonbury.

If they were determined to have disease in Glastonbury, no matter at what price, they could not do much more towards effecting their determination, if they suffer such places to exist. The water-supply does not seem perfect; but that we will not now enter upon, for we have pointed out in all kindred the chief sources of the presence of zymotic disease in Glastonbury. We hope what we have said will be taken in the kindly spirit in which it is offered. PRO.

WORDS ON THE DRAINAGE OF LIVERPOOL.

THERE are many people who unquestionably believe that the converse of every proposition has equal claims to truth with the original. They place implicit reliance in the *vice versa* statement, and consider it to be applicable in every instance, and a rule without a single exception. It is not to be wondered at therefore, having regard to the extensive scope of this mistaken credulity, that we continually witness practical illustrations of the false motto, "Never do to-day what you can put off till to-morrow." There is a fatal charm in procrastination, an enticement in delay, and a soothing pleasure in indolence, from which the wisest of us are in no ways exempt. Nine men out of ten experience the greatest difficulty in "making up their mind," and it is unnecessary to enlarge upon the enhancement of the difficulty, when it is kept in view that nine men out of ten must "make up their mind" before any measure involving any public or national benefits can be conferred upon the community at large. Our local boards and corporate authorities are, in general, exceedingly prone to yield to this mischievous species of fascination. They find it impossible to decide, not in a hasty, but in an expeditious manner upon any proposal which is brought under their consideration. They display an amount of ability in disputing upon quibbles which would confound a Lord Chancellor; they require evidence sufficiently tangible and positive to convince an idiot, and, under the guise of asking questions, they propound riddles and conundrums that would puzzle the Sphinx herself. Instead of foreseeing that sooner or later compulsion will succeed to option, and necessity supersede expediency, they continue to let matters take their course, and refuse with a persistency that is invincible, to what our French neighbours call, "accept the situation." Thus it is that sanitary and other measures of the greatest importance are postponed from time to time, only to become eventually the more onerous and the more imperative. Adjournment follows adjournment until the process partakes of the nature of a *sine die* arrangement, and those who ought in the interests of their own welfare and that of others to be readily influenced by the *suaviter in modo*, can only be brought to a sense of their duty by a vigorous administration of the *further in ra*. There is no other reason to which can be assigned the fact, that so very few of our towns have adopted proper systems of drainage and sewerage,—systems which science, morality, and hygiene have long since demonstrated in the clearest manner, to be an indispensable feature of civilisation. Our towns, both large and small, with a few solitary exceptions, adhere to the old routine, and continue, as the population increases, to pollute with commensurate augmentation the earth, the air, and the water.

The practice of discharging the whole contents of the drains and sewers into the nearest river or stream is so prevalent, that innumerable instances might be adduced where it now exists, and has existed from time immemorial. Among cities of considerable size and national importance, in which this practice still continues, Liverpool may be quoted. The Mersey, which bears upon its waters the merchandise of the world, is the common sewer of the city. All the main drainage running from the western side discharge their contents into the river, either directly or indirectly. There is no doubt but that a stream of the volume and capacity of the Mersey, to use a common phrase, can "stand" an amount of pollution that would reduce one of smaller dimensions to the same state that the Irwell is in. But there are limits to the quantity of poison that rivers, as well as human beings, can take with impunity. The experience acquired from the management of the London sewerage, and its effect upon the Thames, have taught us thus much. Similarly to the metropolis, the suburban part of Liverpool, especially the rising borough of Bootle, is increasing rapidly in population, and its drainage and sewerage becomes a formidable addition to that of the parent city. Independently of the fact that before long legislation will step in and forbid, under any circumstances the discharge of sewage or refuse-matter into rivers, the case we have just alluded to, would of itself suffice to render it necessary to provide for the disposal of the sewage otherwise than by allowing it to flow into the Mersey. It must not be forgotten that nuisances exist quite as much, if not more, in degree than in kind, and that extreme dilution will nullify the effects of the dead-

liest poisons. Assuming, therefore, as may be reasonably done, that it is a mere question of time, whatever may be the actual cause, regarding the present disposal of the Liverpool drainage and sewerage, the question that presents itself is, what means are to be adopted to ensure another outlet for it when the present one is permanently closed? One result will be, that in future, instead of so valuable a commodity being wasted, it will be utilised in some manner or other. Whether it will be utilised to its maximum or not depends upon the system adopted; but any scheme of utilisation, no matter how crude and imperfect, is preferable to the suicidal policy of discharging so rich a manure into unproductive waters. That we ought to utilise our sewage—that is, get so much manurial value out of it—is as recognised a maxim among professional and scientific men, as that we should get so much work out of a horse, or so much steam out of coal. If the Liverpool authorities determine upon irrigation as their principle of utilisation, they must, in the first instance, provide for that indispensable adjunct to this method—so much land. It is not necessary that the whole of the land to be acquired should be in one and the same locality. On the contrary, it would be better to have several sewage farms, so that the drainage of the different districts might be accommodated separately. This is particularly desirable in a city similar to Liverpool, in which there is a high level and a low level system of drains; for some of the land could thus be supplied with sewage on the principle of gravitation, while the remaining less accessible portions could be appropriated to the utilisation of the sewage that it might be necessary to raise by pumping.

It may lift all, or nearly all, its sewage into one main sewer, and discharge it over a large tract of sandy ground, or it may deal with it separately, as may prove best upon a mature consideration of the whole question, which will undoubtedly, before long, have to be grappled with in a considerably more extensive and energetic manner than the authorities have yet displayed. Some attempt has been made to utilise the sewage of Liverpool on a farm of about forty-five acres; but the results have not been satisfactory, and do not bear out those which have been obtained elsewhere. This is not to be wondered at, when the difference of conditions attending the case is taken into account. So long as the drainage and sewage of Liverpool is permitted to flow into the river, so long will that rapid and cheap outlet be made available for the purpose. Any trifling irrigation that may be carried on in the meadows can only be looked at in the light of an experiment, and, moreover, an experiment not particularly well carried out. But once let a veto be put upon the present system, let the great Mersey drain be closed, and we shall witness a very different state of affairs. The authorities will be then compelled to regard the matter as *serius*, and after the usual amount of delay, indecision, and negotiation, will set vigorously to work to solve the question on a more extensive scale than has been yet attempted.

RESTORATION OF WINDSOR PARISH CHURCH.

THIS work has been completed, and the church opened. What is done is only a portion of an extended scheme involving an estimated expenditure of 8,000l. The portion of the work now carried out consists of the erection of the chancel, organ-chamber, and Royal pew, the re-seating of the floor of the church, the removal of the organ, the alterations of the windows, and the reconstruction of the western gallery. The addition to the east end of the church is in the Perpendicular style, and is built of stone from Wycombe, with Bath stone dressings, the interior facings being of Corsham stone, with blue Corsham and red Mansfield bands. The east end of the chancel has five sides, in each of which there is a two-light window, one of the windows being filled in with stained glass, presented by the vicar as a memorial to the late Mrs. Ellison. The subject represented is that of visiting the sick. The window is by Heaton, Butler, & Bayne. The reredos takes up the whole of the five sides, one side behind the communion-table being filled in with mosaics by Salvati. The panels of the reredos are separated by twisted columns at each angle, the capitals being carved and surrounded with angels in the posture of adoration. The Royal pew is situated on the south side of the chancel, and opens by arches into it, and also into the

south aisle. It is lighted by two two-light windows, and one circular window over them. There is an entrance to the Royal pew and the chancel from the back of the church.

The chancel opens into the nave by a moulded four-centered arch, 22 ft. wide, 18 ft. to the springing points, and 11 ft. to the crown. Over the organ and royal pew arches there are three clearstory windows. The roof is open, of Dantzio fir, and rests upon crockets, on which are carved angels with musical instruments. The floor of the church has been entirely re-seated. The pews have been abolished, and low open seats of deal, stained and varnished, substituted. In the ends are carved panels of quatrefoil tracery. The church is lighted by a series of arcades, suspended from the roof in the centre of the arcade arches, by smaller lights under the galleries, and by a larger corona in the chancel. The lighting has been performed by Messrs. Hart, Son, Peard, & Co., London. The decorations are by Messrs. Heaton & Co., London. The heating of the church by hot-water apparatus was entrusted to Messrs. Wellman, of Windsor.

The organ, which formerly stood in the western gallery, is now placed in the chamber on the north side of the chancel.

The contract for these works was taken by Mr. Kelly, for 4,168l.; but, from a statement made by the vicar, the estimated expenditure, exclusive of printing and advertising, amounts to 5,814l. The designs upon which the work was carried out were by Mr. S. S. Taulon, architect; and they have been superintended, on the part of the architect, by Mr. T. A. Cressy, as clerk of the works.

At the luncheon which took place after the opening, Mr. John Walter, M.P., in the course of an interesting address, complimented the architect on what had been done.

THE COFFERDAMS FOR THE THAMES EMBANKMENT.

INSTITUTION OF CIVIL ENGINEERS.

At the first meeting of the session, November 8th, Mr. C. B. Vignoles, president, in the chair, the paper read and discussed was, "Description of the Cofferdams used in the execution of No. 2 Contract of the Thames Embankment," by Mr. Thomas Dawson Ridley.

The contract upon which these cofferdams were used was let by the Metropolitan Board of Works, in January, 1864, to Mr. A. W. Ritten. It extended from the landing pier at Waterloo Bridge to the eastern end of the Temple gardens, a length of 1,970 feet. Mr. J. W. Bazalgette was the engineer-in-chief, and Mr. Edmund Cooper was the resident engineer; the author having charge of the works for the contractor. The breadth reclaimed from the river by this portion of the Embankment varied from 110 ft. to 270 ft.; the depth of water, when the tide was low, in front of the wall, averaged 2 ft., and the rise of tide was 18 ft. 6 in. The borings showed the bed of the river to consist of sand and gravel, resting upon the London clay, at depths varying from 21.58 ft. to 27.10 ft. under low-water mark, whilst the foundation of the wall was in all cases designed to be carried down to a depth of 14 ft. under low-water mark.

It devolved upon the contractor to design dams to the satisfaction of the engineer, who reserved to himself the power to adopt either caissons or cofferdams. The author considered that dams of timber and puddle would not only be cheaper, but could also be more expeditiously constructed, than iron caissons; and having succeeded in obtaining the engineer's sanction to one of the plans which he submitted, the work was begun.

The Temple Pier was the most important work in the contract, and it was therefore requisite to lay its foundation dry as soon as possible. To effect this, two short dams, one at each end of the pier, completely enclosing a short length of the river wall, were first begun. No. 1 was 111 ft. 6 in. long by 25 ft. broad, inside measure, and No. 2 was of similar breadth, but a few feet longer. These dams consisted of two rows of piles of whole timbers, averaging 13 in. square, with a clear space of 6 ft. for puddle. The piles were from 40 ft. to 48 ft. in length, having cast-iron shoes 70 lb. in weight, and were driven 4 ft. into the clay. Cast iron was used in preference to wrought iron for the shoes, as giving, at an equal cost, a much larger base for the timber to rest upon. Where the driving was difficult, shoes having cast-iron bases and wrought-iron

straps were employed. The piles were secured by three rows of walings of whole timbers, 13 in. to 14 in. square, through which, and passing through the puddle space, at distances of 6 ft. 6 in. horizontally, were bolts 2½ in. in diameter in the lower waling and 2 in. in diameter in the middle and upper walings. Cast-iron washers, 9 in. in diameter and 2½ in. thick, were used to distribute the pressure over a large surface of the walings. To avoid the difficulty of having to procure a number of long timbers, the piles were in a few cases only of the full length required, and the others, after being driven, had lengthening pieces fixed to them, so as to raise the dam to a height of 4 ft. above the high-water line. Before proceeding with the construction of these two dams the ground was not dredged, but in all the dams subsequently constructed, the sand and gravel were cleared off to the level of the clay before the piles were driven. Where the ground had not been dredged, great difficulty was experienced in driving the piles, and in the two dams in question one-sixth of the whole number pitched, having shown symptoms of failure, were drawn. In all cases the piles so drawn were observed to have cast their shoes, and their lower extremities were usually bruised into a mass of tangled shreds. The failure generally occurred when the piles were passing through a bed of compact sand, resting upon coarse open gravel. Beneath the gravel, and resting upon the clay, was a layer of septaria, which offered a serious impediment to the passage of the piles; but when once the clay was reached, the driving was comparatively easy. The space between the piles was dredged to the level of the clay, and filled with well-tempered puddle. The transverse struts, of which there was a tier to each waling, were of whole timbers, 8 ft. apart in the length of the dam.

Simultaneously with the construction of these dams, the filling-in of the space behind the Temple Pier was going on, the line of the dam was being dredged, and the driving of the piles begun. The Temple Pier, 470 ft. in length, was irregular in outline, projecting in some parts upwards of 30 ft. in advance of the river wall, and the breadth across the foundation trench in the centre part was 57 ft. To avoid the necessity of having to use a large number of struts of such great length, this dam was strengthened by means of buttresses of piles, somewhat similar to those used in the cofferdams constructed for the Grimsby Docks. (Vide Min. of Proc. Inst. C.E., vol. ix., p. 1.) These buttresses were placed at intervals of 20 ft., and were backed up by struts extending across the foundation of the pier. The scantlings of the timbers and the sizes of the bolts in this dam were similar to those in dams Nos. 1 and 2, the walings only being a little stouter, averaging 14 in. square.

In cofferdams there was usually a frequent settlement of the puddle, producing channels underneath the bolts and a consequent leakage. In such cases holes were bored, with a 3-in. auger, through the inner row of piles, immediately below the tie-bolts, and pellets of clay were driven through these into the puddle until the leakage was subdued.

The quantities of material used in the dams were:—In the Temple Pier dam, timber 152 cubic feet, iron 285 lb., and puddle 9 cubic yards per lineal foot of dam. In the other dams, timber 117 cubic feet, iron 202 lb., and puddle 9 cubic yards per lineal foot of dam. The staging from which the dredging was executed, and the piles driven, consumed 19.6 cubic feet of timber, and 13 lb. of iron per lineal foot. Sissons' and White's steam pile-drivers, and those of Appleby Brothers, were used in addition to others wrought by manual labour. The cost of driving was a little under 4d. per foot of the pile when the ground was dredged, but was much higher where the ground was not dredged. The preparation of the piles cost seven-eighths of a penny, and the fixing of the walings and shoring 4½d. per cubic foot, exclusive of the cost of fixing the tie-bolts.

In estimating the pressure to be resisted, and the requisite strength of the dam, the depth of water was taken at 22 ft., the piles were assumed to be 12 in. square, and the struts 13 in. square. The weight of a cubic foot of the dam was estimated to be 100 lb., and the breaking strain of the timber, measured by a load upon the middle of a bar 1 ft. long and 1 in. square, was taken at 400 lb. The pressure of the water was found to be 15,125 lb., or 6,752 tons per lineal foot of dam. The momentum of the water tending to overthrow the dam was 110,916, whilst the momentum of the dam

itself was 83,200. It also appeared that if the dam had been 9.33 ft. instead of 8 ft. in thickness, it would, considered as a wall, have been, in relation to the pressure of the water, in a condition of equilibrium. The resistance of the piles to fracture at the ground line was calculated to be 47,127 lb. in relation to a force acting at the centre of pressure of the water. If one-third were taken as a safe load, the result was 15,709 lb. to resist a pressure as before stated of 15,125 lb. Disregarding these resistances, and reckoning the whole pressure of one bay to act upon each strut, the thrusts were—on the lower strut 222.82 tons, on the middle strut 77.5 tons, and on the upper strut 47.94 tons. But with every strut resisting an equal pressure the load on each would be 26.14 tons. For the pressure of the puddle on the tie-bolts, the author had no satisfactory data, but he assumed it to be less than that of a similar section of water, and approximately the load upon the tie-bolts was calculated to be, at all events, less than the following amounts:—On each lower bolt, 24 in. in diameter, 85,250 lb.; on each middle bolt, 2 in. in diameter, 54,375 lb.; and on each upper bolt, 2 in. in diameter, 37,625 lb.

The total cost of the removal of the dams was 11. 4s. per lineal foot, made up thus:—Clearing out puddle, 13s. 6d.; dredging outside of dam, 7s. 6d.; cutting off piles, 3s. per lineal foot.

THE STATE OF OLD ST. PANCRAS CHURCHYARD.

THE condition at the present moment of interesting Old St. Pancras graveyard is a disgrace to those who have control there. Herein are buried some of the oldest, noblest, and distinguished families of the three kingdoms, and mingling with them are remarkable and noteworthy foreigners or exiles from almost every European state. Common respect for the dead, if not archaeological interest, ought to be apparent instead of absent, and whoever is to blame for this state of things, whether it be an individual or a local community, there ought to be no quibbling in stating the facts above board. On the first occasion when we visited this graveyard, we noticed desecration, demolition, and neglect, and we deplored that it should be so. During these last few days we have again visited St. Pancras, and we were horror-struck at the wanton havoc, the triplefold, increased desecration evidenced. The shock of an earthquake, had it passed over this graveyard, could hardly have produced such wreck and ruin as may be witnessed by any person who chooses to visit and confirm our statements, for deny them none can. Since our previous visit, a period of a few months, several monuments have been smashed and tumbled down, and the iron railings surrounding others have been wrenched from their bases and carried away bodily. In fact, a system of constant plunder is going on in this graveyard, which receives not the slightest care, and has not the semblance of a walk except what leads to one or other door of the church. From some inquiries which we made in the precincts of the church, we heard that the disgraceful state of the graveyard was causing indignation and disgust in the neighbourhood, and an agitation is mooted for a local subscription to put the place in some decent state of repair, if it can be proved that there are no available funds for the purpose attached to the church living.

We allude to this painful subject in a rather forcible manner now, from the fact that we have on more than one occasion heretofore hesitated, in the hope that as what seemed the worst was reached matters would mend. Matters, however, that had gone on from bad to worse for some years (and more noticeably since the Midland Railway crossed the churchyard) have now proceeded from worse to—well, we are at a loss for a superlative to express it. We may simply say that though the dead in Old St. Pancras received a Christian burial at the period of their interment, their remains are now subjected to worse than barbarian treatment.

British Archaeological Association. The opening meeting is announced to take place at the Society's Rooms, 32, Backville-street, on Wednesday, the 23rd inst., at eight o'clock, when Mr. Dillon Croker, F.S.A., will read a paper "On the Legends of the Wye." This was one of the papers prepared for the Hereford Congress, and postponed for want of time.

BUILDING APPLIANCES.

Rooke's Knobs and Spindles for Locks.—It was long the practice to fit the square end of the spindle of door-knobs into a corresponding opening in the knob or handle, and then to secure them together by passing a screw-pin into the neck of the knob laterally to go into a hole sunk in one face of the spindle. This has always proved a troublesome system of fastening one to the other from the frequency of the screw pin getting loose when touched by the hand, and from the difficulty of adjusting the distances of the holes in the spindle to suit the varying thickness of doors to which they are to be applied. The invention patented by Mr. A. B. Rooke, consists in cutting a screw thread on one end of the spindle, and in fitting an internal threaded cap or socket nut over the same. When the spindle is passed through the lock, one of its knobs bears against the escutcheon plate or ring, and the free end projects beyond the other side of the door. Over this free end is passed the second knob, which is made with a hole to fit the spindle, and then the threaded cap or socket nut on to the end of the spindle is screwed until the second knob bears against its escutcheon plate or ring, with sufficient pressure to prevent any rattling of the parts, and yet allow an amount of freedom in turning. Sometimes both ends of the spindles are screw threaded; in that case both the knobs are secured by means of socket nuts.

The inventor claims as advantages of this sort of lock furniture over that in common use, that it can be produced more cheaply, as stamped mounts can be used instead of cast; is more easily adjusted, and cannot come loose; the spindles fit more tightly, so that there is not so much rattle about it as with the ordinary; and can be applied to knobs of any substance, as glass, wood, porcelain, and metal.

We have no doubt of its superiority over the method commonly in use.

Wilson's Patent Double Seal Stench-Trap.—In this trap now being manufactured by the Carron Company, the cup is about double the depth of the ordinary bell-trap, and has a grooved ledge around it, about half-way down. Fitting in the groove is an india-rubber washer, cast upon the bell. In place of the grating is a circular metal plate, having a narrow flange round its outer edge; cast upon the inside of the bell is a tube, about 8 in. long, pierced with large slots; this tube fits and passes downward through the hole in the bottom of the cup. Around the tube beneath the cup is a strong brass spring, held in position by a small collar screwing upon the bottom of the tube; it will thus be seen that the spring around the tube draws down the flange of the circular metal-plate with great pressure upon the rubber-washer, and excludes any stench that might arise from the drain and pass up through the water in the bell-trap beneath. To raise the tube, bell, and flanged plate, a thick rod is cast upon the plate, having a ring at the top, and passes upwards through an ordinary trap grating at the top; the rod is pierced at a certain distance down to allow of the inside appliances being drawn up, and a pin being run through the hole, so that when in use it forms the ordinary bell-trap, and when not in use, by withdrawing the pin, it drops and becomes impervious to stench, as before described.

THE SO-CALLED "CHARITIES" OF READING.

We mentioned last week the public meeting of the Reading School of Art. Mr. Henry Cole, in the course of his observations on that occasion, made some remarks on local charities, the spirit of which will apply to other places besides Reading. The speaker said:—I am told that there are lots of schools in Reading, but in Mr. Jones's "Sketches of Reading," a sort of guide-book to Reading, I find mentioned the churches and chapels, the charities, the hospital, the gas-works, the iron-works, the corporation; in fact, everything is mentioned except schools, and I am really puzzled to know how many schools you have, and how many children they accommodate. But I take it for granted that you have schools, and I also take it for granted that if you have not sufficient schools you will have to provide them either by your voluntary exertions, or by means of rates. In this book—"Sketches of Reading"—there is a great deal of curious information. I find here a list of charitable bequests to this town, and very remarkable they are. First I read that somebody, more than 200

years ago, left some rents to provide shirts and shifts for ten of the poor of Reading. I dare say in those days shirts and shifts were much more difficult to get than they are now, and I dare say that the land which was left to purchase them is worth a great deal more money than it was worth in the year 1610. Then, in the next year, there was money left for a charity, the like of which in all my experience I have never heard of before; one John Blagrave, who was taught in the Free School at Reading, and became an eminent mathematician, had this quaint notion: he left a certain amount of money to be given annually to poor servant-maids who had continued in one service in Reading in good name and fame for a term of five years at least. Then you are told how the money was awarded. Three poor maids were elected to try, and the winner was decided by the highest throw of the dice. Now, I do not know whether that goes on at the present day or not, but I have a shrewd suspicion that something of the kind takes place. The next thing we find is that there was a charitable fund provided for two or three poor butchers. Then, again about fifty years after, I find that a fund is left to be distributed every three years amongst six poor maids towards their marriage portions; in fact, if they were good servants, it would be to the interest of some rapacious landowner to get married to get their marriage portion. Then I found other rents were left which were to be given to three male servants, the chance to be decided by lot. You seem to have been a gambling set of people. Lastly, I find the maids again; the same kind of provision is made for them. Then it seems from this book that there has been a good deal of change of late years, and some part of these bequests have been turned to other purposes for the support of schools and other things, but still I find that annually at Easter, gifts of not less than 10*l.*, and not exceeding 20*l.*, are distributed to meritorious female servants, being members of the Church of England, and having lived five years consecutively in one family. That seems, by the wit of Chancery, and the good will of the people of Reading, still to be the way of distributing charity here. With all submission to you, I think you could do a great deal better with your money. I find that the total revenue from these charities amounts to 2,777*l.* a year; at least it was so a year ago. Now, I venture to suggest that great advantage would arise from using all these funds for the purposes of education. You hardly know what the amount is. Just imagine what good could be done with that 2,777*l.* You could have a series of institutions of an educational character. I hear that you are going to revive the Grammar School, and the Prince of Wales came here to lay the first stone. But you are going upon the old-fashioned plan of building the building, and getting into debt for it I believe, and then you are going to leave the master, just as you have left my friend Mr. Havel, to make the best he can of it. I am not quite clear that that is the right way. I do not like the term Grammar School. I do not believe that you will ever get a good Grammar School in Reading, although you had a good one here fifty years ago. Times have changed, and people want something else besides grammar; therefore I venture, in the interests of science and art, to ask you to look well ahead as to what is to be taught in that school after it is built and paid for. If you could but make use of this 2,777*l.* in the right way, you might have an excellent set of schools in Reading. At Faversham, in Kent, charities amounting to 2,000*l.* a year have been devoted to schools, and those who are interested in education in Reading should make a pilgrimage to Faversham and see what excellent schools they have got.

GENERAL CONDITIONS FOR CONTRACTS.

Sir,—In common, no doubt, with many of your readers, I have considered with great satisfaction the manly and true remarks made on this subject by the President of the Royal Institute of British Architects in his opening address. His very pertinent question must be answered. "Why not agree," he says, "to certain general conditions of contract as an equitable basis of contract between our employers and the builders engaged in their works." Mr. Wyatt is not ashamed to say "our employers." He does not support that absurd position which some architects wish to assume who talk of their "clients," and say that they occupy a position between the employer and

the builder, and having no bias on one side or the other, are at all times ready to do even-handed justice. The demand to hold such a position seems to me ridiculous. There is not one man in a thousand who has the firmness and the cool, unimpassioned judgment necessary for such a post. In case of a dispute between the employer and the builder, the architect's own conduct is generally so mixed up in the question, that he were more than mortal to be able to do justice, in opposition to an employer, who may be a strong-minded unscrupulous man. Why should any gentleman object to a full and fair arbitration clause? I, as a builder, have found the objection to such a clause mainly proceed from a class of practitioners who are known for being most unscrupulous in their transactions with builders. There is many an architect to whom the builders of London would leave any dispute (in which he had no direct interest) with the greatest confidence; but no architect has a right to be arbitrator in a matter wherein his own conduct and interests must be so intimately mixed up. A model arbitration clause has been put before me, which I venture to think might be generally adopted. I send it herewith, in case you think fit to print it.

A LONDON BUILDER.

"Provided always that in case any question dispute or difference shall arise between the employer or architect on his behalf and the contractors as to what additions if any ought in fairness to be made to the amount of the contract by reason of the works being delayed through no fault of the contractors or on account of any directions of the architect involving increased cost to the contractors beyond the cost properly attending the carrying out of the contract according to the true intent and meaning of the signed drawings and specification or as to the construction of these presents or as to any other matter or thing arising out of this contract except as to matters left during the progress of the works to the sole direction of the architect under the clauses relating to the interpretation of the drawings and quality of workmanship and materials or in case of the contractors not being able to obtain from the architect any certificate to which they may claim to be entitled, then any such question dispute or difference or the matter or value which should be certified is to be from time to time referred without any suit at law or equity to the arbitration and final decision of the architect or in the event of his death or unwillingness to act then of an architect and in the event of his death or unwillingness to act then of an architect to be appointed on the request of either party by the president for the time being of the Royal Institute of British Architects and the costs of any such reference shall be in the discretion of the arbitrator."

LARGE HOTEL FOR COATHAM, REDCAR.

A MEETING of the directors of the Victoria Hotel Company was held at Coatham, Redcar, last week, when it was unanimously decided to proceed with the erection of the building forthwith. The architect, Mr. Charles J. Adams, of Stockton-on-Tees, was instructed to procure estimates for the work in accordance with the designs approved, and to lay the same before the next meeting. The building will be a very large one, the hall in the centre, with galleries round it, being over 100 ft. long, and 35 ft. wide. There will be raised terraces in the front, 80 ft. deep. The site is a commanding one. It is intended ultimately to erect a club in connexion with this building, the front of which, when completed, will be 260 ft. long.

WORKS FOR THE COUNTY OF DURHAM.

The following works were, at the last Quarter Sessions, ordered to be commenced in the county as soon as the weather will permit, the plans proposed by Mr. Crozier, the county architect and surveyor, having been approved.

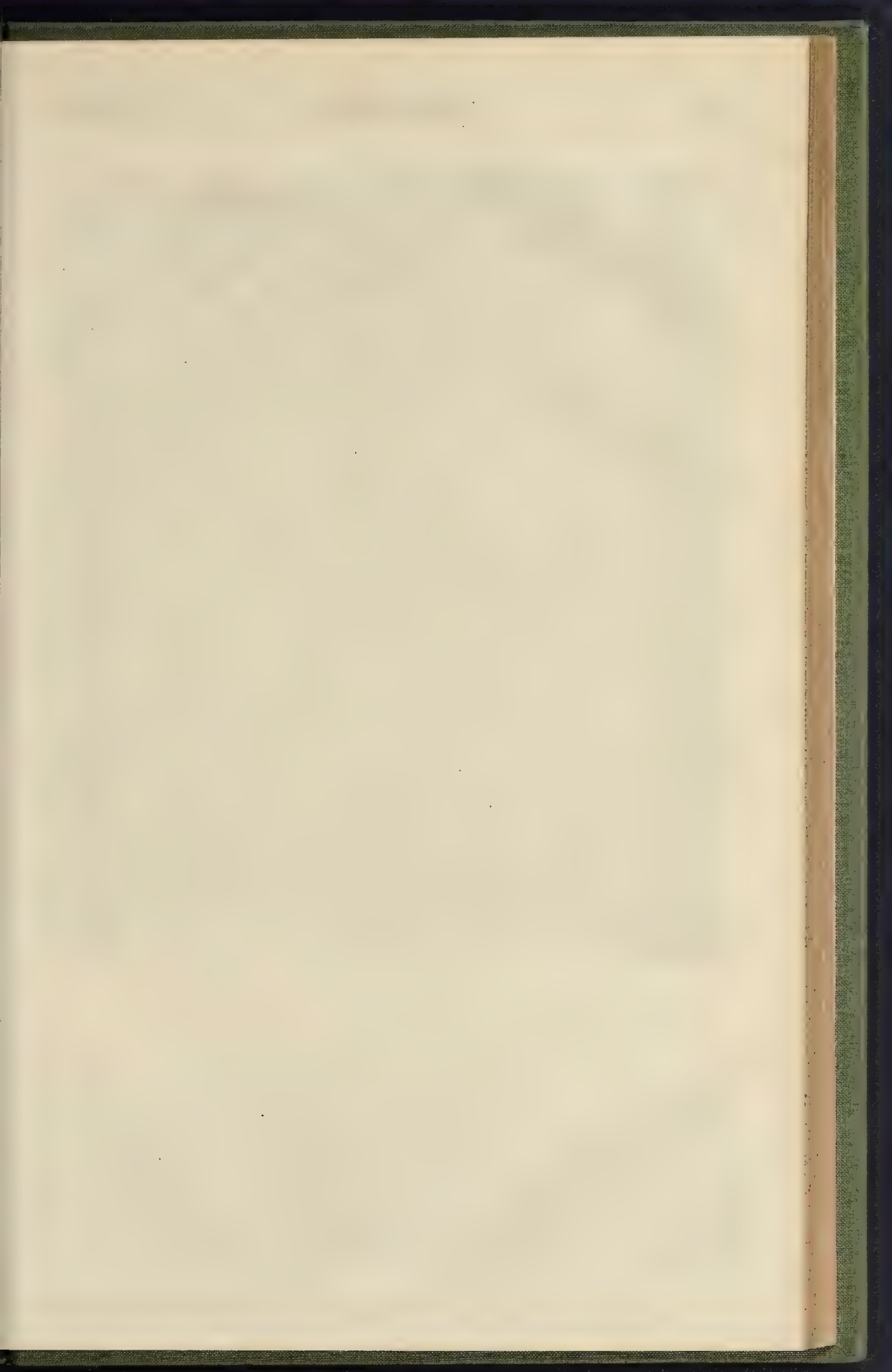
1. New police office, court, and station at West Hartlepool, including superintendent and sergeants' houses, rooms for single men, cells, stabling, &c. Estimated cost, 3,000*l.*
2. The same at Stockton. Estimated cost, (including purchase of an acre of ground for site), 3,000*l.*
3. New police court, cells, and men's rooms, at Jarroon-Tyne (including property purchased). Estimated cost, 1,200*l.*
4. New police-office (occasionally to be used as a justice-room), new cells, and men's rooms, at Willington, near Durham. Estimated cost, 400*l.*

New police office and station, St. John's Chapel, Wearside. Estimated cost, 300*l.*

Superintendent's house, stabling, and improvements to court at Wolsingham, are now in progress.

A new police-station is also ordered for Shildon, near Bishop Auckland, and will be commenced in the spring.

There is evidently life in Durham,—and crime.





COUNCIL CHAMBER IN TOWN-HALL, DETTELBACH, BAVARIA.

COUNCIL CHAMBER IN TOWN-HALL AT
DETTELBACH, BAVARIA.

We have previously given a view of the interesting Town-hall, or Rath-haus, in the quaint little town of Dettelbach, near Würzburg.

It will be remembered by those who have seen our former illustration that this building is a large rectangular structure built over a stream, with a square porch attached to one of the longer sides. This porch is approached by two flights of stone steps, below which is a vaulted chamber used as a prison, and above the porch is a semi-octagonal chamber, which was originally a chapel or oratory. It is prettily vaulted in stone, and has a Late Gothic window in each face. The porch opens into a hall, with a large

oak staircase. To the right and left of this hall are large chambers, with flat ceilings composed of huge beams of oak. These rooms now are used as a parochial school, and contain nothing remarkable. The rooms on the upper story are, however, very interesting. Opening from the upper hall or landing is the before-mentioned little chapel or oratory, and to the right of it is the remarkably interesting chamber represented in our illustration.

This room is about 46 ft. long by 25 ft. The ceiling is very noticeable: it is supported upon two principals, which are richly moulded, and these are connected by a series of purlins. There are no common rafters. This is not a roof, but simply a ceiling, as it takes quite a different form from the outer roof of the building, and is

nearly 20 ft. below it. The ceiling is repeated over each of the four chambers in the upper story of the Rath-haus.

The sides of this Council Chamber are very picturesquely arranged. Each window is placed in a deep embrasure, formed by quasi-classical pilasters, adorned with medallions and ornamental panels. The seats formed in the window spaces are very picturesquely managed. All the windows in this chamber retain their old glazing, consisting of small circular panes of glass, and there is also some well-designed metal-work attached to the wooden casements. There are several curious old portraits of former *bürgermeisters* hung round the room, and some good furniture of the earlier portion of the eighteenth century.



RESIDENCE, WILDEBERWICK, EAST GRINSTEAD, SUSSEX.—MR. ALFRED SMITH, ARCHT.

...the session, well
...which is liberal
...contents of its library; and
...annual entertainment for a
...doing all this, the council
...invest 384*l.* in Consols, and
...balance in hand of some 130*l.*
...account. Does this look
...on to lament a supposed
...pects:—

...who are disposed to maintain
...of concentration of energy,
...called 'living business,' the manage-
...for the last few years has not been
...once was. The days of Mr. C. C. Nelson
...Lewis are frequently recalled to memory,
...empty and affairs are tied up; and we
...ought to express the hope that . . . the
...become worthy of the penultimate past."

...sir, pretend to gauge the precise
...of these remarks. Whose or what
...the writer has observed tied up will
...remain a mystery to all but himself.
...own part, I am reminded of "the days
...C. Nelson and Mr. Hayter Lewis," not
...benches are empty," but when they are
...led. It is possible that this may be the
...meaning, though he says precisely the
...but a gentleman who believes in the
...ions of concentration of energy," and in
...penultimate past" (why not, while we are
...is, say the *paulo-post future*?), may be
...for being a little obscure, particularly
...devotes himself to that absorbing
...al pursuit,—the search for mares' nests.
...clusion, sir, let me ask seriously whether
...after all, so much to regret in the pre-
...duct of affairs at the Institute? Is it
...at the Voluntary Architectural Exami-
...been revived? that Mr. E. M. Barry's
...been espoused so warmly? that the
...as met the Builders' Society in
...sultation for the public good? Is it

street, and
refers to, and
mentions, there would
looking at our own collection,
much as it ought to be, considering its
and its convenient position.

As some expense in advertising, printing, &c.,
would be incurred, funds in addition to the pre-
sent resources of the Museum would have to be
provided,—perhaps by a fee for exhibition, or by
exhibitors becoming members of the Museum.
But would not the Exhibition committee them-
selves arrange with our council to continue their
work in our Museum in the modified form sug-
gested by "E. W. T."?

JOSEPH CLARKE, Hon. Sec.

MEMORIAL FOUNTAIN, GLASGOW. COMPETITION.

SIR,—Nine months ago the Commissioners of
the Glasgow Corporation Waterworks advertised
for designs for a memorial fountain to com-
memorate the services of the late Lord Provost,
Mr. R. Stewart; the cost of the fountain was
not to exceed 4,000*l.*, and a premium of 50*l.*
was to be given for the best design. It would ap-
pear that about fifty architects sent in drawings,
and for eight months nothing has been known for
certain what the Commissioners' intentions were
about awarding the premium. The minds of the
competitors were, however, set at rest by each
receiving from the secretary one of the most im-
pudent notes I ever read, dated the 9th of
November, informing them that the Commis-
sioners have agreed that the cost of the fountain
shall not exceed 2,000*l.*, instead of 4,000*l.*, and
they are further invited to do their work over
again,—to send in "modified designs," is their
pleasant way of stating it. But the impudence,
meanness, and dishonesty of the affair lie in this
—that they do not intend awarding the pre-
mium already wrought for by the man who has
sent in the best design according to the first

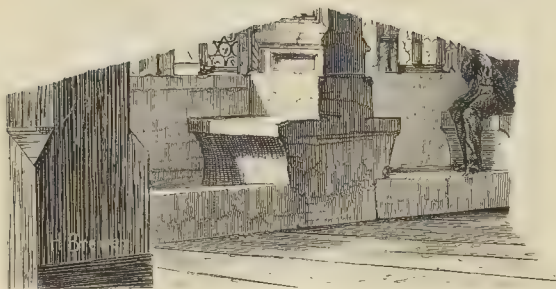
- REFERENCES.
H. W. Hot-water Coll.
A. Conservatory.
B. Drawing Room.
C. Garden Entrance.
D. Dining Room.
E. Gentleman's Room.
F. Billiard Room.
G. Library.
H. Kitchen.
I. Sanitary.
J. Breeding Room.



Plan of Ground Floor.

REFERENCES.

- K. Larder.
L. Servants' Hall.
M. Butler's Room.
N. Housekeeper.
O. Store Room.
P. Q. Hall and Principal
Entrance, with Clock
Room, Water-closet,
&c. under.
R. Library.
S. Entrance Porch.
T. Open Court.



COUNCIL CHAMBER IN TOWN-HALL, D.

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DETTELBACH, BAVARIA.

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oak staircase. To the right and left of these are large chambers, with flat ceilings composed of huge beams of oak. These rooms are now used as a parochial school, and contain no remarkable features. The rooms on the upper story, however, very interesting. Opening from the upper hall or landing is the before-mentioned little chapel or oratory, and to the right of this is the remarkably interesting chamber represented in our illustration.

This room is about 46 ft. long by 25 ft. wide. The ceiling is very noticeable; it is supported by two principals, which are richly moulded. These are connected by a series of ribs. There are no common rafters. This is not simply a ceiling, as it takes quite a form from the outer roof of the building.

RESIDENCE, WILDERWICK, EAST GRINSTEAD, SUSSEX.

"WILDERWICK," which we illustrate in our present number by a perspective view of the entrance front and a ground-plan, is about two miles and a half from East Grinstead. The site of the house has been chosen both to command beautiful views of the surrounding country, and be in proximity to the fine-grown trees, which are always valuable in preventing a nude or raw appearance round a new house; but before building on this site it was necessary to make a mutual arrangement with the parish to divert the road to Lingfield, thereby shortening it considerably, and leaving the house sufficiently distant from the road.

The entrance-porch, 8 ft. square, opens into an entrance-hall, 36 ft. by 19 ft., which contains the principal staircase, and small cloak-room. The hall, being two stories in height, has a gallery leading to the bed-rooms, and is lighted by a skylight, in addition to the windows. Immediately on the left of the entrance is the door to the library, 22 ft. by 19 ft. (with bay window), and opposite, on the right, is the door to the cloak-room. A corridor facing the entrance porch gives access, on the left, to a drawing room, 30 ft. by 17 ft. (with bay window), which communicates by glass screen and door, with a conservatory, 20 ft. by 16 ft.; on the right to a dining-room, 25 ft. by 17 ft. (with bay window), and leads thence by double glass doors (protected externally by projecting oak barge-boarded roof) to the lawn and terrace. Passing through the swing-doors to the extreme right of the hall, we have, on the garden side of the corridor, a 5-ft. passage for light, which, being near the swing-door of the dining-room, is fitted up with a dinner-flap; a gentleman's room, 17 ft. by 16 ft.; a water-closet and lavatory; a billiard-room, 27 ft. 6 in. by 19 ft. 6 in., lighted from the roof, in addition to the windows (one of the latter has a slate hood, and hung as a casement, affords access to the garden); and a workshop, 16 ft. by 11 ft., which communicates with the billiard-room, as well as the garden. On the other side are a lady's store-room (fitted with lavatory), 15 ft. by 13 ft., with bay windows; housekeeper's room, 14 ft. by 14 ft.; butler's room, 20 ft. by 14 ft., fitted with strong closet; and an open court for light, 15 ft. by 10 ft.; passing which (in the passage leading to back entrance), we have a kitchen, 22 ft. by 15 ft. (with small cook's pantry); a scullery, 13 ft. by 12 ft.; brushing-room, 12 ft. by 7 ft.; a servants' hall, 18 ft. by 15 ft.; and ladder, 15 ft. by 12 ft. On the first floor are three good bed-rooms (with bay windows), three smaller bed-rooms, two dressing-rooms, a boudoir, bath-room and water-closet, in addition to which, and over the kitchen offices, are five maids' bed-rooms, housemaids', and water-closet, two men's bed-rooms, and a large box-room. The men and maids have separate and distinct staircases to their rooms.

In the basement are coal, wine, and beer cellars, and game larder.

The external walls of the house are entirely constructed of the local stone (quarried by the proprietor), with square beds, and joints, and rough face, except the weatherings, cills, and window-heads, which are rubbed, and the dressings and quoins tooled. All the walls are lined inside with a half-brick wall, tied with iron to the stone wall, leaving a 2-in. space between them, to prevent dampness. The hollow space has also been made use of for ventilating the rooms at pleasure by means of sliding brass ventilators in the skirting. The roofs are covered with Delabole slates, and finished with tile cresting. The principal reception-rooms are fitted up with pitch-pine, and the panels of the doors and window backs are arranged so that the heart of the wood producing the figures comes in the centre of each panel. The staircase is also of pitch-pine, with turned and twisted balusters.

The estimated value of this house is called (in round numbers) 10,000*l.*, including conservatory and heating with hot water. Mr. J. T. Chappell, of London and Steyning, has carried out the works, from the designs, and under the superintendence of Mr. Alfred Smith, architect, of the Adelphi.

Reydon Church.—I wish some one would attack the cruel people who have whitewashed the grey stone walls of Reydon Church, in Suffolk, and further embellished the exterior with facings of gas pitch.—B.

MANAGEMENT OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SIR,—Your youngest professional contemporary has of late taken such a truly filial interest in the welfare of the Institute that one can but regret when its advice is ill-timed or is based on assumptions which are not precisely in accordance with fact. In a leading article of last week, which refers, *inter alia*, to the financial condition of the Institute, we read as follows:—

"It appears that a considerable sum of money—not much less than 2,000*l.*—is annually expended in its support. This ought to produce tangible results. It would be false delicacy to overlook the fact that questions are often put to members by strangers, and even to leading members by others, bearing upon this point, which are not easy to answer."

Now, sir, as a plain matter of figures, the expenses of the Institute last year did not exceed 1,440*l.* I attend the evening meetings in Conduit-street pretty regularly, and I am not aware that any great curiosity is manifested by "strangers" as to what the details of these expenses may be. Still less am I disposed to believe that any member of the Institute can be ignorant on this point. Lord Dundreary has with truth observed that there are some things which no fellow can understand, and there may possibly be Fellows of the Institute who are puzzled by a debtor and creditor account; but inasmuch as a balance-sheet of receipts and disbursements is printed and sent every year to every member, what delicacy or difficulty there need be in answering questions on finance, I am at a loss to conceive. Referring to my own copy of this document for 1869, I find that the expenses of the Institute for that year (omitting shillings and pence for the sake of brevity) were as follow:—

Rent, fuel, and light	£264
Stationery, postage, and advertisements	64
Salaries and wages	396
Publication of Transactions: reporting, printing, and illustrations	211
General printing	159
Furniture, fittings, and repairs	60
Refreshments at evening meetings	22
Expenses of conversations	116
Purchase of books for library	37
Money prizes and medals awarded	82
Donation to the Architectural Museum	25
Petty disbursements and sundries	23
	£1,439

I submit, sir, that this is no very large sum to represent the annual expenses of a society which includes about 600 members, which rents amplified and convenient premises in the best part of town; which retains in its service a secretary, a librarian, and a clerk; which publishes its Transactions once a fortnight during the session, well printed and well illustrated; which is liberal-handed with prizes and donations; which is constantly adding to the contents of its library; and which provides an annual entertainment for a thousand guests. After doing all this, the council managed last year to invest 384*l.* in Consols, and to carry forward a balance in hand of some 130*l.* to the present year's account. Does this look like deficient administration in finance?

But the article goes on to lament a supposed *decadence* in other respects:—

"There are not a few who are disposed to maintain that in that important function of concentration of energy, which is commonly called '*doing business*,' the management of the Institute for the last few years has not been so successful as it once was. The days of Mr. C. C. Nelson and Mr. Hayter Lewis are frequently recalled to memory, when benches are empty and affairs are tied up; and we must be bold enough to express the hope that . . . the future may soon become worthy of the penultimate past."

I will not, sir, pretend to gauge the precise significance of these remarks. Whose or what "affairs" the writer has observed tied up will probably remain a mystery to all but himself. For my own part, I am reminded of "the days of Mr. C. C. Nelson and Mr. Hayter Lewis," not "when benches are empty," but when they are well filled. It is possible that this may be the writer's meaning, though he says precisely the reverse: but a gentleman who believes in the "functions of concentration of energy," and in the "penultimate past" (why not, while we are about it, say the *pauzo-post* future?), may be excused for being a little obscure, particularly when he devotes himself to that absorbing zoological pursuit, the search for mares' nests.

In conclusion, sir, let me ask seriously whether there is, after all, so much to regret in the present conduct of affairs at the Institute? Is it nothing that the Voluntary Architectural Examination has been revived? that Mr. E. M. Barry's cause has been espoused so warmly? that the Institute has met the Builders' Society in friendly consultation for the public good? Is it

nothing that it has offered additional encouragement to the art-student? that it has kept a watchful eye on the new Building Act? that its committees do their best to maintain a due respect for ancient monuments, and preserve the integrity of professional practice? Are its meetings really less well attended? its sessional papers less carefully edited? its official duties less conscientiously discharged now than formerly?

I leave these queries to be answered by any one who will give credit where credit is due, and who may be, like myself,

A PLAIN-SPOKEN FELLOW.

THE RIGHT TO THE ARCHITECT'S DRAWINGS.

SIR,—I see some judicial authorities seem to be of opinion that the original drawings of a building belong to the client, instead of the architect; if so, it suggests the following queries:—

Is the architect required to furnish *without charge* copies of the plans for the use of the contractor?

Is a sculptor entitled to retain the model from which he executes a statue which has been expressly designed for a client?

If I order a piece of machinery, can I claim all working drawings or models which may have been prepared for the use of the workmen in the manufacture of the same?

If I employ a solicitor to prepare a conveyance for sale of property, can I demand of him the draft copy?

If Baron B., or any other Judge, gives judgment against me in a cause, and I have consequently to pay the costs, am I entitled to demand the notes he takes on hearing the case?

A PUZZLED INDIVIDUAL.

ARCHITECTURAL EXHIBITION AND ARCHITECTURAL MUSEUM.

SIR,—The suggestion of "E. W. T." in your last number, for an Architectural Exhibition in our Museum is one on which I should be glad to hear further, either from him or from others interested in the subject. Some years ago the idea was talked over by the officials of the Exhibition and the Museum; but although, as it then appeared, we had not space for so large a number of drawings as were displayed in Conduit-street, we might accommodate such as "E. W. T." refers to, and, in addition to the advantage he mentions, there would be the opportunity of looking at our own collection, not studied as much as it ought to be, considering its value and its convenient position.

As some expense in advertising, printing, &c., would be incurred, funds in addition to the present resources of the Museum would have to be provided,—perhaps by a fee for exhibition, or by exhibitors becoming members of the Museum. But would not the Exhibition committee themselves arrange with our council to continue their work in our Museum in the modified form suggested by "E. W. T."?

JOSEPH CLARKE, Hon. Sec.

MEMORIAL FOUNTAIN, GLASGOW. COMPETITION.

SIR,—Nine months ago the Commissioners of the Glasgow Corporation Waterworks advertised for designs for a memorial fountain to commemorate the services of the late Lord Provost, Mr. R. Stewart; the cost of the fountain was not to exceed 4,000*l.*, and a premium of 50*l.* was to be given for the best design. It would appear that about fifty architects sent in drawings, and for eight months nothing has been known for certain what the Commissioners' intentions were about awarding the premium. The minds of the competitors were, however, set at rest by each receiving from the secretary one of the most impudent notes I ever read, dated the 9th of November, informing them that the Commissioners have agreed that the cost of the fountain shall not exceed 2,000*l.*, instead of 4,000*l.*, and they are further invited to do their work over again,—to send in "modified designs"—is their pleasant way of stating it. But the impudence, meanness, and dishonesty of the affair lie in this—that it they do not intend awarding the premium already wrought for by the man who has sent in the best design according to the first

invitation, and which I hold they are legally and morally bound to do.

My object in writing to you now is, first, to call attention to the reasonableness of this; and, in the second place, to call on the competing architects to insist on the first competition being decided, and the premium paid, as promised, before the second one goes on.

I hope it is quite unnecessary to say that no architect who has the honour of his profession at heart will so far demean himself as to take any notice of this second call for new designs till the present competition be decided.

A COMPETITOR.*

BROOKS'S BANK, MANCHESTER.

SIR.—In speaking of the new bank illustrated in your paper, you justly observe that "Mr. Truefit has shown, as usual, much originality in the design;" but there is something not quite satisfactory about the appearance of the large porch as shown in your illustration. What is the construction of the sides of the porch: is it an arch or a lintel? The jointing of the stones, so far as indicated, appears to be vertical, which leads to the conclusion that the masonry is, in fact, supported across the sides of the porch by what appears to be an iron girder, forming a straight soffit below; but, if so, why use the arch form in the masonry, thus suggesting the idea of an outward thrust tending to push over the angle column? And, again, in the front of the porch, where the bearing for the masonry is shorter, are the three flat arches really arches, or lintels? The absence of any indication of jointing leads to the latter supposition; but, if so, why cut away the stone into the arch form, and thereby weaken its bearing capability, besides incurring a waste of labour and material? Perhaps Mr. Truefit can explain; but the feature as shown in your engraving is not quite satisfactory to the eye of

A CRITIC.

THANKING you for enabling me at once to answer "A Critic's" question as to the construction of the porch at Brooks's Bank, Manchester, I beg to say that the arches, front, and sides are all properly jointed (and not vertically so); that the T iron beams, fringed below and perforated ornamentally, form permanent "centres," which give an appearance of, as well as actual strength to, the arches; and this would not have been gained if they were tied together, as is often the case, with hidden rods.

The only other way of treating these openings in stone would have been with straight lintels and upright joints (single stones being out of the question), and with iron supports visible or hidden. I am afraid, however, that your correspondent's eye would have been offended much more by that mode of treatment.

GEORGE TRUFFITT.

CEILINGS AND THEIR CONSTRUCTION.

It may appear at first sight somewhat absurd that I should trouble you with a communication on the above, but having had a ceiling fail in a building in which great interest had been taken, and having heard recently of many similar instances, I thought the subject worthy of investigation, involving, as it may, some of us in trouble and certainly in expense: so to the point. The ordinary mode of procedure is as follows:—Laths are fixed to the joists, very often closely together, and frequently the ends of one row are nailed over the ends of the adjoining row: the coarse stuff, as well as the fine, is "run." Thames sand is used, and the plasterer, to get over his work as quickly and conveniently to himself as possible, forms his screed across the ceiling with too great a substance of coarse stuff, and consequently unduly weights the laths; add to the foregoing the very short hair which only is at this time to be obtained, and you are in a possession of the causes of failure. I will now suggest what I believe to be a remedy. Though mentioned lastly, yet by no means least in importance, is the hair supplied to us. Why is it so short? The answer is that in these days every effort is made to improve the breed of cattle, and the finer the breed, the shorter the hair. It is true, we have importations of hides with long hair from cold countries, and with coarse shorter hair from the River Plate and Monte Video, but for building purposes this hair is no longer available, and for the following reasons:—The

tanner sells to a middle man, who sorts the hair, and sells the longer to blanket and felt manufacturers: so if we insist upon long hair we must describe goat's hair: this in the wet is 3s. 6d. per bushel. Double fir laths should be used instead of the thinner varieties, known as single fir. Thames sand makes the stuff too short, and should not be used. Sand obtained from roads that have been metalled with ordinary pit gravel is the best. Plasterers should be restrained from overloading ceilings, which should have only the minimum substance upon them; and, lastly, coarse stuff should not be "run," because the process takes from its strength, and that it does so is evidenced by the fact that run stuff seldom or never blisters; if run coarse stuff is used it should be for the floated coat only. The pricking-up coat should be made after the old manner, that is, chalk-line should be slaked, road sand added, the whole turned up in a heap and allowed to remain for a time, then passed through a screen, and afterwards made up with a large quantity of hair and water, and allowed to remain three or four weeks before use. This will prevent blistering, and thus may save ceilings be obtained.

T. E. KNIGHTLEY.

THE SCULPTURE IN THE BRITISH MUSEUM.

SIR.—From the manner in which a letter in your paper of October 8th, on the cleaning of the sculpture in the British Museum, has more than once been brought to my notice, it seems to be assumed that I am in some way responsible for the care and material safety of the collection, and for the dangerous treatment it is said by your correspondent to be undergoing at this time. I shall be greatly obliged if you will allow me to state that I have no connexion whatever with the British Museum. Some time since I received a letter from the secretary, informing me that the trustees did not consider the services of a sculptor were required in the sculpture department, and my attendance closed.

RICHD. WESTMACOTT, R.A.

A LONG STRUGGLE.

WE have reason to believe that the following statement is correct. We go out of our way to print it, in the hope that one of our readers may find himself able to give a hand to a man who appears to have persevered under difficulties:—

SIR.—Believing you to be a friend of the working man, I have taken the liberty to address these lines to you, thinking you might be able and willing to give me a suitable advice. A sketch of my life will, I think, be the best way of making you acquainted with my wants of the present.

My age is forty-nine years; I am the eldest son of a working gentleman, who was too poor to give me any education more than could be obtained at an old-fashioned day-school, kept by an old man who had seen better days. He usually slept half the time away: so my chances of acquiring knowledge was not much, especially as I never went after I was ten years old. I learnt to read and write and cipher a little. I first went to work in the garden; after that I went to a coach-painter's for a year, and then three years at a wire factory in London, the working hours of which were from 6 a.m. to 2 p.m. As I had to walk four miles, I used to get up at four o'clock in the morning, and it was generally half-past nine at night when I reached home. Not much time, you will say, for a boy to improve himself. But I advanced a little. Every penny I could get went for books, which I read with avidity. Poetry I had a great predilection for; I even tried my hand at poetry. I tried also at drawing and painting in water-colours, but did not succeed, for want of technical knowledge; for I found no friend to assist me in my studies. After a deal of practice, I became a tolerable letter-writer. Any fresh character I saw I could copy with accuracy.

When I was sixteen years old my mother died, and I was sent into Berkshire, to an uncle, a master-builder, doing a good business. There my mind received a new bias. I saw that buildings were delineated on paper before erection; consequently there was some scope for taste and imagination. I purchased a case of second-hand instruments, and in a little time I became an expert draughtsman and colourist. Finding that many more things were requisite in the building trade, I went into geometry, arithmetic, mensuration, &c. Having a great aptitude for figures, I was not satisfied until I had mastered land and timber measuring and gauging. Some of these things I have now almost forgotten, for the want of practice. While I was learning those things I did not omit to seek practical knowledge: I worked at bricklaying, carpentry, and masonry. Not that I did any work at either of those branches like a man who has made only one of them his study for life, but I thoroughly know how they are to be done. To vary my amusements I next looked to music, and learned so far as to play tolerably on the violin and harmonium. I next took to writing poetry, of which I have enclosed you some specimens, which were published in a local paper in Bedfordshire.

At the death of my uncle the business fell to pieces, and I had to look for employment elsewhere. I have been journeyman, foreman, &c., in various parts of the country. I have built shops, dwelling-houses, farm-buildings, railway stations, schools, churches, &c., some from my own designs; but I am now, with a large family and invalid wife, in want of a job.

What I profess to do is to take charge of any sort of work in the building trade, set out and measure up the same, take out quantities, prepare working and other drawings, measure land or timber, keep a prime-cost account, keep time, &c. I think I should be useful to a surveyor or builder. My character will bear any amount of investigation as regards honesty, industry, and sobriety. I have not stated anything but what is true. My drawings will speak for themselves, and for the other things a few minutes' examination would be sufficient. For these last six weeks I have advertised, by 30,000 letters, and with any drawing I enclose are now getting low, and I should like to meet with something to bear me over the winter; I am not particular what, so that I can live by it. If it is in your power to assist me to a job, I shall be extremely obliged to you, and shall feel ever grateful for the kindness.

I have tried all my life to bring my family up in a respectable manner, and I wish to give my boys a better start in life than I had, but at the present I see no prospect of doing so, for I have only been able to exist by studying the strictest economy.

W. M.

CHURCH BUILDING AT THE PRESENT TIME.

A FEW observations made by Mr. Godwin at the Institute last week brought forcibly to mind the enormous extent to which church and chapel building and restoration have for some time been carried on by the Established Church, the Nonconformists, and the Roman Catholics. The following, from a Doncaster paper, bears on the subject:—

"The church-building of the present day does not depend on great feudal lords, but upon the combined efforts of every class according to their means. The new church of St. George, Doncaster, must have cost, from first to last, not less than £20,000, and the thorough or fourteenth-century cost would have been about £5,000. Ripon Cathedral has been restored at a cost of £40,000; the parish church of Grantham, at a cost of £20,000. Within the last fifty years the number of churches in the parish of Sheffield has increased from four to about thirty. The diocese of Ripon stated at its last meeting that the number of churches consecrated in his diocese was seventeen in the three years ending 1868, and 27 in the three years ending 1870. The Bishop of Lincoln reported an equally satisfactory progress in his great diocese. In the course of the last three years sixteen new churches have been built in the diocese, and seventy-seven churches had been rebuilt, restored, or enlarged; and at a meeting at Nottingham, on Monday, to promote a lay organisation to co-operate with the clergy, it was stated that during the past few years 100,000 ft. of wood had been expended in the county in building and restoring churches. We should feel obliged if any of our clerical readers would supply us with the statistics of church-building and church restorations in all the dioceses of England for the last few years."

A. B. C.

Re HALIFAX PERMANENT BENEFIT BUILDING SOCIETY.

SIR.—Will you allow a competitor to reply to the inquiry made by "Suspense," as I am afraid he would have to remain longer in suspense if he had to await some official information. I chanced to learn the following in respect of the matter, and when I tell him that the building has been already commenced, he will perhaps be surprised. The design first in order of merit, as he well knows, was put aside on the score of cost. The second seems to have been more successful, as Mr. Samuel Jackson, of Bradford, the author of it, is carrying out the work. I cannot say, for I have had the opportunity of thoroughly examining the perspective of this, as also the one rejected, and I must say they present a very striking resemblance to each other in the point of view. The second premium is awarded, but the third-best has not yet been found by the committee. One competitor, I was told, had withdrawn his design, which will probably be the course followed by others, to get out of their designs.

A. COMPTON.

ROYAL ACADEMY OF ARTS.

INSTRUCTIONS FOR ADMISSION OF STUDENTS IN ARCHITECTURE.

QUESTIONS respecting the admission of architectural students to the Royal Academy, and the proposed course of study there, are so constantly being made in the professional journals, that I should feel obliged if you could insert the enclosed "Instructions for the Admission of Students."

As regards the proposed course, I will take the earliest opportunity of communicating it to you, so soon as the Council of the Royal Academy may have decided on it.

H. PHENE SPIERS,
Master of the Architectural School.

Each candidate to be a student in architecture shall present to the Council a certificate from an architect-member of the Royal Academy, or to the Royal Institute of British Architects, or of any other public institution, for teaching art and science, certifying that the applicant has followed the study of architecture and architectural drawing, and has acquired a reasonable degree of proficiency in the same. The applicant's all further submit to the Council three drawings (not necessarily made by himself, or by a drawing of ornament from the east, such drawings being declared by him, in writing, to have been made or executed by him, and the same being attested by the person commending him, to the honesty of his knowledge and belief. If such certificate and drawings are approved by the Council, the candidate shall be required to make, in

* Two other letters to same effect received.

the Academy, each drawing or design as may be required—the subjects to be determined by the Council; who, drawing, together with the certificate before referred to, shall be laid before the Council; and if approved, the candidate will be admitted as student for seven years, in like manner as other students.

Those who have been unsuccessful in their first subsequent period, may renew their application at any subsequent period, by again going through the prescribed forms. All instruction in the Academy is gratuitous, the student providing his own materials.

Letters and packages from the country must be addressed, prepaid, to the Registrar, Royal Academy of Arts, Burlington House. Persons resident in London or its vicinity must apply in person.

Lectures, to which probationers and students have access, are given, on—Architecture, by Mr. G. Gilbert Scott, R.A.; Sculpture, by Mr. Henry Weekes, R.A.; Painting, by Mr. Charles West Cope, R.A.; Anatomy, by Mr. Richard Partridge; Perspective, by Mr. Henry Alexander Fowler.

Master of the Architectural School, R. Phend Spiers. The Library, containing a very valuable collection of works of art and architecture, is open to all students on Mondays, from 10 a.m. to 3 p.m., and from 4 p.m. to 6 p.m.; and on Tuesdays and Thursdays, from 6 to 9 p.m.

GREASE FROM VELLUM.

Can any of your readers mention a process for extracting grease spots from the pages of an illuminated book? The vellum in question is in decay. L. H. B.

THE STRIKE AT EATON HALL.

Sir,—With reference to the strike of masons and labourers under the employ of Messrs. Smith, Taylor, & Co., builders, at Eaton Hall, Cheshire, I will, with your permission, state the facts of the case.

There were certain arrangements in existence which the firm could not tolerate any longer; for instance, in connection with the floors alone, there were thirteen fliers, twenty-one fitters or joiners, ninety-two labourers, with only ninety-one banker masons, on a very elaborate job. The work was costing nearly as much per cubic foot as for preparing the firm were perfectly satisfied with the amount of work performed by each man (taking in consideration the labour already afforded him). The change consisted in supplying each flier with materials by a system of trucks, and other mechanical means; so that we should have doubled the quantity of work done by each flier, without calling on him for any extra exertion (or, as they said, endangering their lives). The men, more strictly speaking, the masons and masons and their labourers, would not listen to a word of explanation, but struck work before I had been on the works twenty-four hours. They at once resolved themselves into a committee of the whole body (after telling me that would not have a b— stranger there), for the purpose of howling and threatening, which, I suppose, is the fashion of the Cheshire masons and their labourers of discussing what they term their serious grievances.

THE STRANGER THEY WOULD NOT HAVE DOWN THERE.

CAN AN ARCHITECT'S "YOUNG MAN" BE A GENTLEMAN?

Sir,—I have ever observed your willingness to aid in a good action. Grant me, then, a corner of your paper that I may pour some oil on the troubled waters of "J. J.'s" stormy bosom:—

My dear "J. J."—You arrived at the house of Xenodochia, and, feeling yourself a Wren, twice upon the knocker you claimed admittance. Awaiting the response, you stood motionless with intellect, the five o'clock dining out of your Vitruvian eyes, and the "Can I, Mr. and Mrs. Punter, be peeping out of your kit. There you sat, the perfect type of a perfect gentleman, before the castle of an equal—more probably an inferior—at whose gate the fortune of war compelled you to lay down your sword.—I mean your saw. But *Saw-Loose* saw it not. He saw in double knocks anatomy and filthy laces. But, glancing in the mirror cunningly arranged outside his window, what did he see? "A common carpenter"—it could not be one of the lively head of artisans. And yet it was so. With maddening wrath he pounced upon you. "Man of glue," he said, "made for me the fifth of knacker's yard, down on your knees. How dare you thus—" But let me not recall his brutishness, but point out your revenge.

Take a house—a mansion—near the den of this savage. Let it be such a one as your architectural mind has so often pictured, and furnish it as your elegant taste may dictate. Keep six lacqueys for his one; a four-in-hand who he keeps on a one-horse chaise. Pass him on the road; distance him everywhere. Folly, disease, send for him and should be dare to raise your knocker twice, take no spoil yet, as far and feather him. Do this, and won't you go, as you say, to your port and read his whining letter in the *Lancet*, inquiring, Can I, Mr. and Mrs. Punter, be peeping out of your kit. There you sat, the perfect type of a perfect gentleman, before the castle of an equal—more probably an inferior—at whose gate the fortune of war compelled you to lay down your sword.—I mean your saw. But *Saw-Loose* saw it not. He saw in double knocks anatomy and filthy laces. But, glancing in the mirror cunningly arranged outside his window, what did he see? "A common carpenter"—it could not be one of the lively head of artisans. And yet it was so. With maddening wrath he pounced upon you. "Man of glue," he said, "made for me the fifth of knacker's yard, down on your knees. How dare you thus—" But let me not recall his brutishness, but point out your revenge.

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most insinuating; for he is aware that he is only Mr. C.'s clerk, or Mr. C.'s young man, and his knook is based on the style of a rising governor, transposed to a much lower key. His modest knook saves his dignity many a knock down. The apothecary or the pawnbroker is so taken with it that he will sometimes, in a gust of similitude, condemn to me a remark touching the state of the weather; but, of course, he knows better than to place himself on any more familiar footing with Mr. C.'s young man, a young man that he has more than once seen blown sky high, a young man that he would not make nearly as familiar with as he does with his coachman. Now, Mr. C. himself expects Talb to be a man of artistic taste and very refined feeling, fully capable of realising in form and colour all manner of poetic conceptions. Why should he be so? He is paid for it. But what business has he to mind if he is more frequently met with a frown than a smile? What right has he to permit his poetic feelings to be blunted with the recollection that his shortcomings are never forgotten, his successes never lauded? Writing to Captain Hall, a client, Mr. C. says,—"My young man, Talbot, is sufficiently intelligent to see to the matters to which you refer; I shall send him over to-morrow." Talbot goes; and, having seen to the matters referred to, but not having been seen by Captain Hall, who could not see an architect's young man,—no, not through a microscope.—Talbot resumes intimation, through the butler, that the servants are at dinner in the hall. He declines the invitation, and takes a peek at an inn in the neighbourhood. He has just discovered that an architect's hack cannot be a gentleman, and he accepts the situation with resignation. But he sometimes asks himself the question whether an architect can be a gentleman; and if so, why, he is not so more frequently. HENRY TONIN.

THE RIVER. MDCCCLXX.

Instar Omnium.

O River of dismal haunts!
Livid, discoloured, and changed;
Once thou wert dear to thy fount,
And death was from thee estranged.
Now thou art hellish, in sooth,
Rife with the breath of disease—
A river of blood, and, to boot,
A river of wealth midst thee.
Into thee it is still met
The City's ill and foul stime,
While law in the public street
Makes nuisances a crime?

O River of myriad ills!
Pure at thy primal source,
In turning a thousand miles,
You're lost at last per se.

Factories, reeking with fumes
And sewage, seething and fell,
O'er thy way 'neath the sun,
Making the river a hell.

Roll on, and never roll back,
E'en with the flow I do;
Roll on, most putrid and black,
Till our city is sorely tried.

But warning comes in vain,
We mallow such in flats,
Choking each sewerward drain,
And building holes was built.

The husband and wife, and child
Are craving for light and room,
For water and air muddled;
And must they rave on till doom?

O Statesmen, look to the poor,
Sicken and doleful, who
Can but pray to God, and endure,
The while looking up to you.

C. H. C.

APPROPOS CHARADE.

My first is heard where stock, and shares,
And money most abound;
The sound suggests an ancient man,
Wash, wrinkled, silver-crowned.

My second has no past, no future,
Only the present day;
'Tis ere, favorable as Fate,
And it never goes away.

My whole lived in the ancient days,
So very far and bright,
That modern time has named from him
Her forest, geyser's gift.

Fierce were the men of ancient days;
Thus, I, my ancestors whole;
But fiercer yet the men who thir'd
For his modern namesake's soul.—A. H. S.

Ans.—PARIS.

ERRONEOUS ESTIMATING.

Sir,—Referring to the two lists of tenders commented on in a recent number, I find that taking the list, "the alterations and additions to Nos. 3 & 5, Buckingham Palace," the average is 1,824; that leaving out the first and last two, the average is 1,864, so that the lowest tender is nearly one-half the average.

For the "Old Fellows' Hall," the lowest tender is two-thirds the average. It would be interesting, I think, to members of our profession if the architects' estimates in these instances were published, as I am a little at a loss to know on what principle tenders so much lower than the average (especially from amateurs) can be taken into account.

A SURVEYOR IN PRACTICE MANY YEARS.

* We have received some statements concerning the Buckle and Road tenders which are so remarkable that we must look at them again before we decide as to publishing them.—Ed.

THE CHELSEA OFFICIALS AND THE METROPOLITAN LOCAL MANAGEMENT ACT.

MR. DANIEL WYATT, of Eldon-terrace, Maudsley-grove, Fulham-road, was summoned to Westminster Police Court by the parish of St. Luke's, Chelsea, for neglecting to pay the sum of 27l. 14s., being his share of the expense of paving the said terrace. Mr. Rayment, barrister, instructed by the solicitors to the vestry, prosecuted; and Mr. John Evans, of John-street, Bedford-row, defended.

The short facts are these:—On the 28th of September, 1867, a resolution was come to by the vestry to take and make up Maudsley-grove, and an order was served upon the inhabitants to that effect. The parish subsequently did what they deemed necessary in order to put the street in thorough repair, and it was contended that the sum charged to the defendant was a fair one, and for which he was liable according to the Act of Parliament.

For the defence, Mr. Evans, who defended in the absence of Mr. Straight, tendered himself as a witness, and from his testimony and that of other persons it appeared that Mr. Evans built the whole of the houses in the grove, at a cost of 20,000l., and early in 1867 asked the vestry to make the road and pave. In September they passed a resolution adopting the street; but in consequence of the opposition raised by some of the inhabitants as to the excessive cost, they subsequently abandoned it. The street was impassable, the property deteriorating, and, after repeated applications to the vestry to complete the work, he did it at a cost of 300l., made the road, and paved the fronts of the whole twenty houses, the work being done thoroughly and well. Subsequently the vestry came to the decision, in January last, that the work had not been properly executed, and although Mr. Evans, the surveyor to the parish, had sanctioned the work and put down the pegs for the levels himself, the stone was all taken up, a quantity of it broken with hammers and carted away, and the remainder relaid, and the defendant therefore held that on this ground alone, without entering upon other points, he was not entitled to pay, as the vestry had not paved within the meaning of the Act.

Mr. Woolrych said it was a hard case for Mr. Evans. If, however, the vestry had proved that they had done work which was paving within the meaning of the Act he would have made an order. The law now was, and therefore he should dismiss the summons for want of evidence.

Mr. Rayment asked his worship to state a case for the Court of Queen's Bench.

Mr. Woolrych said he should decline to do so. They would have to serve him with a rule, when he should say that certain resolutions were come to and an order made; that this order had never been enforced and still existed; that the inhabitants were compelled to pass their street; and that afterwards the vestry went there, pulled the stones up, broke some, and put the others down again. He acknowledged the supreme power of vestries, but at the same time a magistrate was not a puppet, who simply sat on the bench to register their edicts and do for them without a sufficient proof. They had behaved very badly in this matter, but still, as he had said before, he thought he should be compelled to make an order. If they brought sufficient proof, and if Mr. Patten were so compromised that they could not bring him into court as a barrister, or some one who knew the facts, would do, but not a clerk who sat behind a desk and knew nothing of his own knowledge.

Subsequently, after a great deal of argument, the case was adjourned for a fortnight.

COUNTRY PATHS.

Sir,—Mr. G. B. Jesse's suggestion that the Ordnance maps should define public footpaths and ways, to preserve or secure the right of way, is worthy of notice; but it might be difficult to do so, on account of confined space. The difficulty would add travellers and pedestrians can testify from experience. It has, I believe, been decided recently by the common-law judges, that a footpath may be ploughed up by the land-owner legally, to the prejudice of the public, provided that the right of way is reserved. CHAS. COOKE.

MONUMENTAL.

Statue of the Prince Consort at Cambridge.—The Syndicate appointed June 2nd, 1870, "to consider the best site for the statue of his Royal Highness the Prince Consort, and to report thereon to the Senate," have made a report to that body, recommending that the statues of King George I. and King George II. be removed from their present sites and placed at the west end of the Senate House, one on the right hand and the other on the left of the Chancellor's chair, and that the site opposite the south doors of the Senate House be appropriated to the statue of the Prince Consort, the south doors being made to open so that this entrance may be used.

Dean M'Neill's Statue.—A very long and bitter discussion has taken place in the Liverpool Town Council as to a statue subscribed for by the admirers of Dean M'Neill, of Ripon, and formerly of Liverpool, which had been presented to the Corporation. The question was whether it should be erected in St. George's Hall. The matter was opposed by all the Roman Catholic members, on the ground that the bitter manner in which the dean had assailed their creed, slandered its members, and ridiculed its ministers, would cause them to regard the installation of the statue as a standing insult. The

motion was also opposed by some Dissenters and by some members of the Church of England, upon the ground that McNeile enjoyed too local a fame, and was also the exponent of too sectional a portion of the Church of England to be entitled to the distinction. Other Dissenters supported the motion upon the hope that in future all local men of distinction, of whatever creed or party, would be entitled to have their memories similarly honoured. The motion to erect the statue was carried by thirty-six to sixteen.

Removal of the Thorneycroft Statue at Wolverhampton.—At a special meeting of the Town Council, held a fortnight ago, a resolution was unanimously agreed to, for the appointment of a deputation "to confer with the family of the late Mr. George Benjamin Thorneycroft, with a view of obtaining their sanction to the removal of the marble statue of the late Mr. Thorneycroft, the first Mayor of this Borough, from its present position in the cemetery grounds to the vestibule, or public hall, of the new Corporation buildings in North-street." The family expressed themselves perfectly willing to acquiesce in the proposal to remove the statue to the new town-hall, subject only to the condition that it should be removed under the superintendence of Mr. Thorneycroft, by whom the statue was chiselled. We believe the Cemetery Company have the power to insist on the statue remaining where it is, but no objection is anticipated.

Memorials of the late Sir James Young Simpson, Bart.—The London and Edinburgh Committees have united their efforts, and resolved to issue a joint circular to the friends and admirers of Sir James Simpson. The form of the memorial agreed upon is:—1st, a monument and statue in Edinburgh; 2nd, a marble bust in Westminster Abbey; 3rd, a hospital in Edinburgh for the diseases of women, constructed on those principles which Sir James so often and so clearly enforced; 4th, similar hospitals in London and Dublin, should sufficient funds be obtained.

Monument to the late Robert Scott Lauder, R.S.A.—The pupils of this distinguished Scottish artist, who during ten years taught the students of art in the School of Design in Edinburgh, have just erected to his memory a monument in the Warriston Cemetery, at Edinburgh. The monument, which has been executed and designed by Mr. John Hutchinson, R.S.A., is a monolith of Sicilian marble, in which, in a circular panel, is inserted an alto-relievo head of Mr. Lauder, chiselled in the finest statuary marble. Among his pupils were Herdman, Orchardson, the Burrs, Cameron, Petty, Graham, McWhirter, Hutchinson, &c. The monument has been inaugurated in the presence of the subscribers, who have handed it over to the care of Dr. Lauder, representative of the family.

CHURCH-BUILDING NEWS.

Hull.—The newly-erected church of St. Matthew, Anlaby-road, Hull, has been consecrated by the Archbishop of York. The style of architecture is Gothic of the thirteenth century. The building comprises clearstoried nave, with north and south aisles and a chancel, terminating with semi-octagonal apse, having organ-chamber on the north side, and clergy and choir vestries on the south side. Under these is placed the heating chamber. At the east end of the north aisle is placed the tower with spire, and the communication to the ringing-chamber and belfry-stages is by a spiral stone staircase. The entrances to the church are by the north porch and west doorway. There is also a separate entrance to the vestries. The church is constructed of brick and plastered internally. The windows of the aisles and chancel are of three lights, with pierced traceried heads. The clearstory has tripled lights, with pierced and cusped heads, and there are circular traceried windows to the clearstory of the chancel. The west end has coupled two-light traceried windows, with large traceried rose-window over. The ringing-chamber stage of the tower is arched and lighted by long narrow openings. The belfry-stage has coupled two-light openings on each face, with stone shafts and traceried heads. The spire has stone incarnes on each face, with shafts with traceried canopies, surmounted by crosses. The walls are faced externally with white brick relieved by red brick arches and bands, and chamfered and moulded brick jambs and arches to the several windows, doors, &c. The spire (not yet erected) is to be constructed

of brick. The whole of the stone intended to be carved is left in block. The roofs throughout are slated, and surmounted with red earthenware ridge cresting. They are open-timbered throughout with framed rafters, covered with wrought boarding. The chancel roof is boarded on the under side of the rafters, and divided into panels by chamfered ribs. There are wood floors to the organ-chamber and vestry, and under all the seating. The seats are open benches, with solid ends cut ornamentally. Wrought-iron gates are to be placed at the entrance porch and to the churchyard from the Anlaby-road. The church is heated by means of hot air. The internal dimensions of the building are:—Length, 123 ft. 3 in.; width, 54 ft.; height from nave floor to ridge, 52 ft. 6 in. The height of the tower and spire when completed will be 167 ft. Accommodation is provided in the church for over 800 adults, and the total cost of the building, including fence walling, is 4,500l. Mr. C. Hutchinson, Hull, was the contractor for the brickwork, masonry, plastering, carpenter, joiner, and painters' work; Messrs. Pycock & Sons, Leeds, have done the slaters' work; Mr. G. Wilson, Leeds, the plumbing and glazing; and Messrs. Heaps & Robinson, Leeds, have fixed the ironwork and heating apparatus. A bell supplied by Messrs. Mears & Co., London, has been fixed by Mr. T. Walker, of Lowgate, for use until the new peal of six can be obtained. A small organ for temporary use has been obtained of Messrs. Forster & Andrews. The architects were Messrs. Adams & Kelly, of Leeds. The estimated cost of the design was 4,500l. The site besides was valued at 1,500l.

Weston-super-Mare.—The parish church of Worle, Weston-super-Mare, having been restored under the superintendence of Mr. Norton, was re-opened on All Saints' Day. Open benches of stained deal have taken the places of high pews, the gallery has been dispensed with, and the twisted pillars and falling arches have been set in proper order. An arcade of arches divides the nave from the north aisle, and on the north side of the chancel a chapel has been erected, parcelled off by carved oak screens; this chapel serves as an organ-chamber and a vestry, besides providing accommodation for the school children. Two windows have been placed in the south side by the Rev. W. C. Fox, as a memorial of his grandparents. Throughout the restoration the many antiquities with which the edifice abounds have been preserved, and in making the necessary alterations many objects of interest have been discovered. The floors are laid with encaustic tiles. The altar dais is of Irish black marble, also inlaid with encaustic tiles. There is an oak reredos, at present unfinished, which is intended hereafter to contain sculptured subjects. At the top and base of the reredos is a carving, in sycamore wood, by the Misses Wodehouse (daughters of the late vicar). The roofs of the whole building are of open timber, with tracery principals and moulded cornices. The total cost of the work will exceed 1,500l.

Henley-on-Thames.—The re-opening of St. Nicholas Church, Remenham, has taken place. The works, which have occupied the whole of the preceding summer, consist of the addition of a south aisle, new porch and vestry, the removal of the galleries and of the whole of the interior fittings, which have been replaced by open fittings, the windows being filled with stained glass. The architect was Mr. Rowland Plunbe, of London, and the works were executed by Mr. Owthwaite, of Henley.

SCHOOL-BUILDING NEWS.

Darlington.—The foundation-stone of St. William's Roman Catholic Schools, to be erected on Albert-hill, Darlington, has been laid. The buildings have been designed in the Gothic style by Mr. Richard Robinson, of Darlington, architect, and comprise a school-room, 122 ft. long and 24 ft. wide; a class-room, 15 ft. by 12 ft. 9 in., with two large porches, and separate yards for boys and girls. The exteriors of the principal fronts are of red pressed bricks, interspersed with bands of black bricks, stone vills, and key-stones, whilst the interior will have white bricks for the lower part and plaster above, with an open-timbered roof, stained and varnished. The north front has ten coupled lancet windows, with a triple lancet window in the centre, over which rises a central gable, with projecting roof, supported by wood brackets or stone corbels, and under this gable is a stone niche for the reception of a carved figure. The

east and west fronts have large triple lights, the upper front filled in with stone tracery, intended to receive coloured or stained glass. These fronts have large projecting gables, supported by bold timber brackets or stone corbels, the whole finished with wood mouldings. In the centre of the school roof is a large bell-turret of open timber work, covered with a slated spire, surmounted by a gilded cross. There will also be ornamental iron crosses on each gable. The schools will be warmed by hot-water pipes, and ventilated by open windows, Sheringham's patent air-valves, and a ventilating turret in the roof. They will provide accommodation for 370 children, according to the recent requirement of 8 square feet for each child. The contractors are—for brick, stone, and plaster work, Messrs. Michael Watson & Son; for carpenter and joiners' work, Messrs. Laverick & Forster; for plumber and glaziers' work, Mr. T. Johnson, Tubwell-row; for slaters' work, Messrs. Wharton.

Friar Mere (near Olham).—St. Thomas's new school buildings, situated in Delph, and in connexion with Friar Mere parish, were commenced in April last, and opened on October 6th. The plan of these schools is symmetrical, and is arranged in accordance with the regulations of the Committee of Council on Education. The entrance porches are placed at opposite ends of the building, and open into inclosed vestibules with lavatories attached. They give access to schoolrooms, which, by the removal of a moveable partition, can be thrown into one large room, 70 ft. in length. The class-rooms for both boys and girls form a projecting wing at the back, and open out from the large schoolrooms. The style of the building is Early Decorated Gothic. The principal front has a large centre gable, with three-light windows filled in with geometrical tracery, and surmounted by a belfry with angle shafts and canopies. The porches at each end have double pointed arches and gables, and between these and the centre are four three-light windows divided by stone mullions. The roof is hipped at each end of the building, and terminated with wrought-iron finials. The fall of the ground has permitted a terrace to be formed to the front, with centre flight of steps and entrance gateway. The play-grounds for boys and girls are placed at the back. In the interior the roof and timbers, which rest upon moulded stone corbels, are exposed, stained and varnished. The rooms are lined with pressed brickwork to the sill line. Abundant light has been given to every part, and ventilation has been provided. The contractors were Messrs. J. & J. Whitehead, masons, Marsden; Messrs. Gibson & Maude, joiners, Keighley; Mr. Charles Nelson, plumber, Bradford; Messrs. Hill & Nelson, slaters, Wakefield and Batley; Messrs. J. Whitehead & Son, plasterers and painters, Dob Cross, Saddleworth; and Mr. Edward Worroll, Uppermill, supplied the gas-fittings. The architects were Messrs. Lockwood & Mawson, of Bradford and London.

Kelsale.—The new school buildings which have been provided for Kelsale and Carlton have been opened. The building was formerly called the "Workhouse," and divided into several tenements. It was one of those large old-fashioned buildings which had more pretension to strength and stability than beauty of architecture, but which was capable of being converted into something more useful; and this has been done by taking out the old inside and replacing it with a new one. The outside has also had new roof, chimneys, windows, entrance-door, &c., and the result is that school accommodation for 200 or more children has been provided; comprising three large and lofty schoolrooms, for infants, boys, and girls, with separate class-rooms, offices, and apartments for a resident master and mistress. The works have been performed by Mr. Thomas Denny and Mr. William Kerridge, both of Kelsale, under the supervision of the architect, Mr. Norman Shaw, of London, at a cost of something like 600l.

Elland.—The new Wesleyan School building, which has been erected on the site of the old school, adjoining the chapel, in Eastgate, is now approaching completion, and although not yet ready for permanent occupation, it is opened. On the ground floor are a room intended to be used as a day school, 26 ft. by 27 ft.; two class-rooms, 11 ft. by 15 ft.; a lumber-room, 10 ft. by 11 ft.; and a kitchen, of the same size. The upper room, which will be used as a Sunday school, is 60 ft. long by 27 ft. wide. It is so arranged that it can be divided, so as to allow of four class-rooms, two at each end. The building has been erected by Mr. S. Ridehalgh, Mr. Joseph Hawk-

yard having done the woodwork, Mr. R. Brook the plastering, Mr. Aspinall the plumbing, and Mr. Edmunds, of Halifax, the hot-water apparatus. The total cost of the new building will be about 600l.

Blackburn.—The foundation stone of new schools for the Holy Trinity parish was laid on Saturday last, by Mr. Edward Kenworthy Hornby, M.P. The building is after the Early English, or Lancet, style, and will be of stone. Mr. James Bertwistle, of Blackburn, is the architect.

PROVINCIAL NEWS.

Halifax.—There is now in course of erection, upon a portion of the Stannary estate, a building for the use of the Dean Clough Library and its kindred institutions, the cost, according to the *Halifax Guardian*, being defrayed by the Crossley Company, Limited. The building, which stands opposite the old hall, has one front leading into the street leading to the hall, and another into Smith-street. It is in the Gothic style of architecture, freely treated. The façade to Smith-street presents, in the first story, eight two-light windows, with pointed ends. At the upper end is a flight of steps to lead to the large room in the second story, which is in course of formation. A dwelling-house is at the lower end of the building near Stannary. The other façade, fronting the hall, has seven windows similarly treated to the others, and a deeply-moulded doorway leading to the large room on the first floor. This room will be of good proportions, and is divided down the centre by a row of iron columns. When completed, the new building will be an ornament to the locality, and of great advantage to the societies for which it is built. On the rising ground on the same estate, and on a line with the room above alluded to, the Messrs. Crossley are erecting a large block of dwelling-houses for the foremen at the works. The houses form a block, in the Domestic Gothic style. Workmen have commenced excavating the foundation of a new building which is to serve as a County-court and Bankruptcy-court for Halifax. It stands on a site in the Clare Hall estate, between the recently-constructed upper portion of Prescott-street and St. John's-lane, the principal elevation being towards the cross street, which joins these streets. At first sufficient ground was purchased for all the offices required, to be on one floor, and a design was prepared by Mr. Sowerby, of London, Government architect. But the authorities did not consent to that, and the site was reduced to one-half, and the building is to be in two stories. It is to be in the Italian style of architecture, and the entrance for the public, and the private entrance for the judge and registrars, will be from the new street. All the requisite offices for the high bailiff, clerks, and other officials, will be on the first floor. A broad staircase will lead to the court, which will be 50 ft. long, lofty, and well ventilated. There will be retiring-rooms for the judge, the registrars, and for counsel and attorneys. Two retiring-rooms will also be provided for the public; one for males, the other for females. There will also be a room for witnesses. Mr. Charnock is the builder.

West Bromwich.—At a recent meeting of the local commissioners, with reference to the proposed new public buildings, the General Purposes Committee reported that they had accepted the offer of the land on the lodge estate, as the proposed site for the market-hall, town-hall, and public baths, and had arranged for an agreement to be sent to the clerk as early as possible. That purchase made a total number of 7,555 yards. The committee found that to carry out the market-hall in all its completeness, it would be desirable to possess the adjoining estate and belonging to Mr. Prince, containing 1,509 yards, and they proposed to include that in the two acres which the Board had authorised them to purchase. Mr. Prince was willing to sell that land at 4s. 3d. per yard, and the committee asked for authority to accept the offer. The possession of that land will enable the market hall to be constructed in the form of a cross, its main front and entrance being in High-street, while the two wings will extend as roads right and left to Lodge-road and Lombard-street. In view of the requirements of the future, the reasonable price at which the land is offered, and its increasing value in the market, the committee urged the Board to make an additional purchase, which would make the

whole consist of 9,064 yards, at a cost of 2,400l. The following resolution was carried unanimously:—

"That the action of the General Purposes Committee, respecting Mr. Prince's land, be approved and adopted, and that the General Purposes Committee be instructed forthwith to complete such purchase, and be requested to prepare a general specification of the proposed buildings, including an approximate estimate of their cost, the mode of repayment of the loans necessary to carry out the work, and the general conditions on which it is proposed to invite competitors."

VARIORUM.

SOME of the journals have mentioned that Mr. J. E. Planché is writing a poem on the Siege of Calais by Edward III. Mr. Planché, however, does not call it a poem, but a romance in rhyme. The work is completed, and now only lacks a publisher, which one may suppose will soon be forthcoming. We have read part of it in MS., and found the story particularly interesting,—the writing, as a matter of course, bright and elegant.—Mr. Edmund Sharpe has reprinted in pamphlet form, "Four Letters on Colour in Churches, on Walls and in Windows" (Spon & Co., Charing-cross), recently addressed by him to the *Builder*. Mr. Sharpe has several books in the press, including an illustrated Account of his Recent Archaeological Tour amongst Lincolnshire Churches, and an elaborate work on the Ornament of the Transition Period.—Lovers of pottery and porcelain and their history, will be glad to hear that Mr. William Chaffers is engaged upon a work entitled "The Ceramic Gallery," which will include 600 illustrations of rare and choice examples. The first part will appear, through Messrs. Chapman & Hall, next January.—The last published number (123) of "Proceedings of the Royal Society," which, by the way, is a model of its kind for promptness and good editing, includes an account of an elaborate series of "Experiments on the Action of Red Bordeaux Wine (Claret) on the Human Body," by Dr. E. A. Parkes, professor of Hygiene, in the Army Medical School, and Count Cyprian Wolowicz, M.D. We are bound to say that we find ourselves unable to deduce any particularly valuable results from the experiments, but more acute physiologists, doubtless, will do so.—Messrs. Thos. De la Rue & Co. have issued as usual a series of their "Red Letter Diary and Memorandum Book," in dainty shape for the ladies, shrouded in Russia leather and satin, and in robust case for the ruder sex, all, however, what may be termed, in the slang of the day, "good form."—No. 3 of the *Illustrated Review* is an advance on the previous numbers. If the work maintain this standard, it ought to obtain a circulation. The writer of an appreciative notice of Thomas Carlyle, the first article in the number, in setting forth Carlyle's works, oddly enough omits to mention his *History of the French Revolution*.—The "Bulgaria Annual," edited by Miss Braddon, contains a number of stories and engraved illustrations, of more than average merit.—"Our Food: a useful Book for Boys and Girls. By Ellis A. Davidson. Cassell, Petter, & Galpin, London and New York." This little work follows out the course commenced by "Our Bodies," and two or three others; and it gives some elementary lessons in domestic economy. The instruction is to a certain extent technical. Some elementary lessons are given on the proper combinations and uses of the different kinds of food, intended chiefly for girls.—"The Eighteenth Annual Report to the Council of the City of Manchester on the Working of the Public Free Libraries, 1869-70. Manchester: Tubbs & Brook." During the past year the Manchester Free Libraries have been used by about 2,172,046 readers, of whom 412,489 have borrowed books to read at home; 73,799 are readers in the reference library, for the purpose of study and research; 103,077 are readers of books in the branch reading-rooms, and about 1,607,190 have availed themselves of the public news-rooms. The numbers include about 126,061 female readers, of whom 111,869 are borrowers, and about 14,692 are readers in the reading-rooms. The total number of volumes on the shelves is now 100,936, against 92,355 at the date of the last report. The number of volumes called for during the year has increased from 893,648 to 914,883; consisting of 477,544 vols. taken home by borrowers; 110,996 vols. issued for use in the branch reading-rooms; 115,388 vols. issued in the reference library; and 192,007 specifications of patents. As compared with the number of hours the

libraries were open during the year, this large amount of issues represents an average of 260 vols. issued per hour, or 4½ vols. per minute. Practically, however, the largest demand takes place every day during certain hours, and it is found that the greatest number of issues during any of the busiest hours reaches the rate of about 1,000 vols. per hour, or 17 per minute! The largest proportion of the comparative increase is found to have been as follows:—8.56 per cent. in the class of science and art; 8.48 per cent. in the class of politics and commerce; 4.57 per cent. in the class of theology and philosophy; and 3.84 per cent. in the class of literature, poetry, and works of fiction.—The *Academy* tells us that Mr. O. Homan's third volume in continuation of his "Christianity and Ancient Art, and Christianity and Medieval Art," is completed, and will be published in the spring. It will be more generally interesting than the preceding volumes, on account of recent occurrences in Rome.

Miscellaneous.

Extensive Canal Scheme in the South of England.—A scheme for shortening the sea passage between the Bristol and English Channels by the construction of a great western maritime ship canal across the counties of Somerset and Devon has, it is said, been so far approved by practical men that it is expected to be almost immediately brought before the public in a matured state. The length of this canal is to be fifty-nine miles, its width at surface 124 ft., and at bottom 31 ft., and the depth 21 ft. This would enable all vessels of moderate draught to pass through from sea to sea. The canal, it is considered, would be of immense advantage for coal traffic from Wales.

Society of Arts.—The opening meeting of the 117th session of this society was held on Wednesday evening last, at the Society's House, and Lord H. G. Lennox, M.P. (the chairman of the council), delivered the opening address.

Roman Catholic Church-building at Dunedin, Otago, New Zealand.—An establishment called St. Joseph's Conventual Church, which is intended to partake of a monastic character, requiring to be enlarged, plans were prepared by Mr. John Miller, of Dunedin, architect. The present church will form the eastern nave, 65 ft. by 30 ft.; and there will be new north and south transepts, 85 ft. by 30 ft.; chancel, entirely devoted to the clergy, 25 ft. by 30 ft., continued westward, enclosing a sacristy, or priests' robing-room, 20 ft. by 12 ft., constructed upon the same level as the chancel. Internally, as well as externally, the church is cruciform. The extreme length of the main axis is 150 ft., and the minor axis 100 ft., whilst the extreme height from the ground level to the apex of roof is 40 ft. The exterior elevations are flanked with buttresses, antique mullioned windows, steeply pitched gables, the western one having octagonal turrets, enclosing stairs, ascending to the organ gallery, choristers' gallery, &c. Tenders having been called for, the following were made:—The church, if erected in brick with internal finish in cement, is estimated to cost, by Mr. William Dalziel, 2,700l.; Messrs. Wood & Dunn, 2,950l.; Messrs. Goodfellow & Hunter, 3,112l. If executed in brick, with internal finish in Oamaru stone:—Mr. William Dalziel, 3,000l.; Messrs. Wood & Dunn, 3,200l.; Messrs. Goodfellow & Hunter, 3,293l. If executed in Oamaru stone internally and externally, i.e., the most desirable:—Mr. William Dalziel, 3,400l.; Messrs. Wood & Dunn, 3,680l.; Messrs. Goodfellow & Hunter, 3,680l.

Value of Land at Dundry.—Mr. G. S. Tricks, of the firm of Wm. Tricks, Son, & Wallop, offered for sale by auction, at the White Lion Hotel, Bristol, an estate at Dundry, consisting of 236 acres of arable and pasture land. The estate was first offered in one lot, and, being unsold, was then put up in eleven lots, in accordance with particulars. The following prices were realised:—Lot 1, 12a. 3r. 2p., 930l.; lot 2, 2a. 2r. 36p., 1,720l.; lot 3, 86a. 2r. 3p., 2,710l.; lot 5, 22a. 8r. 26p., 1,500l.; lot 6, 8a. 0r. 3p., 560l.; lot 7, 36a. 1r. 31p., 2,850l.; lot 11, 12a. 1r. 20p., 730l. Lots 4, 8, 9, and 10 were bought in. The property was freehold, and land-tax redeemed; and the title of the vendor was a registered one, under the provisions of the 25th & 26th Vic., cap. 53.

Instruction in Science and Art for Women.—The second of the opening course of lectures by Professor Huxley, in the season's programme of "instruction in science and art for women" was delivered in the lecture theatre of the South Kensington Museum, on Saturday morning last, to a numerous class. The elementary programme consists of three parts:—first, the opening course of lectures by Professor Huxley, on "Elementary Physiology," secondly, a course of lectures, by Professor Guthrie, on "Elementary Physics and Chemistry," and, thirdly, a course, by Professor Oliver, to "Illustrate the Phenomena of Life, whether physiological or morphological, by means of Botany." These are all morning lectures (eleven o'clock); the elementary course, or courses, being continued every Wednesday and Saturday, and the more advanced every Tuesday and Friday. The advanced course will consist of a series of lectures on physics (heat and light), by Professor Guthrie; and a series, by Professor Huxley, on human physiology. In addition to these morning lectures, there is an afternoon course, on Wednesdays, at half-past two o'clock. Mr. Pauer's first lecture of a course on the Pianoforte treated of instruments used before the invention of the pianoforte, a, the Clavichordium; b, the Clavichord; c, the Clavicymbalum; d, the Virginal; e, the Spinnet; f, the Harpsichord.—The Pianoforte. Its difference from the previous instruments. State of Chamber Music of the Sixteenth and Seventeenth Centuries.—Composers mostly Organists. Chamber Music becoming popular. Its style.

Damage Done at Strasburg.—A special correspondent of the Times, writing from Strasburg, says:—Some of the claims which have been lodged are interesting, and, as proceeding from competent officials, may be regarded as authentic and legitimate. The architect of the cathedral estimates the damage it has sustained at 1,500,000*f*, a sum which seems enormous, although the fabric is far more injured than might be concluded from a superficial examination. The fabric of the Bibliothèque is set down at 200,000*f*; a valuation of its contents, which, for the history of the province, are simply irreparable, is modestly declined. The Picture Gallery is valued at 250,000*f*, the edifice, and 426,700*f*, the contents; the Theatre, 900,000*f*; the Palais de Justice, 530,000*f*; the Prefecture, 864,000*f*; the Hôtel de Ville, 100,000*f*. The administration of the Quays and Bridges claim 419,387*f*. The Citadel claim is split up into nearly a hundred distinct reclamations, its church figuring for 45,000*f*, for the fabric, and 60,000*f*, for the fittings. The Gasworks, 86,000*f*—a modest claim. The gasometers were destroyed, and for three or four weeks to come Strasburg will continue without gas. The number of houses absolutely destroyed is about 300, but so many have been so greatly shattered internally as to require rebuilding that this is an under-estimate.

Architectural Remains in India.—Mr. J. Burgess, the editor of two albums of architectural remains, chiefly of the temples of the Jains, or Shrawaks, at Palitana and Girnar, has submitted to the Bombay Government an elaborate report suggesting plans for a thorough survey of the architectural and archaeological remains throughout the whole of the central area of India. The lists of remains appended to the memorandum enumerate upwards of 800 temples and other antiquities.

Railway Traffic Returns.—The traffic receipts of the railways in the United Kingdom for the week ending November 11th, 1870, upon a mileage of 13,771, amounted to 813,915*l*, being equal to 59*l*. 2*s*. per mile. For the corresponding week of last year the receipts were 783,052*l*, the number of miles open 13,544, or 58*l*. 4*s*. per mile. A comparison of the two weeks shows an increase in the aggregate receipts, of 25,863*l*, and in the number of miles open, of 227.

The late Lady East as an Artist.—A painted glass window has been placed in the hall of Bourton House, Moreton-in-the-Marsh, in memory of the late Lady East. The window, which, besides twenty panels of painted border, comprises fifteen panels representing the various armorial bearings of Sir James East's family for the last 200 years, was painted by Lady East for the town residence.

Watford Union Chapel.—The hot-water apparatus for warming this chapel was set up by Messrs. J. Jones & Sons, of Bankside.

Wolverhampton.—Two churches, in St. Peter's, Wolverhampton, have been consecrated, the first by the bishop of the diocese, and the second by the Right Rev. Dr. Abraham, late bishop of Wellington, his coadjutor. The names of the churches are St. Andrew's and Christ Church, and both are entirely free. Neither of them is quite complete, and there is about 1,00*l*. of debt upon the existing buildings. The part of St. Peter's parish in which these two churches stand will soon be formed into an ecclesiastical district, under the title of St. Andrew's.

Royal Academy.—A course of lectures "On Architecture" is announced to be delivered by Professor G. G. Scott, R.A., on the 16th of February, 2nd and 16th of March. We are glad to be able to say that Mr. Scott is better than he was. While inspecting works at Chester Cathedral he was seized with illness (an affection of the heart), and was conveyed with difficulty to the Deanery, where he has lain ever since, now nearly a month.

A Carved Casket.—The casket (containing the documents relating to the inauguration of H. R. H. Prince Christian of Schleswig-Holstein, as Lord High Steward of the Borough of New Windsor) was of oak from Windsor Forest, carved by Messrs. Halliday, Brothers, from a design in the style of the Perpendicular Period, by Mr. A. Y. Nutt, of the Office of Works, Windsor Castle.

Jack-of-all-Trades.—Sir: Some of the auctioneers seem bent on doing every one's business as well as their own. Here is an advertisement (with a difference) from a recent number of the Times:—

"MESSRS. PHEASANT & CO., auctioneers, estate and house agents, architects, surveyors, and land valuers of timber, agricultural estates, copyholds for enfranchisement, railway claims, certain and general disquisitions, and for administration.—Deceased, London."

Management of London.—Once more the prospect of a municipal government for the metropolis fades away. Mr. Bruce has taken back his implied promise to deal with the subject next session, and Londoners who long for a government must be content to push their expectations forward to 1872.

Liverpool Architectural Society.—The meeting held on the 16th inst. was occupied with a continuation of a paper by Mr. H. H. Statham, jun., titled, "Notes of a Short Tour among the Lincolnshire Churches," adjourned from last meeting. It was illustrated by a number of sketches made by the writer.

Borough Surveyor of Kingston-on-Thames.—The surveyor, Mr. Slagg, has resigned his office. It is understood that he will remain in Kingston for private business. A committee of the Corporation is charged with the election of his successor.

Borough Surveyor, Barrow-in-Furness. Mr. Howard Evans, assistant surveyor to Salford corporation, has been appointed borough surveyor to the corporation of Barrow-in-Furness.

Societies.—The Royal Society and the Society of Antiquaries severally held their first meeting for the session on Thursday evening, the 17th inst.

Institute of British Architects.—At the meeting on Monday next (21st), Mr. B. Ferrey will read a paper "On the West Front of Wells Cathedral."

Society of Painters in Water Colours.—The private view of the Winter Exhibition of sketches and studies is fixed for Saturday, the 26th inst.

TENDERS.

For new sewers, for the Enfield Local Board:—

Parson	2,900 0 0
Marshall	1,480 0 0
Small	1,414 0 0
Hayes	1,400 0 0
Riley	1,363 0 0
Patman	1,293 0 0
Anderson	1,264 0 0
Stander	1,250 0 0
Hayes	1,180 0 0
Sheldon	1,197 0 0
Carter	1,181 10 0
Kelly	1,180 0 0
Pizzey	1,157 0 0
Hubbard	1,130 0 0
Bayes	1,110 0 0
Bagbird	1,102 1 0

For enlarging factory, Blackfriars-road. Messrs. Tress & Innes, architects:—

Fish	2,190 0 0
Cunder (accepted)	1,655 0 0

For re-building No. 59, Bow-lane. Messrs. Tress & Innes, architects:—

Fish	2,170 0 0
Mosey	1,677 0 0
Brown & Robinson	1,641 0 0
Lawrence & Sons	1,630 0 0
J. & F. Coleman	1,589 0 0
Ramsay (accepted)	1,497 0 0

For the third block of cottages (three in number), for the Bromley Cottages Improvement Company, Limited.

Mr. George Truett, architect:—	
Payne & Balding	2,450 0 0
Brown	375 0 0
Jayes (accepted)	339 10 0
Harper & Spooner	275 0 0

For warehouse, Radsworth-street, Baldwin-street, City-road. Mr. John Collier, architect:—

Moore & Grainger (accepted)	22,049 18 8
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For the erection of offices in King-street, Gravesend, for Mr. Francis Southgate. Quantities by Mr. J. Scott.

Mr. Thos. Chas. Sorby, architect:—	
Gold	2,219 0 0
Cobham	1,330 0 0
Blake	1,137 10 0
Hill & Sons	1,086 0 0

For completing houses, for Mr. Evans, at Selhurst.

Mr. Thos. W. Willis, architect:—	
Wren (accepted)	21,252 0 0

For the erection of four shops and dwelling-house, at Leytonstone, Essex. Messrs. Simon & Archer, architects:—

Scholtes	21,620 0 0
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For drainage works, Deal, Kent. Mr. Edward W. Fry, surveyor. Quantities supplied:—

Neave	21,275 0 0
W. & G. Dennis	1,105 0 0
W. J. Jones	1,147 0 0
Chamberlain	1,145 0 0
Cotter	1,133 0 0
Mather	1,121 0 0
Coleman (accepted)	1,121 0 0

For the restoration of Hingham Church, Norfolk. First contract. Mr. James R. Colling, architects:—

Luff	22,198 0 0
Spaul	1,830 0 0
Brown	1,830 0 0
Hubbard	1,740 0 0
Tooley	1,680 0 0
Cornish & Lacey (accepted)	1,647 0 0

For the United Methodist Free Church and Schools, Wellington-road, Toxteth Park, Liverpool. Mr. W. J. Mason, architect. Quantities by Mr. Northcroft, surveyor:—

Forde	23,398 5 0
Potter	3,511 0 0
Tomkinson	3,511 0 0
Bosman	2,960 0 0
Cheetham	2,808 0 0
Huish & Co.	2,807 0 0
Harrold	2,804 0 0
Harrold & Girdle	2,805 0 0
Industrial Building Co.	2,804 0 0
Nicholson & Ayre	2,803 0 0
Urson	2,803 0 0
Bridge (accepted)	2,770 0 0

For the erection of villa residence, at Cloughton, Birkenhead. Mr. Lewis Hornblower, architect. Quantities by Mr. Northcroft, surveyor:—

J. & W. Walker	24,765 0 0
Nicholson & Ayre	4,694 0 0
Fisher	4,599 0 0
Huish & Co.	4,533 0 0
Blakeley	4,411 0 0
Industrial Building Co.	4,385 0 0
Urson	4,275 0 0
Forde (accepted)	4,017 0 0

For the erection of schools, Church-road, Brixton. Mr. Joseph Gale, architect:—

Clark	27,501 0 0
Downs	3,493 0 0
Cole	3,424 0 0
Gannon	3,374 0 0
Brown & Robinson	3,282 0 0
Henshaw	3,211 0 0
Rider	3,200 0 0
Snell	3,177 0 0
D. King & Son	3,130 0 0
Shepherd	2,963 0 0

For the restoration of Combeley Church, Lincolnshire. Messrs. T. C. Hine & Son, architects:—

Nave & Aisles, Chancel.	
Hodson & Faxon	21,021 0 0
Stevenson & Weston	1,417 0 0
Worth	1,314 0 0
S. & W. Patinson	1,343 0 0
Leeming	1,277 0 0
C. & W. B. Milson	1,174 0 0
White & Wood	1,109 0 0
Water & Henshaw	1,141 0 0
Otter & Bins	1,115 0 0
Thomson	1,108 0 0
Otter & Elsey	1,115 0 0
King's	979 0 0
Johnson	1,011 0 0
Young (accepted)	995 0 0

For making up Osborne-road, for the Acton Local Board:—

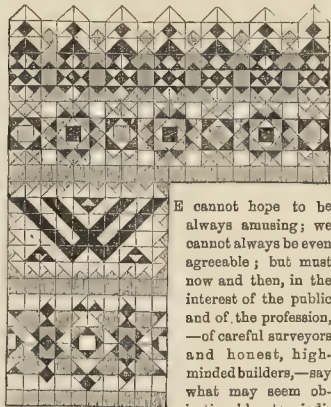
Blackmore	2,639 0 0
Hare	451 0 0
Forry	375 0 0
Chalkers	394 0 0
Porter	336 0 0
Simson	295 0 0

In consequence of the Reduction in the Newspaper Postage, Subscribers within the United Kingdom will be supplied with THE BUILDER direct from the Office, at the rate of Nineteen shillings per annum, PAYABLE IN ADVANCE.

The Builder.

VOL. XXVIII.—No. 1451.

On Several Subjects: Some of them
Serious.



We cannot hope to be always amusing; we cannot always be even agreeable; but must now and then, in the interest of the public and of the profession,—of careful surveyors and honest, high-minded builders,—say what may seem objectionable to individuals. Several occurrences have recently led to unpleasant discussions, have brought us many letters, and need further ventilation. Foremost amongst these is what we may call, for a double reason, a "tender" subject. Correspondents urge that a wrong impression has been produced by the paragraph entitled "Erroneous Estimating," which appeared in the *Builder* of the 5th of November inst., and which was subsequently transferred to the columns of many of the daily papers. It has been taken for granted, they complain, that the difference in the tenders for the work specified to be done at Nos. 3 and 5, Buckingham Palace-road (one, the highest, being 2,188*l.*, and the other, the lowest, 800*l.*) was entirely owing to the builders themselves, and demur to the remark that as all the builders tendered on the same bill of quantities, this "discreditable difference" must have arisen merely through the prices: they think undeserved obliquy has been attached to the builders in this particular case; and suspect that some one else is to blame besides the builders. One correspondent, signing himself "Audi Alteram Partem," and in whose good faith and accuracy we have reliance, says:—

"I happen to be the surveyor employed by one of the parties tendering for the work to make his estimate for him, and, on looking over the papers put into my hands, I found this paragraph at the end of the stipulations:—

"The bills of quantities are taken out with great care, and are believed to be correct; but of this the contractor must satisfy himself, as neither the proprietors nor the architect will hold themselves responsible for the quantities."

Acting upon this express instruction to the contractors, I took sundry measurements of the proposed work; but, unfortunately, the bills of quantities had come into my hands so late that I had not time to test all the items, and was obliged to content myself with trying a few of them. The results much surprised me, as you may gather from the following instances:—

1. In the carpenter's bill of quantities, as issued to the contractors, there are the following items:—

- Fo. 1. 30 squares. Firing out to joist floors.
Fo. 2. 30 squares. Firing out for ceilings to receive the plasterer's lath.

Fo. 3. 36 squares. Firing out the old joist above and below, to secure level floors and ceilings.

or 96 squares of firing out altogether; while I cannot make out so many as 40 squares. The

basement and the ground floors were to be entirely new, both joists and boards; so no firing out was necessary for either the basement or the shop floor or for the basement ceiling. There, remained, therefore, the shop ceiling, the first-floor ceiling, the bedroom ceiling and the upper bedroom ceiling to be fired out; also the joists of the first floor, the bedroom floor, and the upper bedroom floor,—four ceilings and three floors in all. The measurement of these floors and ceilings is given incidentally in the bills of quantities themselves, the new ground floor being stated to be '5 squares 12 ft. super, 1½ in. tongued and grooved shop floor.' There ought to have been, therefore, if this measurement be correct, 20 squares 48 ft. of firing out to ceilings, and 15 squares 36 ft. to floors, or 35 squares 84 ft. in the whole, instead of 96 squares, as put in the bill of quantities. How this excess of more than 60 squares, worth from 7*s.* to 8*s.* per square, was obtained I am utterly at a loss to conceive. Some great blunder must surely have unfortunately been made, either in the squaring the dimensions, or in the manuscript, or in the lithography. It is only right to put such a construction upon it until there has been an opportunity for explanation.

2. The second instance (not so astounding as the former), which I shall give is this:—In Folio 1 of the carpenter's bill of quantities, there is an item of '2½ squares of 1½ yellow batten flooring.' Now, I have already mentioned that the shop or ground floor was to be '1½ in. tongued and grooved,' and that it measured 5 squares 12 ft., which measurement, I believe, to be sufficiently correct. There would remain, therefore, the basement floor, and the first, second, and third floors, or four floors in all, to have new boards. If the area of one floor be 5 squares 12 ft., how can four such floors measure 2½ squares? Surely four times 5 squares 12 ft. must be 20 squares 48 ft., not 2½ squares as put in the bill of quantities. There might possibly be a few feet more in the upper story, if the walls were half a brick thinner than in the stories underneath, but this would make but a very trifling difference.

3. Folio 2 in plasterer's work shows:—'50 yds. plain cementing to chimneys.' My assistant went on the roof, and could not by any means make 25 yards of this, not even if he reckoned the inside of the parapets as well.

I could mention other items, but your space I fear would be too much occupied. Enough was seen by me to convince me of the propriety of the instruction to the builders, to satisfy themselves as to the quantities, and enough I think has been brought forward by me to show that estimates would be likely to vary in such a case as this. One contractor would go through the whole of the work himself, and form his own conclusions as to quantities; another would go partially into it, as I was compelled to do for want of sufficient time; and others would take the quantities just as they were furnished, and estimate accordingly. My advice to my client under the circumstances was this, to put his estimate in at a prime-cost price, believing there would be a sufficient excess found in the quantities to yield him a profit. To go lower than this I dared not advise him, for I was not sure whether the quantities were to form part of the contract, in which case he might probably be compelled to make an abatement if the quantities were found to be considerably less than stated.

I have written this, sir, to mitigate in some degree the effect of the expressions of surprise and censure which have in this case fallen so heavily upon the heads of the unfortunate builders who could so widely differ as do the respective sums of 2,188*l.* and 800*l.* Did this preposterous difference arise, in my opinion, from difference in price alone, I should say, let the builders by all means suffer the obliquy which would deservedly attach to so 'discreditable a difference,' but any one may readily see that, if the builders went into the quantities themselves, they did not, in fact, all 'tender on the same bill of quantities,' and may suspect that the differences might probable arise from other circumstances than mere difference of prices.

In conclusion, will you permit me to suggest that more time should be given to contractors to make their estimates than has been customary of late, and that greater facilities should be afforded them to go into the quantities themselves if they desire to do so? The short time given in many cases is indeed preposterous, and is utterly inconsistent with making trustworthy estimates. Another point which I wish to submit

to you, as a man of great experience in your profession, is, whether you deem it expedient for architects themselves to take out the quantities of the work which is to be executed under their direction. I have always found that much more satisfaction has been given and confidence expressed when well-known quantity surveyors have been employed for that purpose. I have endeavoured to look most carefully into this case, and I sincerely trust that I have not in any way misunderstood it, and so have unintentionally misrepresented it. If it can be shown that I have done so, I shall be happy to make any suitable apology or retraction: until then I must believe that the builders have had scant justice done to them in this matter; and that, as the accusation against them has been so public and wide-spread, it is only right that any fair defence which can be offered on their behalf should be made equally so."

Most certainly; and we willingly give insertion to these observations. The architect, Mr. Dale, we have no doubt, is quite able, and will be glad of the opportunity to explain the apparent errors.

We printed last week a list of tenders for erecting the tower and spire of Wraybury Church, under Mr. E. Brandon, architect, which is strangely similar in its terrible diversity to that we have just now mentioned, the highest being 2,323*l.*, the lowest 950*l.*, and both were, as we believe, from very respectable persons. Surely it is the duty of all concerned in these and like cases to endeavour to arrive at the right explanation of such an injurious discrepancy. We have obtained from one of the builders, not amongst the lowest, who tendered for Wraybury Church tower the following rough abstract of the quantities:—

The works consist of a new tower and spire, and making good to present building.

Cost of material on the site as follows:—Rubble rag per ton, 10*s.*; Hassock ditto, 8*s.*; Bath stone, 1*s.* 6*d.* to 1*s.* 7*d.* per foot cube; bricks, 3*s.* per 1,000.

Quantities as supplied by a London surveyor:—

219 yds. dig, wheel, and cart.	
88 yds. concrete.	
2 rods of brickwork in cement in underpinning.	
350 yds. cube of rag waling.	
2,592 ft. facing to ditto.	
4,832 ft. cube of Bath stone.	
157 ft. cube of Portland and Mansfield	
160 ft. super. of 2½ in. rubbed York paving.	
The labour on masonry (including waller and bricklayer) amounts to the sum of, £. 212 0 0	
Material, &c., joiner and carpenter	61 0 0
Plaster, smith, glazier, and decorator ..	93 0 0
Surveyor's charges	51 0 0
Extra scaffolding to spire; inclosing, covering up old building, &c.	150 0 0

We should like to know if all the builders were supplied with quantities from the same surveyor, especially the lowest, and if the above list be similar to their own.

We impute no improper motives in the cases we have commented on; we have not the slightest ground for doing so. We simply seek explanation.

That dishonesty, however, has been elsewhere exhibited we are assured. With reference to some work done last year, for example, a builder informs us, that having gained a contract, the architect who had taken out the quantities informed him, under promise of secrecy, that the bills, on which he had made his estimate included 25 rods of brickwork in excess, and requested a participation in the advantage! The writer refuses us the name of the person in question, or we would print it, and take the chance of an action for libel. Moreover, if the delinquent proved to be a member of the Institute (which we do not for a moment believe), we would immediately take steps to obtain his expulsion from that body, regardless of personal consequences.

We have received two additional letters concerning the tenders for the Kensington Workhouse Infirmary. We can find space for only a quotation from one of them. The writer says:—"The surveyors appointed by the guardians, talk in their letter to you (p. 910), about the closeness of the competition for the works. You may not think this so remarkable when I tell you that more than one of the persons who tendered, determined at the last moment not to

price out their quantities, but obtained a sum from one of the other firms, and sent in an offer at something over that. Touching the cost to the parish of taking out these quantities, are you aware that the sums set down in the bills for specific works (for example, allow 986l. 10s. for service-pipes to cisterns, for water-closets, &c.) amount to 4,400l.? So that if only 2 per cent. be charged altogether, and not 3, as 'Ratepayer' asserts, the surveyors get 84l. for merely writing down these items."

We cannot just now pursue this part of our subject further.

"Audi Alteram Partem" asks us at the close of the letter we have printed above, whether we "deem it right or expedient for architects themselves to take out the quantities of the work which is to be executed under their direction"? We unhesitatingly answer we do not consider it expedient they should do so.

The case of Jones v. St. John's College, Oxford, the report of which will be found in our present number, is another warning to builders (if they will but take it) against the reckless folly of signing contracts without having their conditions properly looked into. The counsel for the College argued that "supposing an order for extensive alterations had been given a day or two before the expiration of the time, so that it was physically impossible the work could be completed, the penalties for non-completion could have still been enforced." The judges seem substantially to have agreed in this view of the law, saying, "If persons would bind themselves to absurdities or impossibilities, they must take the consequences. These contracts were often very one-sided, and the builders frequently put themselves absolutely in the power of the employer and his architect; but if they will continue to sign these contracts, such gross folly could not affect the judgment of a Court of Law." The difficulty which builders have found in dealing with such contracts before signature is that not one solicitor in a hundred understands the full bearing of the conditions of building contracts; it requires a very precise technical knowledge and a large experience to see their meaning and extent. Our readers know that the Committee of the London Builders' Society has had under consideration for a long time a set of conditions of contract founded on the agreement with the Council of the Institute of British Architects. The wide publication of these, when thoroughly revised and settled, will assist in bringing about a better state of things.

We print the following, dated from Primrose-hill, in order that we may add a comment:—

"I think it may possibly produce some good effect if I report to you the fact,—discreditable to the district surveyor,—that when my next-door neighbour's chimney was on fire, from deficient sweeping, the fire burned through into this house, destroying the mortar of the party-wall, filling my house with smoke, and compelling me to apply to the fire insurance office, whose workmen are now employed in stripping the wall within my house, and stopping up the holes created by the fire. This fire was no serious matter in itself; it was confined to the chimney, yet so badly constructed are the houses that this work is required.

Not being an architect, nor intimately acquainted with the building trade, this occurrence has induced me to look, as a matter of curiosity, at the new houses in course of erection near me. It is really scandalous that such work should be allowed. If our Building Acts are to secure life and limb, and to prevent the spread of fire, it is truly disgraceful that builders, and architects also, should be allowed to build such houses as I see around me."

We know nothing of the particular case in question, but we undertake to say that many existing houses might be burnt down through the want of the proper parging of the flues, without it being at all "discreditable to the district surveyor." At his visit he urges on the foreman, we will say, the necessity of properly rendering

the inside of the flues, and is promised attention. Do all that he can, however, look and inquire as he may as the work goes on, he is in the hands of the bricklayers, to a great extent. It is impossible for him to prevent it from being omitted in parts, if the men are so disposed. Should he discover that a portion is not done, he is told that a boy shall be sent up afterwards. He is told that a boy has been sent up, and that it is all right. In fact, when dealing with scamps, let the district surveyor do what he can, flues may be insufficiently parged. Nor can he prevent bad brickwork generally under similar circumstances. It must be very bad indeed before a magistrate would condemn it, being aware that condemnation might mean the ruin of the speculator, and so thousands of houses pass which the district surveyor knows perfectly well are very badly built, but not badly enough to justify him in going to the police court.

In the case of foundations, too, the Act says the walls are to be built "on solid ground or concrete." The district surveyor may know that the site is unstable, but a layer of concrete has been put into the trenches, sufficient to meet the requirements of the Act, though not to prevent settlements and cracks hereafter, and he also knows it would be useless therefore to take the case before a magistrate. In a word, our correspondent may be right with reference to his particular case, but he may rest assured that a vast deal of bad building is done under the Metropolitan Building Act, without it being "discreditable to the district surveyor."

And now from Builders to Architects' Drawings. When we reported the application for a new trial in the case Ebdy v. McGowan,* we gave the key-note of the concluding passage. At the trial, Baron Bramwell repeated, with additions, the unsound observations we reported, and the rule was made absolute entitling the Rev. Mr. McGowan not to pay Mr. Ebdy for what the latter had done towards the erection of a parsonage-house for him, until Mr. Ebdy had delivered up to him the plans. Baron Bramwell, when the rule was asked for, said,—"If an architect be employed to make plans of a building, and be paid, it seems preposterous, almost childish, to say that he shall retain them." Again,—"The usage set up is impossible, and perfectly suicidal. It only need be stated to show it does not exist. It no sooner comes into existence than it cuts its own throat by its absurdity;" and other nonsense of the kind. It is quite unnecessary to point out to our readers the unsoundness of the Judge's dictum. It has been repeated *ad nauseam*, that an architect, except in very special cases, is not employed to make plans, but to produce a building, and that the plans are an accident in the case, the architect's mode of communicating his orders to the workmen, and may or may not be used; may be chalk-lines on a board, or an elaborate water-colour picture. Even in the case that the design is not carried out, the real position is clearly understandable.

If an employer request an architect to prepare drawings for a building for him to be sent abroad, let us say, or to be put into other hands to carry into execution, the architect will assent or refuse, as he please; and if he assent, and hand over the drawings, make such charge as he may have arranged for. But if he be appointed to act as architect for a certain building, and the matter go no further than the preparation of the drawings, being stopped by the act of the employer, there is nothing absurd, nothing preposterous, nothing suicidal in the statement of the usage that the employer should pay, for the time and skill expended, a certain proportion of what would have been the full charge if the design had been carried out; and no injustice whatever in the fact that he has nothing to show for his

money; provided, of course, that the stoppage took place through no evil act of the architect. To the question put by one of the Judges at the trial,—"Supposing the architect dies, can his executors keep the plans and yet demand payment for them?" we should say, certainly not. Further, there is the question of courtesy, and willingness to act liberally. Mr. Sydney Smirke, —whose evidence, which materially helped to lead to the present decision, seems to have been misquoted,—writes to us as follows:—

"It would appear by the report of *Sittings in Banco*, Court of Exchequer, Nov. 16 (in re Ebdy v. McGowan), that my evidence has been probably misapprehended, or, at least, obscurely expressed. I beg to subjoin what, to the best of my belief, was exactly the purport of my evidence, and I will add that, after the fullest reconsideration, I retain the opinion expressed.

I stated in my evidence that the custom of the profession has long been, and is, that the architect retains the drawings of a building after its execution, unless under special circumstances or contract; and I gave reasons why such practice is convenient and proper. In reply to the question, What is the custom when the drawings are made, but not erected, under my superintendence? I stated that I gave up the drawings to my client, if he wished to have them, and charged a commission of 3 per cent. on estimated cost; adding that I did so because I thought it fair that both parties should have a *quid pro quo*.
SIDNEY SMIRKE."

The decision has had one serious result already. At the private meeting of the Institute to which we referred recently, held to consider the position of the question concerning the demand of the Board of Works for the drawings for the Houses of Parliament, it was

"Resolved—That this meeting adheres to the opinion entertained by a large proportion of the profession, and supported by a mass of evidence as to the practice in all parts of the kingdom on the question raised between Mr. E. M. Barry and the Office of Works, which of late was embodied in a series of resolutions passed at the special general meeting held on the 9th of May last, maintaining the architect's right of ownership to his drawings, and promising Mr. Barry the support of the Institute. But, considering that the law officers of the Crown have, in a case submitted to them by the First Commissioner, expressed a contrary view as to the legal aspect of the question, and that the point, if disputed further, would have to be settled at law, the meeting feels that it cannot advise Mr. E. M. Barry personally to contest his right in a hostile manner.

Feeling, therefore, that it would be undesirable for any individual architect to enter into a legal contest with the Government, and observing from the official correspondence now produced, that the First Commissioner is willing that a joint case should be submitted to the law officers of the Crown, and that he undertakes to abide by such decision if Mr. E. M. Barry will do so, this meeting would recommend Mr. Barry to agree to the principle of a reference to disposing of his case."

It was further

"Resolved—That, inasmuch as the case of Mr. E. M. Barry now under consideration has exceptional features, this meeting is not prepared to accept the decision concerning it which may be arrived at (if the reference above mentioned) as a rule for general guidance; but would prefer that, at the earliest possible opportunity, a legal decision on a case involving the question of an architect's right of ownership to his drawings should be obtained in one of the superior courts, where evidence as to custom can be produced."

Acting on the advice given, the difference had been brought to the point of arranging an agreement to refer the claim to a retired Judge, when the judgment in *Ebdy v. McGowan* was given. In the face of this judgment, acting under high legal advice, Mr. Barry has withdrawn from the contest, and has told Mr. Ayrton he might have the drawings when he liked. Lawyers say the decision referred to will now be looked on as settling the law, and that no reference would be at liberty to disregard it. We cannot consent, however, that the general question should be considered settled, and trust that before long means will be taken to obtain a legal decision upon a less exceptional case than either of the two we are speaking of.

Leicester-square.—The Metropolitan Board of Works have given notice of their intention of applying in the next session of Parliament for a Bill to enable them to take the garden or inclosure in Leicester-square, to extinguish all existing rights in the same, and to empower them to appropriate and set apart the same for ever as a place of recreation for the public.

* See p. 211, ante.

OPENING OF THE NEW PUBLIC BATHS, BRIGHTON.

The formal opening of baths, the establishment of which has been the subject of much controversy and discussion during several years past, has now taken place.

They are situated at the bottom of North-road, forming part of the old barrack property now in the hands of the Corporation, and are accessible by an iron gateway, through an archway in the buildings, the land for which was not long ago purchased from the town council on lease, opposite Cheltenham-place. They have been constructed by Mr. Blackmore, and Messrs. Reed, engineers, the contractors; the brass-fittings, locks, and other ironmongery having been supplied by Mr. H. Woollett. The main building of the baths is not new, the northern portion of the old Infantry Barracks having been adapted to the purpose; the whole of the interior having been removed and re-constructed for the present purpose. There are two separate entrances to the baths, dividing the women's from the men's, which have no connexion, except at the money-taker's office, which is situated between the two entrance-doors. The first, or northern entrance, leads to the women's baths; on the ground-floor, first and second class, of the former of which there are two, and of the latter three, with waiting-room outside, the floor of which is covered with kamptulicon. The walls are faced with Minton's tiles, and the wood-work of the baths is of pitch-pine, stained and varnished. There is no difference in the fitting up of the baths themselves, except that the second class are a trifle plainer, although possessing equal comfort and convenience in other respects. The southern entrance leads to the men's baths, which are on the first floor, approached by a flight of oak stairs, the first and second-class baths being separated by a gallery at the top of the staircase. The baths are similarly fitted to those of the women, the difference between the first and second class being in appearance very trifling. There are six first-class and eight second-class on the men's side, each bath-room being about 6 ft. square and containing a bath 5 ft. in length, made of iron in one piece, and covered with a white enamel which gives them the appearance of porcelain, and possessing the requisite of perfect cleanliness without unnecessary trouble. They are all fitted with apparatus for the supply of cold or hot water in any proportion required, the supply being regulated from the outside by the bath attendant, by means of valves with indicating plates, so as to prevent the possibility of a mistake. The waste pipes from the whole are connected with the common sewer. In each class of baths is fitted a shower-bath, for use as may be required. Each bath-room floor is covered with cement, on which is a carpet and footboard; and all other conveniences have been provided for the use of the bathers. In the rear of the building, on the basement, is the steam boiler, by which the hot water is prepared; and on the ground floor is a commodious washhouse with copper and apparatus for washing and drying the towels.

DUDLEY GALLERY EXHIBITION.

The committee who manage the exhibition, now held twice in the year, at Egyptian Hall, want a name irrespective of that of the room in which the pictures are shown, and which is not exclusively reserved for them. They should settle this at once. The present collection is scarcely so remarkable as some that have preceded it, but contains a number of good and agreeable pictures worthy of longer notice than the pressure on our space enables us to give. Three pictures by Mr. G. F. Watts, attract attention. The first, which is a design for a larger one of the same subject, he names "Love and Death." A draped figure is pushing open with resistless hand a chamber-door from which Love is coming out. Death, by her vastness, overshadows Love, and seems to render all human interposition useless. It is hazy, but suggestive. His other figure design is a fine monochrome of Francesca and Paolo, as Dante saw them in the Inferno. The pale head that reposes on the bosom of the shrouded lover is sadly sweet. Love defies torment.

Mr. A. B. Donaldson's illustration of the old Venetian legend of the "Return of St. Mark, St. George, and St. Nicholas, the Patron Saints, to Venice" (78), is a meritorious and striking work entitled to careful notice. Miss Ellen

Freer gives a new reading of "In Memoriam." A charming young lady, wandering in the woods flower-gathering, comes suddenly upon a tree upon which she perceives certain well-known words cut. She tenderly clasps the tree, and presses her lips to the initials. The glints of light upon the dress are cleverly managed. Our "Country Garden," by Mr. J. C. Lewis, is a blaze of children and flowers. Mr. Elithu Vedder's "Dead Abel" (34) is an impressive picture. The dead body of Abel, lying at the foot of his offering of fruit and flowers, is well posed and modelled, the result of intelligent study. Mr. H. Wallis exhibits a fine picture, "His Highness and his Excellency the Ambassador of the Florentine Republic." "The Art Critic," by Mr. Claude Calthrop, portrays capably a jester passing his opinions upon a picture-gallery, so as to move the mirth of a fat monk. Mr. Calthrop is making good progress in his art. Mr. Poynter's "Little Girl" (204) and Miss Osborn's "Venetian Water-carrier" (209) are amongst the very good things in the collection.

YOUR NEIGHBOUR'S MUSIC.

A CORRESPONDENT from Whalley Range, Manchester, sends us a lamentable account of the sufferings of some members of his family more than usually nervous, through the pianoforte playing and the singing of his neighbours, and implores us to suggest a remedy. He says, "Although the division walls are 9 in., that is, a brick length, and of course plaster, in addition, in thickness, sound can plainly be heard in the room we mostly occupy, the room over, and also in the cellar under. Each note on the piano can be heard quite plainly." Sawdust has been put in at the floor next the wall, the recesses on each side the chimney-breast have been battened and papered, and other expedients tried, but all is of no use. Nor, we are sorry to say, can we suggest anything in reason that would prevent the annoyance. It would, of course, be lessened if his neighbours could be persuaded to remove their pianofortes from the party wall to the other side in each case (he lives in a block of three), and this is what our correspondent should endeavour to bring about.

In stating this gentleman's grievance we express that of thousands, and yet builders in erecting ordinary houses to sell make no endeavour to prevent the nuisance: and little wonder; for if any of them did, they would probably get no more for their houses, or be undersold by less careful competitors. The public may blame themselves.

BUILDERS' CONTRACTS.

JONES V. ST. JOHN'S COLLEGE, OXFORD.

This was an action in the Court of Queen's Bench, before Mr. Justice Mellor, Mr. Justice Lush, and Mr. Justice Hannen, by a builder, to recover a balance of 990l. under a building contract with the College. They set up (except as to 120l. paid into court) a cross claim of 870l. for penalties, at the rate of 3l. a day, under a clause in the contract providing for delay in the completion of the works. The builder to this replied that the delay was occasioned by alterations ordered by the College, which rendered it impossible, as they well knew, to complete the contract and the additional works within the specified time, unless an extension of time were allowed. There was the usual clause in the contract for referring disputes as to time, or quantity, or quality to the architect, who, however, had certified the amount due without any deduction for penalties, which did not appear to have been claimed; and there was a provision for extension of time by him, but there had been no such extension.

Mr. Manisty, Q.C., and Mr. J. O. Griffiths were for the plaintiff; and Mr. Kemplay was for the College. The plaintiff greatly relied upon the recent case of "Westwood v. The Secretary of State for India" (decided by the House of Lords in the Court of Appeal in 1869), and where the Court as to set-off for penalties held that the contractor was not liable, the public Government having by their own acts and orders knowingly rendered it impossible for the contractor to do the work within the time. On the other side, the express terms of the contract were relied on, and it was urged that, however hard and unprofitable to the builder, he bound himself by so strictly that he could not resist the claim for penalties, and it was maintained that the case cited was not precedential, and that in the course of the discussion more than one of the learned Judges seemed to think that it was so, but that it was wrongly decided; and in the course of the argument, the counsel for the College being asked by Mr. Justice Mellor whether, supposing

they had given an order for extensive alterations a day or two before the expiration of the time, so that it was physically impossible the work could be completed, and they had fixed any extension of time, they said they had enforced the penalties, he admitted that he was bound to answer, according to this view, that they could not.

In reply, on the part of the plaintiff, it was urged that, as this contention was simply a question of law, it was sufficient to show that the defence set up by the College was as contrary to law as it was to common sense and justice, and that the case of "Westwood v. The Secretary of State," was rightly decided, and that the principle of law, based on the facts of that case, was such that no one could take advantage of his own wrong or enforce a penalty for a default caused by his own act and conduct.

The Court, at the conclusion of the argument, retired to consider their judgment, and, on their return, proceeded to give judgment in favour of the defendants, the College. The plaintiff, the builder, they said, had expressly contracted to do not only the original, but the additional works within the specified period, unless there was an extension of time, which had not been allowed. It was urged, they said, that this was hard on the contractor, but he should be liable to penalties for a breach of the nature of which he could not have known at the time he entered into the contract. If persons would bind themselves to absolute or to absolute impossibilities, they must accept the consequences. No doubt, these contracts were often very one-sided, and one of the parties put himself absolutely in the power of the other. This was not, however, the reasonable and fair terms on the other side, but that could not affect the judgment of a court of law. The terms of the contract were clear, though its operation might be hard; and it did not appear that, in point of fact, in this case the extra works were out of the scope of the contract, or had been ordered at a time when it was not yet completed. The case cited was distinguishable on the pleadings, as the point in question did not arise, and it was not, though the Court had expressed the opinion mentioned. The judgment of the Court, therefore, must be for the defendants.

BUILDERS' BENEVOLENT INSTITUTION: ELECTION OF PENSIONERS.

The thirty-fourth election of pensioners in connexion with this charity took place on Thursday last, 24th inst., at Willie's Rooms, King-street, St. James's, Mr. Alfred J. Mansfield, president, in the chair. As we stated in our recent report of the anniversary dinner, there were then forty-four pensioners in receipt of annuities from the Institution, twenty-two men and twenty-two women; the men receiving 24l., and the women 20l. per annum each. To this number two pensioners were added by yesterday's election, one male and one female, there being five male and seven female candidates. The male candidates were: William Peters, Benjamin Johnson, Francis Sandon, William Gale, and Mark Mistry. The female candidates were: Harriet Proctor, Mary A. Morgan, Frances Seare, Mary St. George, Jane Boothill, Elizabeth Trevelyan, and Alice Hoare. The Chairman, after expressing his regret that the funds of the Institution at the present time would not permit of the election of more than two out of the twelve candidates, declared the poll to be opened, and it remained open from twelve o'clock till three. At the close of the poll the scrutineers, Messrs. Stirling and Matthew Hall, announced that the successful candidates were Benjamin Johnson and Mary Ann Morgan. It was also stated that the unusually large number of 1,200 votes was left unpolled, the votes recorded being 800 less than at the last election. A vote of thanks to the scrutineers (proposed by Mr. Thomas Smith, and seconded by Mr. John Thorn), and a similar compliment to the Chairman (proposed by Mr. George Plackett, Treasurer, and seconded by Mr. Joseph Bird), having been unanimously passed, the proceedings terminated.

A HOUSE FOR THE LEARNED SOCIETIES.

Thames Embankment Site.—Dr. Gray, in his lecture at the Statistical Society, on the 15th, advocated the claims of the four principal institutions connected with social science, namely, the Statistical Society, the Institute of Actuaries, the Juridical Society, and the Social Science Association, to the grant by Government of a site upon the Thames Embankment, a plan for which has been prepared by Mr. Bellamy, and stated that if such a site can be procured a building fund will not fail to be contributed by the members of those four societies.

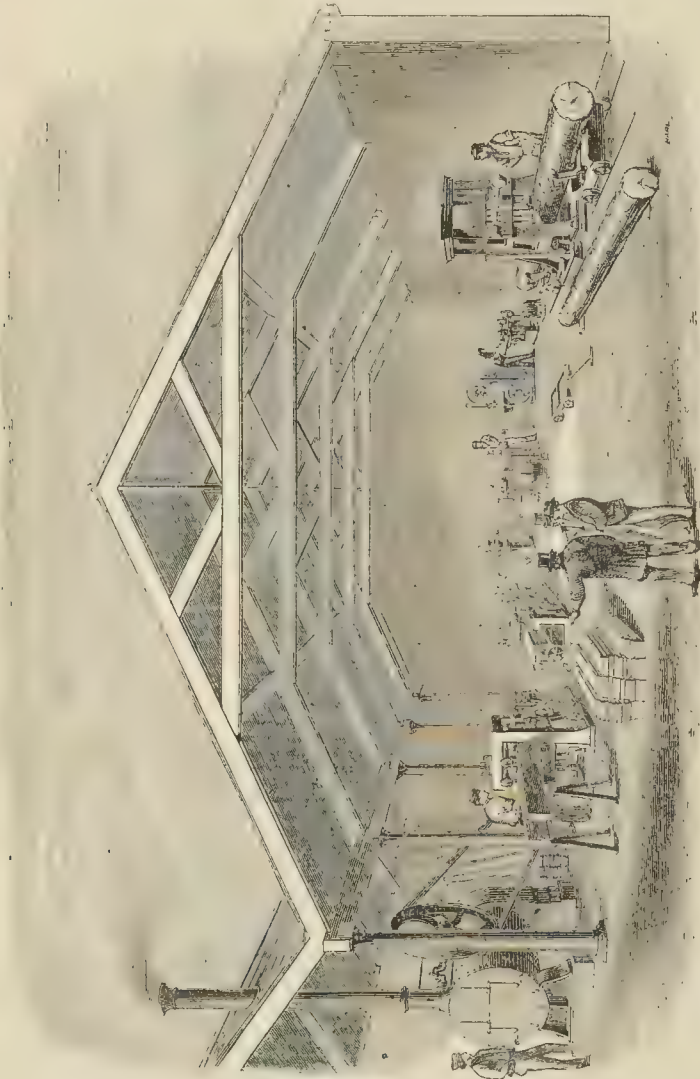
Victoria-street Site.—A meeting was held on the 24th of November, at the Rooms of the Statistical Society, at which a scheme, illustrated by drawings by Mr. E. W. C. F. Schmidt, architect, together with a report, was laid before the delegates of the Societies present. This scheme proposes to utilise No. 4, Westminster-chambers, and the vacant ground at the back, to meet the requirements of the societies.

There is evidently a movement in the right direction, but it seems to us to want a good head.

with light cutters, which finish the moulding after it has been roughed out by the first top and bottom cutters, and being driven at a very high speed, and having nothing to do but skim the surface of the wood, they turn out and at a speed unattainable with any machine not possessing this improvement. As the finishing cutters work only in the clean wood which is perfectly free from grit, they will run a long time without getting dull. All the spindles of this machine run in self-lubricating bearings, of considerable length, which enables them to work at high speeds without heating.

On the opposite side of the shop is a special machine for running small mouldings, not exceeding 3 in. wide by 1½ in. thick, which it turns out worked on all four sides with a good finish, at the rate of 40 ft. a minute. As in the machine last described, the spindles are all made of mild centred cast steel, and run in self-lubricating bearings; and, being small in diameter, they admit of being driven at 6,000 revolutions a minute, at which speed, we are told, they run perfectly cool. The middle of the shop is occupied by a large circular saw, which is now in the hands of Messrs. Ran- some & Co., which are now so well known as not to require any notice here, the only new feature in it being an additional arrangement for cutting circular mouldings and for chamfering and shaping straight or irregular shaped pieces. The band-saw shown at the end of the shop is fitted with an effective arrangement for packing the saw immediately above and below the cut. This is the invention of Mr. Richards, of Philadelphia, and enables the saw to stand a considerable amount of forcing without being unduly strained or buckled. An improved saw-sharpening machine is always kept at work for sharpening both the frame and circular saws used in the various machines.

The whole of the machinery is driven by a new description of portable engine recently brought out by Messrs. Ransomes, Sims, & Lead, of Ipswich, with the special object of economising fuel. The boiler, which is unusually large for



A TRIAL-SHOP FOR MACHINERY IN MOTION.

THIS building has been erected at the works of Messrs. A. Ransome & Co., King's-road, Chelmsford, for the twofold purpose of thoroughly testing all new machines as they are from time to time brought out, before sending them away, and also for a show-room, in which intending purchasers may select at all times a selection of the newest and most improved wood-working machines in full operation, and so be enabled to judge for themselves of the merits of the machines before ordering.

From the fact that new machines are being constantly brought out at these works, it results that the selection in the trial-shop is constantly changing; and although some of those which are in general demand are always to be seen working here, yet the chief feature of interest is the exhibition of the various new mechanical appliances and tools, which are tested and perfected in this building before they are brought before the public.

The machines shown in the engraving are of special interest to builders, as they comprise almost everything that is required for preparing joiners' work, from the saw-frame to the lighter machines for tenoning and mortising; and, as they mostly possess some novel features, a brief notice of them may not be deemed uninteresting.

In the front, on the right hand, is a planer combined with a deal frame, for planing a log or two deals may be desired. The chief novelty in this machine appears to be its great compactness and the peculiar arrangement of the working parts, whereby the necessity for deep excavations, and the costly foundations which have hitherto been required for machines of this class are dispensed with, and the frame stands upon its own foundation. This is fixed at the floor level upon two stones set in a few courses of brick-work, the only parts of the machine which go below the floor being a portion of the fly-wheel, and the lower part of the swing frame. All the working parts are made

of wrought iron, and are as light as possible, consistent with sufficient strength. Although the saws make as many as 200 strokes in a minute, there is scarcely any perceptible vibration in the machine.

Opposite to this machine is a small double deal frame, which at first sight appears too small to be capable of sawing anything but battens; but although it stands entirely above the floor, and is only 4 ft. 6 in. high over all, it will saw two deals or planks at a time, up to 11 in. by 3 in., with great speed and precision. The main framing and foundation-plate are cast all in one piece, and the entire machine is so strongly constructed that the saws can be driven at 350 strokes a minute without undue vibration. The

spindles of the cutter-blocks, if sufficiently strong to work heavy mouldings, are too large to admit of being driven at the very high speed, which is necessary to secure perfect work. In the machine under notice, this difficulty is overcome by the introduction of two additional cutter-blocks, one of which acts upon the upper and the other upon the under side of the board or moulding. The spindles of these extra cutter-blocks are made of a special quality of cast steel, which is very hard on its surface, but has a soft, tough core or centre: the result is, that great strength is obtained with a small diameter of bearing, and these spindles can be driven nearly double as fast as they could be if made of iron. These extra blocks are armed

with a new patent planing and moulding machine, which takes in boards up to 12 in. wide and 4 in. thick, and works on all four sides at once. The weak point with machines combining the two operations of planing and moulding has hitherto been that

the planing and moulding machines are too large to admit of being driven at the very high speed, which is necessary to secure perfect work. In the machine under notice, this difficulty is overcome by the introduction of two additional cutter-blocks, one of which acts upon the upper and the other upon the under side of the board or moulding. The spindles of these extra cutter-blocks are made of a special quality of cast steel, which is very hard on its surface, but has a soft, tough core or centre: the result is, that great strength is obtained with a small diameter of bearing, and these spindles can be driven nearly double as fast as they could be if made of iron. These extra blocks are armed

its nominal power of 10-horse, is made sufficiently strong to work safely at a pressure of 100 lb. to the square inch, the ordinary working pressure being 80 lb., at which the engine will give out double its nominal power. The fire-box is of large size for burning the chips and shavings made by the machines, instead of coal, and the feed water is heated by the exhaust steam to nearly boiling point before it enters the boiler. The cylinder is provided with a steam-jacket, which is constantly filled with hot steam, and thus prevents any condensation of the steam in the cylinder; and the engine is fitted with an improved variable expansion-gear, by which the amount of steam used can be regulated according to the number of machines at work.

The machines are all substantially fixed, and the shafting runs in a tunnel under the floor; so that the belts are all out of the way. It seems to us that any builder contemplating the erection of machinery could not fail of getting some useful hints from a visit to this place.

THE STUDY OF CHURCH ARCHITECTURE.*

ALTHOUGH this is the second time only that I have attended the meetings of this Association, I cannot say that I have the feeling of being in the presence of strangers. For, in the first place, I see before me the familiar countenances of several of your members, in whose company I spent a very pleasant week at the end of August, amongst the Lincolnshire churches; and, in the second place, I cannot help thinking that you will be disposed to accept me on the footing on which I desire to stand with respect to this Association, namely, as a friend, who having long ago withdrawn from the practice of architecture as a profession, and having therefore no further personal object to serve in this respect, desires to aid the junior members of the profession in the pursuit of a study to which he has devoted a considerable portion of his own life, and on a tolerably complete knowledge of which depends in a great measure their future excellence as professional men; I mean the study of the History of Church Architecture. And here let me guard against the possibility of being misunderstood. When I speak of the study of the History of Church Architecture, I mean the serious study of the progress of a great Art—the art of Building,—during the Middle Ages; and I do not mean that dilettante study of Mediæval art which, mixed up with the examination of barrows and tumuli, the investigation of British earthworks and the Roman roads, the rubbing of bræses, and the collection of tiles and pottery, passes under the general term of Archaeology; in the pursuit of which Antiquarianism holds the first place, and Art the second in the breast of the student. Nor yet do I mean that attempt to unite ancient art with modern practice in church buildings and church observances, which calls itself and is known as Eclecticism. The true architectural student has, in fact, a far simpler, and it appears to me, a far nobler course open to him. He has to trace out and to follow the progress of this great art, by the help of the admirable illustrations of it which remain still in all parts of Christendom.

He has to note the changes of form, in outline, detail, and carved work, through which Mediæval Architecture passed, from its earliest infancy, in the eleventh, to its highest perfection at the close of the thirteenth century, and subsequently declined again from this point to its final extinction in the sixteenth century. He has to mark and to record the indications of this gradual, but regular, constant, and simultaneous, progress, and to turn the lessons which it thus teaches him to his future use and profit. There is no nobler or more interesting study open in the whole range of the history of art and civilisation; and I rejoice in this opportunity of arguing a society which has so much energy and vitality in its management, and so many active eyes and hands amongst its working and junior members, and which has now so firm a position and standing in the country, to put itself at the head of a movement, which shall have for its object the extension of elementary knowledge in the subject of church architecture, not only amongst its own members, but as well to those numerous amateurs in all parts of the country

whose only means of acquiring any at the present time is limited to the annual meetings of the local societies to which they may happen to belong.

Now I am aware that it has been somewhat the fashion of late in certain quarters to decry this careful and attentive study of our national monuments, and to refer the young architect to his own inspirations, to the light of nature, and so forth, rather than to ancient example. This counsel is very delusive and very mischievous, and can only lead to failure. Every art has its alphabet and its grammar, as well as its language and its poetry; and it would be just as irrational to expect any one to comprehend and appreciate the latter before he had learnt the former as it would be to call on a youth to compose Greek verse before he knew how to read and write the language. No one can possibly design a good Gothic building who has not, by diligent study, become thoroughly imbued with the spirit in which those early masters thought, designed, and built. There is no royal road to success in this direction.

But it has been also urged that the knowledge thus obtained leads to servility, and disposes the student rather to copy than to invent and to design. But how was it with our forefathers,—the men who constructed all these glorious buildings? They were evidently all brought up and carefully trained in one school of art, and had not even the liberty and choice that we have; yet we never find them repeating themselves, or copying their neighbours' designs. Of the thirty churches which we visited in August more than half were built in the same period, and within a few years and a stone's throw of each other; yet there are not two of them the main features of which can be said to be identical, or even greatly similar. The truth is that the saying which applies to the poet, "*Poeta nascitur, non fit*," is true also, in other words, of the architect. It is not the study of excellent work which causes copyism, but the inability to turn the knowledge thus obtained to good account. An inventive and cultivated mind well trained in this noble school of art, and thoroughly imbued with the feelings and spirit which it breathes, should have no greater difficulty in the nineteenth than in the thirteenth century in producing works of merit and originality. But it is in architecture as in everything else; and it is hardly necessary to say that no amount of study will compensate for the want of natural talent and ability.

With these preliminary remarks, I will proceed at once to the matters on which I have undertaken to address you to-night; but here allow me to observe that you will, perhaps, be disposed to think, before I have finished, that the title of the paper, as I sent it to the secretaries, and as it is inserted in the programme, might have been more correctly stated; for, although I shall certainly have to explain to you the use I propose to make of colour for the purpose of indicating distinctions of style, I shall have much more to say to you in regard to those distinctions themselves, the perception and appreciation of which are of so much importance to the architectural student. My first business, then, is to point out to you these distinctions. Now, in order to do this, it is absolutely necessary that I should make use of terms by which to characterise them; and, of course, it is very desirable, in doing so, to make use of terms in general use. But it so happens that it is impossible for me to do this, for the simple reason that there are no terms in popular use which are applicable to, at least, two classes of buildings, to which I wish to draw your special attention. I have, therefore, been obliged to invent terms for this purpose. They are contained in a little work which I published some years ago, but which, having been long out of print, is known, I dare say, to few who are present this evening; and to those who do happen to know them I dare say I can make the repetition of them less wearisome by the addition of several particulars which have not yet been published.

Of course, no one who has paid any attention to this subject is ignorant of the fact that it is to Mr. Rickman that we owe the first classification of our national architecture; and that he divided it into four styles, from the Conquest to the Reformation, which he called Norman, Early English, Decorated, and Perpendicular. Now, it is no reflection on Mr. Rickman to say that this division, simple as it is, and well fitted as it was at the time he wrote, for the purpose for which he intended it, is not adapted to

the advanced state of knowledge on the subject which we now possess, and does not answer the purpose of descriptive writers of the present. It does not, for example, make any provision for the two large classes of buildings to which I have already referred: I mean, first, those that were erected during the half-century that intervened between the first appearance of the pointed arch and the final disappearance of the circular arch; and, secondly, those which were constructed during the seventy years that intervened between the first appearance of tracery in windows and its employment in that flowing form which Mr. Rickman instances as the chief characteristic of his Decorated period.

Now, during these two periods of art, some of the most important and interesting buildings in the kingdom were raised,—buildings more characteristically national, perhaps, than those of any other period,—buildings which possess features and peculiarities that enable us to identify and to distinguish them satisfactorily and completely, as well from those which preceded as from those which followed them; but buildings which it is impossible to classify and describe, without circumlocution, by any of the terms which Mr. Rickman has bequeathed to us.

It was to provide a fitting place in our Nomenclature for these two Periods of English Art that I proposed, some years ago, the division of our National Architecture, from the Conquest to the Reformation, into six Periods instead of four, a division which has since then been coming into pretty general use, and which is illustrated in the six diagrams behind me.

Mr. Sharpe then proceeded to explain the characteristic features of these periods, as contained in his work on the Seven Periods of English Architecture;—and which have been more than once stated in detail in the *Builder*. He insisted on the importance of the Transitional Period; on the interest attached to the struggle that was carried on throughout its entire duration between the two forms of arch, and on the employment of the Pointed arch in arches of construction, and of the circular arch in arches of decoration; on the fertility of invention exhibited in the ornamentation of this period, and on the rise of a new school of English Art during this period, completely emancipated from the influence of earlier ideas brought over by Norman architects; and he instanced the large number of important buildings which still remain to us of this period.

Passing rapidly over the Lancet period, he dwelt on the characteristic features of the Geometrical period, in which he asserted that Gothic art attained its highest development in this country; he drew attention to the features which distinguish it as well from the Lancet as from the Curvilinear periods, and referred to the long list of noble buildings which illustrate this graceful period, as well on the Continent as in England; and amongst which he instanced the Presbytery of Lincoln Cathedral as belonging to the highest class of European art, whether as regards its outlines and its main features, or its sculptured details and carved work.

Mr. Sharpe then pointed out the evident decline in all these particulars in the succeeding Curvilinear period, drawing attention to the fact that the point at which this decline commenced may be said to be identical with the introduction of natural foliage into carved work, which took place in the middle of the Geometrical period. He described the unsuitability of the most usual forms of vegetation for the ornamentation of capitals and corbels; and whilst admitting the excellence to which the builders of the fourteenth century attained in the imitation of the leaves of the vine, the oak, and the maple, pronounced the thin flat forms of these vegetable products to be unfit for solid stone or wood work, except on flat surfaces, and to be capable of being successfully executed only in such materials as bronze, copper, or iron. He remarked also that the mistake was soon discovered, and that before the close of the fourteenth century, conventional foliage having only a certain affinity with real foliage was again in vogue.

He accorded, however, to the Curvilinear period the merit which was due to the invention of flowing tracery, and the excellence of its sculptures; and instanced the Easter sepulchres to be seen in the chancels of Heckington, Hawton, and Navenby Churches, and in the presbytery of Lincoln Cathedral,—all belonging to this period,—as containing, in the figures of the soldiers and angels guarding the tomb, some of the most admirable representations of the human

* By Mr. Edmund Sharpe, from a lecture to the Architectural Association on the 18th inst.

form, and of drapery, to be found in any age or in any country.

Concluding this rapid survey with some remarks on the characteristic features of the work of the Rectilinear period, the lecturer proceeded to show how, in the preparation of the ground plans, sections, and elevations of buildings executed at different times, he proposed by the use of different colours to indicate the periods to which the several works might belong, in the manner which has been already explained in the *Builder*.

But the novelty on this occasion was the exhibition of a large number of diagrams of the arch-mouldings of the pier-arches of the cathedrals and abbey churches of the kingdom, which covered entirely the side walls of the larger of the two exhibition-rooms in Conduit-street, and which, executed in the six colours which Mr. Sharpe has appropriated to the six periods of his division, and arranged in their true chronological order, exhibited in the exact sequence in which these colours occur in the prismatic spectrum, the progress of the art of moulding in stonework from the eleventh to the sixteenth century. The lecturer having explained the manner in which these diagrams were prepared, and the usefulness for this purpose of the little instrument called the cymagraph, of which, although invented by Professor Willis more than twenty years ago, the use at the present day, he believed, was confined to himself and one or two others, proceeded to point out the different characteristics of the moulded work of the different periods, the slow and gradual progress of this transition, the power of fashion over the forms and profiles of these mouldings, and the certainty that it is in this direction that we are to look for the surest indications of the age of a building; and that it would be by no means impossible to be able shortly, by the help of these unfailing records, to determine, within a few years even, the date of a building that was constructed five or six centuries ago.

Mr. Sharpe concluded a lecture which occupied upwards of two hours, and was listened to throughout with the undivided attention of a large and intelligent audience, which completely filled the large room, by urging on the junior members of the profession, to whom he specially addressed himself, not to content themselves, in the pursuit of this study, with the examination and comparison of drawings and engravings, the study of which was, no doubt, at all times, but especially in the first instance, most desirable, but to lose no opportunity of visiting, studying, and making notes of every bit of ancient architecture to which they could obtain access; and expressed the hope, in case health and leisure permitted him, to renew the invitation which he had addressed to the Association last summer, and which had been attended with such pleasant results, and trusted that at least double the number who responded to it on that occasion would be found ready to devote a week next summer to similar researches together amongst an equally interesting group of English churches.

ON THE WEST FRONT OF WELLS CATHEDRAL.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting, on Monday, the 21st inst., Mr. E. P. Anson, Vice-President, in the chair, a paper "On the West Front of Wells Cathedral," by Mr. Benjamin Ferrey, F.S.A., was read. We make some extracts:—

The excessive beauty of the west front of Wells Cathedral, as a whole, is undeniable, and exhibits genius of the highest order. For its purpose of presenting to the religious spectator in a single façade the portraits of triumphant monarchs, saints, and prelates, in one great assembly, the design of the front is unequalled, and small is the deviation from true principles which has been perpetrated for this display. How monotonous would have been the west front of this great cathedral if its treatment had followed the hackneyed rule laid down by the author of the "Norman Conquest." Although ordinary artists may fairly be hampered by such canons as are well set forth by Pugin and others, there have been, and ever will be, men of such originality of thought that their productions cannot be controlled by every-day rule. Their works are stamped with genius, and no better evidence of this assertion can be met with than will be found by those who care to study both

the composition and details of Bishop Jocelyn's great work,—the west front of this cathedral.

The materials of the whole front consist of Doubling stone and blue lias columns, aboat, string-courses and pedestals; but this additional enrichment is carved in white lias, and adds much to the effect of the soffit, though palpably an afterthought.

Another noteworthy characteristic is the selection of the subjects of the sculpture, as pointed out by Professor Cockerell. They are chosen to impress upon the beholder the grand verities of the Christian faith; and there is a total absence of all apocryphal and superstitious subjects. Whether the intention of the sculpture was to express in stone the glorious theme of the Te Deum, as ingeniously suggested, or with whatever meaning they were executed, they are worthy of admiration, and a higher tribute to the excellence of the figures can hardly be adduced than the praise awarded to them by the great Flaxman, whose remarks were as follow:—

"Bishop Jocelyn rebuilt the Cathedral Church of Wells from the pavement, which having lived to finish and dedicate, he died in the year of our Lord 1242. The west front of this church equally testifies the piety and comprehension of the bishop's mind. The sculpture presents the noblest, most useful, and interesting subjects possible to be chosen. On the south side, above the west door, are alto-reliefs of the Creation, in its different parts, the Deluge, and important acts of the patriarchs. Comparing to these are alto-reliefs of the principal circumstances of the life of our Saviour. Above these are two rows of statues larger than nature, in niches, of kings, queens, and nobles, patrons of the church, saint bishops, and other religious, from its first foundation to the reign of Henry III. Near the pediment is our Saviour come to Judgment, attended by angels and twelve apostles. The upper arches on each side along the west front, and continued in the north and south ends, are occupied by figures rising from their graves, strongly expressing the hope, fear, astonishment, expectation, or despair inspired by the presence of the Lord and Judge of the world in that awful moment.

In speaking of the execution of such a work, due regard must be paid to the circumstances under which it was produced, in comparison with those of our own times. There were neither prints nor printed books to assist the artist. The sculptor could not be instructed in anatomy, for there were no anatomists. Some knowledge of optics and a shattering of perspective were reserved for the researchers of so sublime a genius as Roger Bacon some years afterwards. A small knowledge of geometry and mechanics was exclusively confined to a few three earned masters in the whole country, and the principles of the sciences, as applied to the figure and motion of man and inferior animals, were known to none. Therefore, this work is necessarily ill-drawn and deficient in principle, and much of the sculpture is rude and severe, yet in parts there is a beautiful simplicity, an irresistible sentiment, and at sometimes a grace exceeding more modern productions.

It is very remarkable that Wells Cathedral was finished in 1242, two years after the birth of Cimabue, the restorer of painting in Italy; and the work was going on at the same time that Nicolo Pisano, the Italian restorer of sculpture, exercised the art in his own country; it was also finished forty-six years before the Cathedral of Amiens, and thirty-six years before the Cathedral of Orvieto was begun, and it seems to be the first specimen of such magnificent and varied sculpture united in a series of sacred history that is to be found in Western Europe. It is therefore probable that the greater relics of the west front might be brought from the East by some of the crusaders.

But there are two arguments strongly in favour of the credit being English. The family name of the bishop is English,—"Joceline Trevisa," and the style of the sculpture and architecture, is widely different from the tomb of Edward the Confessor* and Henry III.,† which are by Italian artists. There are many compositions of the Almighty creating Eve, by Giotto, Florence; Buonarroti, Bullfinch, Pisa, Ghiberti, and Michelangelo. This is certainly the oldest, and not inferior to any one of them."

For dignity of expression and posture many of the statues can hardly be surpassed, and the affecting series of groups filling the long range of niches over the west triplet window, illustrating the Resurrection at the last great day, are wonderfully fine, and we can only regret that an imperfect knowledge of anatomy has somewhat marred the treatment of this most solemn representation. Nevertheless, the attitudes and expressions of despair and grief are exemplified in a wonderful manner, and the uplifting and rising from the tombs conceived and carried out in the most masterly way. It must be remarked in reference to these several groups, that they are not sunk or carved out of the solid masonry, but executed in detached blocks and inserted within the niches. Curiously enough, also, each group has an incised number, still distinctly visible, showing the order in which they were to be placed to the south of the façade. The bishops have their mitres and priests their tonsure, though, in other respects, all are entirely naked. Above and around these figures must be noticed the bold and splendidly audacious foliage which fills the spandrels, and, although much is decayed, there yet remains a considerable extent of this fine and effective carving standing out in the most artist-like manner; indeed, throughout the whole of this front, the capitals, bases, and hollow mouldings at the back of each of the insulated

shafts exhibit beautiful carving, and present an admirable study for the carver.

Immediately above this Resurrection stage, as it may be termed, which extends not only across the west front proper, but fills also the sides of the two towers, there is a central feature, consisting of nine niches, with well-moulded trefoil heads, resting on as many blue lias columns, and containing what has not inappreciably been termed by Professor Cockerell, "The nine orders of the Heavenly Hierarchy," though his supposition can scarcely be borne out now that a close inspection of the statues has been made. The sadly dilapidated condition of these statues is truthfully shown by the series of photographs: they are hopelessly going to ruin, and no effort, I fear, can save them; it is, however, a satisfaction to possess such unquestionable evidence of their condition, and to be able, even in their present imperfect state, to give some idea of their former vigorous outlines. Great difference of opinion prevails as to the course which should be taken with the sculpture, which is so completely crumbling away, that no trace of it will shortly remain. Some are for awaiting this result rather than touch the fragile remains, while others recommend that these figures should be at once removed while there is sufficient indication of their character, and be carefully preserved in the cathedral, and that others, executed by skillful hands, should be placed in the niches—a suggestion not unworthy of consideration.

Above the range of statues comes the tier of twelve niches, containing, beyond doubt, the figures of the twelve Apostles: most of them can be identified by the instruments used in their martyrdom, or by significant emblems. A peculiarity of much beauty, in the arrangement of these niches and canopies, deserves notice. The present dilapidated condition of the canopies and capitals gives the impression that the greater number of the sustaining columns are wanting, and several are gone, but the series of niches is divided into three large bays, containing in each four figures, the group being separated by projecting columns, while the figures themselves are divided by smaller attached columns at the back of each niche, the canopies to the figures projecting in a pendentive manner, and the soffits formed of free and beautiful foliage. This is an unusual treatment, but quite worthy of attention, as showing the happy manner of relieving the monotony of twelve similar niches as usually arranged.* A very imperfect idea can be formed of the beauty of these canopies, as, with the exception of fragments at each end, the weather has completely destroyed the other parts of the twelve canopies. The figures which fill the niches are, I think, unquestionably, of later date than the rest of the statuary, but they are singularly grand and effective works when considered from the distance from which they were to be viewed. Before describing each, I would call attention to the conventional arrangement of their positions. The cathedral being elected to the glory of God and in honour of St. Andrew, he, as the patron saint, occupies a central position, and is considerably taller than the other Apostles, his head filling the upper portion of the canopy. Another statue, with symbols so completely decayed that his identity is difficult to discover, may not improbably be St. James the Less, the figure being remarkably short, and the head unusually large. There are traces upon all the figures of colouring, though slight, yet in the protected parts of the robes the deep maroon colour is found, but no remains whatever of gilding, but the bright colours of the stone, affected by the weather, give almost the brilliancy of gold.

To those who are acquainted with this cathedral, it will hardly be necessary to point out the striking effect produced by the multitude of slender shafts at the several angles of the buttresses, and in the niches and arcades. These shafts, many of them in lengths of 13 ft., in one piece of blue lias, by their number and position form a great feature of the front; unfortunately a number of them, owing to the perishable nature of the blue lias, have either crumbled away or been blown down. At various times, as these accidents occurred, other shafts have been supplied, but instead of being rein-

* By a reference to the details of this front, given by Britton in his "Wells Cathedral," it will be seen that his illustration of this part is most inaccurate: every niche is there shown as supported by columns on the same plane, and the artist has completely missed the charming deviation from the common rule.

* Dr. Beavenuto.

† Wm. Torrell.

stated in blue lias or other grey marble, Douling stone has unobtainably been used. The charm, therefore, which was produced by the beautiful tint of the grey shafts has been wholly lost, and the monotony produced by a large quantity of small stone shafts is most palpable. There are, however, a few of the original shafts yet remaining, and the pleasing effect they produce, especially when the setting sun shines upon them, has only to be seen to be appreciated. Colour entered as much into the minds of the great architects of earlier days as form and composition, and no repairs to this beautiful west front can be effected, which does not reproduce, as far as practicable, the original conception in the colour of the materials.

In an early water-colour drawing of this cathedral, made by Turner, that great artist showed the beautiful variety of tint produced when a great number of the original shafts were yet standing: nobody knew better how to express in colour the pleasing contrast which was produced by the judicious mixture of these materials.

It is to be regretted that the perishable nature of blue lias renders it unsafe to be used in the proposed restoration: the softness of its colour blending so well with the Douling stone, points to it as the most fitting material, but after much consultation it has been resolved to use Kilkenny marble instead; its colour resembles blue lias closely, and of its durability no doubt can be entertained, as all the buildings in which it has been employed affords ample evidence of its excellent qualities.

The Devonshire and other marbles possess a purple hue very unlike the blue lias; and where so large a number of columns, &c., are required, it is of the highest importance that the colour intended by the original architect should be secured. Those who have watched the condition of this great western portion of the cathedral have seen with deep regret the rapid decay going on from year to year: every winter or heavy gale produces fresh mischief, and within a late period the fall of canopies and portions of the statues and bases has become dangerous to those daily passing by the north-west corner of the cathedral.

It is of the utmost importance that every feature of this incomparable front should be saved, if possible; but this can only be accomplished by a timely renewal of those parts of the design which are essential to the protection of others. By way of example, I will only allude to the abaci to the capitals of the upper series of niches, containing successive groups of figures, illustrating the Last Resurrection. All these abaci and their supporting columns were of blue lias, or some imperfectly-formed marble. The former have entirely disappeared: not an abacus remains; and, as a natural consequence, the wet having penetrated to the carved foliage of the capitals, the frost has materially damaged them, and all will be destroyed in a short time, unless some steps be taken to arrest the progress of destruction. Again, I find that, although especial care was taken by the original builders to prevent the crushing or injury to the joints by the insertion of oyster shells into all the bedding joints of the masonry, yet sufficient caution was not taken in placing the Douling stone on its natural bed. Hence in many places it has already split and fallen, and there are many parts of the west front which must speedily become ruinous, and ought at once to be removed and replaced by good stone rightly bedded. It is not difficult to discover where this defective material is used, as a slight tapping on the face will crush the surface, already weakened by cracks and fissures, through which the weather penetrates.

It is important that nothing should be done to this front but what is really essential to the conservation of the valuable artistic work which remains. Neither new forms nor materials of any kind should be permitted; it is indeed lamentable to observe the disastrous effects which the last few seasons have caused to this beautiful façade. A mere comparison of the engraving in Britton's work, published in 1824, with the present state of the front, will show the ravages which time has produced; but this is not the sole cause of mischief. In former repairs, cast-iron ties and plugs were extensively used; these have done immense damage, and objects probably safe, if they had been left undisturbed, have been shattered by these injudicious efforts at protection. In any other precautionary steps, copper dowels and cramps only should be used.

HAMPSTEAD.

A new Baptist Chapel was opened on Thursday last, at Child's-hill, Hampstead. The design is Byzantine in style, and consists of nave and side aisles, with gallery at front end. The doorway is double, and the whole entrance is embraced by a bold circular arch, pierced with a quatrefoil window, the spandrels being filled in with encaustic tiles. The front window has seven quatrefoil piercings, and is inclosed in a semi-circular arch, with carved impostas and label terminals.

There are large schoolrooms under the back portion of the chapel, with class-rooms attached. The ground-floor is furnished with three vestries. The chapel is capable of seating about 500 persons, but it is designed so as to admit of side galleries and longitudinal extension, to eventually hold 800 persons. The cost of the whole, including boundaries, will be about 1,250l.

Mr. W. Allen Dixon, of Kentish-town, is the architect; and Messrs. Wicks & Co., of Limehouse, were the builders.

All doubts as to the purchase of the Heath for the use of the public can now be set at rest, for Mr. John Pollard, the clerk to the Metropolitan Board of Works, has given notice of his intention of applying in the next Session of Parliament for leave to bring in a Bill to confer upon the Metropolitan Board of Works powers to obtain it.

HAYMARKET THEATRE.

Mr. W. S. Gilbert's fairy comedy, "The Palace of Truth," is an excellent work, both in a dramatic and literary point of view. As for the plot, it is enough to say that all who enter the palace, with the exception of one who holds a talisman, are forced to speak the truth on every occasion, without being aware that they are doing so, to remind readers of fairy tales of the story on which the play is founded. The first act moves a little slowly, but the following two, when the influence of the palace is at work, are full of lively interest, dramatic surprises, and poetical writing. Mr. Gilbert, if he continue in the course he is now pursuing, will materially help forward our dramatic literature. Mr. Buckstone, Mr. Kendal, and Mr. Everill, who have parts, much aid the success; but the chief praise for acting must be given to Miss Robertson (the Princess Zaida), and Miss Caroline Hill (Mirza, her companion), the latter of whom has never had so good a chance before, and makes the most of it. The acting of both these ladies, in the last act especially, is admirable, and worthily justifies the nightly recall of each after certain speeches. Two poetical landscapes, and an Eastern interior, by Mr. Morris and Mr. O'Connor, provide appropriate setting for an elegant and artistic work.

ELECTION OF A CHAIRMAN FOR THE METROPOLITAN BOARD OF WORKS.

At a special meeting of the Metropolitan Board of Works a successor to the late Sir John Thwaites, chairman of the Board, has been elected.

By a resolution passed at a recent special meeting, the appointment to the office was to be for one year only, the salary being 1,500l. a year.

When the voting was proceeded with, the following was the result of the show of hands:—For Colonel Hogg, 24; Mr. Dalton, 15; Mr. Le Breton, 18; Mr. Rantz, 11; Mr. Savage, 16. Mr. Rantz having the lowest number of votes, his name was withdrawn.

A second show of hands was taken:—For Colonel Hogg, 23; Mr. Dalton, 15; Mr. Le Breton, 20; Mr. Savage, 18. Mr. Savage's name having been withdrawn, another poll resulted in there being 20 votes each for Colonel Hogg and Mr. Dalton, and 14 for Mr. Le Breton. On the two former names being submitted there were:—For Colonel Hogg, 20; and for Mr. Dalton, 16.

The final show of hands gave 22 votes for Colonel Hogg, and none against him. A division was, however, called, when there were—

For Colonel Hogg 24

Against 12

Majority 12

Mr. Collinson declared Colonel Hogg elected, and vacated the chair, to which the newly-elected chairman was conducted amid loud cheering.

Colonel Hogg thanked the members of the Board for having elected him to the highly responsible position of its chairman. He entered

upon the duties, he said, with a feeling of the deepest responsibility, and he looked to the various chairmen of committees and other members to aid him by their co-operation in preserving the honour and dignity of the Board.

It having been known that the Board had determined to elect one of their own number to the chairmanship, Sir William Fraser withdrew his candidature. Lord Robert Montague was nominated, but not seconded, as a candidate, and the nomination, therefore, fell to the ground.

Colonel James Munro Hogg is the eldest son of Sir James Weir Hogg, bart., a member of the Indian Council, and who represented Beverley and Honiton in previous Parliaments. He was born at Calcutta in 1823, and was married, in 1857, to the eldest daughter of Lord Ponrhy. Colonel Hogg was educated at Eton and at Christ Church, Oxford. He joined the 1st Life Guards in 1843, became major and lieutenant-colonel in 1855, and retired in 1859. At the general election of 1865 he was returned, with Sir William Tite, for the city of Bath without opposition. In the House of Commons he was a supporter of the Conservative party. He described himself as "not opposed to progress, but against all rash and dangerous innovation; in favour of the relief of Dissenters from Church-rates, and of retrenchment in the national expenditure, but not so as to impair the efficiency of the Army and Navy." At the general election of 1868, Colonel Hogg was defeated at Bath. Since that time he has been without a seat in Parliament.

MEDIEVAL PLANS.

With respect to your article last week on the use of architectural drawings by the Medieval constructors, I should wish to mention a fact not too generally known.

The architect of the Cathedral of Caudebec (Caux) is buried in the Lady Chapel, well known for its pendent vault; one side of the memorial tablet is taken up by a plan of the cathedral slightly cut into the stone and blackened.

The date of the above church can easily be ascertained; from what I recollect of its architecture, I should think it belonged to the beginning of the fifteenth century.

Mr. Gwilt, in his *Encyclopædia*, gives a section of this Lady Chapel, and I should very much like to know how he obtained it.

JOHN B. COHEN.

OPAQUE GLASS FOR MURAL DECORATIONS.

We mentioned, some time ago, the use that was being made by Messrs. Jas. Powell & Son, at Whitefriars, of opaque glass of various colours cut into forms for wall pictures, in the same way that transparent glass is cut for medallions in windows, the enamel shading being burnt in. They have since spent time in perfecting this material, and making it applicable for ornamental panels and for pavements, and have set up a reredos in Chedington Church, formed entirely of this material. This reredos has a subdued and agreeable effect, and will doubtless prove very lasting. It seems to have been made purposely to represent an ancient work by irregularities and stains, a proceeding the principle of which we are not bound to commend. Mr. Alexander Nesbitt has recently exhibited drawings from some mosaics which are preserved in the Palace of Prince del Drago (formerly the Palazzo Albani) at Rome, and originally formed part of the decorations of a hall in the Palace of the Scioian family, which hall was afterwards converted into a church, known as St. Andrea, in Catabarbars, and was pulled down in the seventeenth century. These mosaics are composed of pieces of glass and marble, cut into such forms as to fit them to form parts of the design, as in the same manner pursued by Messrs. Powell. Mr. Nesbitt writes,—

"Considering the style of art and the subjects, the story of Hyacinth, and figures of Egyptian divinities, the larger portion cannot with probability be attributed to a later date than the third century of our own era, and the other subjects probably of about the same period. Several facts known as to the manufacture of glass in Rome are quite consistent with the assignment of this date. Glass, of all shades and colours, both transparent and opaque, at that period being used by the Romans for covering walls, not only in tesserae, but in shaped pieces as stated above."

Messrs. Powell's endeavours in this direction should certainly be aided. The material, if properly set, is applicable for external as well as internal work.

THE USEFUL, STRUCTURAL, AND BEAUTIFUL, IN ARCHITECTURE.*

I do not intend to treat the profession of an architect as something which requires to be dreamily thought of, or dreamily spoken about. I wish to look at it in a common-sense way, so as to see, if possible, what elements he requires to study to develop the high objects of his profession; and, to do this, I wish to consider all that is good in architecture as the result of that which is *Useful, Structural, and Beautiful*.

In speaking of these separately, I wish you to keep in mind, that, in my opinion, all three are needed to produce architecture in its truest or highest sense, viz., beauty being dependent on that which is truly useful and structural, or, to put it more strongly, I hold that it is impossible to get beauty, unless you have the stamp of fitness for the object intended to begin with, and then the adaptation of the material in a structural or symmetrical sense, these two elements being needed to lead on to that which we call beautiful.

I have heard it advocated that an ugly thing might be quite as useful as a shapely or well-proportioned thing; but this I cannot agree with in the fullest sense, as we every day find that the higher the development in an æsthetic sense, the greater its value as to use. No doubt we may quench our thirst by going on our knees at the burn-side, or we may do so out of the ugliest article that ever was devised; but you will agree with me that there is a higher sense of enjoyment in drinking out of a vessel which has the stamp of use and beauty combined. Or again, you may get shelter and a certain kind of convenience by living in a hut on the hill-side, or within the four walls of a building whose proportions are of the most ungainly kind; but surely the shelter and convenience of a house that is well shaped and well proportioned is more to be desired; as, besides the utility of it, an æsthetic sense of pleasure will be got, which the badly-proportioned building can never give; and it is with these views that I come to speak of the importance of

The Useful.

The need of the architect making this his first consideration is very obvious. A thing, to be of the highest value, must be useful, and nothing more so than the houses we live in. A house should be arranged so as to suit, or even improve, the habits of the people who live in it. It should be convenient for the carrying out of domestic arrangements in the simplest and easiest way. It should be a healthy house, otherwise it sadly fails in that which a habitation ought to be; just as we find that beauty and symmetry in nature go for nothing if the germs of disease are at the root of it.

In the matter of convenience and completeness, houses should be as far as possible self-contained, both inside and outside. This should be striven for in designing houses of all classes, but especially those of the lower, as the occupant is always more independent if he has his own door to go in by, and when in, to have each room so placed that it can be occupied independently of another; and no kind of designing taxes the architect more than that of arranging a small house so as to make it thoroughly useful in this respect.

A mistake is often made in not having the bedrooms of the largest size that the internal space will admit of, and the value of this is so well known to those who have the benefit of large sleeping-rooms, that the wonder is that architects should sacrifice the bedrooms of a house to those of the day-rooms.

No man in the world has more to do with the health of a community than the architect. He has the means, so to speak, of creating buildings which will either be constitutionally healthy or unhealthy. If the house is contrived to begin with, so that it is deficient in that which provides for ample light, ample ventilation, and good drainage, it gradually becomes a diseased house, which nothing will cure; and I cannot impress upon you too strongly the need of designing houses which will prevent, as far as possible, that share in the death-rate of our city which unhealthy houses lead to.

The evil of ill-arranged houses, bad drainage, and overcrowding, as affecting the health of the people, is every day becoming more important

and better understood. I therefore press upon you in the most earnest manner the responsibility that attaches to your profession in this respect.

A useful, healthy, and beautiful building has a moral and physical effect upon people, apart altogether from its value as a beautiful object; and I do beg of you that, in planning, you give places where bad air is likely to be generated, plenty of glass, plenty of daylight, and not windows which are mere pigeon-holes.

Glass does not shut out the benefits of sunlight to the same extent as stone walls do, and nothing is better for ventilation than the simple method of lifting up or taking down the half-sash of a window of ample size.

It pains one to see houses erected every day with these small openings, 12 in. square, or something like that, which, apart from what I have mentioned, cannot even give light for the purposes of cleanliness, and such a sparing of glass can have no excuse now that we have no tax upon the number or size of the windows of our dwelling.

Apart from providing means for plenty of light or plenty of air, a house can be so arranged as to situate those places connected with the sanitary portion of the house so that the drains need never pass under the building at all. This system of passing sewerage drains right through and under the building is one of the greatest sources of disease that I know of. It is a mere question of planning to have closets and sculleries on the back wall of the house, free to be lighted and ventilated from the open air; and when this is done, the drain never goes further into the house than half the thickness of the outer wall. The main drains should always be at the back of the building, and not at the front.

Another important consideration as to drains is their ventilation. Drains, if treated as well-ventilated coal-pits are, need have no bad gases in them at all. Drains, as usually formed, are sealed up at every point by traps and cesspools, and have the gases bottled up in such a way as to be under constant pressure, and find their escape into our houses at imperfect junctions of the drains, incomplete cesspools, or even through the cesspools themselves, as I verily believe that drains without ventilation have the gases acting in the same way as the gases of badly-ventilated coal-pits, and with their convulsions and explosions, forcing the bad air through the cesspools, however well trapped they may be; therefore I am not at all satisfied with the present system of trapping drains.

I cannot leave the consideration of the Useful without noticing particularly a failure in the design of many buildings as far as the Useful goes, and that is, the disposal of what is considered the inferior part of the house (but which I think as important as any), so that it is almost impossible to give it that share in the structural and beautiful part to which it has a right.

How often do you find, for instance, in villa dwellings, the kitchen part of the house standing out in the most objectionable way, which must not only render it an eyesore to those who own it, but a continual obstruction in the view of others.

Architects who have the laying out of the grounds for villa buildings, can do much to prevent this, by foreseeing how one building will stand in relation to another, as very often the ground is so laid off, that instead of the fencer commanding the view which he expected, he finds the principal rooms look out only upon that which obstructs the landscape.

Good planning, and giving the back of the building some little share in the taste which is wholly devoted to the front, would obviate this to a great extent.

Again, nothing about a house is of so much use as the chimneys, both for the purposes of smoke and ventilation, and yet how badly they are treated. They are placed in every possible awkward position, and are got rid of at the earliest possible point of the structure, so as to necessitate the various chimney-head devices which mar so much the sky-line of many of our street and villa buildings. Why should chimney-heads be treated so? You would suppose in some cases that the designer was ashamed of his roof and chimney-heads, and wished either to keep them out of sight altogether, or to degrade them so that they might have no share in the otherwise pretentious parts of the building. No parts of a building are more useful, or give the architect a better opportunity for crowning his structure with that which may be made beautiful.

Before leaving the useful, I would impress upon you the study that is needed for making our churches, theatres, and music-halls, useful

to the fullest extent. In all three the same useful elements have to be considered, viz. —

1st. The form which will give least obstruction to sound, so that both speaker and hearer may lose nothing. 2nd. The position of the speaker in relation to the hearer, so that each may see and be seen. 3rd. The comfort of both as to seating, heating, and ventilation, so that full enjoyment may be derived from that which is spoken, acted, or sung. These things being well considered, will assuredly lead on to that which is symmetrical and beautiful.

I stated at the outset that I wished to consider architecture in a common-sense way, and to get at the sense of this division of it; I know of no better teaching than that which you get by looking how nature works in this respect. We find, for instance, that when man tries to get that which is most useful, the health, symmetry, and beauty of the thing desired go hand in hand.

If you wish to grow a useful tree, or to rear a useful animal, you have to consider how to nourish both, so that their vigour may not be impaired by bad soil, or bad feeling, or by anything that will impair the health of either; and if this be wisely done, you may depend upon it that more perfect symmetry and a more perfect beauty will be the result.

As in nature, so in architecture; and this leads me, without further preface to speak of the

Structural.

Although I have divided my subject into the structural division of three, I find it a difficult matter to prevent repetition, owing to the way in which these blend and work into each other. But as this difficulty only proves my proposition, I must not grumble in having to use too many words, so long as you have patience to listen.

This blending is observable in that which leads to the judges of our flower-shows, agricultural meetings, &c., determining what are the best points of that which should get the prize. It is that which combines use, form, colour, and such like, which are all elements of beauty. For instance, the Clydesdale horse which would take a first prize would be the animal which, in the matter of use, would have strength, health, and action, and these would result in true symmetry which again would give beauty to the whole.

A building may be convenient and healthy, but unless it is substantial and well-constructed it is of little value. No doubt a house may be made strong enough by the mere heaping up of material, without regard to proportion, symmetry, or anything else, but this is not treating the structure in a scientific way, or in that way which will lead on to its being beautiful. In any erection designed upon scientific principles, whether of iron, wood, or stone, there should be little or no waste of material; in short, neither more nor less than that which will give it stability and endurance. I admit that it is a difficult matter to get at this accurately, and that it is better to lean to the side of strength than to that of weakness, as beauty will not easily be marred by that which gives it power, unless you go so far as to create the feeling of the structure being overloaded by the material used in it.

An element in structure which ought never to be lost sight of, is to consider what form is best adapted for enduring the strain which comes upon it, keeping in view, of course, the nature of the material which has to be used. For instance, it is a gross mistake to construct an arch of timber where the strain is that of a moving load, while the same form may be quite suitable and last long enough if the strain is the result of mere dead weight alone. It is a mistake, too, to attempt to combine materials of different properties, such as iron and wood, or malleable and cast iron together; they will never work equally, and should therefore never be combined.

As to the true use of material, I do not believe in any rule-of-thumb arrangement, but in that which springs from a geometric foundation, and I would have architects therefore frame their designs upon that principle.

Taking stone as the material which architects have most to deal with in this country, I need not say how valuable a knowledge of Geology and Mineralogy is to the student; — geology instructing him as to what is likely to be found; mineralogy enabling him to determine whether the structure of the material is fit for the purpose required. The stone which is found in a district is always most suitable for it, if properly treated, and from a want of knowledge in these two branches of science I have seen architects and engineers adopt styles of building

* By Mr. James Gowans, architect; read at opening meeting of the Edinburgh Architectural Association, November 2nd. A number of photographs of Classical Structures, lent by Mr. Matheson and Mr. David Cousins, were exhibited.

quite unsuitable to the character of the material they had at hand; this occasioned the using of stone from a distance, at a much greater expense, and was not more suitable for the thing that had to be done.

I will merely glance at other considerations as to the structure:—

1st. A building must be perfectly strong, and fit to stand without fracture; therefore the foundations require to be thought of,—that is, not founding one part of the building on soft, and another part on hard ground.

2nd. Provision for sustaining equally walls which have to go to different heights, or which may have to carry unequal loads.

3rd. The bonding of material together so that all may have their due share in sustaining the structure.

4th. The allowances which have to be made for settlement of walls, where a lighter thing has to be tied to a heavier, such as the spires and towers of churches, oriel windows, and such like.

5th. The strength and durability of material.

6th. The causes which lead to what is commonly called "dry-rot," but which I believe should be called "wet-rot," the result of timber being used which, to begin with, was constitutionally liable to the bad effects of damp, had air, or other influences which tend to consumption.

These are only a few of the many points which, in a practical way, require to be considered, as every day we see buildings bulging, fracturing, and going to decay, from neglect of what could easily be guarded against in such cases.

No doubt some men are born with an intuitive perception for that which is proportionable and well adjusted; just as we find men who have naturally a bias towards other things, and which they acquire more readily than the man who has to go to the fountain-head for his instruction. At the same time the man who has the thing born in him cannot dispense with the mathematical rule, which leads him to the truth of the science which he is acquiring.

It is the same in architecture, and the true way is to design upon some geometric principle, such as multiples of cubes, equal diameters, or uniform angles. By planning in this way, you economise space; you work upon harmonious lines, preventing anything like discord or competition, where angles have to be used; and you are sure thereby to have the elements of true construction and proportion in your building,—thus laying a foundation for that which will give beauty. At the same time, I need not tell you that although you may be working on true principles, you cannot all at once arrive at that which is anything like perfection in architecture. This is the case in everything else that requires development, and particularly so in architecture, as you cannot be building up the one day and pulling down the next, that which has been raised with the simple view of testing the principles on which you are designing.

In painting a picture, or modelling in clay, either of these costs little trouble, and little loss to obliterate if unsuccessful; but it is a different matter with a building, and what I would like above all things would be, that the younger members of the profession who have not yet gone far in the rut of off-hand designing or imitating other styles, would try this system, and persevere in it. I am certain they will arrive at the same opinion as myself, as to its value in getting easily at that which is most to be admired in architecture. In closing the consideration of the useful, I asked you to think of what Nature did in this way; and, if there be truth at all in the manner I am placing this subject before you, you must go to the same fountain-head to see what she does in the way of structure. The principles which guide Nature never vary in the highest embodiment of God's work. How perfectly the structure of our own bodies is designed to sustain the wear and tear of the varied strains which are put upon them, and how geometric the principles are which give symmetry to that which we consider most perfect in the human frame!

This brings me to consider

Beauty,

as springing from the useful and the structural. If a thing has the look of fitness and true structural proportion, it will please the eye without further adornment. I have already said that I thought a heavy responsibility lay upon an architect as to the effect of houses upon the health of the people, and also as to the power he

had by proper internal arrangement, of improving the habits of all classes, more especially that of the lower. In short, he can forward the moral and physical condition of a community by the kind of houses which he plans. Besides this, I would lay another burden upon him, and that is, that he should use the power he has of teaching or developing the perception of beauty, which in the mass of the people lies dormant.

Some have naturally an eye for beauty in architecture, just as some have an eye for a good picture, or a good piece of sculpture. Now, these are teachable things, and the province of instructing the public in these arts, rests very much with the architect, the painter, and the sculptor; and you will never get their support to the same extent in the encouragement of these arts, until they can appreciate and put a true value upon that which is really beautiful. In architecture many people are ignorant enough to believe that the useful cannot be combined with the beautiful, unless at a sacrifice; or rather perhaps that not having an eye for that which is symmetrical and beautiful, they rest content with that which is ill-shaped and ugly.

One house may have simply the four walls and the roof that covers them to give it beauty in a symmetrical form, while another may have extreme size, broken outline, and profusion of ornament. But if the latter has not been designed in conformity with that which is proportionable, there can be no real beauty. There may be something in its mass and ornamentation that will please the uneducated eye, but which will fail to give that lasting pleasure, which beauty, springing from true principles, always gives. The education of the eye of an architect is what can only be brought about by a close study of that which is truly shaped and well proportioned; and one of the first and best lessons to get, is to design upon the geometric principles which I have before alluded to. Besides teaching the eye to catch that which is most subtle in beauty by drawing from nature, I have a great belief in the good that has to be got by modelling, drawing in perspective and sectional drawing, so as to enable you to see the object with the mind's eye from every possible point of view. No mere geometric line drawing can give you this faculty, and I know of none more valuable to the architect for producing beauty in detail. How often do we find something designed which looks very well on paper, but when executed and taken in conjunction with other objects, which have an influence upon it, appear quite different from what was expected.

One of the early lessons in this way which I myself got in drawing, was the practice of making sections of the most intricate things, cutting them up in every possible direction, so as to get at the form which this method of drawing gave.

Another thing that mars the beauty of some of our principal buildings, and which could easily be foreseen by mere perspective drawings alone, is the effect such structures have in conjunction with other important buildings, or surroundings. The frontage gets all the beauty, so that while in looking at the geometric front of the structure, you are ready to admire it, yet the moment you step aside and allow the eye to reach the roof, gable, or chimney-heads, you find an ill shape and ungainliness which quite destroy the general effect of the building itself as well as those adjoining it.

The detail of a building should, like music, be harmonious and truthful. Nothing is more painful to my eye than a conglomeration of angles all competing and all at discord with each other. You find nothing of this kind in what are called the "true styles." The ornamentation of such styles naturally springs out of the construction, or takes its key-note from the geometric figure, which lies at the root of the design. For instance, in the Greek in its purest, the geometric figures are the square, the circle, and the elliptic curve, and these are all that are needed for its development, whether as to use, symmetry, or beauty,—or again, in the Gothic, the square, the circle, and the equilateral triangle are the only geometric forms that are required to bring about the same result. Another thing which, to my surprise, exists notwithstanding all that has been said and written about it, is that designers still attempt to get beauty by using deceptive objects, which would lead one to suppose they had begun by making the exterior of the building their first thought, and that the inside had to be sacrificed to the outside. This springs from trying to imitate

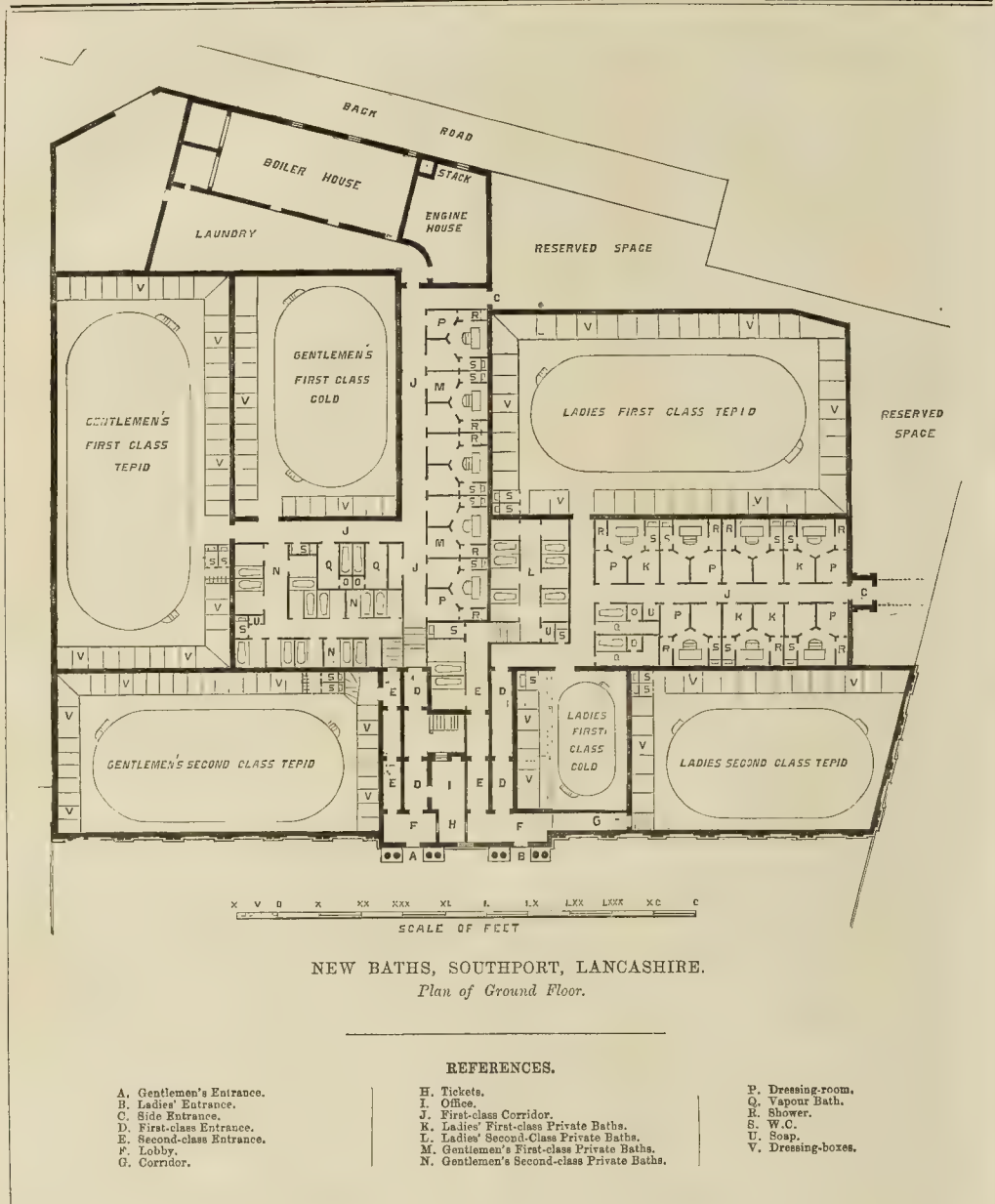
styles of building belonging to times when the wants and requirements of the people were very different from what they are now.

I do not object to an architect adopting the features of any particular style, if that style can be produced by the natural wants for which the building is intended; but I do object to the abusing of such a style as the old Scotch Baronial, which seemed to have sprung up as something indigenous to our country, at a particular time in its history; for we must remember that the features of that style which we so much admire in original buildings, were the result of honest and true designers, working out from the necessities of the interior that which gave power and beauty to the exterior. They at that time needed their embattled towers and turrets, and hence they used them; now we have no need of such things, and hence their uselessness.

I have already said that you may rear up a building which, from its size and expensive decoration, will for a time be spoken of as beautiful; but no lines are, I think, more true than those which say that "Beauty unadorned is adorned the most." In my experience I have found that the simpler a thing was, the more difficult it was to design it so as to give beauty. For example, a workman's house, which has nothing about it but its form to make it beautiful, taxes the designer fully as much as a large building where expense is no object. A man who can plan a small house with all that is useful, structural, and beautiful; who can, with a well-proportioned and simple exterior, have fitness of purpose; is, in my opinion, an able designer than he who builds up a large structure, gets what passes for beauty, but which is simply the result of a conglomeration of broken lines, badly-proportioned masses, confusing and competing angles, blind windows, mock turrets and tympani, and such other deceptions. I am sorry to see these things adopted by architects in our city. Do beware of this deceptive system of designing: it is untruthful to begin with, and in that way can never be useful. Nature, which is the fountain-head of all beauty, never acts thus. Everything is needed and guided to its purpose, and the higher the form the more absolutely are these rules adhered to. What a finish is given to the human figure by that covering which conceals from the eye that which is needed for the use and structure of the body, but which otherwise would be unpleasant! In like manner, a building that is well proportioned and symmetrical is ready to receive adornment which will enhance its beauty, but that adornment should spring from that which gave the form and shape, or from borrowing from nature emblems appropriate to the uses for which the building was erected. In this way a building may not only be enriched and properly dressed, but it will be able to tell its own story as to the uses for which it is intended.

In conclusion, I should like to press upon your Society, what I have pressed in other quarters, and that is, the need we have of getting our architectural students more thoroughly educated in an elementary way. Under the present system of training, the pupil is expected to learn all that he ought to know of his profession by a few years' drawing in an architect's office, where there is little or no instruction given as to the principles of his profession, the chief or head clerk's time being too much taken up with the bustle of business. Hence we find that there is much ignorance of the main objects which architects ought to attend to, such as those I have pointed out; and things will not mend in this way unless architecture meets with encouragement from Government, or otherwise, as has been done in forming chairs for agriculture, engineering, and such like. I have said that an architect has more to do with the health of the people than any other person: this being so, common sense tells us that his first duty is to take means for making himself thoroughly acquainted with all that will conduce to that end, and so act upon it. A healthy nation is an able nation in every way. It is more useful, stronger, and more perfect than a people who are morally and physically weakened by bad housing and bad drainage, the improvement of which is particularly the province of the architect.

In closing this address, I trust that I have struck at the truth in some of the points which I have noticed; and, though rudely conceived, that it may be like a building whose merits lie in the usefulness and correctness of its design, and not in the polish or ornamentation of the material of which it is composed.



OPENING OF THE NEW BRIDGE OVER THE SEVERN AT STOURPORT.

THIS new bridge has been thrown open to the public. The viaduct, which is about 1,000 ft. long, consists of forty-five segmental arches, the centre one over the river being of iron, and 165 ft. clear span. The spandrels of this arch are filled in with tracery, a shield forming the centre-piece with bars and the initials "S. B. T., 1870." There is a projecting cornice supported by ornamental brackets, surmounting which is an open balustrade, with panels and pilasters, and a moulded handrail forming capping, and ornamental lamps on each side. The abutments and a portion of the land arches, extending to about 100 ft. on each side of the river, and also the parapet walls surmounting the same, are built of Higley stone. There is a string-course and cornice formed of the same material, as also the

moulded caps to pilasters. The remaining portions of the viaduct at either end are built in brickwork upon piers rising from inverted arches; the whole of which, as also all other portions of the masonry, are upon a foundation of concrete made of gravel and blue lias lime. The parapet upon this portion of the work is in brickwork, forming panels and pilasters, having a yellow moulded brick string, and coped with Higley stone.

The roadway is 25 ft. wide, and the foot-path 5 ft., the latter paved with Staffordshire blue diamond bricks, the same being kept in place by a Rowley rag curb. There is also a new toll-house: this is faced with pressed red bricks, with Higley stone dressings: a porch of the same material shelters the toll-keeper. About ten months were occupied in erecting the temporary bridge and approaches, taking down the old bridge, and putting in foundations for the

new. The erection of the superstructure has occupied nine months. There has been used in this work the following material:—Timber in piles, coffer-dams, staging, and temporary bridge, 20,000 cubic feet; 20,000 cubic feet of stone, 5,000,000 bricks; concrete, 5,000 yards; and 500 tons of iron.

The designs were supplied, and the works carried out, under the direction of Mr. Edward Wilson, C.E., Mr. G. H. Ashbee being his acting assistant. The contractors for the ironworks were Messrs. Lloyd, Foster, & Co., of Wednesbury. The contractor for the other portions of the work was Mr. Henry Hilton, of Birmingham. The ironwork was carried out under the superintendence of Mr. R. Braithwaite, the other portions of the work by Mr. T. Vale; Mr. J. Eales, acting as clerk of works for the engineer. The bridge is subject to a foot-toll of 3d., the tolls for vehicles being double the former amount.



SOUTHPORT BATHS.—Messrs. HORTON & BRIDGFORD, ARCHITECTS.

1880

SOUTHPORT BATHS.

THESE baths are now in course of erection, by the Southport Baths and Assembly Rooms Company, Limited, on the site of the late Victoria Baths Promenade. The material, externally, is Burnley Pierre-point facing, with Longridge stone dressings. The whole of the baths will be on the ground floor, and will be well lighted by top-lights. All the internal walls will be plastered, and the first-class swimming-baths arched, with moulded caps and architraves. The principals of the large roofs are of cast-iron, elliptical in form, cast in two pieces, and will spring from moulded corbels, at level of pilaster caps.

The stairs at back of office lead to a board-room, 40 ft. by 20 ft., with retiring-room and lavatory adjoining, and a mezzanine floor is formed between this and the ground floor.

The whole will be opened for public use by May next, and the total cost, including engineer's work, will be about 23,000*l*.

Messrs. Horton & Bridgford, of Manchester, are the architects; Mr. C. H. Beloe, of Liverpool, is the engineer; and the contract has been let to Messrs. Swindells & Little, of Manchester.

We will go into some particulars as to the intended supply and the arrangement of the machinery.

The salt water required for the baths will be pumped from the sea through cast-iron pipes, 9 in. in diameter, laid on the shore, down to low-water spring-tides, which is a distance of 1,480 yards from the pumps, thus ensuring a constant supply of water, except for a short period at extreme low-water spring-tides. At the end of the pipes a cast-iron cylinder, 6 ft. diameter and 6 ft. deep, is fixed. Inside this cylinder there is another, 1 ft. 6 in. in diameter, and of the same depth as the outer one. In the small cylinder is fixed an india-rubber foot-valve, resting on a cast-iron grating. The space between the two cylinders is filled with stones and gravel. The outer cylinder is open at the top, while the inner one is closed at the top, but has perforations in the lower part of its circumference. The suction-pipe from the pumps communicates only with the inner cylinder above the valve. The water will thus have to pass through the stones and gravel between the cylinders, and to rise up in the inner one before it enters the pipe. By this means it is expected that a considerable portion of the sand will be removed from the water before it reaches the pumps, and thus diminish the wear and tear of the working barrels.

The suction-pipe is carried from the shore, through a culvert under the Esplanade, and thence into the building, where it is laid on the floor of the pipe corridor, the walls of one of the principal corridors of the building having been carried down to a great depth for this purpose, thus rendering the pipes easily accessible for repairs.

The pumps are placed in a dry well, sunk under the engine-room, which, together with the boiler-house and laundry, are situated in the rear of the premises, so as to be as far removed as possible from the portion of the building frequented by the bathers, and there is access to a back street for the convenience of obtaining coals, &c. The pumps are four in number, two being of the bucket and plunger type, and two having plungers only.

The stroke of each of the pumps is 3 ft., and the diameter of the working barrels is 12 in. Only two of the pumps will be worked at one time, the bucket and plungers being used when a large quantity of water is required, and it is necessary to draw it from near low water. The plunger will be used at high water, when the lift is reduced to a minimum. The pumps are worked from a counter-shaft fixed over the well, the connecting rods being so arranged that they can easily be connected with either set of pumps. The engines, two in number, are horizontal, and work with high-pressure steam. They have cylinders 10 in. in diameter, with a stroke of 18 in. One or both of these engines can be used as required.

The pumping machinery is capable of furnishing a supply of over 313,500 gallons in twelve hours, which is more than can possibly be required in that time. The steam needed for the engines and for heating the water will be supplied by two double-flued Lancashire boilers, each 27 ft. long, and 7 ft. in diameter.

The laundry, which adjoins the boiler-house, is fitted with five steaming and similar number of washing tubs, which are supplied with hot and

cold fresh water and steam. In one corner of the laundry is placed one of Messrs. Manlove & Allott's hydro-extractors, which is worked from a shaft connected with the pumping-engine. After the clothes have been steamed and washed they will be placed in the hydro-extractor, which will rapidly remove the "heavy wet" from them, and the drying process will be completed by placing them in drying-rooms constructed over the boilers.

The salt water, after leaving the pumps, will be conveyed to two filter-beds, each 35 ft. by 28 ft., situated under the open space in front of the baths. The water will pass through beds of sand, gravel, and coke, in all 5 ft. thick, and then flow into a large covered brick tank adjoining the filters, capable of containing 177,000 gallons. From this tank it will flow by gravitation into all the baths, or can be pumped up into cisterns placed at the top of the building, in order to obtain a greater pressure for shower-baths and fountains.

There is also a tank over the boiler-house capable of holding 42,000 gallons: this will be used as a reserve for unfiltered salt water, which can be pumped into this tank when the filters and large clear-water tank are full, and which can flow into the filter-beds by gravitation when the pumps are not at work.

The plunge-baths will be treated by means of perforated copper steam-pipes, placed in channels under the floor of the baths, but which are in communication with the water in the baths. The plunge-bath, dressing-boxes, and the corridors, will be warmed by steam-pipes.

The hot salt water for the private baths will be supplied from two heaters, constructed in accordance with Messrs. Hamilton Wood's patent. They are each 10 ft. high, and 5 ft. in diameter inside, and are lined with copper, and fitted with copper steam-pipes; they are placed in chambers prepared for their reception in the front portion of the building, and are supplied with water from the upper cisterns. The first-class private baths will be supplied with hot and cold fresh water, in addition to the salt water. Two tanks for the fresh water are placed over the engine-room, and the water in one of them is heated by the exhaust steam from the engine. The fresh water will be obtained from the Water Company's main, and in addition the rain-water from a considerable portion of the roofs will be collected in an underground tank, and pumped into the supply-tank by means of a steam donkey-pump. The condensed water from the salt-water heaters will also be pumped up and used for feeding the boilers.

The total quantity of water contained in the plunge-baths is nearly 230,000 gallons. The amount of water contained in the salt-water tanks will be 254,000 gallons. There will be upwards of 1,500 yards of cast-iron pipes of various sizes from 9-in. to 3-in. in the building, exclusive of those on the shore. The whole of the machinery, filter-beds, engine-house, and the hydraulic arrangements were designed by and are being constructed under the superintendence of Mr. Beloe. The contractors for the engineering works are, for the engines, boilers, tanks, &c., Mr. J. Clayton, of Preston; for the 9-in. pipes, Messrs. J. Varley & Co., of St. Helen's; and for the pipe-laying and culvert, Messrs. Fawkes & Mand.

The filter-beds and engine-house are being constructed by the company without the aid of a contractor.

The total cost of the engineer's works will be about 6,200*l*.

MENDELSSOHN AND STAGE MUSIC.

SIR,—The writer of some recent interesting and suggestive articles in the *Builder* on theatres and "gaffs," diverged, in the last number but one, into a consideration of the manner in which Mendelssohn had illustrated the "Midsommer Night's Dream" by music; the matter being worth, in his opinion, "a few lines of even different talk." I fear your musical readers must have thought his talk on this matter very indifferent. He complains of Mendelssohn for having written musical illustrations not to be played whilst the speeches were being spoken, but between them; and would have had him write a continuous current of musical commentary to run parallel with the spoken dialogue on the stage. I should have thought that to any one possessed of a faculty of criticism, even if not uniting thereto an ear for music, it would be evident that as spoken words and musical tones and phrases appeal to two perfectly distinct

faculties in the hearer,—the former, as I said in my last letter, appealing to his intellect, the latter to his feeling and imagination,—the two cannot possibly be rightly apprehended at the same time; especially as music absolutely demands a fixed and unalterable rhythm, to which no spoken dialogue can ever conform. The only result of an attempt to combine the two would be that one must override the other: if the music is to be really worth attention, the words must be drowned; if the words are to be properly taken account of, the music must be reduced to a mere mechanical drone, to avoid competing with the dialogue. But it is unnecessary to argue such a question on high critical grounds: the simpler practical test may be taken of trying how any musician would stand hearing a whole evening of talking against music. Any one so appealed to could probably bear testimony that, when in the midst of enjoying anything worth calling music, the slightest remark in an ordinary conversational tone is enough for the minute to destroy all one's pleasure in the music, and occasion often the greatest irritation and annoyance.

The theory propounded is just one of those which look very original and symmetrical on paper, but which every one practically conversant with the branch of art in question must feel at once to be erroneous. Mendelssohn did once, however, as I before observed, make the very experiment alluded to, of combining musical accompaniment with dialogue in one of his cantatas, and the result is, that this part of the work, when performed, is merely tolerated out of respect to his memory.

The writing of long interludes between acts and scenes is, I think, a perfectly legitimate way of keeping up the tone of feeling in an audience during the necessary intervals of a high-class drama, and a resource of which I wish we had more experience in English theatres. Beethoven did the same for Goethe's "Egmont," and Schubert for Schiller's "Rosamunda."

As a matter of fact, it is not the case that Mendelssohn never attempted opera: he wrote a short opera called the "Son and Stranger," containing one of the best comic parts in modern opera; and at the time of his death he was diligently searching for a fitting libretto for a grand opera, on which his mind was very much set.

I read the earlier articles on "gaffs" with so much interest that I can only regret that the writer should have been tempted to push his ideas into a theory which every musician must feel to be totally untenable, and which, if carried out, would soon result in emptying our theatres. H. H. S.

THE BLOCK BOOKS: A CHALLENGE.

THE contribution of Mr. John Pigott, F.S.A., published in the *Art Journal* of the present month, entitled "Albert Dürer and the Fairford Stained Glass," as well as the paper of Mr. Planché which appeared in the last number of the *Builder*, upon "Early Wood-engraving in connexion with Playing Cards," having both mentioned my name in reference to the opinions entertained by me upon the subject of "The Block Books," seems to impose upon me the duty of reviving that subject, so deeply interesting in every point of view in the history of literature and art, and to again invite attention to it, in the hope that at least those writers who have hitherto so strenuously upheld the "old system" may afford the public the advantage of their advocacy, and prove, if possible, my reasoning (which entirely reverses all preconceived notions on the subject) to be fallacious. Mr. Planché but does me justice in expressing his belief that, so long as the truth is arrived at, I am wholly indifferent whether the result is favourable to my views or not. "Tenax proposti" is and will remain my motto in the controversy, until I am convinced of my error; but if public judgment, founded upon a full knowledge of the merits on both sides, should be pronounced against me, I will not only cheerfully accept such decision, but very heartily thank my opponents for having cleared up the mystery and elucidated the truth.

After a lapse of two years, therefore, I, with the utmost confidence, repeat my denial, "That printing with movable types was preceded by engraving on wood;" and, further, I challenge literature to prove that a copy of the Block book known as the "Biblia Pauperum" was actually in any known library, public or private, prior to 1455, or known then to be in existence. I

should add that I reject as utterly false every copy of the Biblia which, on the face of it, purports to bear a date anterior to 1485, unless it fulfils the condition I have stated.

When those questions have been decided, it will then be time enough to proceed to the consideration of my declaration, viz., that to Albrecht Dürer is due the credit of having produced the "Block book."

I trust I am not violating any rule of propriety in expressing an earnest hope that Mr. H. Noel Humphreys and M. Berjean, the best modern writers on the subject of early engraving and the Block books, will take the lead, enter the lists, and attempt to uphold the soundness of the theories enounced by them in their respective works, with which I am thoroughly acquainted, and the correctness whereof, so far at least as relates to the block books and early wood-engraving, I directly impugn; and I cheerfully accord them the aid of those distinguished authors on the Continent, who have devoted so much time and attention to the subject. I am content to fight the battle single-handed, and to fairly argue the subject in all its details.

In strict conformity, therefore, with the rules by which such matters are regulated, I now call upon the champions of the doctrine that "wood-engraving preceded printing with movable types," to make forth, and make good the truth of their assertions.

HENRY F. HOLM.

IMPORTANT TO BUILDERS AND THE PUBLIC.

CAREER OF AN IMPOSTOR.

At the Middlesex Sessions, on the 22nd inst. (before Sir W. H. Bodkin, Assistant-Judge), John Fordham Apps (alias Papps, alias Fordham), a tall, respectable-looking man, described as a commission agent, and of superior education, was indicted for obtaining by means of false pretences, from Thomas Hussey, of Kensington, builder, the sum of 20*l*., with intent to defraud. There was a second indictment, for obtaining from George Gilham, of Old Kent-road, decorator, the sum of 15*l*.; a third indictment, for obtaining from James Charles Ring, of Peckham, builder, the sum of 10*l*.; a fourth indictment, for obtaining from Mr. Walton, of Bloomsbury, builder, the sum of 10*l*.; a fifth indictment, for obtaining from Messrs. Sansom & Yates, of Kennington, builders, the sum of 30*l*.; and a sixth indictment, for obtaining from Messrs. Corbett & McClymont, of the Redcliffe Estate, West Brompton, builders, the sum of 15*l*., all with intent to defraud.

Mr. Montague Williams (instructed by Mr. Poncione, of 5, Raymond's-buildings, Gray's-inn, and Wood Green) prosecuted in all the cases; and Mr. Harris defended the prisoner.

The prosecution revealed an amount of artifice and persevering impudence almost without parallel, and the *modus operandi* appeared to be the same in all cases, and having selected some of the most wealthy builders in the metropolis, who had building works in operation, he went to the place of business or home of the builder selected, with his arm in a sling, and stated that on a particular night he had fallen over some timber, stone, or bricks, laid carelessly about the works, and in one case he alleged he had fallen down a cellar, and having thereby broken his arm, he demanded compensation for the injuries he had sustained in consequence of the negligence of their servants. He pointed out the locality where the accident was said to have taken place, and having had a personal interview with the master builder, it was usually followed by a letter, and they are nearly duplicates of each other. One of these letters, sent to Messrs. Colls & Sons, builders, Camberwell, was as follows:—

"To, Robertson-street, Queen's-road, Battersea, 21st of October, 1870.

Gentlemen,—I beg to inform you that on Thursday night last, I fell over your stone, dangerously left in the public way, by the side of St. Philip's Church, Queen's-road, Battersea. On going direct to St. George's Hospital, I found I had broken my left arm. Mr. Rowland, the house-surgeon, set the bone. As I in no way contributed to the accident, either by neglect or want of caution on my own part, and as, in addition to pain, the injury entails loss, &c., I must hold you liable for damages for injury caused solely by your servants' negligence in allowing so dangerous an obstruction in the public way without a light. If you desire a medical examination, I shall be happy to meet your surgeon upon mine, by appointment.—I am, gentlemen, yours obediently, JOHN APPS.

To B. Colls & Sons, Builders, Camberwell."

Another letter, addressed to Mr. Gilham, from whom he claimed damages, was as follows:—

"50, Page's-walk, Grange-road, Bermondsey, Dec. 10. Sir,—The gentleman you refer me to inform me he had nothing to do with the timber on the footway. As it is of that I complain, I must again inform you I hold you alone liable for the accident. In doing so, I wish not to understand I do not desire to make a property of the affair, but having sustained an injury of a serious nature that must incur loss and expense, I ask compensation for the same. If, therefore, you are disposed to meet me in the matter without prejudice, I am open to any fair proposal, and so amicably settle this unpleasant affair. If not, I must in justice to myself, though reluctantly, place the case in the hands of a solicitor, and await the result

of a verdict from a jury. Thanking you for your sympathy as expressed in your note,—I am yours respectfully, J. PAPP.

P.S.—I shall be at home to-morrow; or a reply appointing an interview will oblige."

In the case of Messrs. Corbett & McClymont he sent the following letter:—

"9, Robertson-street, Queen's-road, Battersea, Sept. 3. Gentlemen,—I have to inform you that I fractured my arm on Monday night last by falling over your building material, dangerously left in the footway at your works, Fishborough-road. I respectfully inform you I hold you liable, and in doing so beg to add I do not desire to make a profit from the circumstance, or to enter into litigation on the subject unless compelled, but having met with an injury that, in addition to pain, entails loss, expense, &c., and as I in no way contributed to the accident, either by neglect or want of caution on my own part, I must ask some compensation for injury caused solely by your servants. If, therefore, you are disposed to satisfy yourselves of particulars, and meet me in a spirit of fairness, I shall be happy to concur in any reasonable arrangement that may lead to an amicable settlement. Should you require a surgical examination, I shall be pleased to meet your surgeon by appointment at my house, or at Mr. Leslie's, Queen's-road. I presume you know of the occurrence from your watchman, or Mr. H. Smith, your clerk of works.—I am, sirs, yours faithfully, C. FORDHAM.

Messrs. Corbett & McClymont, 21, Redcliffe.

On the strength of this letter, he received 15*l*., and from all the rest he received money under like representations; but on Mr. Hussey being applied to, he had his suspicions, and vigorous inquiries were instituted by Mr. Harris, Messrs. Colls & Sons' manager, which showed that the prisoner was only an impostor living upon these false representations. Accordingly, Mr. Hussey had a policeman ready at his house; and when the prisoner came to make his demand for the "injuries" he had sustained, a cheque was given him for 20*l*., the prisoner giving a receipt for the money in full discharge of all claims. Before, however, the prisoner left the place, the policeman made his appearance, and took him into custody, with the cheque in his possession. When he was in custody a great number of persons came forward to give evidence how they had been swindled by him in a similar manner; and Mr. Ring, one of the prosecutors, who had seen the prisoner write, "proved that the whole of the letters produced were in the prisoner's handwriting."

Numerous witnesses were examined in proof of the facts stated, and other similar letters were put in evidence; and Dr. Rowland was also examined, and proved that the prisoner had actually attended at St. George's Hospital, complaining of great pain in his arm; but Dr. Rowland had great doubts at the time as to the genuineness of the case, and marked the entry in the hospital books with a query. It was part of the prisoner's case that he attended at the hospital as to satisfy inquiries made by his intended victims; for, when he attended, he at the same time wrote letters to different parties, applying for compensation for alleged injuries, stating that he was at St. George's Hospital with respect to the same, where inquiries might be made, and the prisoner appeared to display such cunning throughout these fraudulent transactions that respectable builders were naturally taken off their guard, and were duped.

Mr. Harris made an ineffectual attempt at a defence, and the jury immediately found the prisoner guilty.

Mr. Montague Williams stated to the Court that it appeared, from inquiries made, that the prisoner, some years ago, had met with an accident to his arm, and that by rubbing and torturing the old wound he could make his arm appear injured, and had, in fact, for a length of time been fraudulently trading upon the old injury, and victimising the public, and builders more especially.

The Judge, in passing sentence, said the prisoner had carried on these frauds with great artifice, and the sentence of the Court upon him was penal servitude for five years.

WEDNESBURY TOWN HALL COMPETITION.

Sir,—In your issue of the 12th instant it is objected that one of the firm (i.e. Loxton, Brothers (the successful competitors), was a member of the selecting committee.

Will Mr. Samuel Loxton, a member of the Local Board, answer solemnly, and state whether he was at the time present at the committee meetings held to select the three premised designs? If he was present, and not acting as one of the selecting committee, by what right and for what purpose was he there? Mr. Loxton's reply will, of course, satisfy any doubt that may still exist in the minds of many of the other competitors. AS INQUIRER.

SEWERS NOT RATEABLE.

THE METROPOLITAN BOARD OF WORKS, APPELLANTS, V. THE PARISH OF WEST HAM, RESPONDENTS.

This was a poor-rate appeal case, Court of Queen's Bench Westminster, before Mr. Justice Mellor, which raised the question whether sewers are rateable. The rate was made by the parish of West Ham on that portion of the sewers constructed by the Board, which lay within that parish, with the embankment belonging to it, together with some buildings pertaining to the works for raising the sewage. The parish, as for the sewer, raised on the recent Greenwich case, in which the sewer works, consisting of houses, sheds, and engines, in that parish, were held rateable; and as to the sewers, it was urged that the land would be valueless to the sewers if not rated. As to the other side, that case was distinguished on the ground of the present value of the buildings, &c.

The Court, after a full argument, determined that the sewer and the embankment belonging to it were not rateable, as being of no present possible value. No one would at this moment give anything for the sewers or the embankment, and the Board could make no profit by them; therefore there was no rateable value. But on the other side, the land covered by the sewers and the embankment. It might be that there was some appearance of inconsistency in holding the buildings containing the pumping-machines as rateable, but on the whole, there was to be a distinction between the two cases, and therefore, in accordance with the former case, the buildings would be rateable, though not the sewers. Judgment for the appellants as to the sewers; rate upheld as to the buildings.

TENDER FOR THE SUPPLY OF GLASS-CASES AND PLATE-GLASS TO BE USED AT THE INTERNATIONAL EXHIBITION OF 1871.

Sir,—With reference to the letter from Mr. John Drew, on the subject of his tender for the above, which appeared in your impression of the 19th, I beg to inform you that although it is true that Mr. Drew's tender of 1,753*l*., included "not only the frames, but also the plate-glass and glazing," yet the same remark applies to all the other firms tendering, and the alteration would not affect the question of the relative amounts of their tenders.

The tenders should have been stated to be for "cases and frames complete, including glazing."

HENRY D. SCOTT, Lieut.-Col. R.E., Secretary.

PROVINCIAL.

Wareham.—The new town-hall and corn-exchange have been opened. In the outset the architectural duties were undertaken by Mr. G. B. Crickmay, of Weymouth, who has designed and carried out the construction of many public buildings in the same county; and with Messrs. Beer, Hobbs, & Best, of Wareham, was completed a contract for the work, according to Mr. Crickmay's plans and specifications, at the estimated cost of 1,332*l*. Mr. Charles Card was appointed clerk of the works. The total expenditure, including all the extras and incidental expenses which will be involved in the work, is now set down by the committee at 1,820*l*., towards which 500*l*. have been borrowed. There remains a deficiency of about 100*l*. The building is situated at the corner of North and East streets. The front wall in each street is built with red bricks and Bath stone. The high-pitched roofs, springing from a stone corbelled cornice, are covered with green slates. A clock-turret, corbelled out at the angle formed by the two fronts, with moulded and enriched oak hoods above the main cornice, supported on stone-corbelled shafts protecting the two dial faces, with open framing for bell, and a high and tapering roof, forms a conspicuous and picturesque feature. Nearly the whole of the ground-floor is occupied by the corn-exchange, with entrance from North-street. A second entrance from East-street, opening into a lobby, will give access by a stone staircase to the suite of rooms on the first floor arranged as a town-hall, occupying the east front, a magistrates' room, and a large reading-room. The style of architecture adopted is Gothic.

CHURCH-BUILDING NEWS.

Wotton.—A new church here has been consecrated. It has been erected on the site and foundations of St. Peter's, Wotton, near Clevedon, a church which had been in ruins for generations. The work was begun about eighteen months ago; and, in excavating the foundations of the nave and chancel, the old walls were traced and built upon. It was ascertained that the chancel belonged to the thirteenth-century style, while the nave was of the fifteenth century, and in the rebuilding the styles have been followed as before, so that the nave is a reproduction of the peculiar Somersetshire style of the fifteenth century, the chancel being of the latest build, a couple of centuries older. The north aisle is divided from the nave by arches. The chancel has a chapel on the north side, forming an organ-chamber and vestry. The chancel roof is vaulted, painted blue, and ornamented with stars. The east window is a lofty triplet, with shafts of Purbeck marble, filled in with painted glass representing a variety of subjects designed by the rector of the church, the Rev. R. W. Hantonville. A considerable quantity of French stained glass of the thirteenth century has been used in this window. At the side of the chancel are two stained-glass windows, in memory of the late Rev. C. L. Cornish, vicar of Compton Dando, and whose remains lie in the churchyard. The floors of the aisle and nave are paved with Godwin's tiles. The outside of the building is of local stone, the inside arches and dressings being formed of alternate courses of Doubling and Bath stone. The inside of the building is lined entirely with magnesian limestone. The place is filled with open and free benches to accommodate about 300, and the total cost has been about 3,000*l*. The architect was Mr. J. Norton, of London; the builder, Mr. B. Newton, of Wexham. The general carving was done by Mr. Margeson, of Bristol; and the figure carving by Mr. Bolton, of Cheltenham.

Hastings and St. Leonards.—The restoration of All Saints' Church has been carried out under

the advice of Mr. Butterfield, of London. Nothing but the shell of the former building remains. The dilapidated exterior was first taken in hand, by Messrs. Avis & Roe, of Silverhill, the contractors. It is, however, in the interior that the restoration has been most complete. The wood-work, tiling, and glass are new. In the chancel, the fittings, stalls, reading-desks, &c., are of oak wainscoting and walnut. The old chancel pews give place to the arrangement of putting the choir there. The floor of the communion is laid with Minton's tiles; and Maw's tessellated tiles are used in other parts of the flooring. The most noticeable change in the nave and aisles is the substitution of open seats for high pews. The font is removed some distance westward, nearer the tower. In relaying the floor at a lower level, opportunity was taken to fit in pipes for a system of heating by hot-water coil. Messrs. Alderton & Shrewsbury executed this part of the work. The main pipes to light the church with gas, have also been laid in. The ceiling of the nave has been removed, leaving the time-stained timbers exposed to view. The organ is placed at the east end of the south aisle. A new instrument ought to be added, at an early date. The belfry walls have now an even plaster surface; and the old groined roof has been brought out. The inconvenient vestry has been removed from its old corner; and a new vestry-room has been built outside the church, on the north side of the chancel.

Welham.—The works of repair and restoration at the church carried out during the last two years, having been completed, the re-opening has taken place. The chancel of the church has been restored in the Decorated style. The old nave roof, which was rotten, and of the date of the reign of Henry VII., has been removed, and an open-timbered roof substituted. The whole of the interior walls, which were covered with stucco and whitewash, have been repaired and painted. The old square pews have been removed, and new open seats of pitch pine substituted. The chancel floor has been paved with West-stone's tiles, and the nave floor relaid with stone and Cranoe Keel Quarry tiles. The church is warmed by a Gill stove, supplied by Messrs. Hunt & Pickering, of Leicester. Stained glass has been added to the windows, and the east window restored.

Coningsby (Lincolnshire).—The restoration of this church is to be commenced immediately, under the supervision of Messrs. Hine & Son, Nottingham, architects. The builder is Mr. R. Young, of Lincoln, whose tender, 1,640*l.*, is accepted for the work.

Over (near Winsford).—St. Chad's Church, Over, has been re-opened for divine service. The fabric of this parish church was, in the spring of 1868, examined by Mr. S. C. Teulon, architect, and he found the roof so much decayed as to be positively unsafe; so much so, that if any weight of snow had lodged upon it in the winter, the probability was that it would have given way. The church itself was disfigured by a low flat ceiling, heavy unsightly galleries, and by pews not only wasteful of space, but unsuitable for the proper observance of divine worship. The tower entrance at the west end of the church was blocked up, and entirely hidden from view by a vestry on the ground-floor, a gallery containing an organ, and above that a rignig-loft. The walls and pillars of the church were thickly coated with whitewash, and, though some of the windows had been restored, others were very much dilapidated. Now, however, through the liberality of the parishioners and their friends, this state of things has been entirely altered. The roof has been taken off and replaced by an open timber one, the rafters and beams being of polished oak. The galleries have been entirely removed, and the western arch and doorway have been opened. The walls have been cleared of the whitewash, and the red sandstone of which the church is built is now revealed. Open varnished deal seats have been substituted for the old-fashioned pews, mostly free. In the south aisle is a new chancel organ by Baynington & Sons, of London, at a cost of 15*l.* The choir and chancel have been laid with encaustic tiles. The repairs to the external fabric are but few and insignificant. Where stone was found in bad condition it has been replaced, and some portions have been dressed. The restoration of the chancel was undertaken by the Ecclesiastical Commissioners, who placed the work in the hands of Mr. Ewan Christian, architect; and the remainder of the alterations have been defrayed by voluntary subscriptions; the architect being Mr. Teulon,

and the contractor Mr. R. Bookett, of Hartford. About 1,600*l.* have already been expended, and 500*l.* more are required to complete the restoration of the north aisle, and for other alterations.

Nether Swell.—On the festival of SS. Simon and Jude a new chancel to the church of Nether Swell was consecrated by the bishop of this diocese. For the better accommodation of the increased population, eighteen years ago a new aisle, larger than the old church, was added on the north side of the nave, and the old church was re-pewed and repaired. To this new aisle has been annexed the new chancel, of which the chief promoter has been Mr. Alfred Sartoris, who has lately bought an estate, and built, in the Elizabethan style, a spacious mansion. The new chancel is Early English, and was designed by Mr. Christian, in harmony with the new aisle.

Hurworth.—All Saints' Church, Hurworth, has been reopened for divine service. The modern shallow chancel has been completely pulled down, and substituted by a chancel of three bays, erected with aisles on each side of two bays; that on the south side being occupied by the organ and vestry, and that on the north being fitted with seats. These aisles are separated from the chancel by clustered pillars, with boldly moulded bases and carved caps and support, moulded arches of three orders enclosed within label moulds with carved terminations.

The arches, opening from the chancel and aisles into the nave and transepts, are similarly moulded, the carved capitals being supported by pillars of polished granite from Shap Fell, with cobbled-out bases of polished stone. The chancel roof is of the curved brace form, open to the apex, the timbers being all of pitch pine, moulded, covered by two thicknesses of boarding, with thick felt between, on which green Westmoreland slating is laid. The curved braces are supported by corbels with carved caps, moulded bases and shafts, also of Shap granite. The windows are all filled with geometrical tracery, and have moulded jambs and mullions, with small caps and bases introduced. The east window, which has been erected to the memory of the late rector by Mrs. Williamson, his widow, is filled with stained glass by Mr. Wailes, of Newcastle. Under the east window is a receding the tracery moulded in Caen stone, supported by shafts of Irish marble, and the panels are filled with mosaic of Venetian enamel, executed by Salvati & Co., of Venice and London, from cartoons by the architect. The principal panels contain emblems of the Holy Trinity, the Holy Spirit, the Pelican and Agnus Dei, emblems of our Saviour, and emblems of the four Evangelists; the minor panels contain foliage of the Byzantine type peculiar to Venetian mosaic. A large part of the ground is of gold glass, and when the sun shines on it—but especially when the gas is lighted at night—the effect comes out. The window on the south of the sanctuary is the gift of Mr. Wrightson, and that on the north is from Miss Balos. The floor of the chancel is laid with mosaic and encaustic tiles. Passing under the chancel arch, we find the nave in keeping, but of a plainer character than the chancel. The ancient pillars have been stripped of their plaster, and restored. A new roof has been placed on the nave, of the original high pitch. The whole of the aisle floors are paved with mosaic tiles. All the old square high-backed pews are replaced by open stalls, with low slanting backs, and the windows have been all re-glazed with tinted glass, having coloured margins. The entrance has been restored to its original and proper place on the south side, the modern west door having been walled up, a window opened out above it, and the tower formed into a baptistery opening into the church by an arch of stone. The church is warmed by Haden's warm-air apparatus, assisted by one of Lewis's patent warm-air chamber-grates in the vestry. The whole of the works have been designed and carried out under the superintendence of Mr. Pritchett, of Darlington. The general contractor was Mr. G. Gradon, of Durham, who sublet the masonry to Mr. Foster, of that city; the slating to Messrs. Atkinson, of Darlington; the plumbing to Mr. Laidler, of Durham; the glazing to Mr. Wilson, of Leeds; the varnishing and colouring to Mr. Dryden, of Darlington. The artistic metal-work has been executed by Mr. Dovey, of Manchester; the mosaic flooring by Messrs. Maw & Co., of Broadley; and the carving by Messrs. Burdett & Taylor, of Leeds.

Houghton Conquest.—The Church of All Saints, Houghton Conquest, to the east of the high road from Bedford to Ampthill, has been renovated under the direction of Mr. G. G. Scott. The works executed comprise the renovation of the oak roofs of the nave and aisles, 800 ft. of oak being required for this; the lead being recast and relaid in the best manner. The walls and buttresses have been underpinned, and where defective, rebuilt,—local sandstone, from the Dowerer Countess Cowper's estate, being used for the walling, and Ancaster stone for the windows, doorways, and other dressings of the windows, all of which were partly built up; some have been entirely repaired and re-glazed, some interesting fragments of stained glass being recovered. All the piers of the arcade have been underpinned. The whole area has been lowered to its original level, and resented with oak fittings; the ancient open benches being repaired and refixed in the nave, those in the aisles being new, but made from the same design. The floors are repaved with tiles, the ancient monumental slabs being relaid in their original positions. The walls and stonework having been cleaned from the whitewash, many mural paintings were found. Over the chancel arch is a *Vesica Piscis*.—Our Saviour is represented showing the sacred wounds,—the world and a rainbow under him; on his right an angel holding a cross and spear; on his left the same with pincers and nails. Over the north door is a figure of St. Christopher, 16 ft. high, crossing the water with the infant Saviour. In the south aisle is a representation of St. George and the Dragon, also many legends and texts, and the Belief. The porch, which is very dilapidated, has been rebuilt; a new oak roof, enriched with carving, has been fixed; the gable contains an elaborate niche, and the strings, labels, &c., carved. The modern fir doors have given place to oak, with artistic ironwork, and a wrought-iron screen has been placed in the tower archway. The organ is entirely new, and erected by Hill & Co., of London, under the direction of Mr. C. L. Higgins, of Turvey Abbey. The chancel has undergone a complete renovation; the oak roof is new, and in harmony with the east window, which latter had for years been blocked with brickwork, but has now been opened out, and the mullions and tracery restored; the side windows, which had suffered by similar treatment, have also been restored, and contain some curious fragments of ancient glass hidden for many years. The stalls and fittings have been reconstructed; the carving of the ends is interesting. The ancient screen, which had been greatly mutilated, has been retained and restored. The clerk of the works was Mr. T. Leigh, of London; the contractor, Mr. J. Fast, of Melton Mowbray. The carving was executed by Mr. S. Ruddock, of Pimlico, and the decoration of the screen by Messrs. Burlison & Grylls. The whole of the cost will exceed 3,000*l.*

The addition of a considerable new portion on the north-east of the churchyard has been made and consecrated, the land having been given for the purpose by the Rev. Lord John Thynne, of Haynes Park.

Bramfield.—The church of Bramfield, or Bramfield, a parish historically interesting as the first charge of Thomas A'Becket, has been reopened for divine service, after having been closed, for restoration, during ten weeks. An addition has been built on the north side, forming an organ-chamber and vestry, and in the interior the gallery has been removed, and the old pews replaced by free and open seats of simple design. The chancel has been raised, and paved with encaustic tiles, as also the octagon room under the tower, which has been made a baptistery and furnished with a font. The whole cost of these and other improvements is estimated at 500*l.* The works have been carried out by Mr. Rayment, of Hertford, under the direction of Mr. C. B. Trollope, architect.

Sweepstone.—The church, after the rebuilding of the chancel at the sole expense of the rector, the Rev. W. C. Hodgson, and the restoration of the nave and aisles by public subscription, has been opened for divine service. The church consists of chancel, nave, north and south aisles, tower, and south porch. The chancel is rebuilt in the style of the north aisle, about the year 1350. The tower was rebuilt in 1842, and the nave of the church seated with the present pews and benches. The rest of the church was left in a sad state of decay, and its restoration could not have been much longer delayed. When the rector had rebuilt the chancel, the parishioners, in vestry, willingly agreed that the restoration of the nave should be at once taken in hand.

The chancel, which is fitted with temporary stalls, is separated from the nave by a low screen of Bath stone. There are encaustic tile pavements in the chancel, from Whetstone & Son, of Coalville. The east window, which is a memorial to the last rector and his wife, by the members of their family, consists of three lights, with two subjects in each light, the filling-up being in its character geometric. The centre subjects are the Resurrection and the Crucifixion. The subjects of the side lights are incidents in the life of St. Peter, to whom the church is dedicated. The window is the work of a young artist at Hull, of the name of Howe. The roof is of a very high pitch, of wagon-shape inside; the deal boarding is left for future painting. The walls are of ashlar; and there is a Gill stove, the flue of which passes underground along the nave to a flue in the tower. The organ, built by Gray & Davison, at a cost of 250*l.*, occupies a recess on the north side of the chancel, the front being corbelled over the player's head, and is highly decorated. The frame is of oak, left in its natural state.

SCHOOL-BUILDING NEWS.

West Bromwich.—The new school in connexion with St. Michael's Roman Catholic Church has been opened. The school has been erected upon the site of the old one, at a cost of 500*l.*, to be raised entirely by voluntary contributions, and will accommodate 200 children—nearly four times the number which the old building was capable of accommodating. It is a gable-ended building, with a plain exterior, constructed in the Early English style of architecture, of red, blue, and white bricks. There is a triple lancet window in the front gable, with stone dressings and diaper brickwork, and there are windows along one side of the building. The roof internally is of open timber, stained and varnished; and the walls, up to the level of the windows, are lined with glazed white bricks.

Maidstone.—The foundation-stone of the new Grammar School, which is to be erected on the Tonbridge-road, has been laid by Sir John Lubbock. The situation of the present school in Earl-street, a very unpleasant if not unhealthy neighbourhood, has for many years been regretted, and a desire has long been evinced to remove it to a more convenient site. The liberality of Mr. Peale led to this being accomplished, and the 1,200*l.* with which he headed the list was followed up by subscriptions to the amount of about 1,500*l.* The design for the new building was provided by Mr. E. W. Stephens. The style is late Gothic. The principal school-room will be 50 ft. by 25 ft., and will seat 180 scholars, but in reality has floor space for 150. Adjoining the school-room, and approached by the corridor, is a class-room, 19 ft. by 15 ft., which will accommodate a class of thirty-four scholars; and in addition to this there is another class-room, 30 ft. by 20 ft., which affords floor space for a further number of seventy-five boys. This latter room may be used also as a dining-hall for resident boys and day scholars. Besides this accommodation for boys, there is a large entrance lobby, a convenient lavatory, boarders' staircase, separate rooms for books, hats, and boots, and several other conveniences. The whole of the scholastic portion of the building is cut off from the master's residence. In the upper portion of the buildings, consisting of two floors, there is accommodation for twenty-four boarders, one room for under master, eight rooms for the master's own use, two infirmaries for sick pupils, and a nurse's room. There is to be a bath-room on each floor, with lavatories and clothes store, &c. The whole extent of ground purchased by the trustees contains an area of 3½ acres; the school buildings, and master's house, and garden taking about three quarters of an acre. The playground is 1 acre, and the cricket-ground 1½ acre in extent.

Ardwick.—The new schools in connexion with St. Thomas's Church, Ardwick, have been opened by the Bishop of Manchester. They will accommodate 650 children—300 infants and 250 boys; have been built at a cost, including the fittings and site, of 4,000*l.*, and will comprise two school-rooms—the lower for the infants and the upper for the boys. The building is of brick, with stone facing, in the Gothic style of architecture. The rooms are of more than ordinary dimensions, and are well lighted and ventilated. Messrs. Royle & Bennett, of Manchester, were the architects, and Messrs. Clay & Son, of Audenshaw, the builders.

Upper Norwood.—New schools in connexion with St. Paul's Church, Upper Norwood, recently erected in Anerley-road, near the Crystal Palace, have been opened. The building, which will accommodate 250 children, consists of a school-room 51 ft. by 25 ft., two class-rooms, teacher's residence, and a soup-kitchen. The style is Gothic: malm facings, relieved with stone dressings, and red brick arches and bands. The school has an open-timbered roof, the height being 15 ft. to wall-plate. The architect is Mr. George Elkington, under whose superintendence the works have been executed by Mr. Hollidge, contractor, at an outlay of 1,200*l.*, exclusive of site.

Red Hill (Surrey).—The opening of a school-room in the Brighton-road, Red Hill, Surrey, has recently taken place. It has been erected from the designs of Mr. John R. Collett, architect. Mr. James Hall, of Sutton, was the contractor; and the ornamental ironwork was executed by Mr. Anderson.

Felsted.—The new school-rooms which have just been erected in connexion with the Felsted Congregational Chapel, at the cost of about 325*l.*, have been opened. The building, which is of timber construction, on concrete blocks, stands in the burial ground, and is contiguous to the chapel and minister's house. The main room is 55 ft. by 22 ft., with infant school-room 16 ft. by 15 ft., and two class-rooms, providing in all accommodation for about 300 children. The buildings are plain and unpretending, and have been erected by Messrs. Smith & Holland, builders, of Great Leighs, under the direction of Mr. Charles Pertwee, architect, Chelmsford.

Worcester.—A new infants' school has been opened in St. John's. The edifice, which has been erected under the superintendence of Mr. Perkins, architect of the cathedral, and Mr. Warner, builder, of Malvern Link, has been constructed upon a healthy site on the right hand side of the Bromyard-road, just beyond the toll-gate, and is therefore in close contiguity with the church itself. There is ample space around it in the shape of a playground, skirted by a dwarf wall. The school presents to the front a pointed gable with wings. The principal school-room is co-extensive with the frontage, namely, 48 ft., and the entrance is by a porch at the lower end. At the rear of this room there are two class-rooms, the dimensions of which are 20 ft. by 14 ft., the intermediate space being covered over and made available for a playground in wet weather. The height from the floor to the wall-plate is 14 ft., and to the top of the pointed roof in the centre about 35 ft.; behind the porch, which is 9 ft. by 7 ft., is a book-room, 7 ft. by 6 ft. The building is of brick, with white stone dressings.

Westerdale, Yorkshire.—A new school is to be erected in this parish. The designs have been prepared by Mr. H. Perkins, of Leeds, architect. The school will be of stone, with open-timbered roof, and will accommodate fifty children.

Matlock.—The new National Schools, intended for the use of the Sunday and day scholars in connexion with the parish church, have been opened. The estimated cost of their erection is 530*l.* of which the larger portion has already been raised. The schools are capable of affording accommodation for 200 children. The architects were Messrs. Hine & Son, of Nottingham; and the builder Mr. W. Statham, of Matlock.

Walkley.—The corner stone of the St. Mary's National Schools, Walkley, has been laid. The schools, the site of which adjoins the church, will be built in the shape of the letter H, and in the Gothic style of architecture. The boys' school, at the one end, will be 45 ft. 6 in. by 20 ft.; and the infants' school, at the other end, will be 48 ft. by 20 ft. In the centre will be the girls' school, 38 ft. by 20 ft., and a class-room, 12 ft. by 20 ft., with entrance-porches, passage, &c. The height of the schools inside will be about 26 ft. Mr. Thomas A. Wilson is the architect, and Mr. John Wilson the contractor. The contract for the erection of the schools amounted to a little over 1,500*l.* The boys' school will accommodate 100, the girls' school 80, and the infants' school 120 scholars.

The Proposed New Harbour, Folkestone.—The plans for the proposed harbour are on view at the townhall. Two schemes are submitted, one of which is estimated to cost 150,000*l.* and the other 200,000*l.* The latter has an additional length of 200 ft.

Miscellaneous.

Want of Elasticity in Portland Cement. Speaking of the repeated failure of large civil engineering works, such as breakwaters, docks, walls, &c., due indirectly, beyond question, to the want of elasticity—in other words, to the brittleness—of cement, the *Engineer* says,—"As an illustration of the nature of strains to which works of this kind are submitted, we may cite the case of the splendid breakwater at Holyhead, now fast approaching completion. Under the full force of a heavy westerly gale rolling in a tremendous sea, the work rocks and vibrates to an extent which can only be realised by those who have stood on the wall inside the parapet at the time; and in direct confirmation of what we have said, we may state that mortar made of good Aberthaw lime has been found to sustain the shocks of the wind and the sea better than Portland cement of the best quality, apparently because the lime mortar possesses more elasticity than the cement. Other instances might be cited, all tending to prove that however suitable Portland cement is for such works as the main sewers of the metropolis, the piers of a bridge, or the Thames Embankment, it is not uniformly the best material that can be used for engine foundations, breakwaters, or other structures exposed to violent dynamical strains. Whether it is or is not possible to impart elasticity to Portland cement remains to be seen. It is certain that unless it possesses some elasticity, it is unlike all other known materials; but if it possesses some elasticity, different samples may possess more or less of the quality. Engineers have now to find out what kind of cement possesses most elasticity, and how far a high tensile strength and great elasticity are compatible with each other."

Arbitration.—The case of *Brazier v. Askew*, where the plaintiff, Mr. Wm. Brazier, claimed compensation for damage to property at Parkgate, Sheffield, alleged to have been caused by the coal-mining operations of Messrs. T. and H. Askew, referred to Mr. J. E. Barker, barrister, was heard by him at Rotherham, and occupied three days. The principal witnesses for the plaintiff were Mr. Dobb, architect, Rotherham; Mr. G. W. Wilson, architect, Sheffield; Mr. P. Cooper, colliery manager, The Holmes; and Mr. Wilson, of Darfield, Solicitor, Mr. Harrop, of Rotherham. The case for the defendants was that the damage was not the result of the coal getting, but of the defective construction of the property. The witnesses for the defendants were Mr. W. Blackmoor, architect, Rotherham; Mr. G. J. Innocent, architect, Sheffield; Mr. B. Sellars, coal-owner, The Haigh; Mr. Beecher, mining engineer, Thorncliffe; and Mr. B. Sellars, jun., mining engineer, Solicitor, Mr. Whitfield, of Rotherham. After taking time to consider the evidence, and having viewed the premises, the arbitrator has made his award in favour of the defendants, all costs to be paid by the plaintiff.

Rain.—In a lecture at Norwich last week Mr. James Glaisher, F.R.S., said:—"The whole of the rain had its origin and fall 800 ft. from the earth. Desiring to discover the influence of the moon on the elements, he took observations, and discovered, after a long series of observations, that on the 9th day of the moon there was much the most rain, and that on the first and last week of the moon there was the least amount. He had taken account from 1815 to 1869 of every day on which there had been an inch of rainfall, and he had found that on July 28th, 1867, the rainfall amounted to 3 in. 7-10ths—the largest amount that had fallen in one day at the Royal Observatory. From careful observation he had made he had no doubt that the moon did exercise an influence upon rain. Another investigation that he made was as to the time of day that rain fell most, and he had found that the largest quantity of rain fell at about four o'clock in the afternoon."

Billingsgate and Leadenhall Markets.—In accordance with the decision of the Court of Common Council, on Thursday last, to enlarge and improve these important City markets, Mr. Corrie, the Remembrancer, has given notice on behalf of the corporation of their intention to apply to Parliament for authority to carry out the necessary works. In the case of Leadenhall Market the sale of meat, skins, and hides is sought to be prohibited, and the land so rendered useless in that direction will be utilised in the enlargement of the poultry market.

Australian Meat.—The cheap food question in its connexion with the importation of meat from Australia, so largely dealt with last winter, has again been opened up at the Norton Folgate agency for colonial produce, in a meeting of medical officers of health for different parts of London, who were called upon to pronounce an opinion with regard to the wholesome character of the food. Among those present were Dr. Lankester and Dr. Hardwicke, the coroner and deputy-coroner, Dr. Aldis, Dr. Septimus Gibbon, Dr. Letheby, the Rev. Septimus Hansard, and many other gentlemen well known as taking an interest in the social progress of the people. The meats were served to the company by Mr. Tallerman, in the condition in which they are being served to the people in "Penny Dinners," namely, cooked with vegetables or with barley, as mutton-broth prepared Scotch fashion, pea-soup, rice-soup, and the *entrées* were mince collops, haricot mutton, fried ham, sausages, meat and rice, meat pies and puddings. Many of these dishes were retailed at 2d., and some at a penny, affording a good wholesome dinner, with dining accommodation in a spacious hall, at a very low price. The highest price charged for a dinner in the reserved seats, the dinner consisting of soup, *entrées*, vegetable, and bread, is 5d., and six dinners are supplied on consecutive days for an abatement of 3d. on the week. The dinners as served were pronounced to be excellent, and the large company voted Mr. Tallerman thanks for his efforts. Complaints have been made that some of the salted meats are unnecessarily salt. This seems to be the case with spiced and rolled beef and mutton, which, however, are very tasty, though, of course, several months old, and give a good relish to fresher forms of food.

Exhibition for the Distressed Peasantry of France.—An exhibition of pictures is being formed, and is about to be opened, at the French Gallery, for the benefit of the peasantry of France, described as being in a fearful state of distress. Baron Gudin, the eminent French marine painter, has been especially active in arranging the undertaking; and amongst the artists who have already promised to contribute to the exhibition may be mentioned Messrs H. B. W. Davis; J. L. Jérôme; A. Elmore, R.A.; P. H. Calderon, R.A.; W. P. Frich, R.A.; R. Fleury; C. F. Danbyrig; E. Long; G. P. Boyce; T. S. Cooper, R.A.; J. B. Burgess; H. Hardy; E. Crowe; A. Gilbert; H. Dawson; Theodore Weber; J. E. Saintin; J. Perrault; Baron Gudin; L. Escosura; F. Heilbuth; G. Ruard; A. Yvon; H. Delissard; W. G. Orchardson, A.R.A.; A. Schreyer; H. Schlessinger; Birket Foster; A. Bouvier; I. Webb; F. W. Hulme; G. F. Tennisswood; Lady Cadogan; J. D. Watson; J. R. Dicksee; J. Burr; A. Ruinat; A. Tadema; Ludovici; E. Armitage, A.R.A. The presentation of pictures, drawings, and other works of art is invited.

The New Mint.—There are signs at last that the new Mint, as well as the new Law Courts, elsewhere noticed, are to be proceeded with. Parliament will be asked next session to authorise the erection of a new Mint, on a site facing the Embankment. The site fixed on is on the City side of the Temple gardens, in a part of the Embankment which greatly needs adornment. The first thing seen on entering the Embankment road from the City is the City Gas Works, the thing most out of place in all this incongruous metropolis. The site chosen for the new mint is next to the gas-works. It is now covered with wharfs and buildings which are fit company for their smoky neighbour. How a new public building will look with the smoke of the retorts beating against it, and the huge gas reservoirs threatening it with destruction, it is impossible to guess. It is to be hoped the selection of the site indicates the removal of the gas-works.

Royal Commission on Pollution of Rivers.—Major-General Sir William Denison, K.C.B., Dr. Edward Frankland, F.R.S., Mr. John Chalmers Morton, and Mr. S. J. Smith (secretary), having completed their inquiries and investigations into the river basins of Scotland polluted by town sewage and refuse from manufactories; also the basins of the Aire and Calder, Lower Avon, Windrush, and the upper parts of the Severn, river basins extensively polluted by woollen manufactures and the processes connected therewith, met at No. 1, Park-prospect, Westminster, for the purpose of considering

Paving by a Driver.—Mr. Charles Pinnington, of 9, St. James's-terrace, Caledonian-road, who states that he has "been employed for the last forty years in driving a conveyance through London and the suburbs, averaging 70 miles a day," and has much meditated on the defects of various modes of paving, has at last taken out Royal Letters Patent for a new mode, which consists of laying granite or other stone blocks on wood in two transverse layers, bedded on a mixture of sawdust and unboiled coal-tar, resting on the sand or other subsoil; so forming an elastic basis for the stone blocks, through which boiled or boiling tar is to be poured, followed up by sand, thus rendering the whole water-proof, to which a coating of tar over the wood before it is laid contributes. Noise, he considers, would be diminished, the granite saved, and the paving be both cheap and lasting, as well as merciful to his beloved horses.

Courts of Justice.—Notice is given that application is intended to be made to Parliament in the ensuing session for an Act to authorise the Commissioners of her Majesty's Works and Public Buildings to acquire and take, by compulsion or agreement, additional property, for the site of the Courts of Justice, in the parish of St. Clement Danes, and for other purposes connected with the proposed Courts of Justice. The large block of buildings which the commissioners propose to take is that which commences at Clement's-inn gateway on the east, extending to Dane's-inn on the west. Northward, the block is bounded by Clement's-inn Hall, and southward by the Strand. It contains, in addition to the hall, several large houses, amongst others, Carr's Hotel, Tuxford's printing-office, the Vestry-hall, and a long row of houses in Clement's-inn. It is not stated what is the precise object to which the new site is to be applied. There are no signs of the Courts being commenced.

Progress of Tramways.—The Metropolitan Street Tramways Company intend applying next month to the Board of Trade for provisional orders for extensions of their lines, including an extension from the Kennington Park-road to the Borough. In Prince's-street, City, on the east or Bank of England side, a line is proposed throughout the entire length of the street; also on the south side of Cannon-street, between Dowgate-hill and College-hill. A line is also proposed along the Southwark Bridge-road to Queen-street, City, between Upper Thames-street and Cannon-street. Mr. Jackson, who has made some suggestions as to the construction of tramways, now advocates the making of a new road from the corner of Mansion House-street, in the Kennington Park-road, to St. George's-circus, in the Blackfriars-road.

Fall of a Tower.—The tower of the church of East Rudham, which had long been in a dilapidated state, has given way, a great part of the west and north walls falling to the ground, the lower portion being used as a vestry: the *débris* covered up all therein,—parish chest, register, lamps, tables, &c. Fortunately, however, the fall did not occur during divine service. The bells were left hanging with no means of access, the circular staircase having fallen with the rest. Being uninjured and valuable, however, an effort was made to save them, and they were safely landed by Mr. K. M. Lane, of this place, engineer. The church, which is in the Decorated style, and dates about the end of the thirteenth century, is also considered in a dangerous state, and divine service has been discontinued therein.

Electro-Telegraphic Progress.—Sir Chas. Wheatstone has just added to his many electrical inventions the completion of a printing instrument. This resembles a piano, having a keyboard of twenty-five notes, each answering to a letter in the alphabet, several of which can be used for stops and numbers. The most frequently-occurring letters are situated towards the centre, so that an operator need rarely move his hands from one position. Great speed is thus obtained; and, if necessary, a printed copy of the forwarded message can be had by the sender of a message.

Dwellings for the Working Classes.—Pimlico—"Colehill Buildings," in Ebury-street, erected for the Improved Industrial Dwellings Company, were opened on the 18th inst. by the Duke of Cambridge, in presence of a distinguished company. We will give some particulars of the buildings in our next number.

Wolverhampton New Town - Hall : Dinner to the Workmen.—The workmen employed under Mr. Horsman, the contractor in the erection of the Wolverhampton New Town Hall, in North-street, having succeeded in completing the timber supports for the roofing in of the main building, the event was celebrated with the usual ceremony of hoisting a Royal standard on the summit of the dome, followed in the afternoon by an excellent dinner, which was given by the Public Works Committees to the whole of the men employed on the work. The north wing of the new buildings (intended for the use of the police force) is already completed, and has been for some time past used by the officials of the corporation, and by the corporation committees. In the principal room, the mayor (as chairman of the Public Works Committee) presided, supported by Mr. Horsman, contractor, &c., and faced in the vice-chair by Mr. Whiston, clerk of the works.

Instruction in Science and Art for Women.—The course, or rather courses, of instruction in science and art for women conducted in the Lecture Theatre of the South Kensington Museum, continue to be well attended. Professor Huxley, in his series of lectures in the elementary course, has had in his class upwards of 200 ladies. Having in his previous lectures physiographically described the rise and progress, so to speak, of the Thames and its basin under the action of rain and pluvial denudation, he proceeded to illustrate his subject still further by showing the effects both of pluvial and of marine denudation in the river's estuary, along the seashore, and outwards into the depths of the ocean. Professor Guthrie, in his advanced course of instruction, has also had fair audiences in more senses than one. He has been enlightening the ladies on the subject of heat, light, and other branches of physics.

The Leicester Industrial Provident Society.—This is a co-operative society, which began ten years since with almost nothing, and after the necessary time and difficulties of incubation, is now rising rapidly, and doing business to the extent of between 30,000, and 40,000*l.* a year; and at the recent rate of progress, will, ere long, be doubled. It is entirely under the management of the working classes. The number of members in July, 1870, was 1,409; in October, 1870, it was 1,697; giving an increase of 288 members in three months. The society has eight branches in Leicester, besides the central stores. The members, and non-members, besides good articles of supply at cheap rates, for ready money, reap considerable profit otherwise from their connexion with the society.

The Strike in Edinburgh.—The Lord Provost of Edinburgh, who had consented to act as arbiter in the stonemasons' strike, gave his decision on Monday as follows:—"The Lord Provost, having carefully considered the statements submitted to him on Saturday last by the master masons and also by the men in their employment, is of opinion that the most equitable decision he can come to is to halve the difference between the parties, and he therefore so decides." The masters and men agreed to abide by his lordship's decision, and the strike has accordingly terminated. The men will now be paid at the rate of 6*d.* per hour instead of 6*d.*

East London Museum.—It will be remembered that the Duke of Buckingham, during his tenure of office as Lord President of the Council, obtained the sanction of her Majesty's Government for establishing a museum in the east of London as a national institution, and he authorised the appropriation of part of the temporary structure at South Kensington to be made over as a skeleton for the new building. The Society of Arts made a donation of 100*l.* towards the same object. The building is now fast approaching completion, and will, it is believed, be opened in the course of next year.

Infirmiry, Basford Union.—The guardians of this union have just completed their new erections, consisting of an infirmiry for 131 beds; infectious ward, 10 beds; probationary and itch wards, porter's lodge, clothes stores, and some additions to the old premises. The infirmiry is said to be provided with all modern and useful appliances for promoting the welfare of the patients and economising labour. The architect was Mr. S. J. Barber, of Eastwood, Notts; and the contractor Mr. G. Hopewell, of Basford.

In consequence of the Reduction in the Newspaper Postage, Subscribers within the United Kingdom will be supplied with THE BUILDERS' GAZETTE direct from the Office, at the rate of Nine Shillings per annum, PAYABLE IN ADVANCE.

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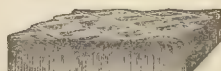
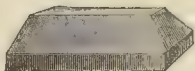
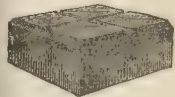
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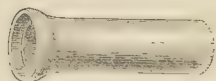
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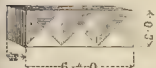
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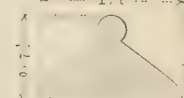
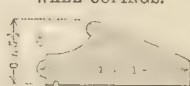
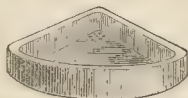
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VOL. XXVIII.—No. 1452.

Engineering Education.*

THE Council of the Institution of Civil Engineers have rendered valuable service to the country by the publication of a volume on the training and status of civil engineers in the United Kingdom and in foreign countries. No name is annexed to the work as that of responsible editor; an inconvenience which may be thought to be counterbalanced by the authority given to its statements, as being put forth by the Council of the Institution. The sources of the information as to professional education abroad (many of them well known and respected in this country) are severally stated, and the opinions of Englishmen of more or less

eminence are extracted in a separate part of the work. There is not, however, any such summing up of the evidence, or delivery of the mature recommendation of the Council on the important subject which they have illustrated, as might have advantageously closed the work. We are rather furnished with materials for comparison and for meditation, than with any original contributions on the part of the Institution to the solution of the all-important question of technical education.

Honestly and fairly the work is admitted, on the first page, to be the result of alarm, and to be undertaken with a view to self-defence—"Technical education in this country," it is remarked, "was stated, a few years ago, to be so much inferior to that in other European States" as to threaten seriously the industrial interests of Great Britain. . . . "The Council of the Institution of Civil Engineers felt it their duty to interest themselves in that part of the inquiry which bore upon their own profession." "They resolved that it would be highly desirable in the first instance to obtain, from the most direct and authoritative sources, full information as to the system adopted for the education and technical training of engineers, and generally as to the status of members of the profession in various foreign countries where this profession had assumed an important position." Somewhat late in the day, then, the replies to the inquiries on the first head are now brought before us. The subject of Continental engineering education is illustrated in some detail, although the very important question of the preliminary training of the student is left out of sight. Few persons whose views on the

subject of education are based on exclusively English experience are aware of what is required, for instance, for the entrance examination into those institutions,—such as the *Ecole Polytechnique*,—a three years' course in which is an indispensable preliminary to the commencement of a special course of three years more, in the exclusively engineering colleges, such as the *Ecole des Ponts et Chaussées* and the *Ecole des Mines*.

The portion of the work which we recommend every reader first to peruse is that containing extracts from Mr. John Scott Russell's volume on Technical Education for the English people, which closes the third part. The mild tone in which the Council of the Institution speak of the menace to our industrial interests finds an echo of portentous significance in the practical statements of Mr. Russell. "It is notorious," says that gentleman, "that those foreign railways which have been made by themselves (sic) in the educated countries of Germany and Switzerland have been made far cheaper than those constructed by us in England; it is known that they have been made by pupils of the industrial schools and technical colleges of those countries. . . . The experienced traveller can read as he travels the work of a superiorly educated class of men. . . . We everywhere feel that we are in the hands of men who have spared no pains, and who have applied high professional skill to minute details." The works of the foreign railway stations, the comfort and convenience of the carriages, the economy in capital outlay, and the amount of net revenue,—every element of comparison except speed,—are contrasted with our own to the disadvantage of the latter.

In marine steam-engines, Mr. Russell—and none can doubt his competence as a judge in this respect—tells us that we are "equalled, if not beaten." The large marine-engine of Dupuy de Lôme, exhibited at Paris in 1867, "would consume less fuel, do more work, endure longer, and run less chance of accident than our engines; all of these being qualities heretofore constituting our own superiority. The iron armour of the French ships is stated to be equal to our own; the artillery superior; the French having obtained that which we had failed to obtain, after an enormous outlay—"efficient breech-loading guns, which enable them effectually to deliver seventeen shots to our ten." Mr. Russell would no doubt have added, if his work had been more recently published, that the iron-clad ships of the French navy, as a rule, are constructed to swim with the deck upwards, and not to turn over like a turtle, and go to the bottom like a shot. The advantages of the technical education of the French shipwrights compared with that which in some parts of this country, and even in some pages of the work before us, we find to be boasted as "practical," never had a more pregnant illustration than in the fate of that supreme effort of our private dockyards.

In land steam-engines, economy of boiler power, advantageous application of steam, and superiority in mechanical contrivance, enable the French engine-wrights "to get more power out of a given quantity of fuel in a higher proportion even than the greater cost of our own fuel exported into France." In rails, railway wheels, tyres, and axles; in large wrought-iron beams; in frames for ships; in plates and bars, the English work is excelled in size and quality, and competed with in price. We can add our own personal testimony to the fact that this great stride in manufacturing excellence has been made within a dozen years. Nor is France alone in her excellence: Prussia equally displays engineering triumphs. She produces "steel cannon, more powerful than any of our own, carrying larger shot, with heavier powder charge; large ingots of steel, of magnitude and quality unequalled by any nation; tyres of locomotive

wheels, which, imported into England, supersede our own highest qualities of iron; and complicated members of machines forged by Krupp out of a single piece of steel, so as to be equivalent to eight or nine of the old pieces, formerly fastened imperfectly into one."

We cite the testimony of Mr. Scott Russell, thus clothed with the authority of the Council of the Institution of Civil Engineers, not so much for its novelty as for its point. In those important branches of the profession of civil engineers as to which the witness can speak with authority, England, he tells us, is behindhand, when compared with France, Germany, and Belgium. In the construction of railways and railway plant (themselves of English invention); in that of marine engines and ships of war; in that of artillery; in smelting, mining, locomotive building, and the great branches of commercial machinery; in the organisation of skilled labour; we are becoming yearly unable to compete with the pupils of the technical schools of the Continent. For other branches of that noble profession which, rightly studied and practised, has for its aim to give to man the mastery over the fury of the elements, and over the physical forces of nature, we have a yet more gloomy prospect. Mr. Scott Russell, in a sketch of the education which he proposes to be given to the civil engineers of England, omits some important departments of the subject; while, in the selection of others which he proposes to introduce there is evinced some want of acquaintance with the magnitude, character, and difficulty of certain great ranges of scientific and artistic study. Thus forestry, a branch of the duties of the civil engineer of the utmost moment in our colonial empire (to say nothing of home) is not referred to. Mining forms no part of the proposed curriculum, although the practice of that occupation underlies the whole of our mechanical prosperity, and gives employment to so many of our population. Agricultural engineering, in which, both in its civil and its mechanical branch, lies the great hope of our future national wealth, is unnoticed. On the other hand, the "Theory of Beauty and Ugliness" is named as one of eight divisions of ordinary technic education, while the attainment of any such theory can only be regarded as the result of the specially devoted lifetime of a man of the highest natural gifts. Again, "Political Economy" is named as a "practical application of pure science" side by side with the far inferior, but not more "purely scientific" subject of "workshop economy." This is like making political history a department of zoology. Mr. Russell has perhaps done more to show the actual defects of our system by giving a sketch of what reformers think is ought to be, than even by comparing its results with those of the higher education of Continental Europe.

Such being the outcome of our present system of engineering education, it is with regret that we see such remarks published by a president of the Institution of Civil Engineers, as,—*"In the practical branches we are admittedly superior"* (p. 192). Such a statement, however true it might have been twenty years ago, can now tend only to mislead. The idea of balancing what is called a "practical" against a "theoretical" education, is one of those shifts by which the introduction of any system of sound training has often been most successfully resisted. Put in its true light it means,—*"Rule of thumb for ever."* No doubt can be entertained that a purely abstract education, uninformed by practical experience, can never make a good engineer, any more than it can make a good physician, surgeon, or soldier. The mere intellectual work of acquiring information is simplified and rendered more easy by the introduction of specimens and experiments; and in all matters of construction no education is worthy of the name that does not make the

* "The Education and Status of Civil Engineers in the United Kingdom and in Foreign Countries." Compiled from documents supplied to the Council of the Institution of Civil Engineers. London, 1870. Published by the Institution.

pupil, to some extent, handy in each constructive process. But the practical experience thus attained is of tenfold or hundredfold value when the attention is prepared to grasp the facts by proper preliminary culture. To speak of "practical" as opposed to "theoretical" education is to put a part for the whole. It is like attempting to teach botany by sending a man to live in the country for a twelvemonth, bidding him observe all the plants that come within his reach, and then calling him into the lecture-room, and requiring him to give his notions of the relative value and range of the artificial and the natural systems.

Our own system of "practical" education for the engineer is thus described by Professor Fleeming Jenkin, M. Inst. C.E., in an inaugural address delivered in the University of Edinburgh in November, 1868, cited in the work before us:—

"Young men, at the age of about eighteen, enter the office of a civil engineer. Usually few questions are asked as to previous training. . . . The ordinary pupil is a sort of ouisance in an office, only tolerated in consideration of the fees which he pays. . . . Most pupils are so ignorant of algebra that they are not only incapable of working out a result for themselves, but actually cannot apply the steps of *la marche* which are given in engineers' pocket-books. The calculation of the solid contents of a wall is often beyond their powers. Their arithmetic is very shaky, and a knowledge of physics, chemistry, geology, or the higher mathematics, is wonderfully rare. . . . Not even a pass examination is required, and the ignorance of some pupils, especially in mechanical workshops, must be experienced before it can be believed. . . . No one teaches them anything, but they have the opportunity of seeing how some actual work is done."

The above description is not our own. It is given to the world under the authority of the University of Edinburgh, backed by that of the Council of the Institution of Civil Engineers! Let us hope that part of the shadow may be set down to the desire of the lecturer to make a brilliant rhetorical display. The remainder of the inaugural discourse is hardly such as to lead us to regard it as altogether a serious effort. The Professor is of opinion that "certainly much less" theory than is given abroad is required by the engineer. He would keep our technical education on a confessedly low footing, and tickets the breadth of his own views by the recommendation to "abolish Euclid as pestiferous." Still, with whatever-sized grain of salt we may season the account, there is in it too much of truth. In times of full employment the engineer in high practice has no time to give to his pupils. We are not aware of any instance in which a system of education has been organised as part of the office routine. In times like the present the engineer, for the most part, has either no pupils at all, or no opportunity of giving them practical experience, and no heart to give them theoretic teaching. The result is that the two or three years spent under the articles of apprenticeship are often wasted, or worse than wasted. If, at the close of the articles, a young man is fortunate enough to get an appointment of sub-engineer, and conscientious enough to devote his best energies to the discharge of his duties, he may be considered as then commencing his education—commencing it without teacher, guide, or prescribed plan of study, and furnished only with an amount of available education that would not be enough to give him the remotest chance of admission to the *École Polytechnique*.

For the contrast afforded by the Continental systems of education we must refer to the volume itself and to previous papers in our own journal. The information the former contains comes from France, Belgium, Holland, Sweden, Russia, six States of North Germany, three States of South Germany, Roumania, Switzerland, Italy, and Spain. In the United States and Canada alone, out of Great Britain, it seems to be considered satisfactory that "any body is as free to assume the style and title of Civil or Mining Engineer as he is to take that of blacksmith, and it is still done commonly without any regard to school diplomas." On the Continent of Europe, indeed, there is no absolute prohibition, as a rule, against the practising of self-taught or untaught engineers. But such men must enter the field at such considerable disadvantages, as compared with those whose skill is attested by Government diploma or official rank, that only in rare circumstances can they have much chance of success.

The natural division between the civil and the military branch of the profession of engineer may be said to be everywhere prevalent. The latter forms, together with the artillery, the scientific portion of all European armies. But

the care of the State extends, in most educated countries, to the support of institutions for the training of civil engineers, and to the consequent recognition of the distinct and organised status of the pupils who pass through these establishments with credit. In France two distinct bodies of civil engineers—the *Ingénieurs des Ponts et Chaussées*, and the *Ingénieurs des Mines*—are in the service of the State. The *École Centrale* was founded, about 1830, by an association of savans to train engineers for private industry. Since 1860 this school has been transferred to the direction of the State. The *École des Mines de St. Étienne*, the *École des Arts et Métiers*, and the *École d'Alais*, are elementary and practical schools for the training of foremen and managers of works. The recognised civil engineer in France enters on the active discharge of the simpler duties of his profession after a careful and thorough education of some fourteen years' duration, seven or eight in a *Lycée*, three in the *École Polytechnique*, and three in the *Écoles des Mines*, or the *École des Ponts et Chaussées*, at Paris. The practical advance made by both the civil and the mechanical works of France during the past quarter of a century is such as to give a complete answer to any questions that may be raised as to the value of the professional training supplied by the State.

In Belgium the *Ateliers*, or Royal Schools instituted in the different provinces, invariably comprise a professional section, preparing the pupils to enter the *École du Génie Civil* at Ghent, the Military School at Brussels, or the School of Mines at Liège. Five different civil diplomas are granted by these schools; although the law does not forbid the title of engineer being assumed without a diploma. The same principle of careful provision for the educational training of a body of competent engineers adequate for the civil requirements of the country prevails, with minor modifications, throughout educated Europe.

With regard to the important question of the status of the civil engineer, either in this country or abroad, little is directly said in the volume before us. On the Continent, as a general rule, the civil engineer ranks with his military brother; holds an acknowledged position in society, a definite rank in his own profession; and on all public occasions, court ceremonies, and the like, has the *pas* over untitled civilians. In this country it must be admitted that the social position of an engineer depends on his personal qualifications, rather than on any *préjugé* reflected by his calling. The history of the profession is fresh within the memory of many of us. Before the great stimulus which was given to our public works by the genius of the Stephenson and their fellow-workers, civil engineering cannot be said to have existed in this country as a distinct profession. Men of practical sagacity, or of constructive or mechanical ability, such as Watt, Rennie, Telford, rose from time to time to fame by the sheer force of genius. The school, if school there were, of pre-railway engineering, was of a very modest and humble character. The immense impulse given to constructive works by the success of the Liverpool and Manchester Railway caused a sudden demand for civil engineers. Robert Stephenson then reaped the full benefit of the education which his father had procured an honourable parsimony in order to afford him. Isambard Kingdom Brunel brought to the aid of hereditary genius the unusual advantage of thorough scientific training, having been a pupil of the *École Polytechnique*. The early railway engineers who came at all near those two distinguished men in public esteem owed their rise, for the most part, either to fortunate combinations of circumstances, to experience, which, though limited, was the largest available, or to that practical sagacity in dealing with physical difficulties, or in inspiring confidence in those who consulted them, which is sometimes a safer acquisition than more brilliant gifts. These men had no tradition of learning, little *esprit de corps*, no idea of any duty incumbent on them to originate a Guild, or to found a Faculty of Engineering. Those of their pupils who had their wits about them obtained rapid promotion, which might enable them to learn their business; those who had no such qualifications were wearyable to find employment as surveyors (for the annual Parliamentary demand for plans), or as draughtsmen. A large body of men became rapidly congregated, with no organisation, no security for education, no definite aim but to do the work of the day,—to make as rapidly as possible the railways and

subsidiary public works, for which the public found the money.

Together with these impromptu engineers grew up the great body of contractors,—men trained, for the most part, to the use of the pick and the shovel, but often gifted with an instinctive knowledge of prices, and a wonderful practical sagacity, to which the world owes not a little. They made, in some instances, large private fortunes. But no one who is acquainted with the actual state of our experience as to the cost of work in 1832, can doubt that the contract system saved, in the early railway operations, many millions to the shareholders.

With the slackening of work consequent on our unwise and improvident effort to complete our great lines of internal communication simultaneously, a change took place which we regard not only as a professional, but as a national disaster. Engineers who had become accustomed to competence, or to more than competence; contractors who had made, or had lost, or had seen others make, large sums of money; dependents of all kinds, down to the sturdy army of the sons of labour created by our public works, viewed with natural dismay the cessation of employment. Then came a sort of galvanic energy, impressed by these men on the public, the period of "contractors' lines," a second season of activity, based on no real national want. The result was ruin. Loss to the shareholders, who had run after promised dividends like sheep at a gap. Ruin to many of the large contractors, who had been tempted by fabulous paper profit to undertake responsibilities which they could only sustain for a time, and of which the public declined to relieve them, and starvation to a host of engineers. It was not under such circumstances that—human nature being what it is—the status of the profession was likely to be defined, or the broad and deep basis of a well-tested education to be laid as the foundation of its future prosperity.

We are not among those who believe that there is no future for the civil engineer in England. But we hold that it is only by equalising the thorough scientific education of the Royal Engineers in this country, and of the civil and military engineers of the Continent, that that future will be secured. Very much is now falling into the hands of the Royal Engineers (the most highly educated body of men amongst us) that would be more naturally, and, in our opinion, with more satisfaction to all parties, discharged by civil engineers equally well educated. For all dealing with manufacturers, contractors, hygienic bodies, agricultural improvers, and the like, a military education is in itself somewhat of a disqualification. The attempt recently made to depreciate the value of the professional service of the architect and the civil engineer, to throw the responsibility of civil works, or of private speculation, on officers of the Royal Regiment, and to "sprinkle in" decorations by the employment of any architect who will condescend to take the part of a painter or decorator, is, we feel certain, most pernicious. In the face of a body either of civil engineers or of civil architects educated and organised as they are on the Continent, such an attempt would not only have been futile, but it would never have been dreamed of. As things stand,—thoroughly wrong as we are convinced that it is,—it can hardly be said to be without excuse.

We shall rejoice if the example of the Council of the Institution of Civil Engineers in publishing this volume be followed by other associated bodies. Nothing would be of more value at the present moment than a good description of the educational establishments which are doing so much for German engineering. The schools at Creuzot, or those attached to the manufactory of Herr Krupp, and some others on the Continent, are institutions of the highest technical value and of the utmost national importance. If we are to remain a manufacturing people, we must equal or excel our neighbours in this essential element of science. A clear, precise, masterly report on the technical schools of Continental Europe is a desideratum of extreme importance for our industrial future.

Proposed Church for West Brompton.—A church of large size is about to be built in Redcliffe-square, West Brompton. The designs have been made by Messrs. George & Henry Godwin, architects, and will shortly be submitted to builders for tenders.

ARCHITECTS, BUILDERS, AND THE PUBLIC.

THE following observations were made by the President of the Royal Institute of the Architects of Ireland at the opening meeting on the 24th ult., and will be found interesting:—

A topic of peculiar interest to ourselves has occupied a good deal of attention lately; and the discussion of it has caused a good deal of criticism—of a more or less depreciatory character—to be directed to our profession, its claims, its charges, its position, and its organisation. I allude to the well-known case of Mr. Ayrton, Chief Commissioner of Works, and Mr. Barry, as architect to the Palace of Westminster. It is unnecessary to occupy your time with any comment on the manner in which this controversy has been conducted. It is worth while, however, to advert to some of the points involved in the case, to remove misapprehensions in the public mind, which have prevailed even in quarters where the habit of judicial caution would, one would have supposed, have caused at least a suspension and hesitation in pronouncing against the custom of an honourable and not unlearned profession which has prevailed throughout the whole extent of Great Britain and America, and had so prevailed within the memory of man. A custom of such men, and so prevalent, is not to be condemned and dismissed as absurd without weighing all the circumstances. The case of the architect has to my mind never been fully or properly stated. Very important elements of it have been left merely implied by one side, and have not been appreciated by the other. I take it that our case, our whole case, stated broadly but simply, is this:—"After affording the client the full use of the plans, we claim the ownership of them, that they are ours, and that we have a right to them, that this right is founded in fairness and common sense, and has been maintained *semper et ubique et ab omnibus*." This is at once a tradition and dogma of the profession; and the only modification of this right is the right of the employer to the use of the plans as far as required for the execution of the works designed, or for explaining details of construction after execution. However circumstances may vary or modify its application, this is the right which we architects claim, which we all claim, which our fathers in the profession claimed before us—we claim no more than they did, and no less; even as they charged at the rate of 5 per cent. for the invention and use of their designs, we charge the same for the same; even as they gave only the use of the plans showing and explaining the invention, so we give only the use in the same way and to the same extent. What is there unfair or monstrous in this? In what way are the public defrauded? We have the same grounds for claiming the proprietorship in our plans as we have for charging 5 per cent. Will any judge say to a jury that an architect is not entitled to charge 5 per cent. for his services? Will he not rather say, and be bound to say, "It has been proved that 5 per cent. is the usual and customary charge for the services of an architect, and if those services have been performed, you must measure the compensation to be paid for them by that scale." Now, here we have a sort of equation: substitute proprietorship of plans for the 5 per cent. charge, and the judge's charge would run—"It has been proved that the proprietorship of the plans, according to the use and custom of the profession, remains with the architect, and you must find accordingly." The cases are perfectly parallel. It is not a question of feeling or fancy, or even reason; it is a simple case of barter and exchange, and therefore to be ruled by custom and usage. Only it happens that every one knows that an architect's usual charge is 5 per cent.; few have the opportunities of knowing exactly the limits and boundaries of what is contained and included in what the architect is bound by custom to give for the 5 per cent.

It is stated that a case has been submitted to the Attorney-General of England on behalf of the Crown, and that his opinion is adverse to the claim of the architects. This is of very little importance; counsel advise on the case put before them, and on that case only. Now, in every dispute there are at least two sides; and, before it can come on for trial, at least two counsel, more or less learned in the law, must advise each that the client who consults him has a good case, and yet one of them must have a bad one. It would spoil a good many

actions if only both cases could be submitted to one counsel; many a busy barrister, in such a state of things, would be reduced to the state of Neal Malone, the pugnacious little tailor, "blame-moulded for want of a fight." There can be no doubt that the opinion of the English Attorney-General is deserving of every respect, but until we see the case on which it was formed and expressed, we shall be premature in assigning any weight to it; and the previous history of this transaction, in which so much passion and prejudice has been intruded, leads one to view any case that would probably be submitted to counsel as subject to great suspicion of one-sidedness and unfairness—a case rather inviting concurrence in a foregone conclusion, than fairly describing doubts and asking for a solution of them.

Incidental to this question there has been a good deal of reference, in anything but complimentary terms to our profession and those bodies—such as our Institute—in which we are associated. They have been called trade-unions, and have been described as organisations for the purpose of overcharging the public. The unfairness of these charges and insinuations must be pardoned for the temptings of them. In the heat of debate the opportunity of delivering a knock-down blow affords an irresistible temptation; no man can pause and reflect on its unfairness. There are, however, differences between our trade-unions and those of Sheffield among the grinders, and those among our *collaborateurs*, the brick-makers of Manchester. We do not raise our rates of wages when trade is brisk, nor do we blow up, assault, or attack in any way, physically or morally, members of our profession who choose to work cheap. It is true we neither admire nor imitate such irregularities of practice; but we do tolerate them. Our trade-union peculiarities are therefore, so far as regards the rate of compensation for services, merely declaratory, and, as such, are as useful to the public as to ourselves,—both they and we have a common standard, easy of application, to appeal to, and by which we are bound. One moment's reflection will show any one that the public—the employers—are even more benefited by having a distinct, clearly-defined scale to appeal to, and by which to measure the value of services rendered, than we are. I will give you an instance. Not long ago a civil engineer made what were called, by a stretch of courtesy, plans of a building, for which he charged, and was paid, 70l. These were very rude and imperfect sketches, without specification, or such drawings of details as would have been necessary to enable an estimate of the cost to be made by measurement in the ordinary way. The building would have cost, if executed, about 600l. at the outside. Now, according to the rules of this our organisation for overcharging the public, had one of us furnished these plans (had you seen them you would recognise the wide stretch of imagination necessary to realise even in fancy the possibility of such a thing); but had they been supplied by a member of this trade-union, he would, according to its rules, have been entitled, when he had completed his work by supplying the additional drawings that were necessary and the specification, to a sum of 15l.! So much for our organisation for overcharging the public. I presume, however, that even our detractors will acknowledge that it is for the interest of the public that architects should be as accomplished as possible in all the arts and knowledge required in the practice of their art, and that it is not undesirable, in the same interest, that they should meet, and by the interchange of ideas and experience, mutually improve each other, and by establishing a healthy tone of public opinion among the members of the profession, keep up a standard of respectability among its professors and practitioners which can be maintained by no other means. We are not singular in having such an organisation,—every calling or occupation among us has its union of some sort or other; and, being founded on reason, usage, and custom, we shall take the liberty of maintaining it, in spite of ugly names and angry vituperation.

There is one branch of our professional practice which is in a most unsatisfactory state,—I allude to the measuring and surveying branch, which concerns itself about the preparing of bills of quantities from the plans and specifications, the measuring and valuing work executed, or the computing the value of works not executed. This is a very important matter, and one which is greatly in need of being regulated as to the scale of charges, according to the guiding prin-

ciple of our organisation as a trade-union, for the protection of employers, and to a less, but still considerable extent, for the protection of contractors. It is very desirable, and I earnestly invite the attention of the Institute to it, that a scale of charges should be framed and published under the authority of the Institute, such as it is, by which a remuneration would be fixed that should be fairly proportional to the labour and time expended. I would advocate, not one uniform per-centage rate, but a rate varying with the quantity and quality of the builder's work done or to be done; so that each employer should be called on to pay in proportion to the value of the services rendered to him. At present there is, I know, a rough approximation to such a system of charging, but it is deficient in every respect; and in fact there is no rule, or, as I would prefer always to put it, there wants an authoritative declaration of the usage and custom of the profession. There are other defects in the present system, or rather want of it. The independent building surveyor is subject to very great temptations. In common with all the rest of the world, he is liable to err—he, perhaps, more than usually so, from the business being one of immense detail, and not admitting of any such mechanical means of insuring accuracy as the system of double entry in book-keeping. For instance, probably no two surveyors, measuring from the same plans and specification, and using the same scale of prices, would bring out the same result. In this liability to innocent and hardly-avoidable error, there is an irresistible temptation to protect the contractor, who only has the means of discovering omissions or shortcomings by taking out all the quantities full, as it is technically called, which, being interpreted, means making the employer pay a little more on all items, to guard against the chance of his paying less on some than he ought. Another temptation not without weight occurs in cases of competition; and it is my experience of such cases that the measurer, although paid, in the long run, by the employer (the public), is generally appointed by and, in the first instance, paid by the builder; and that his continuing to be employed depends largely on his skill and ability in swelling the builder's bill. In theory, he is a sort of arbitrator; in practice, he generally is attorney for plaintiff; and, while I would never dream of charging them with purposely increasing quantities or prices with reference to what the amount of their percentage at foot of the account will come to, I do maintain that there is an unwholesome influence exercised by their position at present, which is such that they will lose their clients if they fail to make out big bills. Now the remedy for this state of things appears to me, and I throw out the suggestion with great humility;—(I am peculiarly circumstanced, but perhaps that peculiarity may be of some advantage in considering matters such as these.) The remedy I would suggest is, that the architect should resume the functions which have by degrees, during the last generation, been gradually devolved on a separate class of practitioners—a distinct branch arisen within the profession. I would recommend that we should become again architects and surveyors; that we should ourselves, either personally or by deputy, in our own office, or by employing some other person, but in every form of the case that we should ourselves be the responsible surveyor or measurer. This is very much the custom in England, and is, I believe, all but universal in Scotland. In England, however, I believe there exists a vicious custom of collecting the charges for these services from the builder, who in turn charges the employer. This is a vicious custom which I hope will never be established here, and it is wholly unnecessary. Let the charge made for the work be a fair and reasonable one, in accordance with a scale published by the Royal Institute of the Architects of Ireland, as the fair, usual, and customary charge for such services rendered, and there should be no necessity for disguise about it. Let the charge be made openly and above board to the employer himself, and therefore to his knowledge; not as the English practice seems to be, surreptitiously, anonymously, in disguise, as it were, as if there were something to be ashamed of. Such a course is largely for the interest of the employer, and not antagonistic to the proper interests of the builder; and in this respect also, should the suggestion which I have ventured to throw out be acted upon, our trade-union will prove itself to be endowed with the highest of the Christian graces,—the charity

which does good to its natural enemy—the public.

The most prolific source of suits at law about buildings is the question of quantity and value. Whether work is done or not, is a matter of fact, and capable of ocular demonstration; whether it is done well or ill, is comparatively rare as a subject of dispute; but quantity and value are the commonest grounds of dispute, and if the ingenuity of the most perverse of human beings were puzzled out to devise the worst sort of tribunal before which to bring such a dispute, none could be devised worse than a British judge and jury. With a judge alone there exists the disqualification arising from technical ignorance, but which is often to a great extent overcome and neutralised by intelligence and good ordinary common sense; but multiply the judge's worst difficulties and disqualifications by twelve, and you have a state of things so monstrous that nothing but the vicious conservatism of mere lawyers has maintained it to the present day. Our common law and trial by jury are themselves on their trial; thinking men are recognising both to be relics of barbarous ages, suitable for a state of society and relations which existed 300 years ago, but which no longer does exist; and we may hope that ere long courts will be established on the principle of deciding cases according to the equity involved in them, and no longer in accordance with arbitrary rules and precedents which have long out-lived the theories on which they were originally based; and it is further to be hoped that arrangements may be made for constituting courts so as that the bench shall not be occupied by a judge sitting alone and unassisted, to whom the technical description of the material facts of the case, expressed of necessity in technical terms, is conveyed, or attempted to be conveyed, in a language as unintelligible as Chinese.

If I am not occupying your time too long, I should wish to say a few words about building contracts and competitions, and our intercourse as architects with builders. I am only saying what is within the knowledge of you all, that building contracts have become a very different sort of thing from what they used to be. They are changed both in form and complexion, and, generally speaking, for the worse. I can remember the time when the ancient style of building was not yet quite exploded, when for every work, at any rate of any importance, each trade formed a separate contract, frequently taken by different men; the person who did the bricklayer and mason's work was a different person from the contractor for the carpentry and joiner's work, who on his part never meddled with plumbing, plastering, painting, &c. In this distribution of the parts of the work among several contractors there certainly arose jealousies and bickering and recriminations frequently if things did not go quite smoothly; each trade was anxious to thrust the blame of delay or failure on to his neighbour's shoulders, and progress was necessarily slower; but there was a compensation in the system for even more serious inconveniences, for each contractor was master, in the strict technical craftsman sense of the word, of his own trade; he had a personal and thorough knowledge of it in all its branches; he had learned it in its first rudiments as an apprentice, and had worked his way to mastership in it. This familiarity begot a feeling of pride in good workmanship, and there was also a sort of rivalry arising from other craftsmen having to follow him in the building to go over and finish his work. Now, in our present system a man may become a builder who knows nothing whatever of the craft of building, and if he be prudent and careful in the selection of the person he employs, he may rise to eminence and opulence by it. It is a fact that few of our builders have really learned their business as a whole. They generally know one trade—well, to which they were originally apprenticed—well, but of all the others have only acquired a very superficial knowledge. Now, to such men the value of work is estimated by what price can be got for it, not by the old scale of prices, based on the cost of materials, and workmanship, and a fair profit added thereto. In such hands workmanship must surely deteriorate. They have not in themselves the same standard of good work as their predecessors had; they are not as good judges of it—they cannot so thoroughly appreciate it; and consequently their chief standard is what will pass the architect's approval, as to quality, and what can I get it done for as to price—both which

considerations tend inevitably to lower the quality of the work, and to raise a trial of skill between architect and contractor—the one trying in vain to get for his employer what the contract sets forth in such constant iteration.—“Thoroughly skilled labour and materials the best of their several kinds,” and compelled in many cases to put up with, and give his certificate for, work which he knows well (and the builder knows too) is not of the quality that he bargained to get, but which is not so glaringly bad as to enable him to prove to the satisfaction of a judge and twelve jurymen that it is not what was contracted for. The builder's interest is only to make money by a job, and pass on to another; and the system of competitive tenders has tended to induce a sharpness of practice between architect and contractor which has gone a long way to overturn that feeling of mutual confidence founded on mutual respect which characterised the relation between them in former times, until a modern set of plans and specification is become a mere trial of skill and ingenuity between the parties. I wish I could even hope that such a state of things could be undone again. I wish we could look forward to a time when the architect would select his contractor from his known worth and intelligence, and pay him a fair price for good work actually done. But this is impossible. There is an amount of convenience to the employers in being able to look forward to the completion of their work at a certain fixed sum, that the system of contracts for a lump sum will always prevail—we shall never be able to get rid of it. We must, therefore, make the most of it by care in the preparation of our plans and specifications, by looking to the character of our builders, and by setting our faces against the acceptance of unduly low tenders. No man can be expected to do work at a loss, if he can avoid it; and if we are pressed with the usual argument that the tender should be accepted, and could be safely accepted if good security be given, it is our duty and our interest to press on the employer the consideration that he will inevitably lose more than the saving of cost in the lessened value of the work, and that a contract, if drawn up with all the ingenuity of man, is only of use with an honest contractor. A man who has nothing to lose will laugh at clauses engrossed on parchment; he is safe in his very impunctuality. The character of the contracting parties, and the absence of any unfair advantage on either side, are the best and most satisfactory contracts.

WHAT IS ART?*

If it be true, as has been surmised by a great critic of human nature, that the same words do not convey precisely the same meaning to any two minds, surely of no word could this be predicated more indisputably than of that short but hardly worked monosyllable “art.” The word is of late years in everybody's mouth; one can scarcely open a magazine without stumbling over an essay on art in some shape or other; but words, as Hobbes told us, are “the counters of wise men, and the money of fools,” and, assuming wisdom for a moment, it may not be quite useless to inquire what it is which this word really stands for with us; of what ideas, or class of ideas, is it the “counter.” To a good many who use it the term probably suggests indistinct images of picture galleries and sculpture ranged upon orderly pedestals; of an annual crush at the Academy rooms; or of Continental guide-books and ciceroni. To a selected few, who possess the golden key to the acquisition of a “taste” in art, it may rather seem to indicate a privileged lounge through the private studios of sundry painters, or a sale of “old masters” at Christie & Manson's, where the initiated may hold sweet converse in that peculiar shibboleth of conventional phraseology which Byron, referring to one branch of art, contemptuously stigmatised as

“The paltry jargon of the marble mart
Where pedantry gulls folly.”

There are those to whom art furnishes a trade as regular and lucrative as other more creditable pursuits; whose occupation is to make merchandise of the brainwork of better men than themselves, and who know to a guinea the market value of each work; and there are those more hardworking and praiseworthy mortals, to whom

“Art” stands as the lifelong endeavour to master the difficulties and problems of one or other form of artistic expression, laborious bit-by-bit, perfecting of the voice or the hand and eye in the self-assigned task of overcoming mechanical difficulties of execution, or of imitating, with arduous exactness, certain forms and aspects of external nature, but with little consideration as to what is the real end and good to be attained by all this conscientious expenditure of labour. And so one might go on enumerating, almost *ad infinitum*, the possible range of ideas which might be called up in various minds by the utterance of this one somewhat too familiar monosyllable. But is all this “art,” after all? There are separate “arts,” in a more technical sense—the art of singing, of portrait-painting, and so on,—but are all these collectively, or is any one of them that which we mean when we speak of “Art” in the highest and widest sense? Was it of such things that Goethe was thinking when he uttered the oracle that “He who has Art and Science (*Kunst und Wissenschaft*) wants not Religion”? Scarcely, one would think. What is it then, this unknown God to whom so many altars are inscribed, and whom divers ignorantly worship? Can our philosophers give us any assistance here?

Now it does so happen, rather curiously, that within a recent period, the two men who may be said to be the leaders of the most strongly opposed schools of thought among us, did on two very similar occasions give forth a kind of brief confession of faith as to what they considered art to be; both taking the great German artist and critic as their prompter, and both, though in sufficiently diverse fashion, coming to very much the same result. It may be suggestive to glance at this. In his rectorial address at Edinburgh, Carlyle, after alluding to the ideal school of culture described in “Wilhelm Meister,” continued:—

“Wilhelm left his own son there, expecting they would make him a master of arts, or something of that sort; and when he comes back for him, he sees a thundering cloud of dust coming over the plain, of which he could make nothing; it turned out to be a tempest of wild horses, managed by young lads who had a turn for hunting. His own son was among them, and he found that the breaking of colts was the thing he was most suited for. This was what Goethe calls art, which I shall not make clear to you by any definition unless it is clear already. I would not attempt to define it as music, painting, poetry, and so on; it is in quite a higher sense than the common one, and in which, I am afraid, most of our painters, poets, and music men would not pass muster.”

Truly, one may fear not, with a few exceptions. This is rather ambiguous, however, and perhaps those who heard it at the time might have a reasonable doubt whether it was “clear already.” Let us see whether Mill, in his address at St. Andrews University, has said anything to define the subject a little more clearly for average comprehensions. He tells us that,—

“There is a true meaning in the saying of Goethe, though hardly to be misunderstood, that the beautiful is greater than the good; for it includes the good, and adds something to it: it is the good made perfect, and fitted with all the collateral perfections which make it a finished and completed thing. Now the sense of perfection, which would make us demand from every creation of man the utmost which it ought to give, and render us intolerant of the smallest fault in ourselves or in anything we do, is one of the results of art-culture. No other human productions come so near to perfection as works of pure art. In all other things we are, and may reasonably be, satisfied if the degree of excellence is as great as the object immediately in view seems to us to be worth; but in art, the perfection is itself the object. If I were to define art, I should be inclined to call it the endeavour after perfection of execution. If we meet with even a piece of mechanical work which bears the marks of being done in this spirit,—which is done as if the workman loved it, and tried to make it as good as possible, though something less good would have answered the purpose for which it was ostensibly made,—we say that he has worked like an artist. Art, when really cultivated, and not merely practised empirically, maintains what it first gave the conception of, an ideal beauty, to be eternally aimed at, though surpassing what can be actually attained; and by this idea it trains us never to be completely satisfied with imperfection in what we ourselves do and are. *To idealise, as much as possible, every work we do, and, most of all, our own characters and lives.*”

In these noble concluding words, which might well form a text or motto for all the centres of education and culture in the land, Mill comes round to something very like the conclusion hinted at by Carlyle, viz., that “art,” in its broadest sense, is a maintenance of the highest ideal of life, the striving after an ideal standard never to be fully comprehended, always beyond our reach, yet always to be aspired after as it rises ever higher and higher. But for this last sentence it might have been objected that his definition was somewhat too hard and material (“the endeavour after perfection of execution”), as Carlyle's, on the other hand, is certainly too vague and abstract, and makes too little account

* By Mr. H. H. Statham, Jun. From a paper read before the Liverpool Literary and Philosophical Society.

of those concrete forms of expression commonly known as the fine arts. The real relation of these latter to the mental kingdom of art, to the "ideal beauty" spoken of above, is much and strangely misunderstood, and is not, perhaps, duly indicated, even in the latter of our two quotations, fuller and more precise though it be than the former. Both philosophers seem to be afraid of committing themselves to giving too high a place to a class of pursuits which unquestionably are made the pretext for an infinity of cant and humbug, and which are often practised successfully (in the eyes of society) by persons of anything but high intellectual endowment or culture. But, in fact, those concrete forms of art, music, painting, sculpture, though too often—

"Profaned by every charlatan,
And sold by all ignoble use—"

are, in fact, the outward and visible signs of an inward spiritual grace, the media through which that indefinable and longed-for beauty is given for the time visible form and feature, the bridge which gives passage from the finite to the infinite. But it is the bane of art, and what gives ground for the half-contempt with which the calling of artist is regarded by many strong and earnest men among us, that the means are constantly mistaken for the end, the physical and material expression regarded, to the exclusion of the metaphysical beauty which underlies this; the mere execution of the craftsman becomes the object of attention, and in place of being the exponent of an ideal world, is rather made a screen to shut it out from us. Too often this is the case with the professed artist himself, who, being mainly occupied in labouring at and perfecting one special form of expression, is under a ten-fold temptation to make that his end, and, unless endowed with an exceptionally high imaginative faculty, almost to lose sight of the ideal object of the art which he practises. How this aim after mere technical skill appears to the artist of really poetical temperament we may learn from a passage in the desultory writings of that remarkable genius, William Blake, the painter and engraver, whose works are only just now beginning to receive something like recognition from a minority of his countrymen. "A man," says Blake, "sets himself down with colours and all the articles of painting; he puts a model before him, and he copies that so neatly as to make it a deception. Now, let any man of sense ask himself one question,—Is this art? Can it be worthy of admiration to anybody of understanding? . . . No man of sense ever supposes that copying from Nature is the art of painting; if the art is no more than this, it is no better than any other manual labour; anybody may do it." The last statement, of course, is an exaggeration; and, moreover, it must be said that there is a high degree, though not a high quality, of pleasure derivable from the contemplation of perfect executive power in any branch of art—from such fruit-painting as that of the Lance, for instance, or from the performance by an accomplished singer of one of Rossini's brilliant pieces of vocal display. But it is no less certainly true that all the higher and more serious value which a work of art can have is in direct proportion to the thought which it contains, to the degree in which it feeds and stimulates the imagination. Finish of form in art is simply the necessary means (absolutely necessary, be it admitted) of setting forth the idea and preserving it for future generations. That this is comparatively little recognised, is partly due to the fact that so many persons interest themselves only in one form of art-expression. A man has a "taste," as it is called, for painting, or for poetry; or he is that most relentless of bores, a "musical man." But those who cultivate no perception but for one form of art-expression naturally come, by little and little, to lose sight of the ideal which underlies it, and dwell only on the material facts and technical skill displayed, about which they get up a disproportionate and even absurd enthusiasm. It is as applied to this class of amateurs that the word "connoisseur" (*quasi a non cognoscendo*) becomes so notable a misnomer, since they are precisely the persons who do not "know" or appreciate the genuine value and meaning of a work of art, but only its conventional or market value. It is when art is generalised; when the several forms in which beauty can be embodied are compared and found to be only various expressions of the same thing, that we learn to place the matriculation of art in its due subordinate position, and to recognise in its various

productions not the means to furnish a drawing-room decorously, or to prop up a society of music-makers, or furnish occasion for the rival display of mechanical sleight-of-hand; but rather the loved and joy-giving symbols of something perfect to be aspired to, channels of escape from the meannesses and littleness of every-day life into

"Regions mild of calm and serene air."

Viewed in such a light, art is surely something which it is good to look into,—something which a society of civilised and educated people might reasonably give their serious attention to, in striving to read aright its deeper and more recondite meaning. That we, however, as a nation, are far enough from any such serious and thoughtful appreciation of art, will, it is to be feared, be but too apparent even on a very general survey. Take, for instance, the art of painting, and its reception and treatment by the public, so far as exhibition-rooms afford a standard for judgment. The fine new suite of rooms of the Royal Academy shows as a motto round the entrance saloon the musical lines of Spenser:—

"The hearts of men that humbly here admire
Fair-seeming shows, may lift themselves up higher,
And learn to love, with zealous, humble duty,
Th' eternal Fountain of that heavenly beauty."

The selection is a most happy one, and perhaps it would be difficult to find a passage more truly indicative of the highest scope of the painter's art. But looking at a large proportion of the works annually exhibited, there is surely some difficulty in tracing any connexion between their subjects and treatment and the sentiment in Spenser's lines. Among defects peculiar to English art, nothing is more remarkable than the apparent aimlessness of a large portion of its productions: one cannot guess why many of the pictures one sees should have been painted at all. This common deficiency in English art was noticed by Mrs. Browning, in her coarse but clever poem, "Aurora Leigh;" where, after speaking of the comparative narrowness of French sympathies, she observes that in France nevertheless,—

"Art walks forward, and knows how to move;
The artists also are idealists,
Too absolute for nature, logical
To austerity, in the application of
The special theory; not a soul content
To paint a crooked pollard or an ass
As the English will, because they find it so,
And like it somehow."

In other words, a French artist paints because he has something to paint; an English one too often because he has to paint something. But if we turn our attention rather to the public than to the artists, and notice what is most admired by those who crowd our exhibition-rooms, the result is far more unsatisfactory, far more decisively in negation of the sentiment embodied in the motto above referred to. What are the pictures which attract a crowd round them, which are the object of delighted comment, which paterfamilias is entreated "just to come and look at?" Are they those "fair-seeming shows" which bring high associations in their train, which open the gates for imagination to wander in fairer and ampler regions? No: almost invariably the pictures which are thus singled out for popularity are representations of some ordinary incident of commonplace, even vulgar, every-day life: a dapper young man asking the "governor's" consent, while his "intended" weeps on the shoulder of a fat mother,—a good little boy reading to a namby-pamby mamma,—a railway station,—a court stag-hunt, or some paltry incident of middle or lower class domestic life. Lord Byron, in a letter written from Italy, said with equal good taste and refinement, that he cared for no pictures but such as reminded him of what he had seen or might see; "as for all your saints and Madonnas, I spit upon and defy them." The British Philistine, with a good deal more excuse, perhaps, is in the same state of feeling as his lordship: he wishes for nothing in a picture but a reflection of himself, or of his own habits or prejudices. He is, to do him justice, too respectable to "spit," and too peaceable to "defy" anybody or anything; and upon all works of ideal art he gazes with a stolid indifference, more hopeless to deal with than the most violent positive dislike.

You may spend two or three consecutive days in the Academy rooms in the high tide of the season, and scarcely hear one remark from any one of the crowd who move with difficulty through the rooms indicating the slightest idea that a

picture, if it is worth anything, is a thing worth serious study; that the artist's thought will not be laid hold of but by the spectator who brings thought of his own to meet it; or that the whole thing is anything but a more or less agreeable lounge, where it is the fashion to go, and where one can meet one's friends: indeed, but for this last motive, might it not be said, as it was of the concourse at Ephesus, that "the most part knew not wherefore they were come together?" It is not surprising that one or two of our most thoughtful artists have altogether declined competition for public favour in such an arena. And it can hardly be said that this nonchalant attitude towards the art of painting as publicly exhibited is compensated for by any very large amount of intelligent appreciation thereof in private life. It is true that the "patronage" of art (as it is termed), the ambition to possess a fine collection of paintings, is no longer considered as the exclusive privilege of the nobility; that this ambition is largely indulged by a class who a generation or two back would have scouted such an outlay as a frivolous waste of money. And there can be no question that among the wealthier mercantile men of England are to be found those who have both a genuine enthusiasm for, and a very competent critical judgment on, works of art of a high class; and that a perception of the value and dignity of art is slowly permeating social strata which were once considered to be necessarily innocent of any such predilections. But is there not, in the mean time, a vast amount also of mere ostentatious display of the power of the purse in such matters, a sort of feeling that it is "the thing" to have good pictures, a display of what is called a "valuable painting" exhibited just as another man exhibits particular old port, as something he was lucky in getting, and which every one cannot get? And is this a worthy way of looking at a great branch of imaginative art? And still nearer is that appetite for speculation in works of art which is too frequently met with, which leads a man to look out for pictures that are likely to rise in the market, and to boast (as we must all have heard people do) that he can get twice as much for that picture, any day, as he gave for it. It is to be feared that this mercenary view of art is only too much encouraged by the grasping and money-making propensities of some of the artists of most popular name among us. It was remarked by an eminent French critic, the late M. d'Henriet, whose admirable essays on art were familiar to readers of the *Revue des deux Mondes*, that many of the English artists, though they devoted a great deal of time to the study of the greatest examples both of ancient art and foreign contemporary styles, seemed to carry none of the fruits of it into their practice; "they make experiments," he says, "with a picture-dealer, and turn out rapidly the style of pictures which will be popular in the market." It is known that this is precisely the case with regard to some of the most popular English painters; and the result is what might be anticipated from such a system; the prices are forced up to a conventional standard by the avarice of dealers, and the painter, finding that he can get his own price for anything with his name to it, is content to turn out pictures with no recommendation except the power of manipulation which long practice has given him, and to repeat himself to any extent, until one is absolutely weary of the sight of his mannerisms. Hundreds of pictures of this kind are bought, at prices which are quite ridiculous, by persons who positively would not give a shilling for the same work without the artist's name on it. And this sort of folly and these forced prices foster the idea that art is only a luxury for the few; a notion which seems at least to be practically acted upon. In how many of the drawing-rooms of persons of average means do we find on looking at the walls any indication of the owner's tone of mind, anything to show that the pictures or prints hung there are introduced from any other motive than merely to fill up the wall and give the room a furnished look? Prints or photographs of some well-known popular picture, or some of those great coarse commonplace engravings which "Art-unions" dispense to their subscribers, mostly form the staple, with perhaps some starved little statuette of a Venus or a dancing-girl; and rarely indeed is there anything which suggests a new and original idea. Yet something far better than this is attainable, were it wished for, without pre-supposing extravagant outlay. I have certainly known rooms, and those of no wealthy owners, which it was a

pleasure to go into, not because their walls were decorated with expensive purchases, the work of well-known or famous artists, but because all that was hung there had a meaning and significance, and whether it was print, or photograph, or water-colour, showed unmistakably that it had found place there not as a mere piece of furniture, nor because it filled up the wall or went well with the carpet or curtains, but because it was something that is or is not loved, that answered to some phase of his own mind, and furnished the starting-point for some pleasant train of thought and association. Thus it is that genuine art, even in its simpler forms of expression, can impart a character and grace of its own to a dwelling, which no mere tasteless or ostentatious expenditure can emulate.

It has been said by Baron, in one of those weighty concentrated sentences of his, that "In the youth of a state arms do flourish; in the middle age of a state, learning; and then both of them together for a time; in the decline of a state, mechanical arts and merchandise." Does not this last ominous sentence seem to fall upon the ear like the knell of the real greatness of our country? That such an idea is present with some of the most clear-sighted and thoughtful minds among us, is evident enough from what we sometimes read,—notably so in a passage from one of Matthew Arnold's late poems, entitled, "Hilde's Grave," where, apostrophising the spirit of the departed German satirist, he says—

"I chide with thee not, that thy sharp
Upbraiding often assailed
England, my country; for we,
Fertile as a soil, for her sons,
Lazily, do pursue our arts
Folio the blare of her songs;
We, too, sigh that she dyes;
We, too, say that she wanes;
Scarce comprehending the voice
Of her greatest, a diet-moulded soul
Of a former age any more
Stupidly travels her round
Of mechanic business, and lets
Slow die out of her life
Glory, and genius, and joy."

It is to be feared that the class which is becoming in many respects the dominant one amongst us has little sympathy with anything that is great or elevated, little aspiration beyond its own restricted and mercenary ideal of life. If we are to rise above this, to escape from this "slough of Despond," it must be, as it seems to me, by informing the minds of the masses of society with some appreciation of a standard above themselves, with something like a love and desire for what is beautiful for its own sake, giving, as Wordsworth has said, "Nobler thoughts and nobler cares" than those of mere existence. We have plenty of schemes for the regeneration of society,—schemes theological, political, social, each claiming to be a universal panacea for all shortcomings of modern life: we have no lack of philanthropists,—some of them with more zeal than knowledge. But man shall not live by bread alone; nor will charitable schemes, almshouses, extension of suffrage, suffice to fill the void, and to convert mere blank existence into anything which can in a true sense be called life. To do this is the province of art, taking the term in the wide sense, as signifying the development of the beautiful side of life, the exhibition and setting forth through whatever form or language of ideal beauty. Progress in this direction must necessarily be gradual, for there are many prejudices to overcome before the ordinary Briton will consent to give anything like serious attention to art at all. Much of the highest art, for instance, deals with the most passionate feelings of human nature exhibited in all their force; but there is nothing from which your typical middle-class Englishman recoils so much as the display of naked passion; it is something which puzzles, we might almost say, frightens him. There is much education of mind to go through, too, before the highest language of art, the highest forms and types through which the beautiful can be made manifest, can even be understood at all by the majority; and it is towards altering this state of things that our national education should be more specially directed than it is.

Lead in Thornbury.—In a deep cutting near Grovesend, on the new line of railway between Yate and Thornbury, the men have come on a load of rich lead ore. Some years ago shafts were sunk near here, but the work was abandoned. The present discovery will most likely give a new impetus to the scheme.

"COLESHILL BUILDINGS," PIMLICO.

The pile of dwellings in Ebury-street, Pimlico, opened in November by the Duke of Cambridge, as we briefly mentioned in our last, has been erected by "The Improved Industrial Dwellings Company," better known as Sir Sydney Waterlow's Company, which was founded in 1863 for the purpose of affording to the working-classes healthful and comfortable homes at fair rents, and getting in return a fair per-centage on the money expended. To obtain a reasonable commercial profit on the capital is, in the opinion of the directors, "an absolute necessity, in order to secure the progress of the work of reconstruction which the company has undertaken, and the first consideration is, therefore, to provide dwellings thoroughly adapted to the requirements of those for whom they are intended, and of so attractive a form and appearance as to obviate the objection often expressed to 'model lodging-houses,' as they are sometimes rather ostentatiously called." They properly laid down as a rule that every tenant must have complete and exclusive use of all the essential accessories to a home, such as water supply, sink, copper, dust-shoot, coal-place, and water-closet. In some cases, economy of space and cost of building have been sought to be obtained by arrangements whereby two or more tenants have had the use of those requisites in common; but the divided use of such adjuncts to the dwelling very much diminishes its value, and the few cases attempted by the company proved comparative failures. There can be no doubt as to the necessity of providing these appendages to every dwelling.

At the present time the expenditure and commitments of the company on capital accounts amount to about 200,000*l*. Of this sum, 125,000*l* have been subscribed by the shareholders, 52,000*l* have been borrowed from the Public Works Loan Commissioners, under "The Labouring Classes Dwelling-houses Act, 1866," and negotiations have been entered into with the commissioners for an advance of the balance. We give a list of the dwellings which have been erected by the company:—

	TENEMENTS.				Total.
	Three Rooms.	Two Rooms.	One Room.	Shops.	
Cobleshill-buildings, King's Cross-street, Ebury-street, and Grove-street, Greenwich	8	19	...	2	29
Tower-buildings, Brew-house-lane, High-street, Wapping	20	20	...	...	40
Staple-buildings, Old St. Peter's-road, King's Cross	30	30	...	...	60
Palmerston-buildings, City Garden-road, City-road	51	50	...	3	104
Crownwell-buildings, Red Cross-street, Southwark	36	36	...	...	72
Derby-buildings, Britannia-street, and Wicklow-street, King's Cross-road	10	12	...	2	24
Gladstone-buildings, Willow-street, Finsbury	40	118	...	10	168
Waterloo-buildings, Bethnal-green Estate	84	84	...	...	168
Ebury-buildings, Ebury-square	21	48	3	...	72
Cobleshill-buildings, Ebury-street and Queen-street	40	25	...	4	69
Buildings in course of erection at Bethnal-green	50	60	...	10	120
	...	130	...	...	130
Total completed and in course of erection	300	623	3	31	1017

The company also purchased at Bethnal-green an estate of about nine acres, which was chiefly covered with small dilapidated houses. Many of these have been pulled down and replaced by improved dwellings, and the remainder will ultimately share the same fate.

The net return upon the capital invested, after carrying the proper contributions to the leasehold redemption, and other reserve funds, has been sufficient to pay a uniform dividend of 5 per cent., and to carry forward balances which at the 30th of June last had accumulated to 2,603*l*.

Let us look now to Colehill Buildings, Ebury-street. Here there are five blocks of buildings, each six stories in height from the basement. The general plan of a block may be described as a parallelogram, having a frontage of 56 ft., divided into four sections by a party wall in the centre, and a passage in the middle of each wing. The two centre sections are set back about 3 ft. from the front line, for the purpose of giving space for a balcony of that width on each

of the upper floors. Each section comprises one suite of rooms, to which access is obtained from the passages leading direct from the balcony. The balconies are reached by a fire-proof staircase, which is continued to, and gives access to, the roof. The larger dwellings, consisting of three rooms and a small kitchen, occupy the end sections of the building. The living-room in each dwelling is provided with a range having an oven and boiler. Leading out of the living-room is the kitchen or scullery, which contains in every case water-cistern, sink, a small fire-place, washing-copper, dust-shoot, and water-closet. The front room is a parlour having two windows.

The centre sections, comprising the smaller dwellings, consist each of two rooms and a kitchen. The plan is the same on each side of the party walls, and every floor or flat is a repetition of the other. In the ceilings of all the rooms a ventilator is placed, which communicates with air-shafts running through the centres of the blocks. The lower panes of the windows are filled in with ornamental ground glass, so that no window-blinds are necessary. The windows are constructed so that the two lower panes are not made to open, and the danger of children falling out, as well as the disadvantages of the ordinary window sashes, are avoided. All the rooms are 8 ft. 3 in. in height. Drainage is effected by means of stoneware pipes passing from the top of the buildings, down the corners of the wash-houses, into a syphon trap, with an upcast ventilating pipe, and thence direct to the common sewer. The dust-shaft carries the dust to covered receptacles at the base of the building, and each shoot is provided with an iron cover, so as to prevent the return of dust and effluvia. The dust-shafts are also continued to the top of the building, and will act as ventilators to the dust-bins. All the rooms are plastered and papered, the woodwork is grained and varnished, and the kitchens are plastered and coloured. Every tenant has his apartments completely to himself, and nothing is used in common except the drying and recreation ground.

An arrangement worth noticing is, that provision is made for a constant supply of water to each of the houses. By a clause in a recent Act of Parliament, the water companies are bound to provide water by meter to those who demand it. It occurred to the company that, by the erection of capacious tanks at the top of each block, they might obtain the means of a constant supply of water to each family at a cheap rate, if they could secure themselves against the inmates wasting it. For this purpose they have fitted the water-pipe in each house with a spring of an ingenious construction, which, when the tap is turned on, allows a moderate supply of water to be drawn, and then stops of its own accord. This effectually prevents the negligent waste of water, and nothing but downright malice can cause it to run to waste. The effect of this will be, that each family in all the tenements will have a constant supply of water in his home every day in the week. This arrangement was made by Messrs. J. Tylor & Sons, of Newgate-market, who have also perfected a stand-pipe, which has an ingenious contrivance of internal valves, so that, even if any one should carelessly leave the tap turned, the valve would shut after a short time, and the water would cease to run. The apparatus well deserves attention, and will enable water companies to do more for some of our courts and alleys than they have hitherto been led to effect.

We will mention that the whole of the stores, cooking-ranges, and cast-iron mantels, numbering in all more than a thousand, were supplied by Messrs. Yates, Haywood, & Co. These have been made under the immediate direction of the architects, and, for simplicity and cheapness of construction, are worth attention. The ranges, with oven and boiler, cost 22*g*. 6*d*. a piece; the iron mantel-pieces, with trusses, 14*g*.; and the scullery-stoves, 6*g*. 6*d*. a piece.

The architects were Messrs. Beck & Lee; the builders, Messrs. J. Perry & Co. The "Ebury Buildings," close by, were erected by Messrs. M. Allen & Son. The cost of the Colehill Buildings is put down by the architects at 51*l*. a room.

One of the chief features in the construction of the dwellings, claimed to be peculiar, is the use of the patent stone manufactured by Messrs. Allen & Son, who built the company's first houses. This material is used for lintels, stairs, window dressings and sills, slabs, and so on;

and it is estimated that by its use a saving of about 20 per cent., as compared with other materials, is effected. In the first-built houses it was used for chimney-pieces, amongst other things; but its employment in this position is discontinued. The stairs at Palmerston-buildings, four or five years old, appear much worn,—the traffic being considerable. The material, we are told, is a concrete of gas breeze and Portland cement, in the proportion of five parts of the breeze to one of cement. A little pure cement, liquid, is first put into the mould, and gives a face to the work that requires no further manipulation.

In speaking of the buildings of a company so well intentioned as this we are unwilling to find fault, but we have an objection, and are bound to state it. We are forced to complain of the want of bedrooms. For a family, the dwellings which have but one chamber are incompatible with ideas of propriety and decency, and the same objection applies to the whole unless the intention of reserving a parlour or bettermost sitting-room be abandoned in favour of providing an additional chamber. We commend this point with great seriousness to the consideration of the directors.

The rent charged, if we understand rightly, is 5s. 9d. a week for the dwelling with one living room and one chamber, and 7s. 6d. a week for that with parlour additional.

The completion of these buildings will close the operations of the company, so far as the employment of its present capital is concerned; but they are quite ready, it seems, if more capital be subscribed, to go on again.

BRIDPORT, DORSETSHIRE. SANITARY INQUIRY.

For ten years past the sanitary condition of Bridport has been the subject of grave and anxious discussion. An inquiry has been often asked for and demanded; but things have gone on from bad to worse. Matters, however, have culminated at last, the Home Secretary having appointed a commissioner, Mr. Arnold Taylor, to institute an inquiry into the state of the town. The inquiry was to commence, in the Town-hall, on Wednesday, the 30th ult. Had the few mistaken obstructive who for several years opposed all local improvements ceased to pursue their mischievous and fatal policy, the town would have been spared a compulsory measure. No doubt the result of the inquiry will show what we have over and over again stated in these pages,—hundreds hurried to premature graves; hundreds more suffering a living death, the consequence of bad sewerage, defective water supply, unremoved filth, badly-constructed and badly-ventilated dwellings, and general neglect, public and domestic.

SANITARY SHERBORNE.

They have peculiar ways of bottling-in smells, and "bottling up" surveyors' and medical officers' nostrils that are too sensitive, in Dorsetshire. The local surveyor in Sherborne, like a sensible gutters, drains, and so on, and the medical officer pointed out the bad places in the town where want of sanitary precautions was likely to result in an epidemic, fever and other symptoms having shown themselves. The chairman of the Board mastered some of his friends, and proceeded to visit the places pointed out as dangerous. The result was that the chairman and his accompanying friends declared "that they were really surprised to find the places pointed out so clean, tidy, and free from smells." We have no doubt that several other people would be equally surprised to hear this information. At the "full moon," it appears, the lamps are not lighted in economical Sherborne, nor even on dark nights when they are absolutely necessary. Does this arise, we wonder, from the fear of having a light thrown on such a dark subject as the black spots in the town? The surveyor was ordered to see to the gas-lamps, the road repairs, and the butcher nuisances; but the medical officer was ordered to be reprimanded and to be more careful in future of speaking or even alluding to foul smells, as it was likely to injure the town. This is certainly a novel method of carrying out sanitary improvements. What hope can there be of public life and safety if sanitary and medical officers are snubbed for being

active in doing their duty, and pointing out a danger? If even the possibility of danger existed, do we not all know and agree that "prevention is better than cure?" It is likely that if we are called upon again to notice the matter, we shall supply the local authorities of Sherborne with facts from personal investigation that they should not ignore. Sherborne no more than Glastonbury is in a position to challenge inspection at this moment in respect of its lanes, roads, sewers, and closets. The local Board, chairman, and others, ought, therefore, to set about doing what is necessary for the health of the town, instead of denying patent evils, and snubbing their officers for performing the most important duties of their office.

WORKS DONE AT THE CENTRAL PARK, NEW YORK.

The thirteenth annual report of the Board of Commissioners of the Central Park, at New York, for the year ending December 31st, 1869, has been issued in a printed form. The report is illustrated by numerous photographs and engravings of various subjects of interest in the park, such as statues and buildings, walks, cascades, and other views, animals, &c. We condense a little what relates to works done and proposed, and other transactions, in course of the year reported on.

The forces of the park have been generally engaged in the development on the grounds of plans heretofore adopted, and in maturing the plans for future operations. The Belvedere at the high ground of a central portion of the park is advanced so that the form of the tower at its south-easterly angle, and the open shelter at its south-west corner, are well defined and readily observable. This structure is designed to afford a prominent place of look-out over the whole extent of the park. The House, situated just north of the play-ground, is complete, and is much used by the boys, for whose convenience it was erected. The Children's Cottage is complete, and is also very much used. The Dairy, a rural structure of stone, is well forwarded. It is arranged for the convenient serving of milk and similar refreshments. The ceiling of the terrace has been laid with encaustic tile of varied design, and the decoration of the ornamental ribs of iron has been finished. All that remains to complete this ceiling is the introduction of the glass panel that is to admit the light upon the statues designed to occupy the central space immediately under it. The laying-out, fertilising, and planting of the maze or labyrinth, on the east of the old reservoir, is completed. This comprises within its inclosure 3,700 lineal feet of gravel walk, and 2,250 trees, as borders or screens to the walk, and is intended to render an attempt to reach its central point or to find a place of exit somewhat amusingly intricate and difficult. A fountain has been arranged at the Harlem Lake, by which a high jet of water is played whenever the supply in the reservoir is such as to admit of its use. A large stone, 17 ft. square, of polished Westerley granite, for the basin of the terrace fountain, has been contracted for. The bronze figures for this fountain are now in course of casting at Munich. The foundation-course for the horse drinking-fountain, at the circle, is set, and a large portion of the ornamental stonework is on the ground. A movable house has been nearly completed, for a cover to prevent damage to the music pavilion by the storms and snows of winter. For the purpose of compacting the bed of new roads, and also the surface of these roads, the Board has imported a steam road-roller, weighing about 15 tons. Invitations were sent to prominent mechanics and others interested in this class of machinery, to attend a trial of its propelling and compressing capacity. It was readily propelled from 110th-street, up the Great-hill, on a grade of 4.61 ft. in 100, and returned down the hill without difficulty or apparent stress on the machinery. The roller has been for some months used on the drive and circle in compacting the earth and surface road-metal. Professor B. Waterhouse Hawkins has been engaged in advancing the group of fossil animals more fully alluded to in the last annual report. A very wide interest, both in this country and in Europe, has been excited among scientific men by this interesting and novel undertaking. The great group of ancient animals formerly living, during the secondary geological epoch, on the continent of America, now being modelled and restored to the natural size and appearance of

the animal as in life, by Mr. Hawkins, for the Central Park, consists of the gigantic hadrosaur, of the exact dimensions (one 26 ft., the other 39 ft. long), as proved by the fossils described by Dr. Joseph Leidy in the "Smithsonian Contributions to Knowledge, No. 192;" also models of Laelap's *Aquilunguis* fossils, described by Cope, together with the aquatic *Elimosaurus* and *Mosasauros*. The second division of the group will illustrate the post-tertiary period, and represents the mastodon, the mammoth, megatherium, megalonyx, glyptodon, &c., thus uniting the early periods of animal life with the earliest evidence of man's existence, and so constituting a complete visual history of the American continent from the dawn of creation to the present time. The excavations for the structure for this department of the museum are now going on. The Board has been exceedingly desirous to proceed with the Zoological Gardens. The chief occasion of delay is the want of a proper outlet for the drainage of the ground and the regulation of the streets and avenues about it. A sewer has been commenced, which will in part accomplish this desideratum; but it will probably be at least a year before it is fully completed. The avenues and streets that surround these grounds are in such a state as to render them almost impossible of approach, and extensive excavation and filling is now going on in the vicinity. With these difficulties to contend with, over which the commissioners of the park have no control, they have done as much work in the last year as seemed practicable. In the habitations for the animals of the gardens, every arrangement that will conduce to their healthfulness and to the facility and convenience of observing them will be provided. Some progress has also been made in the preparation of designs and models for the houses for tropical carnivora. The plans of the proposed astronomical observatory have been much discussed, and extensive inquiry and examination has been made into the designs adopted for similar institutions.

Experiments were being made with Cooper's patent road-watering process, the commissioners having got a few tons of the deliquescent salts from England for trial.

The rate of tax for the year 1869 is 2.27 yielding, on the increased valuation above stated an increased tax of \$2,110,150.54 dollars.

The total expenditure for construction, from May 1, 1867, to January 1, 1870, is	\$5,775,387 14
The cost of the land of the park to the city is	5,028,844 10
Total cost of park to the city up to this time	\$10,804,231 24
Total increased tax in three wards...	\$2,110,150 54
The annual interest on the cost of the land and improvement of the park up to this time, at 5 per cent. ...	\$518,233 57
Deduct 1 per cent on \$99,300 dols. of the above stock, issued at 5 per cent.	3,993 00
	652,240 67

Excess of increased tax in three wards over interest on cost of land and improvements \$2,157,903 67 |

A report of works outside the park follows the main report, and there is a voluminous appendix, with relative tables, diagrams, and plans.

STONEMWORKING MACHINERY.

We have examined with much satisfaction the working of some machines for sawing and moulding stone set up in Battersea, by a company which has purchased the patented inventions of Mr. G. Hunter and Sir William Fothergill-Cooke. The machine in question consists of a bed made to travel longitudinally, with a shaft mounted over it for receiving the revolving cutting or moulding head. So far, the machinery resembles that used for sawing; the head, however, instead of being a plain disc, with cutters, is shaped to the profile of the required moulding, and has the cutters fixed in it according to that outline. The rough block being fixed on the bed, which is made to advance while the head revolves, the upper face of the stone is cut very nearly to the shape of the desired moulding; the edges, however, are rather blunt, and the surface shows the tool-marks. When this operation has been performed, a scraping tool, formed exactly to the moulding, is fixed over the block; and the block being made to traverse several times under this scraper, has its face finished true and smooth, with sharp, clean edges, and the perfect profile required. We saw some

strings and moulded steps well worked in a remarkably short time. The cutters being built up, as it were, can be made to give any required outline, and their form is such that they work a considerable time without needing grinding. A large amount of work for St. Thomas's Hospital has been done by one of these machines. Great saving of money and time is effected, and we should think the machinery can scarcely fail to come extensively into use.

Machinery for tunnelling, quarrying, and sawing stone is worked by the same company. Captain Palmer is the provisional manager, and Mr. John Imray the engineer.

ST. ANDREW'S, WELLS-STREET.

St. GEORGE'S Hall, Langham-place, was the scene of a very interesting gathering on Wednesday evening last,—a parochial tea-party, which included the children of the boys', girls', and infants' day-schools; the children of the Sunday and night schools for boys and girls; the members of the Young Women's Friendly Society, and of the Young Men's Confraternity; the aged pensioners and communicants of the Church; and the women of the Parochial Mission, with their husbands. There were thus in the body of the hall about 700 persons, while the galleries were filled with inhabitants of the parish, who paid each a shilling to be lookers-on.

Mr. Herbert Barnard, presiding, made a happy little speech; and then the school-prizes were presented to the winners: Mr. Hughes, M.P., speaking afterwards. Miss Robertine Henderson and other volunteers sang some songs agreeably; and "Blue Beard" was brought from over the way, thanks to Professor Pepper, for the special delectation of the children. Chief praise is due to the vicar, the Rev. Benjamin Webb, for the success which has attended these gatherings of all classes of his parishioners. They constitute a parish "union" of a more agreeable kind than usual. New schools of considerable extent have just now been completed under the direction of Mr. G. E. Street, and the reredos in the church, designed by the same architect, and cleverly executed by Mr. Redfern, is fast growing to completion. The whole, with its doubled tracery and involved groups in very high relief, has a mixed Spanish and German aspect, which is novel in London.

GLASGOW UNIVERSITY.

The old pile in High-street and adjacent is in course of demolition, and the new buildings on Gilmore Hill, erected from the designs of Professor G. G. Scott, R.A., have been formally opened. We give a view of them, and plan of the ground floor.

The University of Glasgow was originally founded by a Bull issued by Pope Nicholas V., and dated January 7th, 1450-1, exactly forty years later than its only senior, the University of St. Andrews. It was established under the name then given to such institutions, viz., *Studium Generale*, which included theology, canon and civil law, and the arts. It owed its existence chiefly to the exertions of Bishop Turnbull, who in right of his office was appointed under the original foundation chancellor and rector of the University. From the first it formed an incorporation, including the chancellor and rector, the various masters and doctors in the faculties of theology, canon law, and the arts, and the incorporated students in these faculties; and it received the power of conferring degrees upon those who had pursued their studies in the manner prescribed by the statutes.

The University, though then destitute of endowments, and dependent solely on the contributions of the students and of persons interested in the promotion of learning, soon attained considerable success, so that, within four years after the original foundation, the business of instruction was proceeding with zeal and efficiency in a building situated not far from the cathedral, in the street now called the Rottenrow, and adjacent to the chapter-house of the Dominican Friars. This building, called the Pedagogium, appears to have been leased to the University by the bishop upon payment of a rent; and, along with the halls for delivering lectures or carrying on instruction, a house was provided for the residence of the students.

As early as 1460, James, first Lord Hamilton,

gifted to the Faculty of Arts a site in the High-street, for its operations, and steps were taken for erecting or adapting buildings in the locality which has been ever since occupied by the college.

To this place, then, about the year 1465, the teaching and residence of the members of the University were transferred in whole or in part; and the name of Pedagogium, or college, was applied to the new buildings.

Thus, with various success, the business of the University, and of the faculty of arts within it, was carried on until the time of the Reformation, when, along with other institutions of Roman Catholic origin, the University was thrown into confusion by the loss of the support which it had previously derived from the Church.

In 1574 renewed animation was given to the academic teaching by the advent of the celebrated Andrew Melville; and such was the success of the University at this time that the account of Melville's nephew, confirmed from other sources, is not to be looked upon as exaggerated, when he says that "there was no place in Europe comparable to Glasgow for guid letters during these years for a plentiful and guid chepe mercait of all kinds of languages, artes, and sciences."

From the time of the first acquisition of the tenement in the High-street we find in the records frequent mention of the application of all the money belonging to the Faculty of Arts to the erection and repair of buildings; but the funds must have been of the most scanty amount, and the work must have proceeded very tardily; for in 1563 they were still incomplete, when the confusion attendant upon the Reformation disturbed the projects and workings of the College and deprived it of all its resources.

The buildings in the High-street and adjacent ground appear to have been erected at various times,—a small portion of them only dating earlier than the year 1632, when the restoration of the oldest University buildings began.

They consisted of four courts or quadrangles, of which, however, two only form part of the original structure of the seventeenth century, viz., the outer court fronting the High-street, and the second or inner court, communicating with the first by an archway below the tower or steeple. It is but fair to mention that the Glasgow University is an institution whose benefits are not confined to the city or neighbouring districts. Its students, upwards of 1,200 in number at present, and likely to be largely increased, are composed of natives of every county in Scotland without a single exception, and include also in considerable numbers Englishmen, Irishmen, and Foreigners—all of whom receive a first-class university education at a very moderate expense.

It has had remarkable teachers. Speaking of the last 100 years, Mr. Cosmo Innes says,—“No other school of learning, within so short a period, can boast of an array of teachers like Galien and Black in chemistry and medicine; Hutcheson, Reid, Adam Smith, in mental philosophy; Moore, Young, and Sandford, in Greek literature; John Millar and Jardine, in what may be called the art of education.” Nor is it unimportant to remember that it was in Glasgow University that Adam Smith delivered those lectures on political economy which formed the basis of his “Wealth of Nations.”

The necessity for removal had long been felt by those most intimately acquainted with the condition and management of the University. It was recognised so long ago as 1816, when a Bill for the sale of the present grounds and buildings of the Monklands Junction Railway Company and the transference of the college to a new site on Woodlands was passed by both Houses of Parliament, and received the Royal assent. The failure of that measure was only caused by the inability of the railway company to implement their engagements. The reasons for removal became still more urgent than before. But the University authorities found no favourable opportunity for the renewal of the scheme till the year 1864, when a proposal for the purchase of the college lands and buildings was made by the City of Glasgow Union Railway Company, and a sale was accordingly effected with that company, under their Act of Parliament, at the price of 100,000*l*.

Designs were then obtained from Mr. Scott, the necessary money was raised, and the new buildings, as we see them, have been completed.

They form a large oblong rectangular pile, about 600 ft. long, speaking broadly, by

300 ft. wide, and divided in the middle by a building which separates two quadrangles, each of which is about 180 ft. square.

The whole block of the buildings may be divided into,—

1. The south front, with the west angle tower at the north front, containing the art and science class-rooms, with extensive laboratories, in connexion with the natural philosophy and chemistry.

The great tower in the centre of the south front forms the main entrance for the students; on the first-floor is the court-room, with direct communication into the great forehall (yet to be built). Besides the belfry, clock-room, &c., in the upper stages, there is the cold-air chamber in the sub-basement, through which every hour 1,000,000 cubic feet of fresh air are to pass, for the supply of fresh and hot air for the heating and ventilating of the whole building, the cold-air chamber being fed through four large extraction shafts in the east and west walls of the main tower, terminating at a height of about 150 ft. The tower is 200 ft.; the wooden spire, covered with lead and slate, 110 ft. high. There are the examination-hall, and the great staircase at the east of the main tower; and the senate-room on the first-floor at the west.

2. The east building comprises all the medical class-rooms, with the laboratories in the basement. With each class-room is a professor's private room, in connexion with a mezzanine above, fitted up as a private library or museum, as the case may be.

The students' platform in all the medical and other demonstrating class-rooms is raised in a curvilinear system, worked out by Dr. Allen Thomson, to 8 ft., 9 ft., and 10 ft. above the floor line, and reached by a separate staircase: in those cases there are two separate entrances for the students.

3. The north front, the centre portion, with a circular end, containing the students' general meeting-room in the basement, the reading-room on the ground-floor, the valuable collection of books and coins by Dr. Hunter, on the first floor, from whom it derives its name, the Hunterian Museum. East of the centre building is the general museum, with its laboratories and workshops in the basement; west, the library, containing over 100,000 volumes, with extensive premises for workshops, &c., in the basement.

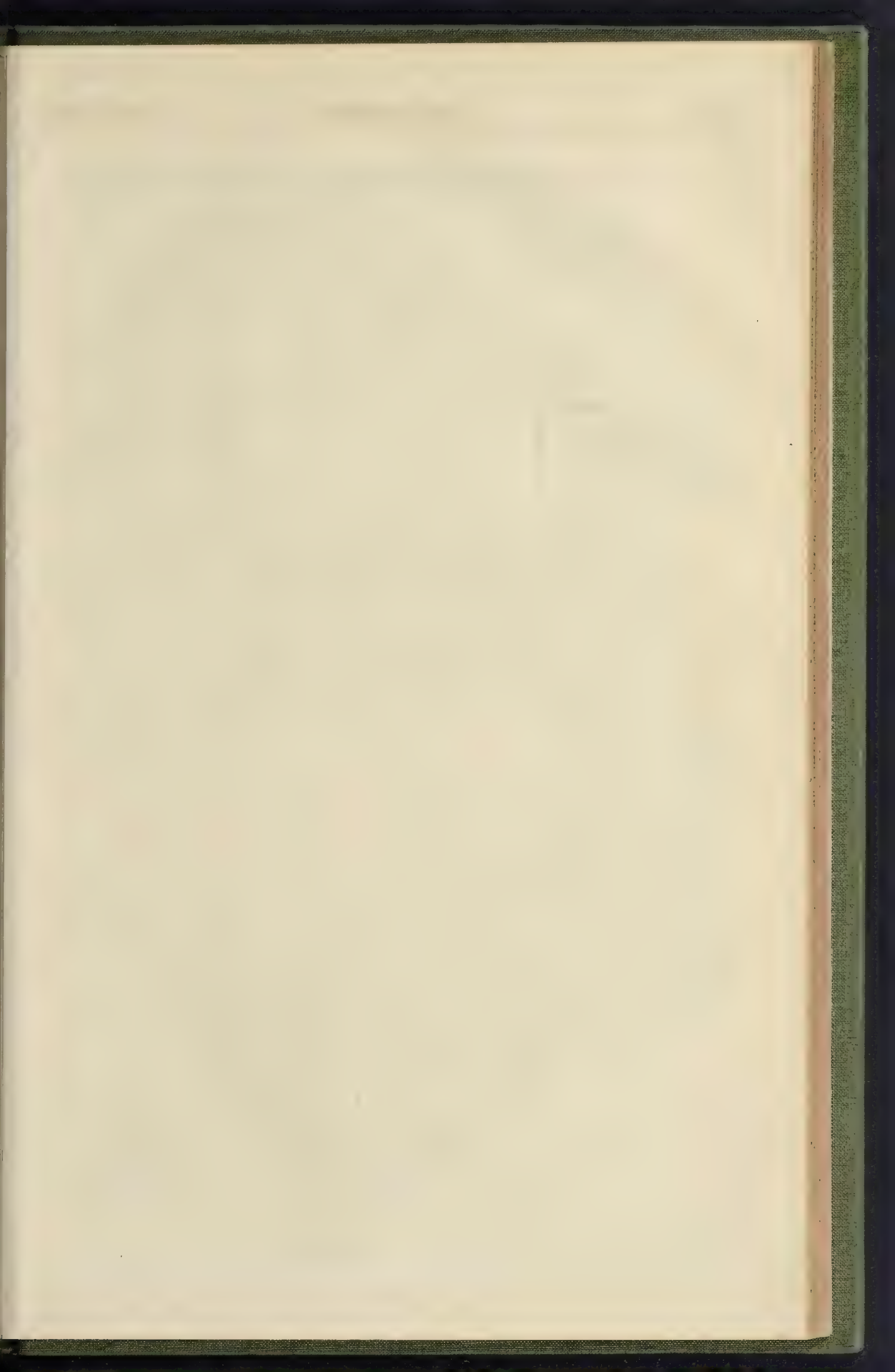
There are two carriage-entrances through the two gates on the south front, leading to the courts; a carriage-entrance on each side of the centre building, on the north front. The level being 16 ft. below the level of the court, the same is reached by a large staircase; the commencement to the large staircase in connexion with the great hall, for the whole of the foundations, is completed to the ground line. There are provisions for three large hoists, to be worked by steam. The attics at the east and south buildings, 10 ft. 6 in. average height, are used for model-rooms and museum purposes.

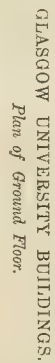
4. The professors' court, at the west of the College buildings, consists of thirteen houses, in lieu of those in connexion with the old college, the whole standing on a lower level of 15 ft.; a block of two houses, on a line with the south front, forming the south block, the residences of the principal, the Right Rev. Dr. Barclay, and of Dr. H. Caird, professor of divinity; seven residences, forming one block to the west; four residences, forming one block to the north, arranged for further extension. To the west is the students' recreation-ground, about 5 acres, with the new hospital, to be erected farther west, which will form the extent of the scheme.

The dimensions of some of the principal apartments are as follow:—Library, 129 ft. by 60 ft.; museum, 129 ft. by 60 ft.; central hall, 114 ft. 6 in. by 70 ft.; Latin, chemistry, natural history, and Greek class-rooms, each 40 ft. by 40 ft.; laboratory, 52 ft. 7 in. by 34 ft.; moral philosophy, 37 ft. 10 in. by 34 ft.; medical jurisprudence, 34 ft. by 30 ft.; physiology, 34 ft. by 34 ft.; small museums, each 30 ft. by 22 ft. 6 in.; reading-room, 73 ft. by 51 ft. Our plan shows the ground floor of the main building and the basement floor of the low buildings on the right-hand side.

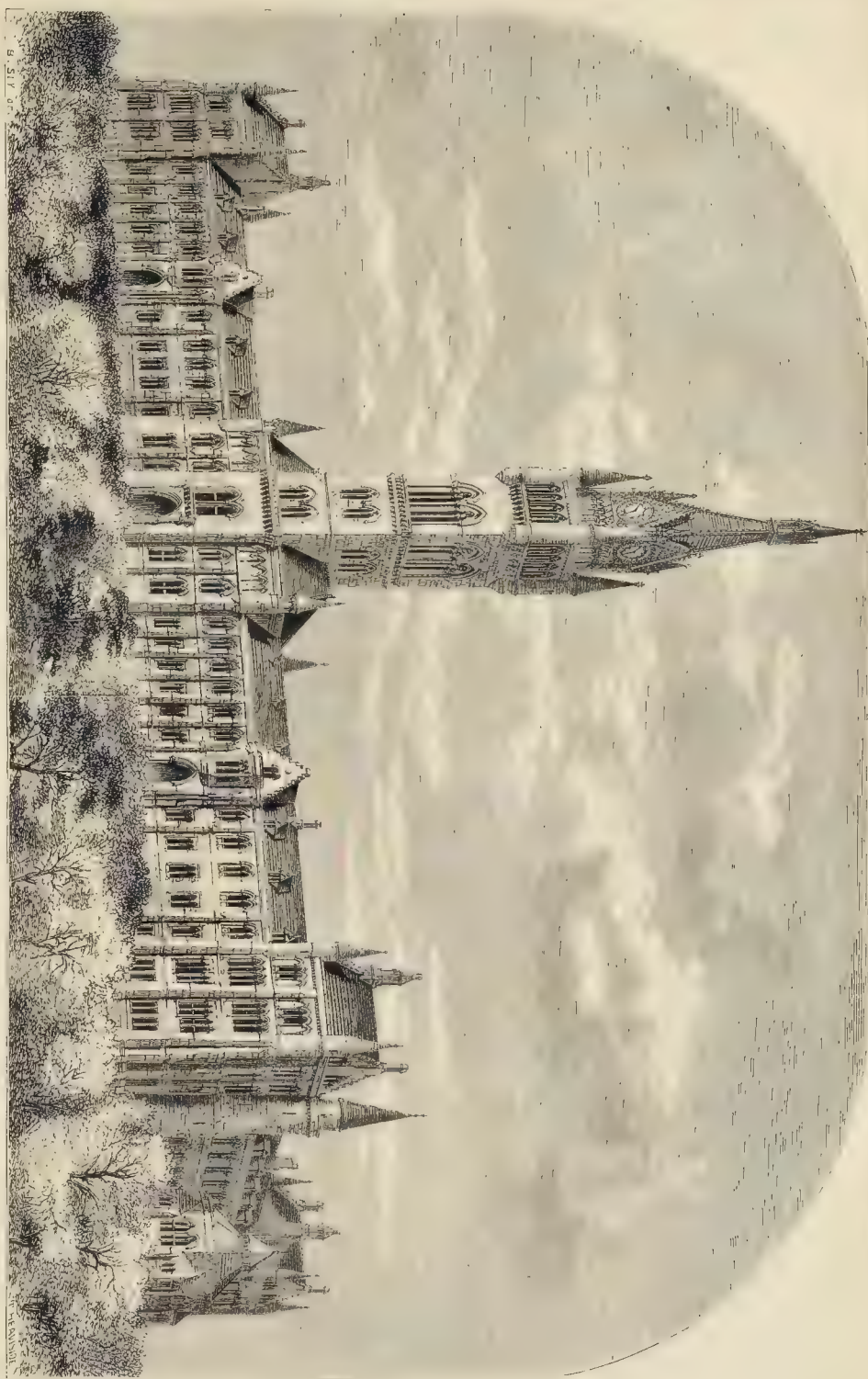
Mr. W. Corradi has been Mr. Scott's representative on the spot during the progress of the works. The amount expended is about 120,000*l*.

Coggeshall, Essex.—Endowments are being made to obtain a town-hall for Coggeshall.





GLASGOW UNIVERSITY BUILDINGS.—PROFESSOR G. G. SCOTT, ARCHITECT.



IMPROVEMENTS IN THE PORT OF DUBLIN.

THE Dublin Port and Docks Board are now carrying out extensive improvements near the entrance to the Liffey, on the south side of the harbour, which, when completed, will add considerably to its position as a commercial port. The object of the improvements is to give an increased depth of water, so that vessels of the deepest draught can enter and remain afloat at all stages of the tide; in fact, to convert the river so to speak, into a large tidal or floating dock. The present river walls, built upwards of fifty years ago, were founded at a depth of only 1 ft. or 2 ft. below low-water; consequently the bed of the river could not be dredged close to the walls without endangering their stability. Mr. B. B. Storey, C.E., engineer to the Port and Docks Board, designed a new wall, to be built in the same line as the old wall, with the foundations so low as 25 ft. below low-water, to enable him to have the river dredged with safety to the depth of at least 20 ft. below low-water, thereby, as the rise of the tide is about 13 ft., giving a total depth of 33 ft. at high-water. To form an idea of the extent of the work, we may state that the new wall is 20 ft. broad at the base, and is 42 ft. 6 in. in height, and is built up to the level of about low-water with large blocks of rubble-faced to that height, with close-dressed calp or limestone face-work. From low-water to top coping, which is 5 ft. above high-water, is faced with close-pitched and draughted granite ashlar, laid in horizontal courses, and coped by weighty granite cope 2 ft. in thickness, and covering the whole top of the wall, which narrows, by stepping at proper intervals, to 5 ft. wide at top.

About August of last year the Port and Docks Board received tenders for carrying this work into execution; and the coffer-dam necessary for the exclusion of the tidal waters, so as to enable the old wall to be entirely removed, and the excavations carried out to the 25 ft. below the foundations of the old wall, until the bed for the reception of the new masonry was prepared, being the most important feature in the construction, it was thought best that the contractor should design and carry out this part of the works at his sole risk, as so much depended upon its proper stability and resisting qualities in going to so great a depth, having 33 ft. to 41 ft. of head of water to riverside, and 48 ft. in height of quay and roadway to be supported on the land side, and also as it was further expected that a large quantity of water would find its way into the pit, so much as 20,000 gallons of water per minute were expected to have to be pumped a height of 43 ft. The board selected the tender of Mr. William J. Doherty, C.E., of Belfast, contractor (although not the lowest by several thousand pounds, but known as having successfully carried into execution several important public works about Belfast, &c.). Operations were commenced immediately after the acceptance of the tender, and have been pushed forward to insure its completion within the requisite time, namely, three years. The total length of wall to be rebuilt is 1,050 lineal feet. The coffer-dam has been completed for one-half the entire length, and the masonry of the new wall has been built for nearly 350 feet. The contractor has been enabled to avoid the great quantity of pumping anticipated, and instead of having to deal with 20,000 gallons of water, the actual quantity lifted is about 1,000 gallons per minute; so that the excavations and masonry are perfectly dry. Clay puddle, of which the dam is made, retained by close piling, driven below the foundations of the new wall, was not procurable when required, and the contractor substituted *peat moss*, easily procured by canal from the county Meath; and it is said to have more than realised his expectations of it. However, he has found a stratum of *clay silt* in the excavations, that provides him now with all the puddle required for the remainder. The masonry of the new mill is built entirely throughout with Portland cement, the mortar being formed in a plant concrete mixed in suitable mills. This class of masonry and mode of mixing the concrete are quite new, being introduced by the engineer, Mr. B. B. Storey, and no settlement or irregularity exists. Pumping, pile-driving, mortar-mills, mixing and hoisting, are performed by five steam-engines, in the aggregate of 80-horse power. About 400 men are employed in excavating quarrying-stone, building, &c., and 35 to 40 horses in bringing the stone to the works.

The stone is lowered into place by means of three-over-head travelling gantries traversing and spanning the entire width of foundations, having on each a set of jennies or movable crab winches of great strength, the uprights and runners of the river side of the gantry staging being supported on the piles of the outer row of the coffer-dam, and the supports of the inner line resting on the quay space within the works. In addition to the piling of the dam, there is also a row of close sheeting and strutting piles driven the entire length on the inner or land side, to support the roadway; the width between the coffer-dam and the back piling being 30 ft., while timber struts and walls, at about 5 ft. vertically, and 10 ft. horizontally asunder, are placed throughout to resist the pressure of the water and foreshore against the coffer-dam on the river side, and the pressure of the roadway on the land side. The cost of this work will be, when completed, about 65,000l. to 70,000l.

THE BLOCK-BOOKS.

I THINK your readers will agree that the burden of proof in this controversy rests with Mr. Holt, for when any one challenges opinions generally received, it is for that person to prove that the statements on which those opinions are founded are false. Therefore I hope Mr. Holt will tell us his reasons for rejecting the following statements respecting the antiquity of the "Biblia Pauperum." These I quote in answer to his words, "I challenge literature to prove that a copy of the Block-book known as the 'Biblia Pauperum' was actually in any library, public or private, prior to 1485, or known then to be in existence." They are the opinions of Mr. H. N. Humphreys and M. Berjeau, who, by careful study of the Block-books, are well qualified to judge, and moreover they are the gentlemen specially referred to by Mr. Holt.

"I passed a portion of last autumn at Munich, where I undertook a careful examination of the Block-books contained in the Royal Library—one of the richest collections known. No. 24 of that collection is a 'Biblia Pauperum,' the blocks of which are pretty closely copied from the original Dutch edition, though somewhat enriched in the style of ornamentation, and other details. It is printed on both sides of the paper in printer's ink, and bears the date 1470, with the printer's mark. There is also another edition from the same block (No. 23) printed in distemper for colouring, and which bears the same mark and date. A third 'Biblia Pauperum' of the same collection, printed in printer's ink from entirely different blocks, and of very inferior execution, bears the date 1471. Here then are at once no less than three of the latest specimens of the 'Biblia Pauperum,' all printed long before 1485. There is also an edition bearing the name of its printer or engraver, Hans Sporer, of Nuremberg, dated 1475. He is a well-known man, and in his last work gives in addition to his name his address behind the Church of St. Martin. Those Block-books which are printed in printer's ink on both sides of the paper were evidently produced at a period long posterior to that during which the Block-books were printed in distemper, and on one side of the paper only, these peculiarities and their style of art, placing them, in the opinion of most bibliographers, full fifty years before the latest of the dates just referred to." (H. Noel Humphreys, letter to the *Times*, August 21, 1868.)

"To saddle upon Albert Dürer the drawings of the 'Biblia Pauperum,' which are scarcely worth the pencil of a glass-stainer of the twelfth or thirteenth century, is too bad. To think that the artist who drew the 'Canticum Canticorum' in the purest style of the Van Eycks was likewise Albert Dürer, is to show an ignorance of the Mediaeval art perfectly astounding. The artist who made the drawings of the 'Biblia Pauperum' could no more draw those of the 'Canticum Canticorum,' than the artist (whoever he may be) of the 'Livre des Sauvages' could copy the 'Source' of M. Ingres. I must acquaint Mr. Holt with the stubborn fact that if Albert Dürer engraved the blocks of the 'Speculum Humane Salvationis,' he must have engraved them in the womb of his mother, for he was born in 1471. Then the 'Speculum' had had four editions, two Latin and two Dutch. As new editions of books did not follow each other in those early times as quickly as they do in ours, when they catch the fancy of the public, to say nothing of the time used in engraving and printing them by two different processes,—first, the woodcut with

the 'frotton,' then the movable types with a press,—we may admit a period of at least twelve years before the curiosity for the folio edition of the 'Speculum' was exhausted. Just at the end of it Veldener cut the blocks in two, in order to illustrate a 4to. printed edition, which he published exactly twelve years after the birth of Albert Dürer." (M. Berjeau, *Notes and Queries*, October 31, 1868.)

"Mr. Horne possessed a volume in the original binding, which contained three of the most celebrated Block-books,—the 'Biblia Pauperum,' the 'Apocalypse,' and the 'Ars Moriendi.' Within the binding was the following memorandum:—'Hic liber religiosus fuit per Plebanum ecclesie anno Domini 142.'—the last numeral being very indistinct, the date may fairly be taken as 1425. All three books were in circulation at that time; and allowing for their having followed each other at certain intervals, 1410, or thereabouts, would be an exceedingly probable date for the publication of the first of them." (Humphreys, 'Hist. Art of Printing,' 40.)

There is a copy of the "Biblia" in Lord Spencer's library, with the date 1467 on the hogskin binding. F. S. A.

THE PROPOSED TUNNEL UNDER THE MERSEY.

It would appear that the promoters of the Mersey Railway Tunnel scheme have not abandoned their project of uniting Liverpool and its Cheshire neighbour by subterranean means. They are now preparing plans to submit to Parliament next session for an extension of their present authorised line, which is from the corner of Church-street and Paradise-street, Liverpool, to Birkenhead. They now propose to carry the line from Paradise-street to a junction with the new station in Ranelagh-street, at or near the site of the Roscoe Arcade; and on the Cheshire side, from Woodside to a junction with the Birkenhead and Chester Railway, at or near to Green-lane, Tranmere. Mr. Dixon, the company's surveyor, professes to have secured most favourable levels from the Tranmere junction, under the bed of the river, and thence to Paradise-street and Ranelagh-street. There will, therefore, it is thought, be no necessity for resorting to engines on Fell's Mont Cenis principle, the ordinary locomotives being perfectly competent to mount the easy gradients proposed to be made.

RELAPSING FEVER IN LIVERPOOL.

A Report of the *Lancet* Sanitary Commission on this subject justifies a warning we have repeatedly given as to building on made-up ground where ashes, mixed with vegetable and other organic debris have been accumulated. The reporters attribute the fever to this cause. As to "the site" they say:—

"This superb site the jerry builders, contractors, and the Corporation have done, and are still doing, their very best to spoil. Whole tracts of land from which the surface-clay has been removed for making bricks have been filled in with millions of tons of chemical refuse, composed largely of sulphide of calcium. The houses are built upon it, and the sewers pass through it. The sulphide is slowly dissolved out by rain, and the solution gives off a stench of sulphuretted hydrogen when it enters into the sewers or escapes upon the surface. As in Manchester, so also in Liverpool, hundreds of houses have been erected upon midden refuse. . . . The most remarkable feature in the case is that this mode of dealing with the asphalt refuse is justified by the medical officer of health. Dr. French is reported to have visited this very spot [one indicated in the report], and to have perceived no smell. But it is a significant fact that a load of vegetable refuse was picked from the very surface, and that the Corporation officers stated that they did not dare to move the whole lest the stench should be too great. No houses can be healthy that are built on such a subsoil, and no sewers can be kept free from noxious gases under such untoward circumstances. The practice shows how easily the judgment of sanitary authorities may be warped by the question of expense. But better a thousand times that the Corporation should erect furnaces and burn such refuse, or carry it out to sea, than that they should thus employ it in building their own nest for generations yet to come."

The subject has been under discussion in the Health Committee, where a letter from Dr. French, in reply to certain statements of Dr. Stallard, was read. The result was, that the Health Committee has wisely resolved to ask the president of the British Association to name two scientific gentlemen to investigate the matter. This was done at Dr. French's suggestion, although he stated that such sites as those based on ashes are healthy; the slow smouldering process of Eremacausis, or combustion at common temperatures, so disposing of the organic matter as to obviate all danger to the health, as completely as if such matter were

burnt in a furnace. Does it? That seems to be a serious question. The heating of dung at common temperatures will no doubt rot such matter, and ultimately dispose of it as completely as if it were burnt in a furnace; but during the process what takes place? It is a ticklish word, "Bremacaulis," to trust to in such a case, however different the process may be from the common heating of dung at ordinary temperatures. Hydrogen is an indomitable volatiliser in its stinking combinations with sulphur, phosphorus, &c., although it may, under various circumstances, quietly associate with carbon into liquid or even solid forms, as well as gaseous, too, in such slow processes as those indicated. No doubt oxygen, also, may convert it into harmless water; but the whole subject needs more light to be shed upon it, and meantime we still regard the casting of midden-heaps into sites for houses as a dangerous practice.

WEST HAM SEWAGE.

THE West Ham Local Board of Health, being under statutory obligation to discontinue the discharge of sewage into the River Lee at Bow Creek, have determined to apply forthwith for Parliamentary powers to enable them to carry out a scheme prepared by Mr. Lewis Angell, engineer to the Board, for lifting and conveying the entire sewage of the district a distance of about four miles from the present pumping-station, to a farm at Little Ilford, which the Board proposes to purchase for irrigation purposes.

CEMENT FROM GAS LIME.

ONLY a few months ago there appeared in the pages of the *Builder* a notice of the application of gas lime to the manufacture of cement, and its use for plastering and decorative purposes. I am now in a position to report that the Pridoux cement has been tested in a variety of ways, and bids fair to become an important manufacture. In Sheffield upwards of 700 tons of gas lime have been worked up. The larger part has been applied to walls and floors, hearthstones, and mantelpieces. Of the latter, about 200 have been moulded and sent out. In four of the busiest parts of the town causeways have been paved by laying the cement with a certain proportion of broken slags from the neighbouring furnaces. These have stood the late rains very well, and are likely to come into close competition with the asphalt usually employed. Perhaps the most happy application of this new material is for floors and roofs. Old boarded floors of warehouses have been covered with about an inch layer, and even in workshops where polishing machinery keeps everything in vibration, the Pridoux cement stands intact. I have daily inspected the roof of a shed which had been covered with the cement. Upon a light frame of wood the material was laid on and trowelled to a smooth face, and in the space of twelve hours it was hard enough to bear standing upon. The rain-water now washes over it without the slightest trace of white particles, nor is there any alkaline reaction to be discovered on the hardened surface. The smoothness of walls and plinths moulded with the Pridoux cement is very striking, and must recommend it strongly to builders.

Now, it may be asked, what is the composition of a cement which possesses these useful properties? It is not a Portland or a Roman cement, although some hydraulic characters are very distinct. It does not set so quickly, but allows more time for finishing up the faces of moulded work. It is far from common mortar; for without any sand it can be formed into blocks which set hard throughout. A piece of a mantelpiece which had been made some six months, gave the following results upon analysis:—

Carbonate of lime	69.08
Sulphate of lime (hydrated)	22.63
Calcic hydrate	1.36
Calcic sulphide	trace
Insoluble matter	6.90
Alumina and oxide of iron .....	.43

It is obvious from the above that the setting must at first be due to the combination of water with the dehydrated calcic sulphate, or, in other words, the plaster of Paris formed by the calcination of the cement. The quantity of caustic lime which is present in the cement keeps the plaster of Paris always fresh, that is dehydrated, until mixed with excess of water employed at the moment of using it. This will account for

the fact that the cement does not lose its qualities by keeping, as the hydraulic cements do. After the plaster of Paris is set, the caustic lime goes on absorbing carbonic acid, and thus indurating the mass in the ordinary manner of lime mortars.

This will be better understood by the following partial analysis of a sample of the cement ready for use:—

Sulphate of lime (dehydrated)	17.46
Caustic lime	54.00
Alumina and oxide of iron	5.00
Insoluble residue	4.15
Hygroscopic water .....	.24

Now when it is considered that such a material is made from a waste product of a most offensive kind, this invention deserves every fair trial of its merits. Gas lime is a necessity if the best and purest gas is wanted. Only the expense and annoyance of its removal drove London gas companies unwillingly to replace it partly by the ferrie hydrates. It is pretty certain that with a market for the waste product they would gladly return to lime purifiers, and it may be predicted that the Pridoux cement manufacture will surely bring on this revolution.

WILLIAM BAKER,
Associate Royal School of Mines, London.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

At the last meeting, on the 23rd ult., seven teen members were elected, and numerous donations were announced, including one of 30l. from the Earl de Grey and Ripon, towards the Illustrations of Fountains Abbey, in the forthcoming part of the *Collectanea*, and one of 5 guineas from the always-liberal Sir William Tite, O.B.

Exhibitions were made by Mr. Bailly of several objects recently found in London, amongst which were some ink-horns, with the arms of Charles X. of France, and thirty silver coins of Ethelred, detached, nearly perfect, from an immense agglomeration of decayed silver money, found in St. Martin's le Grand; and by Mr. C. Brent, F.S.A., of a pair of three-rowel spurs. A paper by Mr. Cumming, on the cross-tau in painted glass, was elaborately illustrated by drawings by Mr. Watling, of Stohman, principally selected from Southwold Church. Mr. Dillon Croker, F.S.A., read an elegant paper on "The Legends of the Wyke."

The next meeting will be held on December 14th, at eight o'clock, when a paper by Mr. Charles Rossier, of Havre, will be read, "On a Roman Pavement discovered in August last in Lillebonne." He states that the position in which scientific societies find themselves in France precludes the possibility of any record of this discovery being made there; and the council have, under the circumstances, yielded to his desire that such record should be made in their journal.

THE "TENDER" SUBJECT.

SIR,—Your article entitled "On Several Subjects: Some of them Serious," is extremely interesting. Will you allow me to ask a question or two as to the appointment of quantity surveyors? The builders say that they, and not the architect, should appoint the surveyor; or that one surveyor should be appointed by the builders and another by the architect, and the quantities should be based upon their joint and agreed calculations. The point upon which I wish information is, how, in this case, can an architect keep from the builder the list of firms who are to tender? My own experience is that when builders know who are to submit estimates, they frequently arrange between themselves who is to have the work, and the lowest tender is the sum which a builder is willing to receive for the work, plus other sums to be paid by him to other builders to keep them out of a real competition.* In my own practice, I would, if I knew how, and could properly protect my client, allow the builders to appoint the surveyor, subject to my approval of him as a man who would not be likely to take the quantities in excess; but I am afraid that if it were a rule that the appointment of the surveyor was entirely in the hands of the builders, the surveyor who took out the quantities most "full," as it is termed, would have the largest practice.

The only remedy which I can suggest to prevent the various anomalies which occur with

* Can our correspondent give us proof of any such arrangement actually made?—ED.

regard to quantities is for the architect to appoint the surveyor, and to make the bill of quantities part of the contract; so that any error discovered in them should be allowed for in the builder's final account,—that is to say, any omission in the quantities should be made an extra to the builder, and any excess in the quantities should be deducted from the contract amount, or treated as omitted work.

H. A. B.

SIR,—I am surprised to see the discussion in your paper on the estimates for Nos. 3 and 5, Buckingham Palace-road, because there is in reality nothing very unusual in the case. All connected with the building trade, or who read your paper, must be aware of the immense difference in the tenders for almost every job competed for. Now I am very anxious to know what explanation the builders themselves can give of the matter, and will therefore briefly dispose of the points stated by your correspondent "Andi Alteram Partem."

First of all, then, it is my practice to employ some one to take out the bills of quantities, but in this case it was not possible, in consequence of the short time allowed for preparing everything and commencing the work. Plans had to be prepared, specification drawn up, bills of quantities delivered, and the estimates received, all in three weeks; nor had I any power to alter this. There was no favour shown; all had the bills of quantities at the same time, and were therefore in the same position.

Secondly.—The few items cited by your correspondent were errors of the lithographer, and were explained to many of the persons who applied for the bills of quantities. They were, however, mere trifles, and could have made very little difference in the amount of the estimate; indeed, so small that it was thought better to treat with the successful competitor respecting them, than cause any delay in issuing the document. My own estimate for the work was 1,300l., which I thought would be a fair value for the job. I am still as much in the dark as any one else as to the cause of the wide diversity of the estimates, and wish so me one would enlighten me.

JOHN DALE.

SIR,—I am very glad indeed to see by your leading article of this week's issue that your able pen is now pointed and directed towards unveiling that which, I am convinced, without your weighty and time-honoured influence, would remain a discreditable mystery. I trust, for the sake of our profession at large, and that highly honourable and intellectual body of men (the builders), you will not let this "tender" subject rest without a solution.

I am certain you will not get the truth from —, and that from this source the mystery will never be revealed to daylight or properly ventilated; but, on the contrary, nothing but dark and still deeper shadows will be the result of applying there. It is, indeed, a good thing for the public and our profession generally that your editorial eyes are always open to correct these abuses, and I trust they may ever prove a terror to evildoers.

A THOROUGH BELIEVER IN THE "BUILDER."
P.S.—I enclose my card, in case you wish for any information I could give.

WRAYSBURY CHURCH TOWER AND SPIRE.

SIR,—In your last you say you should like to know if all the builders were supplied with quantities, &c. The great discrepancy in the tenders naturally calls for some inquiry of this sort, as it seems to reflect on some one. In justice to the architect, who is a stranger to me, except by reputation, I would say, never was a fairer competition. Quantities were not officially supplied. I saw the advertisement in your journal first, and was also invited to tender by the vicar of Wrayisbury; having just completed the reconstruction of the parish church, Windsor, satisfactorily, he said he should like me to do this. I took my quantities from the drawings, which were lying at Wrayisbury for the purpose. I know quantities could be obtained, but have not seen them. Those quoted by you seem pretty correct, except the Bath stone. I do not make so much by 1,424 cubic feet, and still could have done the work for less than my tender, 1,399l. In fact, from experience, I can say the work, according to the plans and specification, is honestly worth that sum.

E. W. KILLY.
* A number of other letters on this subject reached us too late for consideration.

"ARCHITECTURE GIVEN IN."

SIR,—I have just now found the following amusing advertisement in a newspaper:—

"The New Education Act.—Economic, Substantial, and Well-arranged School-buildings.—Messrs. CUI & KUN are prepared to contract for the erection of New Schools, or for the enlargement of existing ones, at the rate of from 27 to 30s. per head, according to accommodation and situation. The plans, specification, and superintendence (by an experienced and highly competent architect) included. Teachers' residences will also be constructed for at proportionately moderate cost. Speedy completion guaranteed.—Address, —, Newport, Mon."

A tailor keeps a poet on the premises, why should not builders keep — AN ARCHITECT?

BRIDES.

SIR,—*Apologies* for my remarks relating to nefarious practices in our profession, seriously enough, the same name on which I received your paper I also received the enclosed note.

"Dear Sir,—I should be very pleased at another time to give you an estimate, if you might feel disposed to put me in the way of one. Hoping it would be more profitable than the present one, Yours faithfully,

P.S.—I have made you a small present of £1 for your kindness and attention to my payments throughout the job, hoping you will accept it."

This contractor was introduced to me by my client. It is the first business I have had with him. The accounts have yet to be passed by me. Need I add that I returned the money at once, in a letter, expressing my surprise, and pointing out to him that it is as wicked to try and bribe, or to throw gold-dust into an architect's eyes, as it is to bribe a judge in court; that the architect occupies a similar position between the employer and employed; and expressed a hope that he would give up this wicked system?

I fear these practices are too common between architects and builders. Indeed, I know some men who not only take gifts from builders, but who tell the parties tendering to include to much money in their estimates for themselves. Especially is this done when architects offer their services gratuitously, which, being interpreted, often means getting their commission from the contractor, instead of having it direct from the client.

I wish some of the leading members of the profession would take the matter up and see if something cannot be done to remove this stain in this respect, and remove the misplaced stigma which overhangs those who act honestly in these matters. Many thanks for your kindness in ventilating the subject in your paper.

HONEY.

THE WANT OF ARCHITECTURAL INSTRUCTION IN MANCHESTER.

SIR,—In reading the account of the annual meeting of the Architectural Association in your paper, I was much struck with the many opportunities afforded to London pupils for the study of the profession. Happening to be a pupil in Manchester, I could not help feeling what a great boon a course of some such lectures as those of which the Society gives a list would be to the many pupils in Manchester, who are desirous of mastering the profession, but who are strangers to any such facilities as those enjoyed by London pupils.

The many able men who constitute the Manchester Society of Architects, are those who are willing to give up a little of their time in delivering lectures suitable to architectural pupils, and could not they bring their pupils to Manchester, and if some such plan were only tried, I have no doubt that it would, by its complete success, entirely compensate those who might be the originators. If the members of the Society would ascertain how many even of their own pupils would be willing to attend and support such courses of lectures and classes, they would, I think, find that the number would be quite enough to give the plan a trial; and if it once became known that such an opportunity existed, no doubt many who are not pupils of members of the Society would avail themselves of it.

By kindly issuing these few remarks in your widely-circulated paper, perhaps this subject will be taken up by those who will use their influence in supplying a want that is grievously felt in Manchester.

A MANCHESTER ARCHITECT'S PUPIL.

MEMBERS OF "THE INSTITUTE" AND THE PROFESSION.

SIR,—There are two or three questions now prominently before the public, most seriously affecting the interests of the profession, and which may, I say, the future existence of the profession, as also the position and dignity of its members; and it has occurred to me that it might be well to bring them again under the notice of your readers, in order that some discussion may take place, with a view to putting matters on a more satisfactory footing.

In the first place, the subject of architects' charges, and the retention of their drawings.

A recent case (Bdy v. McGowan) has been decided against the architect, as a claim on the plans being disallowed; and, although it appears to me this was not a good case to contest (as it is doubtful, when no viable result was obtained by the employer, whether a claim could be established), still the effect of such a decision is to the disadvantage of the architect, as an architect has no right to retain his plans under any circumstances.

If this in the law, it had better be settled at once, before then architects can protect themselves, by making it a part of their agreement with the employers, that they should retain their drawings, which most sensible men would do, knowing well the amount of extra trouble (and probably dispute) which will arise, if the original plans go out of the owner's possession; or else they would have to charge, in self-defence, a higher rate than 5 per cent.

Besides which, if an architect has no right to retain his drawings which are merely the instruments by which he directs the erection of a building, what right has, as your correspondent puts it, "a sculptor, to keep his models, or a draughtsman, his drafts of deeds, &c.,"—and where is the line to be drawn?

It would appear, from the report of this trial, that a sculptor has no right to retain the draft patterns when a case is terminated or when the statue is set up; by the ordinary practice is, I believe, for lawyers to keep both drafts and deeds, and all papers involved in getting up a case, instructions to counsel, &c. An engineer's or iron-founder's drawings, patterns, and models are a similar instance, being the stock-in-trade also; and if they were to be claimed, he would have to charge a very different rate for his work.

Of course, the public are anxious to get all they can for

their money; but why should architects fare differently to other practitioners?

The chief reason is, I fear, that they let themselves down, and do not maintain their proper position. I am not speaking of second or third rate men only, but leading members, and even Fellows of the Institute.

With regard to the "Barry case," it will be a very great mistake, in my opinion, if Mr. E. M. Barry (as stated in your journal of Saturday last) has decided on giving up his property at the arbitrary demand of the Government, and I should not comply with it were I in his position. In my judgment he should go by default in this manner, if it will be much more difficult to contest a case successfully hereafter. Nothing would induce me to give up the drawings, under such circumstances, unless absolutely obliged.

In the second place, the quantities question, and commission on contracts.

Whatever may be the custom in London, it is no secret that in the provinces it is a common thing for "Fellows of the Institute" to take out their own quantities, and in some instances to receive payment from the builders, by way of a percentage on the amount, charged at the end of the bill, and without their client's knowledge; the percentage varying very much, and frequently in an inverse ratio to the completeness of the calculations; so that, whilst competent surveyors willingly take them out at 1 per cent, some incompetent architects (or their clerks) commonly charge 2½ per cent.

Of course, they would plead that the customs of provincial towns are different from those in London, and that the rule prevailing there, of quantities being taken by independent surveyors, would not apply; but I should like to know whether the clause in the declaration, signed by members of the Institute, on election, "that they will not receive or accept any pecuniary consideration or emolument from any builder or other tradesman, whose works they may be engaged to superintend," does or does not apply to an architect receiving payment for quantities.

Such men, to be sure, always show taking a commission also from contractors, large or small, and from tradesmen supplying the various articles required, such as ironmongery and fittings of various kinds, many of whom are in the habit of making such allowances in the ordinary way of business.

Now this is the sort of thing that brings the profession into disrepute, for the public are not able to distinguish between a man who is honest and one who is not. Therefore they are all thought to be much about the same, unless in certain exceptional circumstances, where the character of the architect or peculiar events have enlightened the mind of the public.

So dense, indeed, is the ignorance on this subject, that in some instances where the architect stands out as a useful commissioner, and no per centage from contractors, he loses the work, and has the mortification of finding himself underbid by men who are not so scrupulous. I could name instances where this has been done by Fellows of the Institute.

I would ask, of what use is it to make rules that members are not to do such things, and wink at their being broken? Would it not be better to commit to experts any Fellows or Associates who transgress these or other rules?

This would put the Institute on a higher level than it at present occupies, and would make it a real distinction to belong to it, instead of, as now, being no guarantee from such objectionable practices.

If there were, indeed, I would promise them they would gain thereby at least one member, in the place of some they might possibly lose.

TAR PAVEMENT.

If the ground is well rammed, the specification of pavement I sent you will give satisfaction. It does so here, as it replaces gravel paths. It is not usual to prepare a foundation for York flag, nor is it more necessary for tar pavement for footpaths. T. H. M. TAYLOR.

Guswode, Bury St. Edmund's.

WANTED, A LIFE-BOAT.

SIR,—It has occurred to me, and I doubt not that others have thought the same, that all who are engaged in the various branches of the building trade, relative to building, from the architect to the labourer, could add would further the laudable efforts of the Life-boat Institution, by subscribing to a fund, so as to present it a boat in all straits. Many professions, trades, and societies have done so, and surely the builders will not be one of the last to do such a good and noble action. I shall be glad to forward my mite or help in the cause if the matter be taken up. L. H. B. C.

CITY TOWERS.

SIR,—Will you give your influence to prevent an act of Vandalism? The beautiful church of St. Mary Aldermary has, by the construction of Queen Victoria-street, been brought conspicuously into view. Its tower is unique, and is one of our City's greatest architectural works. Can it be believed that the Metropolitan Board of Works have erected a huge board, announcing that the piece of land (only a few yards in extent) between the tower and the street, to be sold or let on building lease? Complaint is needless. B.

BULLIVANT'S PATENT SASHES AND FRAMES.

THE objects endeavoured to be attained by this invention, to which reference has been made in our pages, are the exclusion of air and dust more perfectly than any of our ordinary methods have hitherto succeeded in doing, and the giving of greater facilities for cleaning, painting, and repairs. The weights, instead of being attached by links to the sash in the ordinary way, are hung to a movable guide-bar, which is of the same length as the sash, and travels in a groove partly in the sash and partly in the pulley-attile. This guide-bar has attached to it a spring fasten-

ing running its entire length, which keeps it constantly tight-pressed against the pulley-attile and sash-stile, and two other small springs which keep it firmly home to the back of the groove in the pulley-attile, with the view of making the sash air-tight. A single screw passes through the centre of the side of the sash when in work, retaining the guide-bar firmly in its place. When this is removed, the weight in falling draws the guide-bar out of the sash, which is then entirely clear of the frame, both inside-head and parting-head being dispensed with. Any sash thus fitted can be lifted out for cleaning by an ordinary servant; and the same facility applies in case of re-painting, with the advantage that as no beads have to be removed, no repairs to the painting of the frame are necessitated. In expensively-decorated buildings this is a point of importance.

The patent also includes an improved arrangement of pulleys. The ordinary cases are dispensed with; a screwed spindle passes through the head of the frame from side to side, upon which travel free the two grooved rollers, either of iron or brass, that carry the lines, the result being that no amount of wear interferes with the easy action of the sash; and there is this contingent advantage, that a Holland blind, if required, can be introduced into the head of the sash frame between the rollers, and be thus entirely concealed from view when out of use. The lines travelling in the groove which receives the bar are unseen from the front, and are not so expensive in cost.

The danger of cleaning and painting windows from the outside now daily incurred, involving, as the police returns show, many serious accidents, is by this patent entirely avoided.

ARCHITECTURAL UNION COMPANY.

THE report to be read at the thirteenth general meeting of shareholders, to be held next Wednesday, the 7th, states that "The Architectural Exhibition Society have, since the audit of 1869, discharged the rent due for the exhibition of that year, but have not paid any of the rent due for the year 1870, amounting to 200l., which causes the large arrear shown in the balance-sheet." The number of shares on the register is 1,037, upon which 10,370l. have been paid. The yearly account is made up to the 25th day of September last, inclusive, and the directors recommend the payment of a dividend of 11s. per share, free of income-tax, which will amount to 570l. 7s. (in addition to 36l. 5s. belonging to the Auxiliary Donation Fund, and 8l. 10s. for unclaimed dividends) a balance in hand of 83l. 4s. 9d.

YOUR NEIGHBOUR'S MUSIC.

SIR,—It has come within my experience that when all other methods failed to stop the nuisance complained of by your correspondent, cutting off an inch from the ends of the joists—of course when they run at right angles to the wall through which the sounds are transmitted, has succeeded. The sound is, in fact, generally "conducted" from one house to the other by the floors, and hence the remedy is obvious.

E. INGRESS BEEL.

*** In the case in question the joists run from front to back.

VALUE OF LAND.

MR. THOMAS BRASSEY, contractor, last week bought the Haythrop Park Estate, near Chipping Norton, Oxfordshire, the purchase-money being 113,200l. The estate comprises a mansion (damaged by fire in 1831, when in the occupation of the late Duke of Beaufort, since which period it has not been restored), seated in an extensive deer park, adorned with timber trees, and surrounded by several farms, with good houses and homesteads, embracing a total area of about 3,500 acres. The estate was sold under the direction of the Earl of Shrewsbury.

Liverpool.—At the Sheriff's Court, in Liverpool, before J. J. Aston, esq., Q.C., as assessor, and a special jury, a case, Paterson against The Cheshire Lines Committee, was heard. It was a claim in respect of a shop in Bold-street, under which the Committee had given notice of their intention to tunnel. The premises were old, and consequently the valuations proceeded on the assumption that it was

bare land, available at the expiration of the present lease, which had four years to run, for the purpose of the erection of more modern buildings. Most of the architects and surveyors in Liverpool were called as witnesses, the lowest valuation on the part of the claimant being 3,390l., and the highest on the other side being 2,654l. The jury, after a long hearing, gave a verdict for 3,000l. The claimant's interest in the premises was leasehold under the corporation of Liverpool, at a nominal rent, for seventy-five years, renewable on payment of a fine, and the amount awarded was at the rate of about 25l. per square yard.

SIR CHRISTOPHER WREN.

LAST week the Oxford Architectural Society visited, amongst other buildings in the City, the Library of All Souls' College, and the drawings of Sir Christopher Wren, who was a Fellow of that Society, were inspected. The visitors were received by the Librarian, Mr. Roberts, in the Law Library, recently erected under the direction of Mr. Bruton. Mr. Bruton briefly addressed the Society on the interest which attached to these drawings, as illustrating the office work as executed by architects of that period. He said there was no doubt many of the drawings were by the hand of Wren himself; others were those of his pupils, by one of whom the well-known twin towers in the large quadrangle of this college were designed. Among these drawings were several of St. Paul's Cathedral, and one for the re-construction of the streets of London, after the Great Fire of 1666. A plaster cast of the face of Sir Christopher Wren, taken after his death, was then shown to the visitors, who looked on it with much interest.

THE WASTE AND UNPRODUCTIVE LANDS IN THE CITY.

THIS important and rather serious subject came before the Court of Common Council on the 24th ult., in a motion by Mr. Isaacs.

"That the Coal and Corn and Finance Committee having in the years 1867, 1869, 1870, and 1871 called the attention of the Court to the large and increasing amount of unproductive lands in charge of the several committees of the Corporation, and the Court having ordered and obtained returns of the said unproductive lands, that it be referred to a Special Committee, to consist of the Chairmen of the City Lands, Bridge House, Markets, Improvement, and Markets Improvement Committees, and the Commission of Sewers, together with members of this Court, to confer with the said committees and commission, and to inquire into the present system of letting and disposing of such lands; and to consider and report whether any, and if any what, changes are desirable in respect thereof."

In the report which was presented last month, said Mr. Isaacs, it was stated that for some years the Corporation had been constantly adding to its surplus or unproductive lands, and had undertaken large bonded debts in respect of them. What was the cause of this? Not the slackness of trade, nor the tightness of the money market. Possibly the restrictions they imposed as to the kind of property that might be built were too many. Or, perhaps, they estimated the value of their land at too high a rate. The motion was carried in the face of an amendment to refer it to the four permanent committees mentioned in the resolution. The blank in the motion was then filled up with the number 12, and the committee was appointed.

INFIRMARY, BASFORD UNION.

Sir,—You will oblige by inserting the following statement:—

The undermentioned firms, all of Nottingham, were contractors at the above Union, in addition to Mr. G. Hopewell:—

Messrs. Dennett, fire-proof arches; Messrs. Danks & Nixon, fire-place blowers (designed by the architect), ventilating fire-grates, stoves, and baths; Messrs. Griffiths & Son, scullery ranges, hot-water cisterns, boilers, and two double hoists; Hopton Wood Stone Company, chimney-pieces; Mr. Hewitt, hot and cold water service, portable bath, and gasfittings.

The following were sub-contractors, all of Nottingham:—

Mr. Shipston, stone-masonry; Mr. Hewitt, plumbing and glazing; Mr. Doubleday, slating; Mr. Mundy, plastering; Mr. Rawlinson, iron-founding; and Mr. Burton, of Basford, painting.

Mr. R. Hancock, filled the office of clerk of the works. H.

CHURCH-BUILDING NEWS.

Carlisle.—The old Church of St. Mary, Carlisle, has been removed from its old habitation in the nave of Carlisle Cathedral. The galleries have been taken down, the ceiling has been removed, thus bringing into view the Norman arches near the roof, and preparations are being made for restoring the place to something like its pristine beauty. In the lath and plaster windows and the damaged piers are now plainly seen the traces of the barbarous taste of those who robbed the cathedral of one of its most interesting parts. The work of restoration will now proceed, the nave remaining in the meantime screened off from the cathedral transept.

Tattenhall.—The parish church of St. Alban, Tattenhall, has been reopened after extensive alterations. Shortly before the death of the late rector, the Rev. Fielding Ould, M.A., it was resolved, in consequence of the dilapidated state of the building, to have it completely restored. About twelve months ago the work was commenced under the direction of Mr. Douglass, architect, Chester, the contractor being Mr. G. Woollams, builder, Tattenhall. With the exception of the tower and the side walls, the building was entirely pulled down, and the work of enlargement and restoration commenced. The space formerly occupied by the old chancel was included in the main body of the church and extended in breadth, and a new chancel was built at the eastern end. The church, as it is now built, consists of a tower, a nave with side aisles, an organ-chamber and vestry, a lady chapel, and chancel. The tower is a square, embattled structure of stone, built in the reign of Henry VI. or Henry VII., and contains a peal of five bells. From the level of the leads, project short grotesque gurgoyles, and two empty niches, probably once containing figures of St. Alban and the Virgin Mary, occupy prominent positions above the new oak door. Inside the tower is open up to the roof of the nave, but a screen of varnished pine, panelled with lights of coloured glass in geometrical devices, conceals the ringers from the view of the congregation.

The west, or tower, window is of stained glass, the subjects being Scriptural. It was the gift of Mr. R. O.orton, churchwarden. A stained-glass window, representing scenes in the life of Christ, is placed at the south side of the tower, and is the gift of Mr. J. Stephens and pupils. The nave is divided from each side aisle by four arches springing from pillars. The roof of the nave is supported by four principals, which, as well as the rafters, are of varnished pitch pine. The nave roof has been raised about 10 ft. from those of the side aisles, and in the intermediate walls on each side four clearstory windows have been pierced. The windows on each side of the aisles have been renewed. The old box pews have been replaced with open ones (a portion of which only are free), which are calculated to accommodate 500 persons. The walls not pulled down were redressed in the interior. The organ-chamber and vestry are on the north side of what was formerly the chancel, and form a sort of north transept, while a similar transept, called the Lady Chapel, is on the south side. The new chancel is raised, and in the centre is set with encaustic tiles. The foremost pews are more decorated than the others. The eastern window has been presented as a memorial of the late rector, the Rev. F. Ould, by his friends. It is of stained glass, and the principal subjects it illustrates are the Crucifixion and scenes in connexion therewith. In a window at the south of the chancel the stained glass which was formerly in the east window is replaced. The new porch at the south-eastern end of the church has been given by Mr. Brodbelt, merchant, of Liverpool and Tattenhall. Panels of parian are framed around by oak beams crossing one another, and in some places richly carved. Each side of the porch is pierced for three Gothic stained-glass lights. In this, as throughout the whole of the restoration, the character of the Perpendicular style of Gothic has been preserved. The cost of the restoration is about 3,500l., of which over 3,000l. have been already subscribed.

Marple.—The new church dedicated to St. Martin, situated on the Brabins Hall estate, near to the Marple railway station, and erected at the cost of Miss Hudson, of Brabins Hall, has been consecrated by the Bishop of Chester. In the east window are representations of the Twelve Apostles, and in the centre is a representation of the Crucifixion. In a large niche on the north side is an organ, with two sets of

keys, cost about 250l., presented by Miss Stevenson, Cotehead, Marple. A new school adjoining has recently been built by Mrs. Hudson, of Brabins Hall.

Crowborough.—The Chancel of St. John's Church has been consecrated. The new chancel is of an oval shape, the roof of wood; it is lighted by five lancet windows of stained glass; that over the altar is by Clayton & Bell, representing the Crucifixion of Our Lord. The windows on either side are also by Clayton & Bell; the one to the left is an effigy of St. Elizabeth, while that to the right represents the patron Saint of England, St. George. The other two windows are of Munich glass. There are other stained-glass windows in the chapel.

Chadlington.—The work of restoration in the church is now approaching its termination, the whole of the nave and chancel being already complete. Many coats of whitewash have disappeared from the walls, pillars, and roof; the ancient gallery has been removed, and an arch opened up into the tower; the ancient lounging boxes, called pews, have given place to modern open seats; the uneven flags in the floor are replaced by red tiles; and instead of the stove, with its yards of pipe, the whole of the church is heated by a combined system of hot-water pipes and hot air, the heat entering the church through gratings in the floor. In the chancel an organ-chamber and vestry have been added to the south side, and two new windows to the north side, the floor being laid with coloured tiles. New choir seats, in carved oak, have also been provided. The architect employed in the restoration is Mr. Buckeridge, of Oxford and London, the details of whose designs have been carried out by a local contractor, Mr. A. Groves, of Milton-under-Wychwood, under the superintendence of the foreman, Mr. Thos. Smith. The cost of this work will be about 2,000l., which sum has been raised from the following sources:—The Earl of Ducie over 1,400l.; St. John's College, Oxford, 200l.; collected from parishioners, 144l.; Diocesan Society, 60l.; other contributions, including balance in Churchwardens' hands, 200l.

Ipswich.—For many years past the church of St. Mary-le-Tower, Ipswich, has been in the hands of the builders. A townsman resolved some years ago to restore the church in a manner worthy of the great wealth and undoubted art resources of the England of the present day. The works have been carried out under the supervision of Mr. R. M. Phipson, architect. Although the church has been nearly rebuilt, the services in it have never been entirely stopped. When the structural portions of the church were reared the enrichment was one of the portions of the work left for future treatment, and the corbel-heads, key-stones of the window arches, friezes of the doorways, and dripstone terminations, were put in in blocks, and left to be carved *in situ*. It is this work which has now been finished. The workmen employed are from the studio of Mr. Phyllis, the artist employed for several years past in the restoration of the sculptured work in Canterbury Cathedral. The most prominent amongst these works is in the west doorway, where a carved frieze surrounds the door: it represents the vine leaves and fruit upon a circular bole with here and there a bird, as accessory to foliage. On each side of the doorway there springs a crooketed pinnacle, having three grotesque animal forms at each of their bases. The south doorway in the tower is enriched by carved heads of the Queen and the Bishop of the diocese, as dripstone terminations: the former of these is on the west side, and the latter opposite. The inner door has a representation of the Annunciation in the angel Gabriel with uplifted finger, on one side, and the Virgin on the other. The capitals from which the mouldings spring have representations of the bramble and thorn. Over the turret staircase door is a corbel with columbine foliage, and a carved grotesque animal. In the interior of the church the principal carvings are the corbels for the springers of the nave of the roof. These represent the English saints, and are carved on a scale sufficiently large to show the features, and the minutest emblems. They are Saints Alban, Augustin, Oswald, Eoba, Etheldreda, Chad, Cuthbert, the Venerable Bede, Swithin, Edmund, Alphege, Edward the Confessor, Anselm, and Hugh. Between each of these is a foliage corbel. In the north and south aisles are corbel heads representing angels with musical instruments, or in acts of adoration; and here, again, these are alternated with foliage corbels, the thorn, oak, rose, ivy, dahlia, primrose passion-

flower, arum, columbine, and other plants, being represented. Nearest the chancel are the heads of the four Evangelists. The style of the work is the Decorated, but much modernised in some details.

DISSENTING CHURCH BUILDING NEWS.

Ipswich.—The memorial stone has been laid of the new building now in course of erection for the accommodation of the English Presbyterian Church, which has been formed in Ipswich within the last two or three years. The site is on the Burlington estate, with a principal frontage on the wide open space at the junction of the North and London roads, and also having frontage on Mill-lane and the Burlington-road. Mr. Frederick Barnes is the architect. Mr. H. Luff is the contractor, the amount of the contract being 2,897l. The walls have reached a height of upwards of 20 ft., and the delay in laying the memorial stone has arisen from the circumstance that the arrangements of Sir A. S. Adair, who undertook to perform the ceremony, did not permit of his being in Suffolk before. The church stands east and west, and consists of what, in Episcopalian architecture, would be called a nave, with an apse at the western end, in which will be the platform for the minister, 78 ft. in length, and 38 ft. wide, and north and south transepts at the west, giving the building at that part a width of 58 ft. At the north-eastern corner will be a square tower, surmounted by a spire of Bath stone, rising to a height of 125 ft. from the ground. It is proposed that a clock should be placed in the upper part of the tower facing the barrack corner. The walls are faced with Kentish rag stones, with Bath stone dressings, and the style of the building is Decorated. At the east end there will be two entrances, one by the tower, and the other by a porch in a corresponding position on the south side; while in a turret at the north-west corner of the tower is an entrance and circular staircase leading to the gallery across the east end of the church, the first floor of the tower forming a lobby to the gallery. There are also entrances to the floor of the church at the west end, and both there and at the south-eastern porch separate entrances and staircases are provided, which will give admission to north and south galleries if added at any future time. The roof will be open, with double hammer-beams and arched principals; the height from the floor to the ceiling (the small space between which and the apex of the roof will be used for ventilating purposes) will be 40 ft. The eastern gable will be 56 ft. high to the top of the pinnacle with which it will be surmounted, and the gables of the porches will be 20 ft. high. The platform for the minister will be in the apse at the west end, beneath it being a small room which will be used as a vestry, and which will communicate by a staircase with the platform. The church will be benches, and there will be sittings for upwards of 500 persons, and should further accommodation be required, side galleries can easily be added. The roof will be divided into three bays, the walls being supported externally by buttresses in corresponding positions to the principals of the roof. In the north and south walls there will be three two-light windows, broken by transoms as a relief to their height. In the eastern gable will be a five-light window, with three single-light windows below it, and in the transept gables will be two three-light windows resembling those in the north and south walls. Ample apparatus for warming the church is to be provided. Mr. Barnes's plans include school-buildings, having a frontage on Burlington-road, but for financial reasons these at present are not to be carried out. A school-room, 22 ft. square, with four class-rooms, is contemplated on the ground floor, and a large room over, on the first floor, available for school and church purposes. These rooms are to be in communication with the church, and a vestry will also be provided.

New Hampton (Middlesex).—The new Congregational Church here has been opened for divine service. The ground was the gift of two ladies, and has a depth of about 106 ft., and a frontage of 66 ft. to the road between Twickenham and Hampton, giving sufficient area for the erection of church and schools. At present the former only has been undertaken. In a limited competition of architects, the plans by Mr. Benjamin Taberner were selected. The church is in the Gothic style of early character, and is of brick, with Bath stone dressings, bands of red brick and blue Bath stone being occasionally intro-

duced. The internal dimensions are 56 ft. 10 in. by 35 ft. 11 in., with a porch in front 23 ft. 8 in. by 5 ft. 6 in., vestry in rear 13 ft. by 10 ft., &c. The height from ground to ridge of roof is 44 ft. The edifice contains sittings for 312 persons, but as it is 18 ft. high on the side walls above the floor line, there is sufficient space to admit of the erection of an end gallery to contain 100 more if found desirable. The principal front has a large four-light traceried window, and a spirelet covering the gable, which latter serves also as a ventilator to the church. The porch has two entrances, and a three-light window between. The side windows are of two lights with cusped heads. At the end of the church, above the pulpit, is a quatrefoil circular window, proposed to be filled with stained glass as soon as funds will permit. The roof is open-timbered and stained. The seats are open benches stained and varnished. The pulpit or platform is of ornamental character, and approached by stairs at each side. The building will be warmed by two of Gurney's Gill stoves placed nearly in the centre of the side walls, and lighted by star burners suspended from the principals of the roof. A dwarf wall with ornamental iron railing and gates separates the ground from the road. The contractors for the works were Messrs. Dove. The total outlay will be about 1,500l.

Southsea.—The memorial-stone of a new Congregational Church for Southsea has been laid, on an open site on the common. The church, which will accommodate upwards of 670 persons, will consist of nave lighted by clearstory, east and west aisles and transepts, and an apse. Arrangements for the organ-chamber have been made on the east side. The walls will be of Isle of Wight bricks and hammered flints, with Bath stone dressings; internally with red and white brick bands and quoins, and the intermediate spaces being stuccoed. The north entrance, facing the Kent-road, will have a portico attached to the tower and spire, the foundations of which only will be put in at present. There will be two other entrances on the east side. The design is Early English, of the latter part of the thirteenth century. Schools and vestries adjoining the south side were erected two years ago. Mr. Stent, of Warrimster, is the architect. Mr. A. Smith, of Portsea, the contractor.

Launceston.—A new Wesleyan Chapel has been opened here. The edifice in style is Gothic, of the geometrical period, and it consists of a nave, side aisles, transepts,—with organ-chamber in one of them,—and a small apsidal chancel. The aisles are divided from the nave by pillars and arches, which support a clearstory, pierced by two-light windows on either side. At the north-west angle and detached from the main structure is the tower, which, with its spire, rises to the height of about 110 ft. The principal front towards the street presents the triple doorway of an open and recessed porch, the openings separated by grouped pillars of polished Aberdeen granite, from the carved capitals of which spring pointed and moulded arches of Cornish grey granite. Over this doorway is a large four-light window, with clustered pillars between the lights and at the jambs, and moulded tracery in the head. Above this rises a gable coped and pinnacled. The aisles have sloping roofs, and are lighted by series of two-light windows. The transepts terminate with gables pierced by three-light windows. Each of the three sides of the chancel has a two-light window, with detached pillars having carved capitals, and filled in with stained glass of geometrical pattern by Bell, of Bristol. All the other windows are filled with cathedral glass. The chapel will seat about 700 persons in open pews, constructed of pitch pine, and there is a small gallery for children at the north end. The chancel and all the passages are paved with Maw's tiles; and the walls of the former to the height of 3 ft. are also lined with tiles of chocolate colour and encaustic band in which the passion flower is conventionally introduced. Between the tile dado of the chancel walls and the window sills, the wall surface is to be painted in panels from the architects' designs by Mr. Harris, of Plymouth, but this portion of the work is not yet completed. Here also will be introduced the deaconage and texts. All the roofs are open to the collar-beam. The walls of the structure are built of local stone, Bath stone, Portland stone, and granite, and the angles of the spire are of wrought limestone. The carving, which is conventional, has been done by Mr. Harry Hems, of Exeter. The Plymouth Foundry supplied the ornamental castings for the gallery front. The general contractors were Messrs. Blatchford, of Tavistock; and the architects,

Messrs. Hine & Norman, of Plymouth. Adjoining the chapel are a large school-room, infant school, six class-rooms, and a minister's vestry; and in these portions of the works the stone dressings from the former chapel have been to some extent introduced, which will account for a difference in the style of the church and school buildings.

Books Received.

Handbook for Shropshire, Cheshire, and Lancashire. London: JOHN MURRAY, Albemarle-street. 1870.

MR. MURRAY has increased the obligations due to him from the travelling public and the inhabitants of the counties illustrated, by the publication of this guide to Shropshire, Cheshire, and Lancashire,—counties that include a vast deal of interesting matter. The preface says justly that a handbook which embraces such a large section of England as this does, extending from the South Welsh mountains to those of Cumberland, from the Severn nearly to the Solway, must needs contain some inaccuracies, and especially in the manufacturing districts, where changes occur so much more rapidly than in others. The editor asks, therefore, for any additions or corrections that can be afforded him. Dipping here and there into the book, we find his fears are not wholly without ground, and that the next edition may be improved by careful review of this. Amongst the alps are some architectural errors, such as the statement touching Furness Abbey, that the style of the abbey "was Early English; but as additions were made to it, as its wealth increased, it gradually assumed a mixed character, known as Transition;"—"the Town-hall at Manchester is after the Erechtheus at Athens," and so on. Liverpool architects will be surprised to find the Custom-house there instanced as one of the noblest architectural works of the age (p. 259), it being one of the dreariest masses of dead-looking ashlar work that can be imagined. The Exchange is described as being "much altered and enlarged by Wyatt" (p. 260), and "Wyatt" also is named as designer of the Nelson monument: with nothing to show that they are not the same man, and that the Exchange is a new building. The statement (p. 256) that in gales the steamboat communication with Birkenhead is stopped is erroneous, except in very rare cases: an old inhabitant tells us during fifteen years' dwelling on the Cheshire side he only remembers the traffic once entirely stopped, and that was by a fog, and was censured as showing unnecessary timidity on the part of the ferry managers.

It may be worth mention that the *Gallery of Art* (p. 261) was pronounced by Waagen to be one of the finest and most interesting collections of early painting in the world. The tympanum of the great portico of St. George's Hall is said to have "a group of figures in Caen stone, by Cockerell." It should be designed by Cockerell. The remarks about Chester and Birkenhead seem very full and correct in the main. St. Mary's, Birkenhead, was one of Rickman's designs, which should be mentioned. Hamilton-square (Birkenhead) is much over-praised; people are giving up their houses there now to go up to the suburbs (Cloughton, and Orton, and the Park). No mention is made of the Cloughton district on the rising ground about a mile and a half from the river, which is one of the pleasantest residential suburbs we know of anywhere near a large town, and has some capital houses.

In the account of Manchester we find no mention of the Albert Memorial there, precursor as to form on a small scale of the remarkable piece of monumental jewelry in Hyde Park, now approaching completion; and it would be as well in speaking of the memorial groups in front of the Royal Infirmary, to give the names of the sculptors. And as to names, we miss in the interesting list of "celebrated men who have been born in or are identified with the history" of Lancashire, that of Richard Cobden. Passing to Haughmond Abbey, Shropshire, the figures in the jambs of the Norman doorway "should not be described as "placed there subsequent to the building of the arch," but as sculptured there. We would add some other notes, such for example that in the account of Tadmorden (Lancashire) no mention is made of Dobryd Castle, the residence of Mr. John Fielden, but it might seem that we were seeking to pick holes, which in truth is not the case.

The guide-book commences with some very

useful introductory essays on the physical geography, geology, industrial resources, means of communication, history, and antiquities of the three counties, with lists of the various places of interest deserving a visit, and skeleton tours to be varied according to pleasure.

VARIORUM.

HARDWICKE'S Science Gossip continues to bring much interesting and curious matter before the lovers of nature. The November number contains information as to the Birds of Paradise, the eggs of butterflies, with curious illustrations, and various other interesting matter.—"Elementary Arithmetic: part II. By Richard Rickard, Cassell, Petter, & Galpin." Mr. Rickard ought to be a competent writer on arithmetic, as he seems to be, for he is assistant mathematical master in King Edward's School, Birmingham.—"Some Points in the Physiological and Medical Aspect of Sewage Irrigation. By Alfred Carpenter, M.D. Hardwicke, Piccadilly." This is a second edition of a paper read at the Social Science Congress, at Bristol, in October, 1869; and contains notes on the recent evidence adduced against irrigation in the Houses of Parliament, &c., to which is also appended a paper on the influence of sewer gas on the public health. A desire for further information upon the effects of sewage irrigation in the neighbourhood of Croydon, has led to the revival and republication of Dr. Carpenter's paper.—"Cardiff Free Library, Museum, and Schools of Science and Art. Eighth Annual Report, 1869-70." The number of issues from the Cardiff library during the year has been 17,871 volumes, which shows that there has scarcely been any increase upon the issues of last year. The result is due to the small number of new works added, and the want of a proper catalogue. The rapid growth of the Schools of Science and Art has necessitated their removal from St. Mary-street to the Cardiff Arcade, where commodious rooms have been rented.

—"The Palestine Exploration Fund managers have issued a preliminary report of a journey through the desert of the Tih and the country of Moab, by Mr. E. H. Palmer, M.A. The report is mainly promissory, however, as well as preliminary. Mr. Palmer intimates that he and Mr. Drake may be said to have performed their journey absolutely unattended and alone. They went to Dhiban, and searched carefully among the broken fragments of the Moabite stone which are still lying there; but every piece with writing on has been either destroyed or removed. Mr. Palmer tells a curious and romantic legend connected with Jerusalem:—

"It is a curious fact that the guardian of the Akra Mosque (whose ancestors once had the care of the entire Haram, until they were supplanted by the Deraf family in the custody of the Cubbetes Sahbra) declares that his father, when dying, indicated to him a spot within the sacred enclosure where an iron chest full of ancient books lies buried, and adds, that from the oldest times each successive sheikh has revealed the fact to his son as the day of his death drew nigh."

As Mr. Palmer remarks, valuable books have been so preserved for centuries in the East. The ancient Jews also buried rolls of the law in earthen pots for safe keeping. He thinks the Palestine Fellahin should be talked to as to such matters. Mr. Drake supplements the report with remarks on the stone circles of Ragb el Mirad. Similar enclosures, he says, are still in use as foundations for thorns as hedges surrounding camps, to keep out the wild animals.

Miscellaneous.

New Brewery, Swindon.—A new brewery is in course of erection, constructed, it is said, upon very economical and scientific principles. It stands near the High street, and covers about 2 acres of land. It is capable of brewing over 2,000 gallons daily, with only one engine and one boiler (double fire: 14-horse power), which consumes not more than half a ton of slack per day. The building throughout was undertaken by Mr. Phillips, of Swindon, who worked from the architectural designs of Mr. Arthur Kinder, of London. The machinery was constructed by Mr. Llewellyn, of Bristol; and the vats, &c., were made by Mr. Oxley, of Frome, and Mr. Bridle, of London. The brewery has now been finished, and a supper has been given by the proprietor, Mr. Bowly, at the Masons' Arms Inn, to the whole of the men that were engaged in its erection, together with a few friends.

Edinburgh Architectural Association.—At the first ordinary meeting of the session, held on the 13th ult., Mr. Thomas Ross, vice-president, in the chair, the President for the current year (Mr. R. Morham, jun.) read a paper "On various Defective Internal Arrangements of Dwellings." He referred at some length to the subject of the ventilation of dwelling-houses, pointing out that, while it was usual at the present day, in the case of most public buildings, to make some provision for this important function, in the case of dwelling-houses it was most frequently quite overlooked, and made to depend very much on the want of fitting about doors and windows; and then went on to show that it was not enough for the architect that his employers were indifferent to such matters, but that it was his duty in all cases to endeavour to impress on them the duty of giving effect as far as possible to the dictates of modern scientific research, and that the mere indifference to the importance of proper ventilation was no reason why it should not be pointed out by him on all occasions as a very necessary thing. One subject referred to was that of water supply, or rather the waste of water, which, he thought, could most effectually be checked by the use of meters, but admitted that there were serious difficulties in the way of their introduction. The question as to the best kind of water-tap, and the case which was tried in the Sheriff Court a few years ago, wherein the relative merits of the ground-plug and screw-down principles were very fully discussed, were then alluded to, and a portion of the evidence in that case was quoted to show that in the towns of Manchester and Norwich the introduction of the screw-down tap had reduced the quantity required per head per day from 38 or 40 gallons to from 13 to 15, which was found amply sufficient for all domestic purposes.

Instruction in Science and Art for Women.—Professor Huxley delivered the sixth of his series of lectures on "Physiology" to a numerous audience in the lecture-room of the South Kensington Museum, on Saturday morning, when he continued his observations on the plutonic and vital agencies that are at work in repairing the waste of dry land which is constantly going on in the various forms of denudation previously described. The seventh lecture was delivered on Wednesday. There was a numerous attendance. The lecturer continued his observations on the "vital" as distinguished from the "plutonic" agent at work in repairing the waste of dry land occasioned by the various forms of denudation. Professor Guthrie delivered the fourth of his advanced course of lectures on heat and light, in the lecture theatre. Having in his previous lecture spoken of the capacity of heat in different substances, the Professor now proceeded to consider how it is that some substances have greater melting powers than others, as was previously illustrated, to some extent, in the melting of wax by bringing up the different substances to the melting degree of temperature; and how it happens that different substances having the same temperature may not possess the same amount of heat. The fifth lecture of his series proceeded to examine and illustrate still further the subject of heat. The first object of illustration was ice, upon which some interesting experiments had been made in the course of the preceding lectures.

A City Lighted by Natural Gas.—The city of Erie, Pennsylvania, stands on the verge of the petroleum region. Natural gas is formed in large quantities beneath the surface in this region, and it has been turned to account for illuminating purposes. On the night of Oct. 26 the city of Erie was lighted by natural gas, obtained from a well sunk near the city gas-works. Thirteen gas-wells are said to be now in successful operation in Erie, and are mostly used to furnish fuel and light to factories. The gas is found at an average depth of 550 ft., and the yield per well is about 20,000 cubic feet a day. The gas is said to require no purification, and is being introduced into private houses for fuel.

A Church Spire Damaged.—The village of Hartfield has been visited by a severe thunder-storm, which did serious damage to the church. The lightning struck the ball at the top of the vane, split the top of the spire, ripped out the shingles and some of the timbers on the south side, and some of the stones on the top of the tower. The whole of the spire, in fact, is so severely shaken, that much of it will have to be removed before it can be repaired.

Lectures by the Rev. Canon Kingsley. The extraordinary cerebral activity of the Rev. Canon Kingsley may be slightly appreciated by an announcement which he lately made before delivering a lecture, at Chester, "On Wind and Rain." "I wish, next spring, to give to those who did me the honour of attending my botanical class last spring, some plain lectures on geology; but not merely on geology. As I said last night at Liverpool, you cannot study one natural science without being forced to study at least a little of three or four more; and therefore I should prefer calling those lectures, lectures on natural history, that is, the history of our planet; at least, the history of its surface, on which we live; lectures on what the Germans call *Erkunde*—earth-lore, earth learning which I hope to see some day taught in every school in the British empire. I think of giving a set of lectures on the very simplest matters; to begin, I think, with the soil in the field; then go on to the cobbles in the street, to the stones in the wall, the coal in the fire, the lime in the mortar, the slates on the roof; and so to lead you (as I ought to be able to do) through the whole geology of this district. And meanwhile, it is fit that I should give you, as an introduction to these lectures, a little talk about wind and rain; for, as you will see, I hope, in time, to show that without wind and rain there would have been no soil, no cobbles, no sandstone, no coal, no lime, and no slates, and (as I may show you in some future course of lectures) no reptiles, animals, or men either. Let us begin with the wind."

Parliamentary Bills.—Amongst the Bills in Parliament Session 1871, will be one for purifying the water and giving a constant water-supply to London, for the control and regulation, amalgamation, &c., of the several companies, reduction of rates, and other cognate purposes. There will be a Bill for the enlargement of Billingsgate Market, purchase of adjoining land, &c. Another Bill is for the acquisition of additional ground, &c., for the Record Office in the Library of the Rolls. There is a Bill titled the "Easton, St. Pancras, and Charing-cross Railway," for the construction of railways from the London and North-Western Railway at Easton Station and the Midland Railway near St. Pancras Station to the Charing-cross Railway at Charing-cross, and streets between Oxford-street and Leicester-square, and between Leicester-square and Castle-street. Another for the "Fulham, Hammer-smith, and City Railway" Company, for a line commencing with a junction with the Hammer-smith and City Railway, in the parish of Hammer-smith, near the Hammer-smith Terminus, and terminating in the parish of Fulham, at a point on the northern side of the King's-road, where the tablet bearing the inscription "Elysium-row, Anno Domini, 1738," is set into the front of the houses.

Sanitary State of Wells.—For some months past an agitation has been going on about the necessity of the local board obtaining a better supply of water. The board refused to do so, but sanctioned the formation of a private company, of which General C. O. Pratt is the chairman, and Mr. Welsh the solicitor. Before this consent had been given by the board, a memorial (in pursuance of the 49th section of the Sanitary Act, 1866), was signed by several of the principal owners and ratepayers, praying inquiry as to the defect of the local board. An inquiry has accordingly been directed to be made, the commissioner appointed for the purpose being Mr. Arnold Taylor, who intends to proceed upon the said inquiry on the 15th instant, at the Town-hall, Somerset.

The Property of the Metropolitan Railway Company.—In reply to the offer of premiums by the Company for the best plan for utilising their surplus property, about 300 plans were submitted. The lands are at Farringdon-road, Barbican, King's-cross, Bagnigge Wells-road, Edgware-road, Praed-street, Linden-grove, Campden-hill, Smithfield, and South Kensington. The Farringdon-road estate is valued at about 350,000l., and that of Smithfield at 150,000l. We do not hear that any decision has yet been come to.

India.—An archaeological committee has been appointed in Ceylon to investigate the ruined sacred cities, and to collect inscriptions. Several ancient cities have been cleared of jungle, and many unknown antiquities have come to light. Photographs have been taken of the ruins of Anuradhapura.

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The Builder.

VOL. XXVIII.—No. 1453.

New Buildings for the 1871 Exhibition, and the Royal Albert Hall.



THE buildings erected for international exhibitions by the commissioners for the Exhibition of 1851 are now so far completed that little remains to be done beyond the tile pavements in some of the galleries. Our readers may remember that the new buildings flank the arcades on the east and west sides of the Royal Horticultural Gardens, and are joined by means of a glass-covered way on the arcades at the north end of the gardens, communicating with the conservatory and the Royal Albert Hall of Arts and Sciences. We subjoin a view* showing the appearance of the buildings above the arcades; also a view of the Hall, the roof of which, as finished, is somewhat different from what was shown in the view we published some time ago. In an early number we will give a plan, showing more clearly the connexion of the various buildings. When the scheme is completed, it will form a remarkable whole. The galleries now finished are in two stories, about 550 ft. in length, besides the staircases and side galleries extending east and west, and are 30 ft. wide. The lower story, coloured pale green and chocolate, has side lights; and the upper, the walls of which are also of pale green, a central skylight. From the latter there will be a way to a promenade formed on the top of the arcades, and overlooking the gardens. They constitute a remarkably fine range of galleries, as may be imagined. The industrial specimens will occupy the ground-floor. One feature whereby the forthcoming Exhibition will be distinguished from its predecessors will be its arrangement of the objects according to classes, and not according to nationalities. No prizes will be awarded, but certificates will be issued showing that the parties receiving them had the distinction of displaying their products in this Exhibition. The first division of the Exhibition is devoted to the fine arts, including articles of utility possessing an artistic character. There are seven classes in this division. What is termed the second division of the Exhibition will consist of manufactures, including also machinery and raw materials.

Paris, it is understood, will be well represented, notwithstanding recent disastrous events. Brussels wants much more space than can be given. Bavaria has intimated that the whole of the space allotted to her will be taken up by a display of fine art. The Dusseldorf Academy have given permission for the exhibition of their pictures and sculptures; and the Royal Porcelain Factory of Berlin will send a collection of porcelain for exhibition. It is to be hoped that our own artists and manufacturers have fully availed themselves of the opportunity afforded.†

Some parts of the Albert Hall will be utilised for purposes of the Exhibition, and the great hall itself will doubtless be the scene of any regal ceremony that may take place in connexion with it. The scaffolding within the Hall is fast disappearing, and the work of completion is rapidly progressing.

The roof is remarkable. It is composed of wrought-iron ribs of various spans, springing from cast-iron shoes, and meeting at the centre a wrought-iron curb, about 18 ft. deep, the underside of which is 33 ft. above the springing line. The inequality of the spans is due to the form of the building, the plan of that portion of the building which the roof covers being an approximate ellipse, the axes being 219 ft. 4 in., and 185 ft. 4 in. The wall at the springing line is only 3 ft. 2 in. in thickness; and to provide for the thrust induced by the extraneous weight of snow and force of wind, and the weight of the roof covering and ceiling over and above that of the principals and purlins, a continuous wrought iron curb or tie is built on the top of the wall. This curb is about 4 ft. wide, and in section is somewhat similar to an ordinary built plate girder laid on its side, the web being 7-16ths in. thick; the flanges 8 in. by 7-16ths in., and the four connecting L irons, each 8 in. by 3 in. by 3-8ths in.

Upon this curb rest cast-iron shoes fitted with adjustment wedges at the back, by which means the principals have exact proportion of strains laid upon them. The principals, thirty in number, spring from these shoes, and are calculated to carry, acting as trusses, their own weight, and that of the structural portion of the ceiling and covering; any weight beyond this being transmitted through the upper members of the principals, as in an arch, to the horizontal curb. The principals are curved trusses, with half-round feet of 10 in. radius, and increasing to a depth of 17 ft. 6 in., where they meet the centre curb. The upper and lower member is of a T section, 9 in. deep and 11 in. wide; the plates, 5-16ths in. thick; and the L irons, 3 in. by 3 in. by 5-16ths in. The bracing consists of diagonal rods, fitted with adjusting screws, and verticals composed of four L irons, 2½ in. by 2½ in. by 5-16ths in., cast-iron distance pieces being inserted about 2 ft. 6 in. apart, and kept in place by bolts. The centre curb is a strongly-built structure of plate and angle iron, and is on plan concentric with the outer walls, the diameter being 16 ft. by 13 ft. 7 in. at the top, and 14 ft. 2 in. by 11 ft. 7 in. at the bottom. The purlins are composed of braced angle iron flanges, with Channel iron struts. On the upper curb is built a ventilating chamber, with movable windows to regulate the draught. Below this chamber the covering is composed of glazing on rolled iron sash-bars of strong section, the lower portion of the roof being boarded and slated for a height of about 12 ft. above the springing.

The ironwork comes from the shops of the Fairbairn Engineering Company, and was erected by the contractors, Messrs. Lucas, under the superintendence of Lieut.-Col. Scott, R.E., the architect of the building; Mr. J. W. Grover, C.E., being also consulted on the constructive part. We mentioned some time ago that when the centres on which the roof was built were struck, the deflection of the centre curb was only 5-16ths of an inch.

For the sake of comparison we add a short list of roofs of remarkable span:—

Canon-street Station	180 ft.
Charing-cross Station	168 ft.
New Line-street Station, Liverpool	220 ft.

applied to works of utility, Feb. 15 and 16; paintings applied to works of utility, Feb. 17; sculpture applied to works of utility, Feb. 18 and 20; engraving, lithography, photography, &c., Feb. 21; architectural designs, drawings, and models, Feb. 22; tapestries, carpets, embroideries, &c., Feb. 23; designs for all kinds of decorative manufactures, Feb. 24; copies of pictures, mosaics, encausts, &c., Feb. 25; paintings not applied to works of utility, Feb. 27 and 28.

Victoria Station, Great Western Railway	120 ft.
New-street Station, Birmingham	212 ft.
St. Pancras Station	240 ft.
Royal Albert Hall	219 ft. 4 in. by 185 ft. 4 in.

This roof, therefore, is within 21 ft. of the span of the St. Pancras Station roof, springing, however, not from the ground, as that roof does, but from the top of a wall over 100 ft. high.

Hydraulic lifts will be employed for the purpose of conveying visitors to the upper galleries of the Hall. It is in these galleries that the exhibition of educational works and appliances will take place, and visitors to the Exhibition be afforded an opportunity of hearing the organ and other musical performances without extra charge.

A report has just now been issued by the Society of Arts, in connexion with the desire entertained by the council to establish a National Training School for Music, which has reference to the use of the Albert Hall. The report recommends that, in promotion of this purpose, a musical section of the society be instituted, with a separate fund, in order to give concerts annually in the Royal Albert Hall. These are to consist of performances of vocal and instrumental music of the highest character, and after paying the expenses of the concerts, the profits are to be applied to the establishment of a National Training School for Music.

Members of the Society, for every subscription of one guinea paid to the musical fund, are to have the privilege of obtaining a transferable ticket for six evening concerts in the arena and balcony without further payment, provided that no member as such shall have the privilege of receiving more than five tickets on those terms; and persons not members of the Society are to have liberty to purchase tickets on such terms as the Council may from time to time determine. A committee has been authorised to make the arrangements for the six concerts as soon as a guarantee fund to the extent of 2,000l. and one thousand subscriptions of a guinea have been obtained.

Our readers will notice in the exterior view we give the position of the mosaic frieze of which we have before now spoken. It consists, we may remind them, of a series of cartoons, each of which averages 4 ft. in length and is 6 ft. 6 in. high, the whole length being 794 ft. The number of cartoons is sixteen, and the subjects of them are the various matters connected with the arts, sciences, and industries. Messrs. Armstrong, Armitage, A.R.A., Horsley, R.A., Marks, Pickersgill, R.A., Poynter, A.R.A., and Yeames, A.R.A., are the artists, and the subjects are agriculture, astronomy, geodesy, workers in wood, and stone, and iron, music, poetry, construction, sculpture, applied mechanics, and so forth. For the most part they are highly satisfactory. These cartoons are in terra-cotta mosaic, of simple outline and colours, the figure outlines being in black, the figures in buff on a chocolate ground and have been executed by female students at the South Kensington Museum for Messrs. Minton, Hollins, & Co.

Much remains yet to be done to complete the building. So vast is the grove of timber within,—the massive central stack reared for supporting the key-ring of the roof, and the circular group of scaffolding proper that lines the great shell,—that it requires all our confidence in the calm assurances given by Lieut.-Col. Scott and Mr. Thomas Lucas to anticipate the opening of the Hall by the 1st of May. On the whole, we think that the present condition of the building is rather less favourable to its acoustic success than will be that of its complete finish. Whatever break is given to the waves of sound by the irregularities of the scaffolding will be equalled by that caused by the persons of the audience. Again, the completion of the ceiling, as to which we shall have a word to say, will certainly not lessen the effect of sound

* See p. 966.

† The days named for the reception of the different classes of objects are as follow:—Machinery, February 1, 2, 3, and 4; scientific inventions, Feb. 6 and 7; educational works and appliances, Feb. 8 and 9; pottery and raw materials, Feb. 10 and 11; woolen and worsted fabrics and raw materials, Feb. 13 and 14; sculpture not

within. The peculiarly hard character of the cement and scagliola used, the careful grooving, tonguing, and binding together into a veritable drum of a segmental portion of the ceiling,—all these are elements of acoustic success. But the main point, after all, we take to be the shape and proportions of the building.

Her Majesty the Queen, whose lively interest in the progress of the building is well known, paid it a visit on Saturday last, accompanied by the Princess Beatrice, coming up from Windsor Castle for the purpose. The Queen inspected the frieze, and then proceeded over a rough but commodious gangway to a platform in the centre of the building, visiting the Royal box, and other portions of the edifice. A little boy named Frederick Britten, a son of one of the workmen employed on the work, sang, without accompaniment, as did also Miss Anna Williams; and one of the officials of the Science and Art Department played several airs on the violin. The Queen expressed her great satisfaction, and encored Miss Williams. After her Majesty's departure, the experiments were continued, and the means were thus given of comparing the effects of similar sounds, as heard in the arena (or, if it be, the boxes, and the galleries.

We are bound to bear testimony as to the excellence of the result. Not only were the faintest notes distinctly audible throughout the whole great building, but they were almost equally audible throughout the minor, or transverse, axis of the ellipse they were somewhat fainter than elsewhere; but the difference, if real, was not great. When the violin was played it was impossible to get away from the sound,—close to the player, at the bottom of the arena, in the boxes, in the gallery,—you seemed equally near to the instrument. The wailing notes of the catgut filled the entire area, and fell on the ear without interruption or echo. The effect of Miss Williams's voice was perfectly charming. The musical sounds passed you even as you stepped into the outer corridor, quite out of the reach of the proposed audience, and seemed, in that position, to soar and float through the air like the notes of the skylark.

For speaking, there seems reason to hope that the amphitheatre will be no less suitable. We were not furnished, it is true, on Saturday, with an orator as well as with a musician and with vocalists; but the brief remarks which we could extract from the modesty of those on the orchestral platform were fully audible. It is probable that great deliberation of utterance will be the main requisite in a speaker in this place, and that, with this, he would be able to fill the Hall. This, however, yet remains to be proved.

Of the organ constructing by Mr. Willis we may find another occasion to speak. It is to be, they say, the finest organ in England. In the quality of sweetness of sound, which, to some ears, is the first of musical charms, all new organs are deficient. That at Birmingham has remarkably improved in this respect since its opening, when it was signally brassy. The large new organ at St. Paul's is a harsh and disagreeable instrument compared with the magnificent old organ by Father Smith, now removed to the choir, on which, the other evening, we heard produced such wailing and sighing of the winds, such rolling responses of thunder, and such a jubilant outburst of the *vox humana* or *vox celestis*, in which the whole forty-four of Grinling Gibbons's lovely cherubs seemed to join with open mouths, that it was worth passing a vigil in the church to hear it,—a vigil of a winter's night.

The point on which we feel, at this moment, the most anxiety is, what may be called with propriety the glass ceiling. We speak on this subject with the less reserve because we are aware that it is yet under discussion. The original plan of lighting the building by elliptical openings in the roof, has been abandoned for that, suggested by us, of glazing the roof. It is very possible to over-light a building, and the effect is very painful to the eye. Our experience of buildings thus rendered all but intolerable is, however, confined pretty closely to those of which the walls are pierced by large and numerous windows, while the roof casts a shade. The positively painful effect which white light, thus treated, produces on the eye, was no doubt one main reason which led to the excellence of the art of the glass-stainer in the thirteenth and fourteenth centuries. Our knowledge of good roof lighting is more restricted. It cannot be said to be more satisfactory. In one of the best known instances, that of the

elegant and commodious reading-room of the British Museum, the light has a perplexing, irritating character, which cannot be altogether due to the atmosphere of Bloomsbury. We believe that the defect is due to its admission through the vertical sides of the lantern. Of course if every ray of light that thus enters be traced, it will be seen at how many angles it must be reflected before it falls fair on the table of the reader.

Now, the external windows of the Albert Hall serve to light the corridors, and rooms, and passages, and throw but little light into the main area of the building. This, we are convinced, is a great advantage. If, then, the ceiling itself be rendered, not glaring, like a window, but luminous, like the atmosphere, we shall have such an irradiation of the whole interior as will correspond with that of an hypothetical temple or theatre. This effect cannot be attained by the use of transparent glass, which would localise the source of light, and entirely defeat the object we have in view. It would not be attained by white, the exclusive introduction of roughened or ground glass; as the white element would still predominate, while the aerial light is blue. It would probably be best attained by the use, or, at least, the free intermixture, of a pale blue glass, or even of the pale rich blue of the early glass-workers, interspersed with ruby and yellow. For this, however, there is neither time nor, we suppose, money. What remains is a treatment *en grisaille*. Many of the windows of York Minster are filled with such glass as we suggest. Not only must the luminiferous quality of the glass be attended to, but it is of the utmost importance to the architectural success of the interior of the building that the harmony of the ceiling should be maintained. It must be a true composition, stamped by unity of design and due subordination of treatment. The glazier must not intrude on us, nor the carpenter, nor the iron-fitter. Anything approaching the endless and unelieved parallelograms of the Crystal Palace will entirely ruin the building. Any emphasising of the lines of rib must be avoided; for, let us remember, it is not a case like that of mullions and transoms, or of the perforations in solid stone in which all our pointed windows originated. Stonework, rich in its own architectural beauty, may make glass subservient to its own requirements. Ironwork has no architectural beauty. Its merits are intellectual, not æsthetic; structural, not decorative. If, then, we make the details of our glass wait upon those of our ironwork, we shall have something poor and inartistic—a station roof or a factory skylight—not a great crystal velarium.

The ceiling, let us suggest, might be in three concentric zones, respectively occupying one-half, one-third, and one-sixth of the diameter. The lower zone should be a bold black diapered or foliated pattern, on a grey ground, the ornamentation to be of the grand severe style of the older glass foliage, of which we have good English examples. The central zone should be for the most part of grey or roughened glass, but still with black diapers or inlet lozenges and lines. The third part should be a repetition of the outer zone, with the exception that the thickness of all the black stencilling, the size and proportions of the foliage or diaper, should bear the same ratio to those of the lower part that is borne by the respective circumferences of the outer and inner circles. Thus treated, we should probably have a ceiling as original and as successful as any other part of the building.

We wish a speedy and successful completion to the Hall, and an inauguration of acoustic experiments (which stands *Kensington* for very charming concerts) in a theatre which is certainly unique.

THE AUTOBIOGRAPHY OF AN OCTOGENARIAN ARCHITECT.*

WHEN an author tells us he helped to lay out Bryanston and Montague squares, now as brown, begrimed, and composed as if a century had elapsed since the last labourer carried away the last ladder used in their erection; that, as ensign, he carried the colours of the corps of the Royal British Artificers, when that body lined the road from Whitehall to St. Paul's, at the

funeral of Lord Nelson; that he was the means of inducing King William IV. to confer the designation of Trafalgar-square upon the Place now known by that name; moreover, that he has studied architecture for sixty-five years, in the course of which period he has been in communication with many eminent men,—we may take it for granted that his talk will be worth hearing. Accordingly, we prepare to listen with attention.

A chocolate-colour covered quarto lies open before us, containing a portion of an outline of the professional career of this octogenarian architect,—a fine old English architect, we may add, of the good old school that considered the grand tour, with its summer loiter in Greece, as an indispensable link between the conclusion of his articles and the commencement of practice on his own account; who, besides having influenced London topography to the extent indicated above, has given some of its buildings finer touches than he delineates with triumph. The Admiralty, those head-quarters of the hopes of so many of the cadets of old English families, especially indebted to his zeal; for it was he who abstracted the two missing columns in the facade to form side entrances into the courtyard. He is associated, too, with another of the lesser lions Londoners always point out to their country cousins, for it was under his superintendence that the first ball was put up at the Royal Observatory, Greenwich, to denote the correct time to the shipping in the river. Our octogenarian, in a word, is Mr. George Ledwell Taylor, formerly civil architect to the Naval Department.

His autobiography is more curious and entertaining than, strictly speaking, useful. The hundred illustrations with which he enriches the first volume of it, now issued, are nearly all too late in the day. The subjects selected have been done over and over again in the long interval that has elapsed since the toms were taken in which they were measured and sketched. They are all interesting, but many are too familiar. Not so, however, when Mr. Taylor and his friend Cressy trudged four thousand miles and more on foot, gallant, sure, and hopeful; through England first, and then by sea, and conveyances occasionally, till more than seven thousand miles had been accomplished, through France, Switzerland, Italy, Greece, and Sicily. In those days John Britton was only commencing the series of pioneer works that have proved so useful to the architectural student, incomplete though they be as far as details are concerned; the issue of Smirke's *Specimens of Continental Architecture* was discontinued; Cockerell's Greek drawings, made only a short time before, were lying unpublished in his portfolio; Pugin was unknown to fame; the Brandons were not; the comprehensive Fergusson was not; the more familiar and friendly Murray was not. Everything was comparatively new, and generally unpublished. And Mr. Taylor measured and sketched York Minster, and St. Peter's, Rome, with the same enthusiasm as when, with Signor Luciani in his guide, he climbed to the roofs of Greek temples to master their construction. Beverley or Basse, Stamford, Strasbourg, or the Temple of Jupiter Olympius at Agrigento, it did not matter which; he measured and drew everything that came in his way, with a tolerable degree of certainty that it had not been done before. In the half-century that has elapsed, however, nearly every building he illustrates has become almost a household word with us. Who does not know every stage in the Leaning Tower of Pisa, or every interstice of the Gate of Lions at Mycenæ, or every detail of Fontaine Abbey, for instance? Yet here we have them once more. There is, however, a second volume in the press, which may contain novelties in the way of sketches. The present instalment shows us about forty-five years of professional experience acquired under circumstances that, upon the whole, appear to have been singularly fortunate.

Mr. Taylor was articled to Mr. Parkinson, of Ely-place, in 1804. It was under him that he assisted in laying out the Portman estate; but the Earl of Shrewsbury appears to have employed our author personally in the alteration of the large house at the south-west angle of Bryanston-square. This is the only commission recorded before he set out with Mr. Cressy, an old schoolfellow and fellow-pupil, on the first of his walking tours. On this occasion they visited the south of England. On the next, they met in York; and thence studied and sketched, after the Minster and Lord Burlington's Assembly

* The *Autobiography of an Octogenarian Architect: being a Record of his Studies at Home and Abroad during Sixty-five Years*. By George Ledwell Taylor. London: Longmans & Co., Paternoster-row. Margate: T. H. Bosc. 1870.

Rooms, Beverley Minster, Fountains Abbey, Rivaux, Ducombe Park, Louth, Boston, Grant-ham, &c. Peterborough, Lincoln, and Ely Cathedrals were also measured and sketched in this tour; the roof of King's College Chapel especially examined, and the construction of it mastered.

Looking back at his investigations of these days, Mr. Taylor has a word or two to say about Lincoln Cathedral. The old part of the west front of this edifice is ordinarily ascribed to Romegius; but he finds reason to believe that the lower portion of the façade, up to the interlaced arches over the great openings, is a part of the first building erected by Paulinus, according to Bede, in 628. His ideas on this subject are fully explained by means of diagrams.

In the following year, 1817, the friends started on the Grand Tour. There were the long boiling drive to Brighton, the slow voyage to Dieppe, including a night at sea, and the rumbling ride in the diligence to Paris, that are now all things of the past—before, however, the real journey began, for Cressy was already in Paris. After a week in that passionate city, they set out for Chartres, and commenced their sketching operations. They measured and drew the cathedral; and the plans of Chartres, Amiens, Rouen, St. Ouen (Rouen), Evreux, Beauvais, and Rheims Cathedrals all appear in the volume before us, drawn to the scale of 100 ft. to an inch. It is not clear, however, that they measured them all, though they visited and examined them. They met with one fact in the neighbourhood of Beauvais, that impressed the author to such an extent that he has related it twice, with the distinction only that he calls the scene of it Villiers in one place and Villers in the other. An eleventh-century church was in the course of demolition at Villiers, and the component parts of it were being sold, the capitals being offered to them at five francs apiece. It is now too late to tell this tale twice with any effect, but the persistency might have been useful at the time.

The friends made a tour of pleasure of 250 miles on foot, through Switzerland, and then came down by Geneva and Lyons to Marseilles. Thence they performed the feat of walking the distance to Frejus, fifty-seven miles, before dinner.

Mr. Taylor shall give his own curt version of this "good joke":—

At Marseilles we joined our friend, Mr. Sanders, and his artist, Mr. Purser. As we had walked through Switzerland and from Lyons, Mr. Sanders, on our return, to rest, observed jestingly, "Gee! I wonder, if you are to find of walking, perhaps you would prefer doing so to-morrow to Frejus; it is only fifty-seven miles, and whoever gets there first shall order the dinner and the wine, and we will carry your luggage," when *Waggon decheux*. "Agreed," said we; "good night."

At three o'clock we got up, equipped our knapsacks to Athens, Mr. Sanders's German servant, and started. The first eighteen miles up the Esterelle, a very steep road, to breakfast. Mr. Sanders was called about eight, and prepared to dress his master's hair, &c. "Well, Andrew, are the gentlemen going to walk to-day?" "Oh yes, Sir, to clock!" "What!" "Yes, to clock, Sir!" "Order horses—four directly." "I will not have any horse dressed, nor wait for breakfast." However, he never caught us up. The first eighteen miles his four horses could only go at a trot, and we arrived at Frejus soon after six. At seven they came, and found dinner all ready, for which, and lodging, he had to pay.

Mr. Sanders, we may explain, was a retired architect, and was Soane's first pupil. He joined Mr. Taylor in his tour through Greece in the following year. At Pisa the two travellers drew the cathedral, baptistery, and leaning tower; and, subsequently, they published their drawings. At Rome, too, they amassed materials for a work which they ultimately published under the title of "The Architectural Antiquities of Rome." Consequently, when we complain of the selection of sketches as representing familiar buildings, we must recollect that the author has performed a share in making them so.

In Rome they found and associated with Hardwick, Donaldson, William, Bassvi, Goldcott, architects; Gibson, sculptor; Eastlake, Denning, and Hanlow, painters; and they made the acquaintance of Canova, through a letter of introduction with which Westmacott had furnished Mr. Taylor. Barry started on his Grand Tour only five days after our author, and for three years they were frequently at the same places within a day or two of each other, without, however, often coming in contact. Cockerell had been over the same ground about five years before, and was well remembered by many persons with whom the friends met. This last architect, indeed, left a trail of regard behind him which Mr. Taylor describes as "devotion." Six of these young men, we may add here, on their return to England, were members of the Architects'

Club, and met at the monthly dinner at the Thatched House, where they must have enjoyed many reminiscences in common. These were Barry, Cockerell, Bassvi, Hardwick, Donaldson, and Taylor.

In Greece, Mr. Taylor was so fortunate as to discover one of the most interesting of the minor monuments of antiquity. His party, which now consisted of four persons,—for Mr. Sanders and his artist had joined them, as indicated above,—made an excursion to Claronia from Livadia. Here, with their minds full of realisations of the great engagements that have made the plain famous through more than two thousand years of history,—of the Boeotians, Thebans, Athenians, and Philip of Macedon,—they were recalled to the present by the stumble of Mr. Taylor's horse over a block of slippery white marble which cropped up in the road. He looked back at the cause of the jolt, and saw an indication of sculpture on the marble, which induced him to call a halt, and make an exploration.

Some peasants working close by were brought to the assistance of the party, and by their united efforts they succeeded in disintering the colossal head of a lion, weighing about three tons; none other, in fact, than that described by Pausanias as having been erected to ornament the tomb of the Sacred Band of the 300 Thebans, who, till they fell before Philip, had never been conquered. Further research yielded more fragments, including one of the hind legs, which was 2 ft. 3 in. in diameter. The satisfaction of this discovery was great; for as Strabo mentioned the fact of the tomb having been erected, and Pausanias more minutely described it, successive travellers had sought for it with curiosity, without, however, succeeding in finding it. Gell, Dodwell, Leake, Hammond, and Holland,—all mention this lion and their unavailing search for it. On the return of the party to Athens, they apprised the English consul and other persons of influence of the discovery; and when Mr. Taylor became Civil Architect to the Navy he endeavoured to persuade the Admiralty Board to allow it to be brought home in one of their vessels. But the lion is still in the land where the generous victors placed it. M. Siegel has published a restoration of it in the "Transactions of the Soc. Archeol. di Roma," 1856, a facsimile of which is given by Mr. Taylor; and there is now a cast of it in the British Museum. As Sir Thomas Wyse points out, the attitude is expressive of agony, defiance, inasmuch as the heroes it commemorated were defeated. In Siegel's restoration it is seated on its haunches, with its mouth slightly opened as though giving utterance to a angry growl. As Mr. Taylor's claim to the discovery was lost sight of, he, as late as 1862, on the receipt of the cast at the British Museum from Athens, made it known to the authorities, in a correspondence printed in full.

Brigands and quarantine were the chief discomforts to be dreaded in Greece. There were neither at Marathon, though two days before they visited that place they were stopped in an excursion to Anceamus, because other persons were performing quarantine there. Mr. Taylor has but little enthusiasm for Marathon:—

"Sunday, June 21st. Set out at six o'clock for Marathon, intending to go by Tricoma, but after two hours' travelling we came to a full stop in the midst of untraversed mountains, and found our guides had lost their way. An hour or two were lost in endeavouring to find a track; but, after all, we were obliged to return to another convent we had passed, and there were put to the road; but we came into the plain by a village at the south end of it, and not by Tricoma, as we intended. We traversed the plain to that place, and were persuaded to proceed to Marathon, where we dined and slept. It is a miserable village between two hills, lying out of the plain, next the sea."

It was generally difficult to procure horses, and many delays had to be endured on that account. But the travellers pushed on and on from Athens to the island of Egina, Corinth, Xantho, and thence to Malta, Sicily, Naples, and back again to Rome, where in the course of the winter they finished their drawings and measurements for their Roman work. On the way home to England their sympathies, of course, were entirely with classic art. Every temple, triumphal arch, and antique fragment on their return journey had a charm for them which their Greek experiences, doubtless, intensified. Only one Gothic building on the route is illustrated, which is that of the church of San Francesco. There are two highly finished drawings of this building, showing the two churches, one over the other; although, we observe, there was only part of a day spent there. These are probably the result of some subsequent visit.

Mr. Taylor prepares a sheet, placing the plans of the classic temples in juxtaposition with those of the cathedrals, which is given in this portion of his work. A second sheet shows us the relative west elevations, to the same scale, of the Temple of Minerva at Athens, and of York Minster. On this subject the author remarks, that the construction and finish of the marble temples is certainly most beautiful, but the magnitude and accommodation for worshippers in the cathedrals surpass them. He leaves his readers, he says, "to indulge in any reflections that may occur to them on the comparison." But adds, that his is a "plain unvarnished tale," which he hopes will be useful. In the face of the illustrations, since published by Cockerell, Donaldson, Gandy, and others, his sketches may be considered rough, but he trusts, modestly, they will be accepted "for what they are worth."

After this Mr. Taylor's experiences are English. He and his friend settled down in London as the first tenants of Mr. Peto's New Farnival's Inn. They occupied themselves with the arrangement and publication of their work on Rome, in the course of which, as a variety to the usual smoothness of their road, they met with obstructions that were the results of two fires, and a bankruptcy on the part of their printers and publishers. Five hundred copies of the work, the price of which was 18 guineas and 24 guineas, on India paper, were burnt in Mr. Moyes's premises. Their first new undertaking was to assist Britton with his work on Canterbury Cathedral. They agreed to make all the necessary drawings, *con amore*, and he closed with them.

More than once in the course of his life the author approached the consummation of desirable events, and then drifted away again before he drew sufficiently close to the opportunity to grasp it. Thus, when friendly with Wilkie, there was a proposition to make him a Royal Academician, which was not carried into effect; and at another time, there was a prospect of associating himself with Sir Charles Barry, which also fell to the ground. On the other hand, he appears to have obtained no lucrative post of Surveyor of Buildings to the Admiralty, with the least possible exertion. The appointment being vacant, he resolved to apply for it, when he was advised by Mr. Lushington, then Secretary to the Treasury, to get three certificates from members of his own profession, and three from bankers or merchants, and send them to Lord Melville with his application. He obtained the requisite testimonials from Messrs. Soane, Nash, and Smirke, architects, and Sir John Lubbock (banker), Sir Thomas Reid (merchant), Sir John R. Reid (merchant), his father's solicitor, his master, Mr. Parkinson, and Mr. Burton; sent them in; and in the course of a few days received the appointment. He retained this post for thirteen years. In 1827, the Duke of Clarence, afterwards King William IV., became Lord High Admiral, and, consequently, the head of Mr. Taylor's department. His subordinate records that he never met a kinder man, and gives several instances of his nice consideration for others. Among other details he relates the circumstances attending the extraction of the pillars from the façade of the Admiralty.

One day the Duke told him he was going to have a large party at his official residence, and that the fact of there being but one entrance to it was very inconvenient. "I wish you to consult with George" (Colonel Fitzclarence), he added; "he is a good architect, and between you, I dare say, you will hit upon some remedy for this on a future occasion." Mr. Taylor declared he had a remedy ready contrived, which he could explain and carry into execution in time for the party next day, if the Duke would give him leave. He had thought over the matter, and was prepared with a model showing the alteration.

"I soon fetched the model, which consisted in removing one column from the front of each entrance, and substituting the entrance by an archway of cast iron similar to that to be removed. The Duke said, 'Excellent, let it be done to-morrow. You saw it can be done in time, which was what I wanted.' 'I am quite sure of it,' said I. Mr. Croker had some time previously sent for me and said, 'I have sent for you, Mr. Taylor, to tell you I am the organ of the Board, and any business you have to refer to me.' I therefore went at once and informed Mr. Croker of this. 'Very well, leave it with me.'"

The surveyor had no idea of thus abandoning his pet scheme, and urged that he must give orders for its execution immediately, in order to ensure its completion in time. But Mr. Croker

was inexorable. In this dilemma the author, who seems never to have been at a loss for a first-class adviser, consulted Sir George Cockburn. "He paced the room as if in a soliloquy, saying, *soho voce*, 'Take care of yourself, and never mind Cockburn!' 'My dear friend, it is an awkward position you are in, I cannot advise you.' Whereupon I made drawings, and took them to Maudsley, who undertook to perform the work on receiving my order to do so." In the afternoon he observed Mr. Croker and Mr. Smirke in consultation over the case, across the street. He went to them and urged his point, but still did not succeed in carrying it. However, the next day he received a letter from the Duke, which enabled him to set to work. A facsimile of the letter is inserted.

In 1830, when on his way to Stangate to give directions concerning the repair of the docks at Deptford, Mr. Taylor observed the late Sir Charles Barry and a stranger, in a gateway, examining what he took to be a block of Portland stone carved into a Corinthian cornice. "What a fine block of stone you have there," he exclaimed. They laughed, and Barry replied, "Let me introduce to you Mr. Ranger: this block of stone, as you think it, is composed of his patent concrete, and is going up as a cornice in a house now building in Pall-mall." This led to an appointment with Mr. Ranger to consider the applicability of concrete to the works in the docks, and its ultimate use there, as well as at Chatham, in 1834. The large storehouse at Chatham, 540 ft. long, was cracking, and coming to pieces. It was imperative that it should be attended to, and it was successfully underpinned and furnished with a solid foundation of concrete, without the removal of the enormous quantities of stores it contained. An account of the process employed was communicated by the author to the members of the Royal Institute of British Architects about two years afterwards, which is reprinted in the volume before us. Mr. Taylor designed the Propyleum at Athens, with central portico and side ones, with Doric columns, full entablature over, tryglyphs, &c., all in concrete. The new Admiral's House at Sheerness was built upon a foundation of concrete. But, once the new material failed; because, we would add in parenthesis, not rightly managed. This was at Woolwich, where a graving dock had been built of it, with a facing of granite. When finished, and adventurously deepened by the reconstruction of the bottom, 4 ft. deeper, he perceived to his horror that the floor of it heaved "like the heaving of a human breast." He reported the failure to the Board with deep sorrow, and a consultation was agreed upon. Mr. Walker was called in, who prescribed granite for a first-class dock, but he ultimately took fright at the subterranean springs that had proved the masters of the concrete, the dock was abandoned, and a large basin only formed.

On one occasion, Mr. Taylor was required by the Board to inquire into the nature of some damage that had been done to the Plymouth Breakwater in a great storm. He relates, with great simplicity, his assumption of familiarity with the diving-bell. When the descent was accomplished, he found huge masses of limestone rolled up from the toe of the work on to the top, one of which was of eight tons weight, as well as breaches in the general line. When at the depth of twenty-five fathoms, surveying, he observed that blood was oozing from the nose, eyes, and ears of the clerk of the works who accompanied him.

The Melville Hospital, Chatham, was built from the designs of Mr. Taylor, with the wards in separate pavilions. He quotes from the report of the Commission for the organisation of military hospitals, the favourable opinions that have been passed upon it, and plumes himself upon the fact that the new St. Thomas's Hospital is precisely similar in plan to his design. He was desired, by the Lord High Admiral, to make plans for a larger building at Sheerness, for 1,000 men; but this was not carried out.

Mr. Taylor built the east side of the new square at Charing-cross, which, after King William's accession, with his permission was to be called King William IV.'s Square. But the name was considered unadvisable, perhaps unwieldy, by "the Woods and Forests" among other authorities. Our author repaired to St. James's, intent upon suggesting to the King the desirability of giving it the name of the victory in which Nelson fell. Here he found Sir Thomas

Hardy waiting, among other officers, for an audience, and as the great hero died in his arms he considered him a more fitting person than himself to make the suggestion. He therefore intrusted him with the secret of his mission, but Sir Thomas would not take upon himself the ungracious task. However, Mr. Taylor waited his turn, saw the King, made his proposal of the alteration of title, and succeeded in his object. "I see," said his Majesty; "give me your plan,—pen and ink," and writing "Trafalgar-square, William Rex," handed it back to him: "There, take that to Lord Duncannon."

At last the day came when there was a change of luck. Lord Dalmeny and Lord Minto, both new members of the Board, considered it would be a saving to pension off the surveyor and appoint an officer of Engineers in his place; which officer, Mr. Taylor found, was to be Captain Brandreth, then about to marry Lord Dalmeny's niece. As misfortunes never come singly in ordinary people's experience, so they came in couples in that of our octogenarian. No sooner was he deprived of his post than scarlet fever visited his large family, and his wife, with two children, died of it. He thought first of qualifying himself for the appointment of district surveyor, and when a vacancy occurred in Westminster he commenced a contest, which he declined on learning that another competitor, the late Mr. Howell, had performed the duties for years before the death of the late surveyor. The autographs of most of the leading architects of the day, collected as references to his ability, are photo-lithographed by Messrs. Whiteman & Bass, and form an interesting page. Ultimately Mr. Taylor embarked in building in Tyburnia and Westbourne. He built, he tells us, the west end of Hyde Park-square, Chester-place, and the south side of Gloucester-square. Then he built a house in Westbourne-terrace, and lived in it. He also built Orsett House, adjoining the last, both of which were kept low to give a view of Mr. Condy's church. He then took five acres of the Bishop of London's estate. But bad times came; and the great fortune that appeared to be coming within his grasp gradually vanished.

But the formation of the South-Western Railway, the Regent's Canal Railway, and the North Kent Railway brought him fresh employment, the nature of which is detailed. The proposal to continue the latter from Stroud to Dover brought him into communication with the Duke of Wellington, of whose letters upon the subject he gives *fac similes*. But he met with but little support from him; especially, he refused to have his name appear as a patron. No one, the Duke declared, used railways less than he did; but on public grounds he would assist the construction of this one. The plans were completed and deposited in due time, and the Bill drawn by Doringtons, with, unfortunately, the name of the Lord Warden of the Cinque Ports placed at the head of the list of commissioners. As soon as the insertion of his name was perceived by the Duke, he resolutely withdrew from all relation with the project. A violent opposition from the South-Eastern Railway Company ensued, which was so far successful as to end in the abandonment of the Bill for the time being. Mr. Taylor relates that he had to bear the expenses of this abortive scheme to the amount of 3,000*l.*, owing to his neglect to obtain the signatures of the directors to an agreement to recompense him. This is the line subsequently taken up and carried out as the London, Chatham, and Dover Railway.

If any one should ask why the octogenarian architect has given us all these particulars, they will find that he has prepared an answer to the question. He says most minds endeavour to do some good, or to leave some record in this life; that he feels these desires; that he hopes to show he was persevering and industrious; and to convey some information to the rising members of his profession that may be generally useful and instructive. And when we have looked through his account of his successes, failures, and mistakes, we feel that he may not have fallen altogether short of his aim.

Microscopic Photography put to Good Use.—Paris is said to contain 1,400 trained pigeons, so that there is a prospect of obtaining news by this means as long as the siege lasts. On the 17th ult. a pigeon arrived from Tours with a small sheet of paper, on which a Government despatch, and 116 private letters, were photographed in microscopic characters.

ON COLOUR IN CHURCHES.

THE four letters addressed by Mr. Edmund Sharpe to the *Builder*, on this subject, since August last,* have been collected by him into a good-looking pamphlet,† and will, no doubt, be thus read again by many who saw them in their previous form. Their collection serves to indicate that the writer has "had his say," or, at least, a share of it, and gives a fair opportunity for a glance at the various views on this much vexed question. The existence of parties in the matter is constantly forcing itself on the attention,—the Mono (or Oligo rather) and Poly schools, now in conflict almost interecine, now in temporary amicable compromise; the "*Droit*" and "*Gauche*," with all the formalities of hostility; and a "*Centre*" between the two, comprising the very large Cave of Adullam of chromaticians. Mr. Sharpe has devoted his well-known skill and fertility of illustration to these letters, and, with the art of an advocate, has put forward all the most prominent points of his side of the question, though, at the same time, we (who knew it already) do not fail to see indications enough that, on occasion, he could be an impartial, as he is an accomplished, judge. It is very satisfactory that the general bearings of any art practice should be often and thoroughly discussed from the first, and especially at the time when discussion may be of immediate value. A correspondent of the *Builder* (p. 649, ante), a little while since, said that "our theory of restoration has to be perfected, now that the greater portion of the work of restoration has been done." Perhaps this is not far from a specimen of most human doings. History sees so much more of the field than the makers of history.

Any consideration which we give it seems to lead us, in the desire for illustration, well away from our immediate subject into generalities,— "to follow any road far enough may lead us to the world's end."

The Cistercians, to whose discipline and customs Mr. Sharpe points with pleasure,—quoting, by the way, some of the instructions of their rule not closely touching the question of colour with an evident relish,—seem in so many respects under a different sky from ourselves that most of us find a difficulty in realising their austere and toilsome lives, and their rigid order. Mr. Sharpe "having visited the remains of all this order in France, England, and Germany" (a task no doubt undertaken in a holiday spirit, but without a holiday desultoriness, and that should surely be completed by the publication of a volume on the subject), must after such a quest have in his mind plenty of river valleys with his favourite buildings "devoid of all florid ornamentation" in the midst, wood-crowned hills in summer and autumn leafage, not to speak of the skies and purple sunsets; and we doubt whether the fiercely ascetic character of the men that erected their homes among these scenes comes up as more than an occasional recollection, when the images of the buildings and their surroundings "flash on the inward eye." The harmony of simple forms, regular repetitions and symmetries, with pastoral scenery, no one disputes; but how the luxuriance, and rich beauty and plenty, and the air of glad content, seem to contrast with the stern life that a St. Bernard of Clairvaux would have lived there, and made to reflect itself on the architecture of his house! Are there not two sets of tendencies in human nature, each with its own interest, the one necessarily excluding the other as far as it is dominant,—the enjoying (of course we only need to speak of good and pure enjoyments) and the self-denying impulses? The expression of the one being:—

"Beautiful earth, and could we eliminate only this life hungering impulse, this demon within us of craving, Life were beatitude, living a perfect divine satisfaction."

Contrasting with the other's:—

"Humiliations and exaltations combining; Exaltations sublime, and yet diviner abasement, Aspirations from something most shameful here upon earth, and In our poor selves to something most perfect above in the heavens."

May it not be that these contradictions are part of a natural order? And may not the links by which these tendencies, themselves as at opposite poles, are connected, forming the multiform and many-sided human nature, be also thus regarded?

* See pp. 621, 742, 781, and 822, ante.

† "Four Letters on Colour in Churches, on Walls, and in Windows" By Edmund Sharpe, M.A., F.R.I.B.A. Spon & Co. 1870.

In architecture, Mr. Sharpe and his school, with their love of pure form, "noble and stately proportions;" "gracefulness in the composition of carved work;" "foliage, arabesques, and diaper-work of the greatest elegance and of infinite variety, arranged chiefly in geometrical patterns;" feminine fairness and gracefulness;" and dislike of the "painful glare of common glass"—are a remove or two from the original Cistercians, with their rigid exclusion of "*Superfluitates, et curiositates notabiles in . . . edificis,*" &c., and the "*Vitree alba fiant.*" And is this the happy mean? Or does a further progress in the same direction land us in "gaudy colour," "harlequinades," "tawdry finery," "meretricious decoration," "an art which is lower than that of sign-painting?" "Hardly so," the advocates of colour reply. "The healthy eye and mind ask for colour; the defect of excess only occurs when there is want of power, and skill of delicacy of hand, and eye, and mind; colour may be carried to any force, if properly regulated; vulgar colour is only unharmonised colour, or in the wrong place; though it may be true that 'the finer the eye for colour the less it will require to gratify it intensely' (J. Ruskin, "Two Paths"); that less must not be under a certain quantity; and, again, Mr. E. L. Catts (at p. 690, *ante*), 'Every great school of architecture used decorative colour (and historical painting and sculpture besides), to heighten the effect of its great public buildings.' Can there be a right or a wrong on this general question, which is simply one of preferences? In the colour controversy there are, however, certain not necessarily connected matters that strangely intermingle: it has been remarked that there is sometimes a strong tinge of what (for want of a better name) we may call æsthetic feeling in many of those who are the lovers of strong colour, and some other matters reprehended by Mr. Sharpe; and that those influenced by the "characteristic sentiment of national sobriety in matters of taste as well as in matters of religious feeling" have often a very bright and genial outlook on the world and things in general. We think we may feel a hearty satisfaction that, notwithstanding all the influences that are supposed to be grinding us down to an exact correspondence in every feature of our characters, rubbing off the angles to a shocking extent, we find so many indications of that infinite variety, which, when co-existing with some important concords, gives the best hope of vitality and consequent progress in the future.

It seems pretty evident that buildings with claims to a considerable antiquity occupy a different position from that of the general mass of new or modern edifices. They have had their finishing done by the hand of Time. Their charm consists, when we can get them fixed in the imagination, so much in the interest due to their history,—to the events that have taken place in them, or within sight of their walls,—to the men who have made them the scene of their energy or their devotedness, or their high humanity; blended in an undefinable war with the tender beauty given by the hands of Time and Nature in the sober harmonised tints, even in the gentle progress of decay. "They belong partly to those who built them, and partly to all the generations of mankind who are to follow us." Such charms as these, which can be only slowly attained, which mostly point to a very high order of excellence in the architecture, or its preservation would rarely have been secured ought, when we find them, to be considered as calling only for maintenance (upholding), and little more. The case is, however, rarer than we sometimes think. Many buildings once again stripped of the "conservative whitewash," with which (to quote Mr. Sharpe's eulogy on our grandfathers), "they considerably covered them up, and so preserved them for us,"—are, barring such tinges of half-destroyed colour as we find on them, restored to us as if time had gone over them, but had forgotten to impress them with his seal. Even then they seem so like fossilised history and art, so inclined to retire themselves from an intimate alliance with modern life, so full of a nature of their own, in fact, that only people of very strong character, very full of force with some work of undoubted value to bring forward, care to thrust themselves on the mind and eye, when the work of ages is the background. Perhaps, with reference to old buildings generally, no safer proposition could be made, nor one that would meet with a more general assent than this,—that in dealing with the heirlooms of nations, each generation should

do its very best, as might surely be allowed, if, say, a Michelangelo filled with story the bare walls and vaults of St. Paul's,—or that it should be very little, and that little of the most careful and least obtrusive kind. Also that, in new buildings boldness and vigour are pleasant, and such buildings are clear from all the limitations—the sentimental reverences, let us say, that properly belong to works with an ærgo.

Space would fail us to consider in sequence the various questions Mr. Sharpe's letters would beguile us to speak about: we will, therefore, merely allude to the matter of "cost,"—to say that it is hardly in the question. The sums that are spent over "the purchase of so many square feet of deeply-coloured and almost opaque stained glass" may have only produced in some cases "gaudy pictures and grotesquely-dressed figures," poor and vulgar results; but the English nation is surely rich enough, and ought to be willing enough, to consider only the fitness and not at all the cost of whatever even the most exacting of dreamers (at all rational) would ask for public buildings, and this of set purpose and continually. Hawthorne, in his "Note Books," recently published, says:—"It takes down one's overweening opinion of the present time, to see how many kinds of beauty and magnificence have heretofore existed, and are now passed away and forgotten; and to find that we, who suppose that, in all matters of taste, our age is the very flower-season of the time, that we are poor and meagre as to many things in which they are rich. There is nothing gorgeous now. We live a very naked life." This sentence of the kindly and observant American, written in England, almost takes away any unpleasant taste that the word in italics may have contracted by being misused by Mr. Sharpe's "small tradesman."

SCULPTURE AND SCULPTORS IN THE BRITISH MUSEUM.

In spite of all the shortcomings of the present inartistic age, it is quite certain that at no time in the history of the world have there been so many chances of getting artistically educated as at the present moment. Daily does there seem to spring up some new society or organisation for the express purpose of putting before the student some fresh means of study and improvement. Books, in almost countless numbers, are at hand for consultation, and teachers more than ready, and cheap enough in all conscience, to devote all their time and energies to the work of instilling into the minds of others the means of doing that which society has denied them the opportunity of doing themselves, able as they may consider themselves, and are! But art-education, after all, if we bring it down to its lowest denomination, or raise it to its very highest, must depend mainly,—first, on the natural instinctive capabilities of the learner, and as much, perhaps, on the power, he may possess of looking at and getting instruction out of what has been done by those gifted few who have preceded him in the artistic race. It is in places like the British Museum Sculpture Galleries, for example, that the sculptor must find instruction and help in the work he has to do. All the lectures, however learned, will be to him as nothing as compared with what is to be got by sight and touch, and even measurement, of the great works to be found collected together in such a place. Hence the value of such a place and its contents, and the infinite importance of preserving it in such a state as that no part of its teaching power may be wasted or lost.

We are led to these reflections from the fact of the opening of a new room in the British Museum, or rather the enlargement of the old "Elgin Room" as it is called, by the addition of a square room at the north end of it, for the purpose with it of containing the whole series of marble slabs, and casts of the Greek frieze from the Parthenon, and from some regret at the way in which these famous works have been treated, and are now in course of treatment. There is, it is quite certain, no small difference between the old Greek way of doing things, and our own modern way of doing them. In Greece, ignorant and unscientific as it doubtless was, a Parthenon and no less, a great temple of solid marble, and marvellous proportions, was reared, may we not say so, to hold up these very marble slabs, and metopes, and pediment figures, at a cost, some say, of a million of money, and all the brains, and hands too, of a great architect of the works, and the help likewise of all his brains

and hands of a great sculptor; nay, the greatest sculptor the world has ever seen. This was all done in ignorant and Pagan days, in days when nothing most surely existed which is now thought indispensable to human existence and happiness. But in contrast with this old way of doing things, what is it that is thought all-sufficient and good enough to house and hold up these very masterpieces of the brains and skill of hand of those ignorant and heathen workmen? Why, the long awkward "Greek room" has been simply lengthened, and that by the mere addition of a square compartment at the end of it, and divided from it by square pilasters, round which, as it would appear, the angle slabs of marble are to wind themselves. In short, this additional space thus fixed on to it, is for the make-shift purpose of holding all the slabs and casts in a single row.

Before we go further it may be as well to note that the great temple from which these fine works of the sculptor's art were taken was some 210 ft. long by 100 ft. wide, and that the Cella or inner walled temple itself, and round which the columns stood, and on which the frieze detailed, was about 170 ft. long by about 70 ft. wide; so that a room to hold these marbles, supposing the whole of them to be still in existence, must have been of those dimensions; the marbles, of course, being inside the walls of it, instead of as in the building itself outside of it. They were too far above the level of the eye, and in the morning and at noonday must have been well-nigh hidden under the shadow of the projecting architrave, and the columns which supported it. In the early morning and evening only could the sun touch these half-hidden sculptures. In the Museum room they are nearly on a level with the eye. Shakespeare evidently thought little or nothing of his great dramas; he wrote them, and left them for people to do what they liked with them. Phidias worked out this great sculptured frieze to fix it up almost out of sight, and simply as a mere record of a "procession," without probably for a moment thinking of it as anything more than that. But as far as it went it was perfect, and no one looking at it beneath the shadows which covered it failed to read and to see in it a true portraiture of a living and ever-recurring event; and, what is more than all to our present purpose, everybody could see in it how the said procession ordered itself, and how it was arranged; indeed, it was ever there to be read as a faithful record of a past act, and the guide, if need be, to a future one. It was the Athenians' stone-book of the great Panathænaic procession.

But with us, to whom the whole idea of the procession is dead, and with us who are above processions, all this intelligible stone talk is nothing, and of little or no interest; and the way in which these marble fragments are exhibited in the British Museum room too clearly proves it; for of arrangement proper there is actually none. Some arrangement, without doubt, there is; but it is not of the right kind, and is just where it ought not to be; for not only is all the original idea of the procession lost sight of, but a painful impression of its being all wrong is forced on the spectator by the ever-painful fact of the whole of the slabs, where it is possible to do it, being permanently fixed and joined together as though the separate slabs of the frieze were one long and perfect piece. All the joints between the separate slabs being filled in with stone-coloured cement, and even where there are blank spaces, and where there are slabs missing. Surely it would be much better not to fill in with cement or plaster the joints between those slabs which are manifestly separated by lost slabs, and where the subject is, of course, broken and incomplete. Indeed, is it not better, where so much is lost, to simply arrange the slabs side by side, and without any filling-in with new cement. They are broken fragments of a once perfect work. Mr. Westmacott has written to say that he has had nothing whatever to do with the arrangement: who has to do with it?

It must be recollected that when this room was originally constructed by the late Sir R. Smirke, there was no door either at the north or south ends of the room: the entrance-door was at the middle of one side of it, the east side coming from the Egyptian Room, and it was at this doorway that the slabs divided so that the door jambs represented the angles of the cella building, or the corners of it, as you went round it. In the building itself was represented the actual Procession, as it took place, for the Procession, after having collected itself in the space between the Propylæa and Parthenon, divided into

two columns, which proceed eastward along either side of the temple, and these having turned to the right and left respectively, reached the angles of the eastern front, and met opposite the eastern door. Here the bearer of the "Ephele," or sacred veil, and the two arrophori entered the temple, and delivered their sacred burdens to the Archon,—represented on the frieze by the way, and always described as a God!—and to the priestess of Minerva. All this is represented on the frieze itself, and one cannot help thinking what a much better plan it would have been, and more "educational," to have built a new room purposely for this magnificent work, of exactly the same dimensions as the outer wall line of the cella of the Parthenon, so that the slabs of marble from the frieze, and the fragments of it, and the plaster casts of those slabs now in foreign collections, might have been placed exactly in the position in which they originally stood in the Temple itself. The sole inconvenience would have been that the corner slabs would have occupied the inner angles of the room instead of detailing round its outer angles, but all would have been intelligible, and the procession might have been read as in the days of Pericles; gaps only occurring where parts of it are for ever unfortunately lost. But a still better way even than this, if one could but for a moment conceive such an expensive thing to be possible, would be to construct a building with a courtyard in the centre of it of the exact size of the "cella," and to arrange the slabs round the outer walls of it, so that it should be in very fact a precise and accurate representation of the cella wall of the temple: the angle slabs would then be right, and the dividing line of the procession seen as in the temple. But of course this is too ambitious a thought, and we only suggest it for the future.

We are here only aiming at a few general thoughts and hints at one or two improvements, and simply wondering at the way in which things are done now—days. We have already noted the marble-cleaning process, and hoped some one would have told us how it has been done. We would, with all possible respect, now ask—Mr. Westmacott having denied all knowledge of such things—what has been done to the plaster casts of those slabs in the foreign collections? They outline the very marble itself in brightness and newness of look, and do verily appear to have been washed perfectly clean. What a pity it seems. Common plaster, it simply dried over, and left for time to do its work, is hardly to be distinguished from marble or stone; no colour can be better, or more sculpture-like; what, therefore, can have induced the powers that be to go to work as they have done, and paint, or wash, or "gelatine" all the plaster up to the high-water mark of a newly-painted fashionable street door, and to utterly destroy—and this, at all events, will not be denied—all the harmony of colour between the marble and the plaster surfaces. There is now in the new square room at the end of the "Elgin Room" a plaster slab, which it is impossible to tell from marble at first sight—no colour can be better—why, we would ask, should so good an accident be brightened up to the tone of Bath-powder? So much for the colour of plaster; the colour of the marble we lamented over before, and regretted that it should have been so unwisely treated as it has been.

It seems almost impossible to comment on such doings in the British Museum without going into a perplexity of details which would probably be of small interest to all but a very few very thoughtful persons; indeed, to say all that is useful and convincing, it would be necessary to write a specification of works required to be done at the Museum; but we may be allowed, perhaps, to hint at yet one or two other things of no small moment. Confining ourselves to this small new room, what a chance was there with but a fragment of an idea out of the jog-trot of the "office!" Why was this room skylighted like a railway refreshment-room, and the glass of it painted or plastered over? In a room lighted in this dull, lifeless way, there is, and there be, no shadows anywhere, for the light in it is too uniformly diffused: it comes from no single point, but from everywhere. The most perfectly lighted room for artistic purposes in the world is probably the Roman Pantheon, with its huge round eye large enough to throw in light, but not large enough to diffuse the light through it all over the whole space to be lighted. An object placed on the wall of such an apartment is thoroughly well lighted, and well seen, but not too much lighted, and the light in it thus let in

throws shadows. Sculpture is half lost where there are no shadows. A round or square hole in the ceiling of this room one-fourth the size of the present lantern would have been all-sufficient, and, while we are about it, with a fit of common sense on us, clear glass; so that when our poor English smoke-and-fog-enveloped sun does shine, and show himself, this for-ever-blessed sunlight may at times come in and illuminate the bewashed marbles; for surely never, from the hour they left the great temple for which they were sculptured, have they, up to this moment, caught a glimpse of that sunlight in which, and by which, they were carved into a living existence.

CONVENTION OF AMERICAN INSTITUTE OF ARCHITECTS.

THE fourth annual convention of the American Institute of Architects commenced Nov. 9th, Thomas U. Walter, LL.D., vice-president of the Institute, in the chair, and was inaugurated with the reading of the annual address by Mr. Walter, which showed that the progress of the Institute during the past year has been decided and healthy. "Its influence for good has been felt throughout the country, and its respectability as an exponent of a noble and honourable profession is all that could be desired."

At the evening session of the Convention, Mr. P. B. Wight, secretary of the Convention, read the report of the Board of Trustees on Competition for Architectural Works. The Convention devoted the remaining portion of its evening session to the consideration of a schedule of terms regulating open and close competitions for architectural works proposed by the Board of Trustees, which, with slight amendments, was unanimously adopted.

The following is the schedule of terms regulating open and close competitions for architectural works, recommended to all architects, building committees, and proprietors throughout the country:—

1. The instructions must not require more drawings or estimates than are necessary in order clearly to explain the design, and should require that all the designs submitted be drawn to a medium scale, which must be clearly defined, and that all perspectives required be drawn to the same scale as the geometrical drawings, and on a plane at the corner of the building nearest the point of sight; a deviation from which will cause their rejection.

2. In case the amount to be expended is limited, the architect must state that an excess of 10 per cent on the expense of executing any design, over and above the sum mentioned, will exclude it from the competition, the amount of expense to be estimated by the professional experts in the jury; and in case the amount to be expended is not fixed, then the competitor may use his own discretion as to the costliness of the design which he makes.

3. A design will be excluded from the competition if sent in after the stated period, and if it contains deviations from the instructions. If, from any of the above reasons, all submitted designs are rejected, the jury are bound to publish reasons which led to their verdict.

4. The period given for preparing the design must be long enough not only for perfecting a design and preparing the necessary drawings, but must make some allowance for the ordinary occupations of competitors. An explicit statement must be given as to the time when the decision on the merits of the designs is to be rendered, and that all designs shall be returned to the authors of the same. An architect's drawings are his own private property, unless paid for, in which case they are for the sole use and benefit of his client; but the actual drawings still belong to the architect who made them.

5. The designs should be submitted to a jury of experts, whose decision is to be final. One-half of the jury should be architects, and, in case of an open competition for a public building, they should be selected by the Institute of Architects or its Board of Trustees, the other half to be appointed by the Building Committee or owner. The jury must be named in the instructions, which they shall have sanctioned before publication. No person can be competent to serve as juror who submits a design, or is in any way interested in any design submitted, or who has not a reasonable intention of participating in the execution of the work.

6. All designs submitted, in open competitions for public buildings, should be publicly exhibited two weeks before the decision is made.

7. In the case of open competition the first premium must not be less than the amount which the architect would have received had there been no competition, and at least an equal amount should be divided among the other competitors, according to the merits of the designs submitted.

8. It is recommended that, in close competitions wherein the number of competitors is limited, a sum equal to the full value of one design be divided equally among all competitors, and all except the one who is selected, be compensated for as provided in the last preceding rule.

9. The instructions must state that in case the building is erected after any of the designs are submitted in competition, it must be given in charge of the author of the design selected, who is to be compensated for the usual compensation; and if any other designs, or part of designs, are used, it can only be done with the consent of the authors of the same, and the full value of the designs or parts of designs used, irrespective of the premiums that may have been awarded.

10. The premiums must be awarded under all circumstances, for the designs which may have been submitted in competition.

11. It is recommended that, in the schemes of competition, it shall be provided that the names of the competitors shall not be known to the jury.

A special committee of five was appointed to compile a pamphlet defining the exact duties and responsibilities of architects, their relations to each other, to their clients, and to the various parties under their control; and to give definitions and explanations of the schedule of charge, and any additions to them that may be thought necessary; and to present the result of their deliberations to the next convention of the Institute; such report to present what is, rather than what should be, the best practice of the profession.

THE FEMALE SCHOOL OF ART.

A SELECTION from the year's work of the students, and especially the rewarded specimens, have been exhibited, as of old time, and on Friday and Saturday last the House in Queen's-square, Bloomsbury, was thronged with the friends of the pupils and supporters of the school. The Queen's Gold Medal has been awarded to Miss Emily Selous (who distinguished herself last year), for a well-modelled statuette of the Diacubus. The same lady exhibits a beautiful head of the Saviour, and models of hands and feet, showing much skill. Miss Waiteman Webb and Miss Edith Boyle have each fairly won a national silver medal, the latter by a design for a screen. Miss Julia Pocock, the Queen's Medallist of last year, and National Bronze Medallist of this, is versatile in her talents, and exhibits, besides an ably modelled statuette from the antique and a Venus, paintings and drawings of heads from the life and fruit. Miss Alice Ellis and Miss Alice Locke (the latter for a charming drawing of the *Lilium Lancifolium*), have each received a national bronze medal. National book prizes (5) have been gained by Miss Banks, Miss James, Miss Hancock, Miss E. Selous, and Miss W. Webb; while what are termed local prizes (in competition only with their fellow students, that is), are awarded to Miss Banks, Miss Blusun, Miss Boyle, Miss Berkeley, Miss Ashwell, Miss Clarke, Mrs. Carter, Miss Cooper, Miss Cauton, Miss Ellis, Miss Gibbons, Miss Hancock, Miss Hentch, Miss Hopkinson, Miss James, Miss Hart, Miss Locke, Miss E. Manly, Miss Moore, Miss Macaulay, Mrs. Pickering, Miss Pocock, Miss Selous, Miss Sampson, Miss Ralph, Miss Tegetmair, Miss Williams, and Miss W. Webb,—twenty-eight in all.

We are glad to see evidences, if at present somewhat immature, that the composition class is at work. Miss Lamb and some others show talent in this direction, and Miss Annie B. Slous, when she has acquired the power of drawing, will make an illustrator.

We hear lamentations that designers of some skill who have left the school (and these, after all, are rare) and are engaged with manufacturers, are able to obtain only very small pay. This is to be regretted. We should be glad to learn the real cause.

EXPENDITURE ON ROYAL SCHOOL FOR OFFICERS' DAUGHTERS.

THE two honorary secretaries have resigned, and have published a letter showing wasteful expenditure. They say:—

"To prove that we are not taking action without cause we submit the following facts—The school at Lansdown (known as Lansdown College), which was purchased for the sum of 4,500l., has had expended upon it to prepare it for the reception of only 70 pupils, the sum of 21,745l. 10s. 6d., besides the additional sum of 3,104l. in furniture."

"The digging of a well, the contract for which stands thus in the minutes:—'To construct a well at a sum of from 100l. to 150l., as deep as may be necessary,' but the cost of which, altogether, has not been less than 1,100l., because, to remedy a defect in it when water was found, a plan was submitted by any entry in the minutes, which cost about 700l., and this, besides the work in the earth, and wasted not less than 700l. of the above sum, the well being now in precisely the same state as it was before the extra work was incurred."

"The building of a gardener's cottage, the first estimate for which was considered to be 1,000l. by the committee, and ordered to be reduced, but which has, notwithstanding this, been built at a cost of 470l."

"And, lastly, the building of a wing to the school, consisting of little but of walls, which, as yet, by the total sum put down for 'contracts' during the past year, of 10,000l., represent the largest sum expended of the work; &c., the sum of 1,182l., the total for contractors alone being 2,411l. 18s. 6d., without the addition of a single penny to the institution."

The result of such management is that the direct cost of the education of each girl in the Royal School, including the office expenses in London, is not less than 57l. per annum, as

against only 43l. in the Royal Naval Female Schools. The whole cost, direct and indirect, or loss to the public, allowing 3 per cent. on the outlay on the premises, and 20 per cent. (the usual rate) upon the wear and tear of perishable articles, is not less than 80l. per head per annum: in the junior school lately set up, it is at present much more. Interference is needed.

STARTLING TENDERS.

SIR,—Now the question of builders' tenders is being ventilated, if you can find room for the following statement of an at present inexplicable difference, it may bring forth some explanation. Together with some eight or nine other builders, I gave in an estimate for the joiners' and other fittings at the Small-pox and Fever Hospitals at Homerton, at the end of last month. The highest tender was 490l., the lowest 150l.! I think this is the greatest difference in tendering yet published. The committee called in some of the lowest, and questioned them as to their knowledge of the construction of joiners' work, as well it might.

To be yet not been revealed to the public what decision was arrived at by the committee, which in justice each builder ought to have heard.

THE UTILISATION OF PEAT.

A PAPER on this subject has been read at the Society of Arts, by Mr. Robert M. Alloway, M.A., in which he described a simple process whereby peat was converted into peat coal of a density like wood. This was done without any expensive machinery, and in a way resembling brickmaking. The peat was dug in the winter, and broken up so as to destroy its elastic structure. It was then thrown into water-holes. This was the winter's work. In the spring, and from April to November, the moulding and drying processes took place. The peat was moulded into "pats," and these were laid on rough tables, where they lay for about three or four days, and were then placed in wooden sheds of open lattice-work for storage, and very soon afterwards were fit for sale and use.

A long discussion followed the reading of the paper, in course of which Mr. Alloway's statistics as to cost and profit were disputed.

AN APPOINTMENT VACANT.

WE are asked to mention that there is now a vacancy in Her Majesty's Office of Works, Whitehall-place, for a technical clerk, at a salary of 150l. a year, rising to 300l. (10l. a year), with prospects of promotion if duly qualified. Any one between the ages of eighteen and thirty desiring the appointment, who has been properly educated under an architect, should apply to the Office of Works, as the appointment will be conferred on the best-qualified applicant.

STRENGTH OF BRICKS.

EIGHT bricks from the works of Mr. D. W. Barker, of Worcester, sent last month as an average to Mr. Kirkcaldy's works, gave the following results when submitted to "crushing stress." The bricks are machine-made:—

Test No.	Description.	Dimensions. Inches.	Stress in Pounds when		
			Base area, Square inches.	Cracked slightly.	Crushed. Steel dropped.
2560	"Pressed" recessed top and bottom	3-20, 9-14 x 4-50	41-13	45,081	86,220
1557	Do. do. do.	3-2, 9-14 x 4-3	41-13	45,399	79,775
1559	Do. do. do.	3-20, 9-14 x 4-5	41-13	35,765	77,831
1558	Do. do. do.	3-2, 9-14 x 4-50	41-13	36,153	75,901
	Mean		41-13	41,552	78,956
	Pounds per square inch			1019	1913
	Tons per square foot			65.0	123.0
1563	"Builders'" recessed top and bottom	3-20, 9-30 x 4-50	41-55	49,060	97,210
1562	Do. do. do.	3-2, 9-30 x 4-50	41-55	34,281	69,371
1564	Do. do. do.	3-20, 9-30 x 4-5	41-55	34,499	67,282
1561	Do. do. do.	3-2, 9-30 x 4-50	41-55	35,541	68,150
	Mean		41-55	36,135	67,382
	Pounds per square inch			872	2.88
	Tons per square foot			59.1	131.2

Bedded between pieces of pine, quarter-inch thick, and recess filled with cement.

OLD BIRMINGHAM.

At the inaugural meeting of the Archaeological Section of the Midland Institute, Mr. S. Timmins read a paper upon "Old Birmingham." Old Birmingham, he said, would furnish much material for the work of the Archaeological Section. Though the motto of the town was "Forward," it must not make them blind to the necessity of looking backward also, and of seeing what had been done in the past, that they might know what to do hereafter. If experience was the greatest treasure which long life afforded, a history of countries must be a most valuable element in the present and future of a town like Birmingham. Birmingham had too often been looked upon as a modern town, and compared with Coventry, Kenilworth, and Warwick, its claims to antiquity seemed rare and small. Still, if they looked back, they would find that it had an antiquity, and a clear and definite history, not often equalled or surpassed. The paper gave a brief sketch of the leading features in the history of Birmingham, the derivation of its name, the establishment of its fairs, its description by Leland in 1838, the founding of Derwent Chapel, its manufacture of swords in the seventeenth century, and of guns in the eighteenth, &c. Birmingham had a history well worth studying, of which they knew but little, but of which they should, could, and ought to know more. It had been thought necessary in the first degree that an archaeological society should exist to explore the past and preserve what was passing in the present for future use. At present Birmingham had no written history worthy of the name. The admirable volume by Hutton was unfortunately written by a very busy man before the science of history was understood, and without any of the research by which old facts were found. That it was an excellent work, but not a history, must be the modern verdict on Hutton's book. The late Mr. Hawkes Smith commenced a history on a more accurate plan, but he left his work unfinished, although its value as a fragment was a great and deserved success. His son, Mr. Toulmin Smith, a man unusually qualified for the work, had barely commenced at the time of his death. It was for the Section to gather up the fragments that remained, that nothing should be lost, to note down old facts which illustrated their history, and to collect and preserve old papers, prints, plans, maps, directories, books, pamphlets, handbills, &c., which, though seemingly worthless now, might contain some scraps of facts which would be eagerly devoured by a succeeding age. Already much had been done by private efforts to collect the materials for a history of Birmingham, and not a few of their townsmen, native and adopted, had shown deep interest and intelligent care in the story of their local life. The Archaeological Section had been established with a view and hope of making valuable contributions to their industrial and social history.

ST. ANDREW'S, WELLS STREET.

SIR,—I thank you for your kind notice of my Parochial Festival. Will you kindly allow me to state, in your next issue, that the architect of the new schools for St. Andrew's, Wells-street, to which you refer, is not Mr. Street, but Mr. James Deason. Mr. Street is only responsible for the remodels in St. Andrew's Church.

BENJAMIN WREED, Vicar.
* * Mr. Street obligingly writes to the same effect.

PAROCHIAL ASSESSMENTS.

INSTITUTION OF SURVEYORS.

At the meeting of this Institution, on the 28th ult., Mr. Henry Grawter in the chair, Mr. Edward Ryde continued his paper on "Parochial Assessments." First giving an account of "The Valuation (Metropolis) Act, 1859," he treated fully of the Rating of Railways. We print the introduction to the latter inquiry, and refer readers professionally concerned to the paper itself:—

In its broad principles, the occupation of a railway company does not differ from that of a farm, and we have to apply to it the same general law. In each case the rate must be made upon an estimate of the net annual value of the several hereditaments rated thereunto,—that is to say, the rent at which the same might reasonably be expected to let from year to year.

If the railway and its stations are situated wholly in one parish, the rent which a tenant might reasonably be expected to give for the entire property is comparatively easy of demonstration. But difficulty arises when, as is usually the case, the line and its stations are situated in many parishes, and the rating for one parish only is the subject for consideration.

Attention will first be directed to the more simple case, and the method of ascertaining the rateable value of an entire railway and its stations will be explained.

The first element of value is what is called the gross receipts of the railway, that is to say, the total yearly earnings of the line from all sources of traffic. The second is the working expenses or the outgoings which a tenant has to make in earning the gross receipts.

The balance of gross receipts which remains after deducting the working expenses, is called the net receipts, and is the fund out of which the tenant's profit and the landlord's rent must come. Of these it is obvious that the tenant's share must first be provided, because, to take an extreme case, if the net receipts should be found to be insufficient to afford him a proper tenant's profit, he would give no rent to the landlord. But a sufficient tenant's profit being provided, the balance of net receipts remaining is the rent which he might be reasonably expected to pay.

From this rent a further deduction has to be made to counterbalance the depreciation which takes place in the value of the permanent way, and to maintain it in a state to command such rent. The amount of this deduction is the sinking fund, which would be required to be laid by yearly to produce a sum sufficient to renew the railway and works at the period of their ultimate decay.

A hypothetical valuation by way of illustration is appended to the paper.

In estimating the occupier's share in valuations of this kind, 5 per cent. for ordinary interest on the tenant's capital, and 10 per cent. for trade profits, are usually allowed. The arbitrator in the case of the Great Eastern Railway Company and Huggley Parish found these two amounts to have been properly deducted. It is, indeed, obvious that, as regards the interest, a tenant requiring to borrow his capital on the security of his rolling stock, would have to pay as high a rate as 5 per cent. per annum, or, if it were his own capital, he should be allowed that rate of interest, because he would have no difficulty of obtaining it from a person offering the same security. It may also be presumed as reasonable that no tenant would be satisfied to calculate on a less amount of profit than 10 per cent. on his capital, when taking into account the rent he would pay to his landlord.

Five per cent. is also very commonly taken as a proper insurance fund against risks and casualties, and 5 per cent. for depreciation of rolling stock. These items are more speculative in their character than the former ones; but, being so, a tenant would probably take care to be on the safe side, and it is not unreasonable to suppose he would undertake to give a higher rent than would allow him to make ample provision for these contingencies. The depreciation of rolling stock will be more or less according to the sum expended from time to time on its repair.

The question of amount of tenant's capital has been the subject of judicial decision. In what is known as the North Staffordshire case, it was decided that the amount of tenant's capital is to be the actual value at the time the rate is made (and not the cost price) of the rolling stock and of the movable chattels.

But things so attached to the freehold as to become part of it, and things which, though capable of being removed, are yet so far attached as that it is intended that they shall remain permanently connected with the railway or the premises used with it, and remain permanent appendages to it as essential to its working, are not to be taken as things which an incoming tenant would have to purchase of an outgoing tenant, and for which he would have to provide capital.

The chattels are defined to be things movable, such as office and station furniture. It was also clearly the intention of the Court to include all manner of tenant's tools and implements necessary for carrying on the business of the company.

The fixtures are turn-tables, cranes, weighing-machines, stationary steam-engines, electric telegraph and apparatus, gasworks, and such like.

The allowance in respect of renewal of way was judicially settled in *The London, Brighton, and South Coast Railway (Croydon) case*. In that case it was decided that, although no charge had, in fact, been made, either by way of outlay or setting apart of the gross receipts, still, if the depreciation be, as it probably is, both certain and capable of an annual average, though not proper to be, in fact, repaid annually, it should be met by laying by a certain sum annually. The judges said,—"We have considered this question with much attention, and upon the whole we think that the company are entitled to a deduction on this head. We cannot make a substantial distinction between this and house property, or any other of a perishable nature which must require renewal; and although we think that the company ought to set apart the sum which they claim to deduct, we cannot compel them to do so in this indirect way. And we think that, whenever the time shall come for actually making the restoration, they will be estopped from claiming more than that annual deduction which they now insist on, exactly as a landlord could not claim to deduct the expenses of restoration made by him of a house."

The amount of this deduction is arrived at by estimating the probable duration of life of the several component parts of the permanent way, and by calculating the sum which, if set aside yearly and allowed to accumulate at compound interest, would amount to the sum required, at a definite period, to reproduce particular parts of the permanent way.

The difference between gross estimated rental and rateable value of lines of railway is difficult to define.

The cost of maintaining the railway is included in the working expenses, and is therefore deducted from the gross receipts before the rental, as described herein, is arrived at.

But the rent which a tenant might reasonably be expected to pay on lease, he providing the sinking fund, for the ultimate renewal, is beyond doubt the rateable value of the property.

The second branch of the subject, the mode of determining the rateable value of the railway in one of many parishes in which it is situated, is more difficult to be explained.

ART AND SCIENCE.

At the public meeting of the Oxford School of Science and Art mentioned already, Mr. Vernon Harcourt, M.P., who presided, said in the course of his address,—Art, of course, is not merely the imitative faculty; it is not the mere servile copying of that you see before you,—although that, in itself, is a valuable power, which I do not, by any means, desire to disparage. But there is a greater art than that. There is the creative art, which is born of the imagination and genius of man. The effect of that on the human mind has been beautifully expressed by that great writer who is Professor of Art in the University of Oxford, Mr. Ruskin. I remember that in one of his most beautiful passages he says,—"That man is not to be envied in whose heart the great charities of the imagination lie dead." I think that is a true and accurate expression; and when he speaks of "The charities of imagination," he very finely describes the effect which that imagination operates on the moral character of man. It has been expressed by a poet also, I think, in very accurate terms, when he says,—

"To raise the soul by tender strokes of art,
To mend the manners, and improve the heart."

This is what we mean by art. Allow me, in

conclusion, just to say a word or two upon the cognate spirit of science, which is also cultivated in this institution. If art is the power of expressing the sense of the beautiful, science is the study of things that are even greater than beauty—it is the study of the laws which govern the universe, which are the foundation of beauty itself. For beauty arises in its secret springs from that very order which forms the fitness, and constitutes the beauty of nature. We all remember those beautiful lines in which Milton deprecates his blindness,—

"All nature left a blank,
And all knowledge at one entrance quite shut out."

But Milton at least had stored his mind with those immortal truths which even in darkness filled his soul with light. But how many among us, not visited with the affliction which Milton suffered, are yet more blind than he—who go through the world having eyes and seeing not, and who hearing do not understand—who see around them the great system of nature, yet know nothing of the laws by which it is governed—who care not to embrace the great opportunities which science offers them of learning those secrets of chemistry which keep all the elements in their proper place—who know nothing of those mysteries of physiology which teach us how we and all living beings are fearfully and wonderfully made; who have read nothing of that great romance of astronomy; who see such signs as we have witnessed to-night in the heavens, and know nothing of those great electrical powers which produce the beautiful Aurora which is now blazing in the sky. Yet all this knowledge is available to those who go through life more like the beasts that perish, because they will not be at the trouble of studying these great truths and these sublime verities with the eyes of science. These men can look night after night on the stars in their courses, yet know nothing of the history that they tell—nothing of the truths which they reveal, of which the poet speaks when he says—

"In reason's ear they all rejoice,
And utter forth a glorious voice;
For ever singing as they shine,
'The hand that made us is divine.'"

To know and to understand these things is to infuse a spirit and enjoyment into life; but to pass through existence caring and knowing nothing of them does not deserve the name of living; we should say of such a man that he vegetates rather than lives. Science is a study of these laws of nature, which it not merely explains, but enables us to imitate; and, as in the case of the steam-engine and other inventions, it possesses almost creative faculties. A close study of the works of God seems to impart to man something of that God-like faculty which endows him with some portion of the power of creation. It is because these studies develop the faculties of man,—because they expand those great gifts which God has endowed our immortal being with,—they are studies which every community ought to cultivate as pursuits calculated to make its members fit to be members of a civilised nation and of a Christian people.

SMALL HOUSES IN THE SUBURBS.

I HOPE you will not consider me intrusive in asking your favour for the insertion of a line respecting our new suburban small houses, especially the class of house consisting of ground and first floors only. Now, I consider and think I can show that this sort of house is the worst that can be designed, if I may use such a term. In the first place, you have a front parlour, which, after taking off the passage, is only 12 ft. wide. Then there is a small back parlour, which is not large enough for a small table. Of course, the idea is to throw open the two rooms when required, by opening folding doors. When this is done, you see two rooms, each with a fireplace, and requiring two suites of furniture, which runs a man to unnecessary expense; and when all is done, you have a very long room, but disproportionately narrow. But this is not the worst feature in this kind of house. After wasting a great deal of passage room, you come to a very small kitchen, say about 11 ft. by 9 ft., which is a very uncomfortable place for even a very small family; in fact, it is all heat and draught. After the kitchen comes a scullery, with a door into a yard or garden.

Now the front passage, doors of kitchen, and scullery are all in about one straight line, causing a tremendous draught, and offering a

very pressing invitation to rheumatic or other chronic complaints.

The houses I have sketched seem to abound by thousands, and certainly look nice and tasty outside with their bay windows and small gardens. But the real comfort of a house is inside.

If the two parlours be kept nicely furnished, a tasty wife does not allow them to be continually used, especially where there are children. Where, then, is the good man to comfortably sit and spend his evening? As I have already shown, the kitchen is hardly large enough to turn round in.

The question is, what kind of house should be built for one who, in spite of moderate means, must and is determined to be a "gentleman?"

In answer, I would say, first of all, say that there is a good-sized kitchen, with say painted walls, and which, if comfortably furnished, would be a useable room, instead of destroying a great amount of comfort, by fitting up a sanctum that can only be entered upon state occasions.

Another thing, the number of poking rooms I have described cause a great deal of house-work.

T. H.

HIGH ALTAR IN THE CHURCH OF ST. CATULLUS, MOOSBURG.

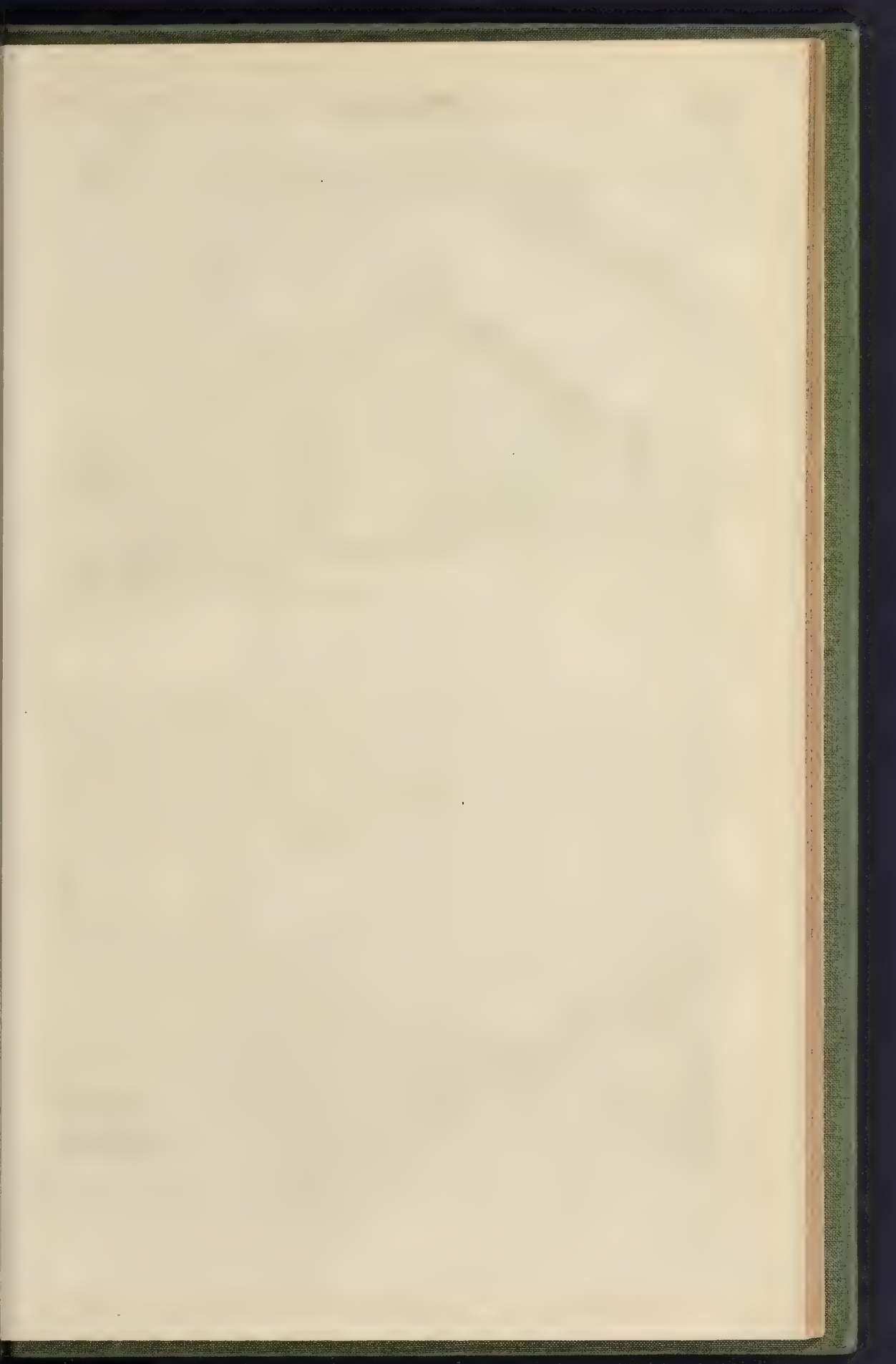
WE have several times alluded to the fine Minster Church at Moosburg, in Bavaria.

The interesting and picturesque little town of Moosburg is situated between Friesing and Landshut, that part of Bavaria which is so rich in relics of Medieval times. It is essentially a pretty town, both as to its situation on the Isar and its architecture. It contains three churches, two of which nearly join one another. They are the Minster Church, or St. Catullus's, and St. John's.

The Church of St. Catullus, or the Minster, is a large Romanesque building consisting of a long nave and aisles of the earliest Romanesque style, very similar to the oldest portions of St. Alban's Abbey Church. It has a lofty quadrangular tower, which is rather later in date than the nave, and is adorned with a series of arcades of semicircular arches. The choir and its five aisles are of the fifteenth century, and contain a magnificent high altar and stalls. The stalls have been previously illustrated in the *Builder*, and the high altar forms the subject of the engraving in our present number. This remarkable example of ancient woodwork dates from the year 1462; and an inscription let into the east end of the apse relates that it was given to the church by Louis, Duke of Bavaria, in that year. The Louis referred to was Louis "the Rich." This Medieval Cross was certainly no miser, for this altar is about as elaborate a work as is to be found in the whole of Germany. It is nearly 60 ft. high, and every portion of it is carved with a delicacy and finish which we have never seen surpassed. The paintings on the valves of the small "ambry" containing the shrine are the works of the eldest Holbein (the grandfather of the celebrated portrait-painter). They represent, when closed, the family of Louis "the Rich," with their various patron saints, and the canons of the Church of St. Catullus; when open, the "Nativity" and the "Annunciation." These pictures were for some time in the gallery at Munich, but were returned by the late King Louis of Bavaria, when the high altar was restored. The shrine enclosed in this ambry is modern, as is also the antependium of the altar. At the back of the altar is a beautiful picture of the "Carrying of the Cross," also by the eldest Holbein. The statue of the Madonna in the centre niche of the reredos, is about 8 ft. high. It is a most superb figure, full of expression and grace; the drapery is perhaps a little too angular, but this is the fault of all German figures of the same date.

The whole of this altar is beautifully decorated with gilding and colour, which has been carefully restored. Great effect is obtained by using gilding of two different colours, the one alloyed with copper, and the other with silver.

In addition to this altar and the stalls previously engraved, the church contains several old monuments, one of which is shown in our engraving. It is a tablet of red marble, richly carved in the latest style of Gothic architecture. There are a second ancient altar, a well-vaunted organ-loft, supported upon marble columns, and a very rich but rather barbarous western doorway. The whole building has been recently restored by subscription, raised in the town and neighbourhood.





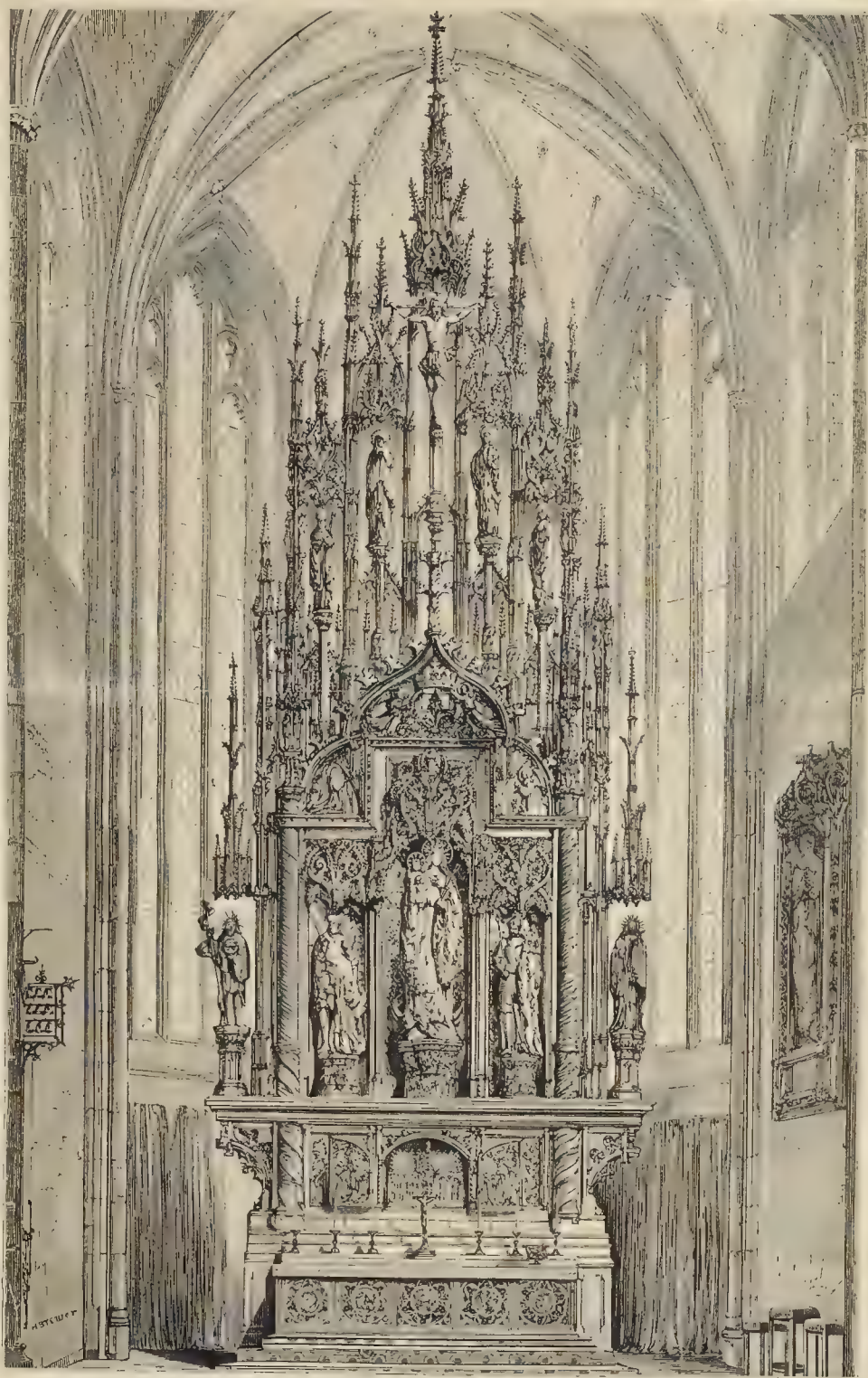
THE ROYAL ALBERT HALL OF ARTS AND SCIENCES, SOUTH KENSINGTON.



THE NEW BUILDINGS FOR ANNUAL INTERNATIONAL EXHIBITIONS.

As seen from the Royal Horticultural Gardens.

[See p. 977, ante.]



HIGH ALTAR IN THE CHURCH OF ST. CATULLUS, MOOSBURG, BAVARIA.—A.D. 1462.

ON LABOUR AND STRIKES.

At the Co-operative Hall, New York, on the 14th ult., Mr. Mundella lectured on "Strikes, Arbitration, and the Civil Service in Great Britain." In the course of his address the hon. member said:—"The relations of capital and labour is the question to which I invite your attention, and I would ask you to consider the conditions under which we approach the solution of this and all other social problems as compared with yourselves. You are an old people in a new country, possessed of all the experience which centuries of European success and failure have given you. You have no trammels of caste, or prejudice, or ancient institution remaining to overcome. We, on the contrary, are in an old country, where all the resources of nature are already appropriated; where laws, traditions, institutions, require to be changed; where we cannot build up without first pulling down. More than all, we have a dense population in a sea-girt fortress without power of extension or expansion. The tendency of industry everywhere is to localise itself. We have our iron and our coal districts, our cotton and our woollen districts. Ribbons are only made in Coventry, cutlery in Sheffield, lace in Nottingham. Wherever numbers are congregated engaged in the same industry, community of interest and sentiment is certain, sooner or later, to bring them into association. Trade-unions are the natural consequence. Combination is good in itself if wisely directed. It is only to be deprecated when the means it employs and the ends at which it aims are not conformed to order and good government. It is, alas! too true that trade-unions have often been managed by misguided men, have aimed at impracticable and injurious ends, and have stooped to intimidation, outrage, and crime. In my country I believe these evil days are fast passing away. The spirit of intelligence and the growth of co-operation, arbitration, and industrial partnerships are raising the condition of the workmen, making more pleasant the relations betwixt the employer and the employed, narrowing the area of strife, and rendering strikes less frequent and less aggravated. In all the large, well-conducted trade-unions of England strikes are now of very rare occurrence and of very short duration. Still, both in England and America, there is a large class which is bitterly hostile to combinations, forgetful of the fact that labour can only stand on equal terms with capital when it is associated. Combination enables the workmen to deal on equal terms with the capitalist. Invariably the power possessed by each has been exercised in turns to enforce unreasonable demands on the other; and strikes and lock-outs, in the absence of any reconciling influences, have been the result. I cannot recall a strike, in my experience, which has not been attended with natural and moral injury to the parties engaged. I could enumerate several in which the pecuniary loss has been from 500,000, to 1,000,000, and the moral loss beyond all computation. If I have correctly informed myself, you are able to point to examples equally deplorable. The evil of strikes will, I think, be so generally conceded, that I need not detain you further with proofs. If, in describing remedial measures, I appear to give undue prominence to boards of arbitration, I beg it may not be understood that there is any conflict of opinion between Mr. Hughes and myself. I am a sincere advocate of co-operation and industrial partnerships.

LEICESTERSHIRE GRANITES.

SIR,—Your issue of Nov. 12 (p. 902) contains a well-written article upon the subject of the Leicestershire granites, which, after giving a description of the method of working at Mount Sorrel, proceeds to give the results of experiments upon the specific gravity of samples from the respective quarries, and appends a series of four tables relative to the weight and bulk of a foot of each class of rock, and the quantity of each description required to pave or coat an equal area.

As the question of the relative values of materials for the construction and repair of streets in towns is one of great interest to many of your professional readers, and, in fact, forms one of the subjects for premium during the ensuing session of the Institution of Civil Engineers, I trust the writer of the article will pardon me for presenting the subject of the specific gravity in one other aspect in addition

tion to the very useful ones which he has enumerated.

Table IV. gives the relative weight of each description of stone required to cover an equal area; the Mount Sorrel Company's material being placed at the minimum, and the Charnwood Company's at the maximum, the difference being as 100 to 110,—the natural inference being that the one is more economical than the other by the value of ten tons of material in every 100 tons used, and this position would undoubtedly be correct presuming that the materials were capable of an equal resistance to crushing stress.

I have frequently noticed in practice that it may be taken as a general rule that the specific gravity of any stone or rock is a general measure of its hardness or resistance to crushing stress, and also that the readiness of any of the harder rocks, such as granites and syenites, to cleave, or, technically, "cut," may be regarded as a certain indication of their brittleness, and a proof that they lack the great essential of durability and economy in road-making, viz., toughness. This is very clearly shown in some of the basalts, which cut with a smooth, almost glassy surface, and are nearly as brittle as the substance whose fracture they represent.

In practice, therefore, it will be found that a greater bulk for an equal value is not always the most economical to use, and the safest test to apply is that of durability; and the only sure guide to this is by practical experiments with the respective kinds of material, laid down at the same time upon a continuous length of roadway. The force required to crush cubes of equal area of the various samples is, however, a good indication of the money value of granite for macadamising purposes; and as the respective firms have furnished them to me from time to time, I give them in a table below, in which I have also included the information contained in the tables supplied by the writer of the article:—

Quarry.	Specific Gravity.	Weight of a cubic foot in pounds.	Number of cubic feet in a ton.	Quantity of each kind required to cover an equal area.	Crushing force per sq. foot, in tons.	Crushing force per sq. foot, in tons.	Remarks.
Mount Sorrel Company	2.552	109.19	13.48	100	17.388	1.118	These crushing weights are given in pounds, as the strength is in direct proportion to the dimensions.
Barnston Hill	2.527	120.60	12.67	106	20.742	1.331	
Marlfield	2.531	120.60	12.67	106	19.056	1.282	
Charnwood Company	2.535	123.44	12.21	110	27.143	1.715	
<i>Other Granites (Barnstone).</i>							
Central Granite	2.542	106	13.5	100	...	...
Arden	2.545	106	13.5	100	...	...
Red Kyrle	2.544	106	13.5	100	...	...

Article in the "Builder."

Mr. Kivell.

SOUTH WARNBOROUGH CHURCH.

THE parish church of South Warnborough has been re-opened by the Bishop of Winchester, after undergoing restoration, and a new south aisle and organ-chamber being built. The original edifice contained only nave and chancel. During the restoration there have been found several moulded and carved stones of the Norman period. These have been preserved and built in the new work, in such a way that the best specimens may be seen in the south-east inner angle of the vestry. The original north doorway, of Norman work, is intact. The colour, wash, and plastering have been cleaned off. The stonework and carving are in good preservation, which is partially due probably to the existence of a porch, but more particularly to the kind of stone it is executed in. There are two kinds of stone used, which would lead one to suppose parts were reworked from the stone of an earlier edifice. There is also a very small window on the south side of the west end of the nave, with very deeply-splayed jambs, with semicircular head, which is probably older than the north doorway. The work is very rudely wrought. The other windows are of different periods, from thirteenth, fourteenth, and fifteenth centuries. The south arcade, dividing the aisle from the nave, is composed of three arches, carried by two pillars, with moulded bases and capitals. The east and west responds are moulded corbels. The roof of the new aisle is a lean-to, of Baltic timber, wrought and left clean from the tools, boarded on the back side, and covered with felt and S.b. lead to the foot. The nave and chancel roofs have been restored and retiled, with ornamental tile crest. The inside of these roofs has been stripped of the lath and plaster, and cleaned, and plastered between, leaving the roofs open. A decided improvement has been effected in the acoustics of the fabric. The old tower and spire were taken down, being in a dilapidated condition, and have been re-erected in English oak, and covered with shingles, surmounted with an iron cross and weathercock. The tower contains at present the three old bells, re-hung in a new frame, arranged so that another may be added to the peal. There are four stained-glass windows; two of them are memorial windows, by Clayton & Bell; the other two are of old heraldic glass, arranged by the same. The other windows are glazed with cathedral plate-glass, in two colours, from the design of the architect. The passages in the nave, aisle, and the whole of the chancel are laid with tiles from Luggwardine, from a special design; some of the encaustic tiles were copied from old ones found during the restoration. The altar-table is raised five steps above the level of the nave floor; on each space the design for tiling is different; the steps are of Portland stone, with glazed tile risers. There is a super-altar, of Devonshire marble, from Messrs. Godd's works, near Plymouth. The piscina has been partly restored, leaving portions with the marks of the destroyer's axe. The priests' choir-stalls in the chancel are executed in oak. The chancel-screen is in English oak, of an open design, so as not to obstruct the view of the chancel from any part of the church. The font is placed at the west end of the nave, and is a portion of a very early one; the bowl is now, of Irish marble, polished: it is copied from the pieces of the original, which were found built in the walls, and is now placed under the new one below the floor line. The church is heated by Porritt's patent warm-air stove. The north porch is new, copied from the old, which was very much decayed; none of the material is fit for reuse. The nave, chancel, and porch roofs are tiled with ornamental tile-crests, purposely made. The pulpit is wrought in Caen stone, executed by Mr. Earp, of London. The nave and aisle are seated with open-bench seats, of Savanah pitch pine, selected, and varnished. The lectern and sedilia are executed in wainscot oak. The contractors were Messrs. Lee & Hale, of Odham, and S. Warnborough. The whole of the work has been executed from the designs of Mr. G. E. Street, architect. Mr. Jas. Radden superintended as clerk of the works.

GREAT EASTERN RAILWAY EXTENSIONS AND THE HOMES OF THE POOR.

THE works of this line are making weekly a perceptible advance. Through Bethnal-green, across the top of Hackney-road, over Dalston-lane, under the North London Railway, and on thence to Walthamstow, evidences of progress

It will be at once seen by reference to the last two columns of the table that the heaviest stone is decidedly the strongest, and most likely to withstand the wear and tear of heavy traffic for a considerably longer period; and when to this is added the discomfort to the public, and the damage to carriage-wheels occasioned each time a fresh coating of macadam is required, the apparent saving by using the lighter material becomes doubtful, and the probability is that the more dense stone will in the end be the cheapest.

GEORGE HOBSON, Assoc. Inst. C.E.

may be witnessed in brickwork, embankments, and iron-girder bridges of the usual ugly type. In London, east and north-east, an immense amount of house property has been tumbled down to provide a suitable course and breadth of line. Some of this house property was valuable, but a large amount of it in the Hackney and Bethnal-green quarters was ruinous, and had or wretchedly built. Bad and good, however, have been swept down, and whole streets and lanes have disappeared. Between the Great Eastern and the North London lines the working classes and the poor traders have fared rather badly. The dispossessed have betaken themselves to the already overcrowded quarters of Shoreditch, Bethnal-green, and offshoots from Hackney-road. A few landlords have been benefited, and a large number of families have suffered. This has ever been the case. It is a great misfortune that works of public utility cannot more often be carried out without inflicting a train of evils. The provision of homes for the poor ought to precede the commencement of all undertakings that necessitate the removal of the poor from their old homes and the centres of their employment.

ST. NICHOLAS'S CHURCH, PORT LOUIS.

WITH reference to a brief notice in our pages some short time ago, of the opening of St. Nicholas's Church, Port Louis, by His Royal Highness the Duke of Edinburgh, wherein the church is stated to have been designed by the late Bishop Hatchard, the Rev. Dr. Huxtable, Bishop designate of the Mauritius, writes to say that it is quite true Bishop Hatchard laid before the committee a sketch of a small church, in Switzerland, taken from a circular asking for subscriptions, which he wished to give the general idea of the sort of church he would like to have built, but that the plans of St. Nicholas's Church are really by Mr. W. A. Mann, the assistant surveyor-general, and present a great improvement on the design shown to him. "Let me add this," says the writer, "the church has been the subject of universal admiration."

WINTER EXHIBITION: SOCIETY OF BRITISH ARTISTS.

FOLLOWING what we are forced to think the questionable example of the Water-Colour Societies, the Society of British Artists has opened its galleries in Suffolk-street with a collection of pictures, studies, and sketches, as a winter exhibition. It comprises 638 works in oil and water-colours, many of which are of a very agreeable character, but can scarcely claim higher praise. It is unnecessary to particularise: on a bright morning a pleasant hour may be spent in the gallery. Some pictures by the late Mr. Pyne must be regarded as the chief feature of the collection.

ANOTHER MAN'S WANTS.

SIR,—I am desirous of following up the modest wants of your contributor:—

I want each Metropolitan Vestry Board to have the name of the streets printed on the lamps at each end of every street or road, and the number of the nearest house on the intermediate ones, for the assistance of benighted travellers.

I want the country vestries to do the same, and to erect at the junction of all principal roads a properly-directed sign-post.

I want reflectors fixed in the top of every street lamp to throw more light around.

I want a more convenient station erected at Clapham Junction over the existing scattered ones, with comfortable waiting-rooms, instead of the bewildering tunnel at present in use.

I want the waiting-sheds on each side of railway stations to be inclosed, and to be made more cosy.

I want the metropolitan and other railways to have the name of the stations distinctly printed on their respective lamps.

I want the postman's time saved by letter-boxes being fixed at each house, and his journey up and down the City offices stairs prevented by each office having a letter-lift.

I want all cab-stands to be under properly covered erections, with small waiting and refreshment rooms for the men.

I want drunken people to be removed at once to the nearest police station.

I want the river steam-boats to be more respectable, and to have a saloon deck for first-class passengers, leaving the roof and fore-cabin to the second-class travellers.

I want omnibuses to have removable covers over outside seats, so as to enable their being used on rainy days.

I want water-carts to be things of the past, and supply-pipes laid on from the main to every pillar-lamp, and the roads watered from same by means of a removable hose.

I want the same to be always ready for immediate use in case of fire; and, above all,

I want to see other people follow the excellent example set by Miss Burdett Coutts.

SMALL BORE.

THE "TENDER" SUBJECT.

SIR,—I am glad to find, from the letter of Mr. Dale in your last number, that I have not misunderstood and misrepresented the "Buckingham Palace-road" matter, and have not, therefore, to make the apology or retraction which I promised, had I unwittingly done so. The explanation of Mr. Dale is not quite satisfactory to my mind, for I think that such errors and mistakes as I pointed out in my former communication—which were only samples of many others which I could have adduced—ought not to occur in cases in which a very handsome commission is charged by the architect for taking out the quantities. I also think that in such cases the architect has no right to divert himself of the responsibility of incorrect quantities by putting a protecting clause in the general conditions, behind which he can shield himself from the consequences of them. I have known a great number of high-minded quantity surveyors in my time, and have found that they not only prided themselves upon the accuracy of their quantities, but always acknowledged their responsibility if they made mistakes.

ARTHUR ALBERTIN PARTEN.

Our correspondent deals too tenderly with Mr. Dale's communication. If we were to express our opinion of the explanation given by Mr. Dale, that gentleman would not find it at all flattering.

WITH reference to Wrayshaw Church's tower and spire, Messrs. Wright, Brothers, & Goodchild, who sent the lowest tender, write to say, in reply to our printed queries, that they took out the spire and tower, along with a course we invariably adopt when the opportunity is afforded us.

"Further, that we would not have obtained the contract had we shown such want of knowledge of the prices of materials and labour as is displayed by the builder who sent you an abstract of his estimate; we admit; yet we can scarcely be expected to explain to the public how it is that we are able to undertake the work at what may appear to be a low cost."

"We think though, sir, that if you were aware, as we are, of the circumstances under which some of the tenders were made, you would not doubt the discrepancy between them; but it is not our business to enter upon that matter."

SCHOOLS OF ART AND OF SCIENCE.

The Maidstone School of Art.—The exhibition of drawings by the students of this school has been held at the Corn Exchange. The distribution of prizes by Sir John Lubbock, Bart., M.P., took place at the Concert Hall. The Mayor occupied the chair. The report said:—

"In reviewing the progress of the Maidstone Art Night Class, for this their third report, it is a great satisfaction to the committee to find that the number of students in attendance continues to be so well sustained, and that the classes are self-supporting. The classes have now been held for rather more than three years and a half, having been opened in January, 1867. The success of the students at the annual Government examination has always been very fair, and the number of prizes taken very encouraging to the pupils, and reflecting much credit upon the master. The number of students who have passed through the school from its commencement has been,—Middle-class students, 108; artisans, 68. The total result of the examination this year has been,—Prizes on examination, 7; ditto on drawings sent up, 8; total, 15; being one more than we have had previously. Six students have obtained full certificates. . . . The committee would be glad to be able to commence a reference library, and would be grateful for gifts of books of that class. Back volumes of the *Builder* or *Art-Journal* would be acceptable."

Science Teaching in Liverpool contrasted with that in other Towns.—A class for the study of elementary mathematics has been opened at the Operative Trades' Hall, Duke-street. Mr. James Hayes delivered the introductory lecture. Mr. James Samuelson presided, and in the course of the evening he congratulated the meeting upon the success which attended the opening of the class for the study of chemistry.

On that occasion thirteen students, he said, registered themselves, which showed that they were doing something to raise Liverpool from the very degraded position which

it held in regard to science teaching. Very recently they were told by the borough council that in Manchester, Birmingham, Leeds, and London, science and art classes flourished to a considerable extent; but the reply immediately made was that a comparison between manufacturing towns and a seaport was not worth very much.

Well, be (Mr. Samuelson) had compiled a statement from the *Directory of Science and Art* which showed the position Liverpool held, compared with that of other seaport towns. Bristol had three schools, the largest number of students in one school being 200, with six masters; Plymouth had three schools, the largest number of students in one being 241; in Southampton there was one school, attended by 140 students; South Shields had four schools, in one of which there were 112 students; in one school in Aberdeen, attended by 250 students; one in Leith, attended by 230 students; in Belfast there were twenty-two schools, one of which had 122 students; Glasgow—with the boys of the Liverpool Institute. Little towns like Lurgan and Newtownards had three schools each, one with 148 students. In 1869-70 there were in all 21,669 persons receiving science instruction in the three kingdoms, of which number Glasgow supplied 1,700; Plymouth, 450; Woolwich, 335; Liverpool, 280; of whom at least 200 were middle-class students; and, by way of contrast, a place called Alexandria (which the Government Directory said was in Abyssinia), 80 students. Mr. Samuelson said they were doing something to raise Liverpool from her degraded position in the matter of science and art-teaching, and he felt sure that it would not be long before the trade antagonists of Liverpool thought only about their pockets. He had never thought so, and he had only been too sorry that gentlemen in the town had not come forward long since and lent them their assistance. That time, however, had not arrived, for Mr. Reade, architect, of this town, had volunteered to give to the members of that hall an introductory address and a course of lectures on the construction of buildings, while one of his assistants had proffered his services in conducting a drawing class.

Mr. Samuelson, in conclusion, expressed the hope that great good would result from those classes.

The Islington School of Science.—A public distribution of science and drawing prizes, with three 15l. scholarships, awarded to the students in evening classes and pupils of the Islington Public School by the Science and Art Department at the May examinations, 1870, has taken place in Myddelton Hall, Upper-street, Islington, Professor Huxley, LL.D., F.R.S., presiding. The admission was free, and the attendance was good. Mr. Wheatley stated that in 1862, 12 students passed; in 1863, 21 passed; in 1864, 31 passed; in 1865, 30 passed; while in the year 1866 the number rose to 35. In 1867, 32 passed; in 1868 (the first year of Mr. Angel's drawing classes), 40 passed; in 1869, 55 passed; while at the May examinations this year the total number of successful students was 62. In addition to these successes, four gold medals, two silver medals, and two bronze medals have been awarded to the school, and also two 50l. exhibitions, tenable for three years, and three 10l. scholarships, the latter having been taken by the boys in the day school. Altogether it was considered that the numbers who had joined the classes, and the great interest taken by them in the instruction, as evidenced by the successful results, indicated pretty clearly the demand that existed in this neighbourhood for scientific instruction. A new session of evening science classes for young men commenced in October of last year. The Rev. Professor Huxley reviewed the work done by the school during the last nine years, and said the general impression on his mind was that there had been a steady progress made in all subjects, with perhaps the exception of vegetable physiology and zoology. Knowing boys as he did, he could say that the school was flourishing, going steadily on, and could not well do better, and this success was in a large measure due to the skill and teaching capabilities of Mr. Howard, the head-master, and Mr. Angel, the teacher. The chairman delivered the prizes, which consisted of volumes, drawing-slates and boards, boxes of paints, chemical apparatus, batteries, &c., to the various successful scholars, shaking hands with them, and speaking a few words of encouragement to each.

The Chippenham School of Art.—This school will probably be closed unless working men avail themselves more generally of the instruction it affords.

Science Examination at Leeds Mechanics' Institution.—Two medals have been awarded to students in the science classes of the Leeds Mechanics' Institution. William Hawksworth, pupil of Mr. George Ward, has been awarded a silver medal in subject 11, organic chemistry, as being the second in the whole of the United Kingdom in this subject; and William Lee, pupil of Mr. Thomas Hick, B.A., has been awarded a bronze medal in subjects 4 and 5, pure mathematics, the third on the list in this subject. These are the only medals awarded to students in Yorkshire science classes, excepting

in navigation and nautical astronomy to students connected with the Hull Navigation School.

The Taunton School of Art.—A public meeting has been held in this school for the distribution of the prizes awarded by the Government Department of Science and Art. The public manifested a warm sympathy in the proceedings, and the hall was crowded. Mr. Arthur Malet, of Pyrland Hall, presided on the occasion, and in opening the proceedings observed that the audience would be happy to learn that there had been a satisfactory increase of pupils during the past season; and as to the quality of the work done and progress made by them, they could judge for themselves, on viewing the examples of skill around the room. It was contemplated shortly to extend the usefulness of the school, and to make it a school for science as well as art.

The Carlisle School of Art.—The annual meeting of subscribers to this school and distribution of prizes to students by the Mayor, has been held in the School-room, Mechanics' Hall, in this city. The Mayor presided. A large number of ladies were present. The secretary read the report, according to which:—

"The Committee have great satisfaction in stating that the school still continues to maintain a high standard of success, the work of the past year having placed it 18th on the list, there being 167 schools in the United Kingdom.

The following is the number of prizes and certificates of merit taken by the students during the year ending May, 1870:—

In the second grade examinations in freehand, geometry, perspective, and model drawing, five obtained prizes, and twenty-five certificates of merit.

In the third grade, which consists of drawings sent to the examination in London, 10 works of eight-four students were pronounced satisfactory, and eight obtained prizes.

In the national competition, which includes only the best work chosen from the first grade, and in which the Science and Art Department award prizes, eight obtained prizes, and six certificates of merit. In the national competition, the committee are proud to state that a silver medal has been awarded to Mr. T. Parker, for an oil painting of a group of birds from nature; and also a Queen's prize to Thomas Palmer, for a drawing from the antique. The master, Mr. Lees, has also obtained a bonus of 20s. for success in the various examinations which have taken place during the year.

The committee can now congratulate you upon the removal from the old school to the present more desirable premises. The new premises are well fitted for everything that could be desired for the education of art students in all its branches."

The Bishop of Carlisle, who was present, addressed the meeting. He said, there could be no manner of doubt that, in regard to art teaching, we are somewhat behind some of our Continental neighbours. Now, he ventured to think that that was not a condition of things which we English people ought quietly and patiently to abide. It may be that there are certain things which some of our nations on the Continent can do that we cannot do; but, at all events, it ought to be shown very distinctly and very clearly that we cannot do them before we quietly sit down in despair, and allow these things to be done for us by our brethren on the other side of the water. He thought we ought to have the same kind of proper national pride as regards art that we have in regard to other matters. Who was there in that room who believed it possible that a Frenchman should ever beat an Englishman? There used to be a rhyme, once upon a time, perhaps, for being a little rough and lame, that—

"One Frenchman can lick two 'Portuguese,'
And one Englishman can lick all three."

That was a very proper feeling for all Englishmen to have, and he had no doubt that every true-hearted English boy in the school would go in for the great truth that an Englishman can always beat a Frenchman or a German or anybody else. That is the view which we have always had; but at the present time a grumbling, pitiful spirit has taken possession of some Englishmen, and it seems that if any great Continental nation—if anything like a great Russian bear appears to be disposed to growl, we forthwith should say, "Oh, don't growl, don't show your teeth, and whatever you do, don't bite us!" Such a feeling as that is disgraceful. We ought all to be desirous of peace, but at the same time we should be confident in the strength which God has given to this great nation. If that be true with regard to questions of physical strength, in regard to that which we hold so dearly as to the hold which Britannia has of the waves, we ought to be prepared to compete with, and, if possible, surpass the nations of the Continent in art as well as in other things. Well done, Bishop!

Northampton Museum Science and Art Classes. The annual distribution of prizes to successful

students has taken place in the town-hall, Mr. W. Smyth, deputy-chairman of Quarter Sessions, having undertaken the work of distribution. The mayor presided. There was a large and appreciative audience. The eastern wall of the hall was adorned by drawings of the students of the art classes. Mr. J. B. Hensman then read the reports. Mr. Charles Lees, the science teacher, reports as follows:—

"The continued success of the science classes. The total number of entries for the winter 1869-70 was 115. Of these ninety offered themselves for examination in May last in the subjects of Animal Physiology, Mathematics, Acoustics, Light and Heat, Magnetism and Electricity, Inorganic Chemistry, and Physical Geography. Thirty-three passed in the first class, fifty-nine passed in the second class. To the thirty-three prizes were awarded. The most successful class was that in Chemistry. Twenty-four were examined in this subject; fourteen obtained first-class, and eight second—a very satisfactory result, considering the difficulty of mastering the symbols and nomenclature which must be thoroughly done to obtain a pass. In my report for 1868 I mentioned the great difficulty under which we laboured in having small and inconvenient classes. I am glad to be able to report that, through the liberality of the committee, and the earnest desire of the secretary for our success and welfare, we have now two excellent rooms, the larger one fitted up as a laboratory, with all the apparatus. Thirty students at one time can now be employed in practical analysis."

Mr. Abram S. Taylor reports as follows:—

"I have to place before you the third annual report of the progress and conduct of the Northampton Museum Art Class since my last report, in which I stated a want of convenience in the class-rooms for the arrangement and lighting the casts. The classes have been removed to the new Grammar School, where class-rooms are more convenient and better adapted for the accommodation of students. The success of the students exceeds that of the previous years of the existence of the class, and the number of prizes obtained in the second and third grades is greater than that of the two previous years added together. The attendance of the students is highly satisfactory, and the progress made is greater than that of last year. The number of failures on the books at the present time is 56; 14 being males and 22 females.

The following is a list of the results of the late Government examinations in freehand drawing, 15 students passed successfully, 5 of them gained the highest number of marks, and consequently prizes. In geometry, 13 passed successfully, and 6 of them gained the highest number of marks, and therefore prizes. In perspective, 7 students passed, and 3 gained the highest number of marks. In model drawing, or drawing from the round or solid object, 14 were successful, 6 of whom gained the highest number of marks, and therefore prizes.

Mr. Smyth, Mr. Buckmaster, and Sir Henry L. Dryden, afterwards addressed the meeting.

DWELLINGS OF THE POOR.

Sir, Many unskilful persons, with imperfect information and knowledge of the subject, would apparently advocate a reform in the dwellings of the poor, which may not meet the real want of what their dwellings should be, wholly forgetting that such a course would infallibly lead to the greater evil of overcrowding, as much as the railways have already reduced their dwellings to a minimum. These reformers begin at the wrong end. What is required is a condition precedent; viz., the erection of beautiful lodgings—houses and suitable dwellings for the poor—a very great want indeed in this wealthy metropolis, and well worthy the attention of Government.

R. L. S.

METROPOLITAN RAILWAY SITES COMPETITION.

Sir,—A short time since the directors of the Metropolitan Railway Company offered premiums for the best plans and suggestions for the utilization of some of their surplus land. In response to this, a considerable number of drawings were sent in, and have been exhibited in shops near the Fenchurch Railway Station. These drawings are most interesting, not merely as showing the variety of modes of laying out the same piece of land, but also the different ways in which the same idea is worked out.

Any object, however, in writing to you is to call your attention to the fearful waste of labour and money expended in the most useless manner. Many of the competitors, not content with submitting in black plan, or even detailed plans, where the scale is too small to show their views sufficiently, have prepared the most elaborate elevations and lighted perspectives, as well as detailed plans of each floor, sections, &c., drawn to a large scale. It stands to reason that such drawings as these cannot be required; as, if the land is to be let for building, the tenant will prepare his own plans, and (it is hoped for the sake of the profession) elevations too; or, if supposing the directors take advantage of their power and build the land themselves, they will employ a professional architect to prepare his own plans, and (it is hoped for the sake of the profession) elevations too; or, if supposing the directors take advantage of their power and build the land themselves, they will employ a professional architect to prepare his own plans, and (it is hoped for the sake of the profession) elevations too.

When the public see these views, with which architects entice upon themselves a man a necessary labour in the art of getting a premium of fifty guineas, can it be wondered at that the directors should be so much inclined to the way to supply drawings for which they were not asked, and which, judging from the liberality of their prizes, the directors, when so requiring, would gladly pay for?

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shillings a superficial foot, whereas some land in close proximity belonging to the Corporation was offered by public auction, about a fortnight since, and a portion sold at the rate of about 1s. 6d. a foot.

J. D. M.

RE THE KING'S CROSS INDUSTRIAL DWELLINGS COMPANY (LIMITED).

THIS was a creditor's petition in the Equity Courts for the winding up of the company. The petitioners were the advertising agents, and their claim was 78s. for advertisements inserted in newspapers by direction of Mr. Barnett, the honorary secretary. The company was formed in May last for the purpose of providing decent and comfortable dwellings for the poor, and arrangements were made for the purchase of a site at King's-cross. The capital was to consist of 25,000 shares of 2s. each, of which the gentleman who signed the articles of association agreed to take 480, but nothing had been paid in respect of shares, and the erection of the building had not been commenced. On the part of the company it was submitted that Mr. Barnett was personally liable for the debt under an arrangement by which he was to receive 1,000l., and bear all the preliminary expenses. The Vice-Chancellor was of opinion that there was no substantial ground for questioning the debt, and therefore he should make the usual order; but he would direct that it should not be acted upon for a fortnight.

WOODEN BUILDINGS.

Sir,—Will you oblige a constant subscriber, and aid me in removing the present nuisance that exists in the erection of the *wooden* premises in front of the shops of the Lower Wandswoth-road. Built in a public place like this, under the nose of the district surveyor, I cannot help wondering that it should be allowed.

F.

THE STRENGTH OF SLATE.

Sir,—Can any of your correspondents give me any information (through the medium of *The Builder*) respecting the strength of slate slab? I want to know what weight a slab of the following dimensions will carry, viz., a circular slab 2 in. thick and 6 ft. diameter, with a circular hole 1 ft. 3 in. diameter cut through the centre. The slab to have a 3 in. bearing round the outer edge, leaving a clear space of 5 ft. 6 in. diameter.

A MASON.

PAINT FOR POROUS STONE.

Sir, Can any of your readers kindly inform me in your next issue which is the best and most durable kind of black paint, and the ingredients used in it, for painting letters in porous stone, such as Portland or Roman, and, if the paint is made in oil, is there any method adopted to prevent the oil from soaking out at the side of the letter?

J. M.

PAINT ON STONE.

Sir, Will you allow me to ask whether any of your readers know of any material by which paint can be removed from a font, &c., executed in Green stone; and whether any one who has tried the experiment has found it answer; and what the cost is?

N.

A similar question has been inserted before now, but brought no satisfactory reply.

SUGGESTIONS FOR LISMORE CIRCUS.

Sir,—I cannot but think that the Metropolitan Board of Works are not exhibiting much taste in laying out Lismore Circus, which lies between Faversham Hill and Kenilworth Town. The plot is about 100 yards in diameter, to judge by the eye; and, if I understand aright, the Board are reducing the space by constructing a 6 ft. or 8 ft. path round the future fence, thereby materially diminishing the area, and affording no convenience to the public, as observation in other localities will show. Then, instead of cutting away the superfluous land, the more economical plan has been adopted of making it into a central round, some 6 ft. high, and about 150 ft. in diameter, and this mound is apparently to be encircled by a gravel walk of some 10 ft. or 12 ft. in width, thereby reducing the promenade to a minimum instead of a maximum, by carrying it round the full circumference of the circle. No doubt the central mound will cost a very pretty penny when stocked with asphaltum and other dressing, and, but surely it is against one of the first principles of art to make a thing appear more than it is, and each must be the effect of the mound in question. Is it, I ask, too late to have it removed? The cost would not be, I should say, great, as more than one railway has land in the immediate neighbourhood already covered with excavated materials; or, if this cannot be done, the mound might be converted into a grass bank, one opposite to each of the entrance gates.

Having now criticised the plan of the Board, I offer my own for their consideration. I would at once to away with the present *assault* of the mound, and bring the outer fence to the inner edge, so that the present excavations, which would be a sufficient protection against passing wheels, &c., inside the iron railing. I would plant a double row of trees, and the trees would make a very ragged line, and a very good one, and, last but not least, require a very broad base; but a very hedge can be grown in a week, and need not be more than 2 ft. thick, costing a very small sum. This hedge might be kept about 7 ft. high, save in three or four places, where bows might be ultimately grown. 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NEW WORKS.

IRISH PRIVATE BILLS IN PARLIAMENT.

LAST week we mentioned some of the English metropolitan Bills in Parliament Session for 1871. The following are the Irish metropolitan and provincial Bills:—"Dublin Main Drainage;" "Belfast Drainage and Improvement;" "Dublin Tramways;" "Dublin, Wicklow, and Wexford Railway;" "Great Southern and Western and Cork and South Limerick Direct;" "Great Southern and Western, No. 1;" "Great Southern and Western, No. 2;" "Northern and Western of Ireland;" "Waterford and Wexford, Whitehaven and Wexford, Steamboats Bill;" "Waterford, New Ross, and Wexford Junction;" "Waterford and Central and Kilkenny Junction;" "Ennis and West Clare Railway."

Considering the insolvent state of many of the Irish railway lines, these intended extensions create a surprise, and we should not wonder hereafter to hear of the companies asking Parliament for powers to abandon them. Nothing, as far as we can see at present, will save many of the Irish lines from annihilation except their purchase by Government; and there is a strong party in the sister kingdom at present who have been energetically working for years to accomplish that end.

THE "STREET-ORDERLY BIN."

AN invention under the above name has been adopted by the authorities for use in the streets of the City of London, and has attracted considerable attention amongst passengers along the Holborn Viaduct and the more frequented thoroughfares, particularly those in which the new asphalt pavement has been laid down. Owing to the impossibility of keeping the main streets clean by means of the ordinary night sweeping, a staff of boys was engaged to keep constantly at work with hand-brush, shovel, and basket, throughout the day, each boy having a section of the street allotted to him. This was proposed several years ago, and called the "Street-orderly System." It soon appeared, however, that the dirt accumulated by each boy was a great obstruction and a nuisance on the edge of the road, and the expense of men and carts constantly going round to collect it was very great.

To meet this objection the street-orderly bin was introduced by Messrs. Burton, Sons, & Waller, the manufacturers of sanitary ironwork, of Holland-street, Blackfriars. It consists of an upright box, a little too like a pillar letter-box, with a sliding lid at top, which opens to receive the contents of each shovel, and a sliding door at bottom, by which the bin is emptied at night by the regular scavengers' carts.

Where space in the street is very scanty, the bin can be made as the base of a lamp-post, and it is particularly adapted for use as a public dust-bin, in narrow courts, where it can be recessed into the wall, so as to avoid obstruction.

"THE WANT OF
ARCHITECTURAL INSTRUCTION IN
MANCHESTER."

I WOULD refer the writer of the letter which appeared with the above heading in your last issue, to the prospectus recently issued by the Manchester Society of Architects, and of which copies were sent to all the known architects in this city, for distribution amongst their pupils and assistants. You will see by the copy I enclose that the object has been to bring prominently under their notice that there are excellent aids to the study of their profession within the reach of all who choose to avail themselves of them, in the classes at Owen's College, the School of Art, &c., and in the magnificent collection of books at the Free Library, which contains a large proportion of those recommended by this society for study, and also that there are several valuable prizes open to them to compete for.

If the writer of the letter referred to had been even but a short time in Manchester, he would, I think, have known that attempts of the kind desired by him have been made by a kindred society, the Manchester Architectural Association, and that, notwithstanding the strenuous and laudable exertions of those who have given both time and money, the result has been a total failure.

It cannot be wondered at, therefore, if the members of the Society of Architects, old prac-

tioners most of them, should hesitate at giving their time, and the results of their experience, in repeating an experiment apparently so unpromising.

J. MURRAY, ROYD,
Hon. Sec., Manchester Society
of Architects.

THE BLOCK BOOKS.

I SCARCELY believe many of your readers will approve the theory of "F. S. A." that where a distinct declaration, purporting to represent a fact, has been made by A, and its truth denied by B, "the burden of the proof rests with B." On the contrary, I venture to submit that in such a case the affirmative of the issue is clearly a duty legitimately and properly cast upon A; and under that belief, I (for the present, at least) decline stating my reasons for rejecting the imaginary antiquity of the "Biblia Panperum," but require the authors of the statements I have called in question to prove their correctness.

In this stage of the controversy I see no utility in "F. S. A." referring to the letters of Mr. Noel Humphreys and of Monsieur Berjeau, unless at the same time he mentioned my communication which led to the first, and my answer to the second, both of which must be perfectly well known to "F. S. A."

If the date impressed on the hogskin binding in Lord Spencer's copy of the "Biblia" had been 467, instead of 1467, it would have been equally as material in relation to the truth. If your next impression should leave my challenge unanswered, I will supplement it with a list of queries, upon the satisfactory solution of which the question I have raised will mainly depend.

HENRY F. HOLT.

MEMBERS OF THE INSTITUTE AND
BUILDERS.

SIR,—Your correspondent "E." in your number of the 3rd inst., p. 971, states that it is no secret that in the provinces it is a common thing for Fellows of the Institute to take out their own quantities, and in some instances to receive payment from the builders without their clients' knowledge, and to charge 2½ per cent. instead of 1½ per cent. charged by competent surveyors; and that such men, too, are not above taking commission also from contractors and tradesmen; and he adds, "of what use is it to make rules that members are not to do such things, and wink at their being done?"

If, sir, your correspondent "E." instead of making sweeping accusations, direct or by innuendo, will furnish me with the name of such a Fellow, and state the occasion, and furnish me with positive evidence of the fact, with his signature attached, I undertake to bring the matter under notice of the Council, who, as high-minded and honourable men, will, I am sure, not blink such a question, but bring it to a practical issue.

THOS. L. DONALDSON,
Hon. Sec. Foreign Correspondence.

TO FRANCE.

PRAYE L'AM! yet longer bear Fate's hard control!
Men sit, and truly, Pleasure and wild Joy
Were all thy worship, and that each vain toy
Absorb'd thy frivolous heart; nor could thy soul
Uplift itself from vilest mirth and glee.
Now, Paris, rise, and show what thou canst be!
How Pestilence can be borne—how trial met—
How Famie wakes nor murrain nor regret—
What though thou'lt agonise before thy wall,—
What though thou'lt echo'st back his trumpet-calls,—
What though, to celebrate some festive day,
He bids thy triumphs of thy Science play,
Be this firm Order—Patience 'neath the doom,
Nor let foul Anarchy thy fame o'ercast;
But thou, devoted to a living tomb,
Win thou from Heaven dear recompense at last.

M. Y. F.

A NEW SCHOOL FOR BRIGHTSIDE,
SHEFFIELD.

A MEETING of the workmen of the Atlas Works has been held for the purpose of taking steps to assist in the erection of schools in connexion with All Saints' Church. The cost of the schools, which it is intended shall accommodate upwards of 1,200 children, will be between 4,000l. and 5,000l. The land upon which they will be erected is near the church, and the whole of it, valued at 800l., has been generously given by Sir John Brown. In addition to this sum, Sir John will contribute 500l. towards the erec-

tion. The want of school accommodation in that part of the town has been long felt. The schools which have hitherto been used are in the Atlas Works, and on Sundays they are so crowded that some additional rooms have had to be taken. But even now sufficient accommodation cannot be obtained. In the proposed new schools, there will not only be large schoolrooms for children, but class-rooms for young men, and rooms in which meetings of working men can be held. The meeting on Saturday took place in the boiler-plate department. It was well attended, there being probably upwards of 1,000 persons present. Mr. J. D. Ellis said it was unnecessary for him to explain the object of that meeting. They were probably all aware that an Act of Parliament had recently been passed, which made it necessary that any schools which were to be erected to be independent of the Act should be commenced immediately, and that a portion of the funds required should be raised before the end of the year. That was the reason why it had been thought necessary to call them together at that time. It was quite admissible that they should make great exertions if they were to have schools in that district which would be independent of the Education Act. What they wanted the men to do was to set about getting funds for the building of schools near All Saints' Church, and upon land which Sir John Brown was prepared to give. If they did not get funds and commence the buildings before the 1st of January, they would lose the large subscriptions which had been promised towards them, and probably Sir John would withdraw his offer of the splendid piece of land. Sir John Brown and other gentlemen addressed the meeting, and resolutions promotive of the object of the meeting were passed.

HALIFAX BUILDING SOCIETY'S OFFICES
COMPETITION.

SIR,—I believe with your correspondent, "A Competitor," that if official information be waited for, at least forty-six competitors may be kept in suspense for an indefinite period. I will, therefore, with your permission, give some particulars which have come to my knowledge.

The chance of carrying out the work on terms to be hereafter agreed upon, of gaining a premium of 30l., and one of 20l., were the baits offered to architects, one of the conditions being that no award would be made unless the directors were satisfied that the designs could be carried out for the stipulated sum of 5,000l.

It was not likely that the gentlemen who were so very shrewd as to secure such a saving clause would be easily satisfied, for, according to the wording of the clause, it would not be sufficient for the authors of the designs to prove that they could be so carried out.

However, forty-nine architects submitted designs, no doubt expecting fair play, and three were selected for trial, the first in order being by Mr. Hagen, of Hull; the second by Mr. Bailey, of Keighley; and the third by Mr. Jackson, of Bradford.

In reply to inquiries made in your columns, the secretary to the society stated that the first (Mr. Hagen) had failed to give the required satisfaction, and that the second was then on his trial. I am not aware that any further official communication has been made, but I am in a position to state that Mr. Bailey also failed, and that Mr. Jackson was more successful, or, at all events, he is commissioned to carry out the work.

Immediately after Mr. Jackson was appointed architect of the building, it was decided to modify his design, and the 30l. premium was offered to Mr. Bailey, whom the directors had, by a former resolution excluded from the competition; the premium was accepted, and the drawings consequently forfeited.

I am only posted up in this matter to September 6th (three days after Mr. Bailey received the offer of the premium). On that day the forfeited drawings were sent from the society's office to Mr. Jackson, and the remainder were then at Halifax.

Perhaps Mr. Hagen will say whether he has received the 20l. premium.

The fact that one of the directors is an architect, and that some of his colleagues are men whose reputation for probity is not confined to Halifax, does not lessen the strangeness of their proceedings.

ANOTHER COMPETITOR.
. The secretary informs us that a circular has now been sent to each competitor, stating that

the directors have selected the first design, and also awarded the premiums to the competitors, second and third in order of merit, with the following result:—

1. "Prosper the Society," Mr. Samuel Jackson, Architect, Bradford.
2. "Architectus," Mr. Wilson Bailey, architect, Leeds and Keighley.
3. "Salon Mérite," Mr. J. T. Meredith, architect, Kidderminster.

Considerable time has been taken up in enabling the directors to decide upon their award; but this has been unavoidable, from the necessity, in their judgment, of testing, by estimates obtained from responsible contractors, whether the design selected as the first in order of merit could be carried out for the amount stipulated, viz., 5,000*l*. Two sets of designs had to be rejected from their inability to stand this test.

To show that great care has been exercised by the directors in keeping strictly to the terms of the circular issued to the competing architects, they deem it right to themselves to state that contracts have been already entered into for carrying out the selected design in the following departments of works, viz.—Mason and excavator, joiner, plasterer and slater, plumber, and heating apparatus, for a sum considerably below the stipulated amount.

CHURCH-BUILDING NEWS.

Little Deuchurch.—The church of this parish, dedicated to St. David, has been re-opened for public worship, after undergoing a restoration or re-building: except the tower, it has, in fact, been entirely pulled down and re-built. The walls of the original church had no foundations, but the present building has; and the nave, which was originally disfigured by pews and a low ceiling, has been improved by the restoration of the old benches, most of which, after undergoing repairs, were used again. The timbers of the old roof, which were previously hidden from view by the low plastered ceiling, are now opened out, and the chancel arch, which was also very low, and was fast becoming dangerous, has given place to one of greater elevation in the Pointed style. The chancel is fitted with stalls, and a three-light stained glass window has been inserted from the architect's own design. A reredos, the centre of which consists of alabaster, inlaid with Venetian mosaics, represents in the centre the Agnus Dei, and on each side angels bearing harps; the reredos is extended to the north and south walls, with paintings on zinc. The whole church is floored with encaustic tiles, from the celebrated Lurgwardine works. The tower has been restored and strengthened, and the peal of bells, which originally consisted of three only—one of which had been broken for many years, and has now been recast by Messrs. Taylor, of Loughborough—has had two bells added, making a peal of five. The whole work has been carried out under the superintendence of Mr. J. Proedy, of London, at a cost of 1,400*l*., which sum includes not only the church restoration expenses, but the building also of a new boundary-wall round one side of the churchyard, the repair of all old walls, drainings—including large culvert drain,—new gates, and various other items of expense necessary to make the work complete. As far as possible, the materials of the old building have been used up,—as in the working in of the old windows, &c. The new church stands pretty nearly, if not almost entirely, on the site of the old one. The work of re-building has been carried out by Mr. Mayman, of Belmont. The church is furnished with heating-apparatus.

Heigham.—The division of the extensive and increasingly-populated district of Heigham into three parishes has been followed by efforts for the provision of more adequate church accommodation. In the parish of Holy Trinity there has for some time been a large and commodious church; and a short time since the more recent parish of St. Philip was provided with a structure used for divine worship until the church itself, which is in course of erection, is completed. Greater church accommodation has now been also provided for the district included in the parish of St. Bartholomew. A "temporary church," capable of seating 500 persons, has been put up. It stands on land abutting upon Adelaide-street, where the principal entrance is; but there is also a second entrance from Old Palace-road. Although designated a "temporary" church, the building has an appearance of substantiality. It is 75 ft. 6 in. long, and 33 ft. wide, with open benches for 500 persons. In the rear front is a porch, 20 ft. by 5 ft., and at the rear a large room for vestry and other purposes, 33 ft. by 12 ft. The building, which is constructed entirely of timber, the sides being strongly framed, and on the outside covered with stucco, is plastered on the inside to within 4 ft. of the

floor, and the walls are lined for that depth with boarding. The roof is lofty. It is constructed in six bays, open to the ridge, which is 30 ft. from the floor. The ribs consist of boards blocked out and bolted together, and covered on each face with radiating boarding, forming a semicircular arch, springing from about 5 ft., and reaching the height of 21 ft. from the floor. There are no rafters to the roof, which is covered with boarding laid upon purlins; and the whole of the boarding, timbers, and framing are stained and varnished. There are no windows in the sides of the church; but light is obtained chiefly from a lantern running the whole length of four bays of the roof. The centre sashes in each bay are opened by lines and pulleys, connected with a rod extending along the lantern, and working on centres, a line with a small wheel at one end opening and shutting the whole of the lights. There are also windows, with trefoiled heads, in each gable. At night the church is lighted by means of twelve star burners, of ten lights each. The floor is formed of thick boards, laid, without joists, upon timbers placed 6 ft. apart, and is suitably covered with matting. The benches are made of deal, with light wrought-iron bearers, for supports, screwed to the floor, and have sloping backs, with a book-board affixed under the seat. The work has been carried out, at a cost of over 600*l*., by Mr. James Youngs and Messrs. Wilkins & Curtis, from plans prepared by Mr. Henry Hall, architect, London.

Thornby.—The parish church of St. Helen, Thornby, will be re-opened for divine service after a thorough restoration and enlargement. The expense attending the work has been considerable, and, at the present time there is a deficiency in the amount required of 250*l*.. The church was very small and altogether inadequate to the wants of the parish. It consisted of a small nave and chancel, with a tower at the west end, and was in a dilapidated condition. The windows, which, for the most part, are Late Square-headed Decorated, have been preserved and restored. The greater part of the chancel was in too wretched a condition to be preserved, and has been partially rebuilt, and a new decorated window, at the east end, now takes the place of an opening, with an arched head and wooden mullion in the centre, which was not worthy the name of a window. The whole of the church has been restored, and conservative feeling has been exercised throughout. A small lancet window was discovered on the north side of the church, and this has been re-inserted in its original position. The tower arch which, like many others, was blocked up and lost to the church, has been opened and restored. In order to provide proper accommodation for the parish a new aisle has been erected on the north side, with windows of Early Decorated character. It is built of Dunston stone, with Bath ground stone dressings to windows, and Dunston hard stone parapets, copings, buttresses, weatherings, &c. The arcade of the new aisle is executed in Bath stone for the most part, but the arches are in Dunston and Bath stone alternating, as are also some of the relieving arches over the windows. The roofs are new throughout, including the porch, and of the best pitch pine. The main timbers are stained and varnished, but the boarding is left in plain wood, without varnish, first, in order to produce a pleasing contrast in colour; and, secondly, to prevent the dropping of wet in the winter season, which is so often the case in consequence of the condensation of moisture. The floors of the church and chancel, up to the sanctuary, are paved with Maw & Company's best black and buff tiles, in different designs, and the parts within the sanctuary and on the foot pace are laid with ornamental encaustic tiles from the same firm, of simple designs. The whole of the seats, including the choir stalls, are of pitch pine, with solid ends, having carved patterns on the outside, suited to the form of the ends. Besides the new aisle, an organ-chamber and sacristy have been erected on the north side of the chancel, with an arch opening into the chancel, and another at the east end of the new aisle. The lower or first side of these arches is supported by corbels carved in natural foliage, slightly conventionalised. The tower arch and the vestry have each a screen of Early Decorated character. The works have been carried out from designs, and under the superintendence, of Messrs. E. F. Law & Sons, of Northampton, architects, and executed by Mr. Gee, of Daventry, builder.

Garston (Liverpool).—The foundation-stone of a church, to be dedicated to St. Matthew and

St. James, has been laid at Mossley-hill, Garston. The edifice, according to our authority the local *Journal*, is to be erected and endowed out of the funds left by the will of the late Mr. Matthew James Glenton. Ultimately those funds will realise about 40,000*l*., and it is intended hereafter to erect a parsonage and schoolrooms close to the church. The work has been delayed for some time owing to the opposition which the trustees,—Messrs. G. M. Bowen and P. Vance,—encountered from the incumbent of an adjoining township, who maintained that further church accommodation was not required in that neighbourhood. It was, however, the particular desire of Mr. Glenton that the church should be erected on Mossley-hill, and the trustees therefore selected the site in question. The church is designed in the early geometrical style, of the thirteenth century. A site has been selected, commanding views of the Allerton and Mersey valleys, and being about a quarter of a mile to the west of the Mossley-hill railway station. The stone of which the walls will be built is being obtained on the site, from a quarry opened for the purpose, bands of lighter coloured stone being introduced to both inside and outside to lighten the somewhat sombre effect of the red stone. The dressings of the arches, windows, &c., are being obtained from the Woolton quarries. The ground-plan consists of a nave, 97 ft. 6 in. long, by 24 ft. 6 in. wide, and lighted by a clearstory of twelve two-light windows on each side, and a west window of five lights; the north and south aisles, 97 ft. 6 in. long, and 13 ft. wide; chancel, 43 ft. 6 in. by 24 ft. 6 in. wide, with a tower, 30 ft. square, placed across its western end, and having arches on the north and south opening into the quasi-transapse, which are used for the vestry and organ, with clearstory above to admit light for the choir, which is placed under the tower. The heights of the building are 40 ft. from the floor to the wall-plate of the nave and chancel, and 64 ft. to the ridge; the tower being 114 ft. from the floor to the top of the parapet, and 142 ft. to the apex of its roof. The entrances are by a large western door, and by a porch in the western bay of the north side. The roofs are to be of pitch-pine, unvarnished, as are also the seats, which will accommodate 800 adults. The font is to be adjoining the west door. The cost of the church and fittings, exclusive of the organ, will be 10,000*l*.; the parsonage, which is to be placed at the south-east angle of the site, being estimated at 2,000*l*.. The architects are Messrs. Paley & Austin, Lancaster; and the builder, Mr. William Winnard, jun., of Wigan.

Carlisle.—The new church of St. Paul, in this city, has been consecrated. The edifice has been erected at a cost of about 3,700*l*.. The original estimate was 2,930*l*.; but some additional work, which was the subject of extra contracts, has been executed, including some little progress with the tower, which, together with a spire, it is proposed to add to the church when the funds allow. The edifice, which has been built from the designs of Messrs. E. Habershon & Brook, architects, stands in an open space of ground, bounded on the east by Spencer-street, on the north by Lonsdale-street, and on the west and south sides by two new roads. It is built, in the Gothic style of architecture, of Newbiggen red stone, with high-pitched roofs, covered with green slates, the windows being of different patterns of geometrical tracery. Within, the church consists of a nave, nearly 30 ft. wide, and 73 ft. 3 in. long, with north and south aisles, divided from the nave on each side by five Gothic arches, of alternate red and white stone, supported by circular columns. The nave is heightened by a clearstory above the arches, containing a series of circular windows and tracery. The chancel is 20 ft. 10 in. deep, and is spanned by an arch extending over its entire width, the walls up to a certain height being painted, so as to represent a wainscoting of coloured tiles. The whole of the roofs are of open timber work. The west front, which looks towards Lowther-street, has a large Gothic window, of rich tracery, but with rather stunted mullions. The windows are filled with cathedral glass, of a green shade, and its colour gives a cold appearance to the interior which might, with advantage, have been relieved. The seats are open benches, and, what is a useful feature of church fittings, have small umbrella-racks at the end. There are two entrances, besides one from the vestry,—one at the north-east angle, where the tower and spire are proposed to be erected, and the other beneath the west window. Seatings are provided for 600 persons. At present

the absence of the tower and spire prevents the fabric presenting an imposing appearance. Those adjuncts it is proposed to run up to an altitude of 120 ft. As designed, the tower will have angle buttresses and four pinnacles above which will be the belfry windows, in an octagonal story, and above which will rise the spire, with high open pinnacles over the spire lights, in addition to the larger ones below. The organ was purchased by special subscription, at a cost of 285*l.*, towards which Mr. Losh, of Manchester, gave 200*l.*, and Mr. Charles Armstrong 50*l.* The contractors for the building and joiners and carpenters' work were Messrs. Charles & John Armstrong, of Carlisle, and the minor contracts were also carried out by Carlisle tradesmen,—the slating, by Mr. James Graham; the plastering, by Mr. Ormerod; the painting and glazing, by Mr. Canning; the plumbing and gasfitting, by Mr. Willoughby. The iron palisading surrounding the church was supplied by Messrs. Porter, Hinde, & Porter; and the heating apparatus, which consists of hot-water pipes, was laid by Messrs. Lees & Graham. The whole of the chancel furniture is from the workshops of Messrs. Kirkbride & Son, and the decorations of the chancel wall and the inscription upon the pulpit were executed by Messrs. John Scott & Son.

St. Mary-at-the-Walls.—An effort is about to be made to thoroughly restore and re-arrange the sitting accommodation of, and to build a chancel to, the parish church of St. Mary-at-the-Walls. The church committee, recently appointed by the parish, at its first meeting unanimously determined to call in the professional services of Mr. Arthur Bloomfield, architect, son of a former Bishop of London and Archdeacon of Colchester, to survey the building and report upon the best means of increasing the efficiency of the accommodation.

Llanvetheline.—The parish church of Llanvetheline, in the county of Monmouth, has been re-opened after restoration. The roof, which was in a very dilapidated state, has been repaired, the old stone tiles removed, the defective timber taken out, and re-covered with slates and a Bath stone ridge, and the gables re-roofed with new stone. The interior of the roof, which is a wagon panelled one, has been carefully restored also. The decayed oak braces and ribs have been cut out and new ones inserted, the panels filled in with new V-jointed boarding, with moulded cornices. A new three-light window has been inserted on the north side of the nave, and the other windows restored and reglazed throughout. The defective parts of the walls have been restored with new masonry, and the inside plastered. A new panelled ceiling has been placed in the tower, with a new open termination, in pitch-pine, to the tower screen. The old shaft and bowl of the font have been removed, and new substituted. A new pitch-pine seat has been fixed in the south-east corner of the church. The warming is effected by one of Gurney's stoves. The total cost of the work is about 400*l.*, the whole of which has been defrayed by the rector, the Rev. F. C. Steele. The works have been carried out by Mr. William White, contractor, of Abergavenny.

Biggleswade.—The ancient parish church of Biggleswade, Beds., dedicated to St. Andrew, has been re-opened, after extensive reparation. The structure is in the Early English style, with square tower and five bells, nave, chancel, and two aisles. There are sedilia on the south side of the chancel, with piscina in a more elevated position. The old church has features of great interest for antiquaries. In regard to the work of reparation, the original plastering, both externally and internally, has been removed, and the interior pointed with light mortar. The outside parapet, walls, and other brickwork parts have been rebuilt in sandstone, to match the other parts of the building, with new stone string-courses and battlements. The tower, which is built of clunch, has been cleaned down and pointed, and new battlement coping put on; and the ringers' chamber, formerly ascended to by means of a ladder, is now reached by a new spiral staircase, built on the tower side. The tower clock has also been renovated, the face having been newly gilded, and new works added to the inside. The square pews of the church and chancel have been replaced by new open benches, those in the nave having square ends, with sunken panelled tracery, and those in the chancel carved poppy-heads, all of pitch-pine. The western gallery and rising-chamber, which formerly hid the tower arch, have been taken down, and children's seats on a raised platform occupy the

space. The side galleries, however, which cover the whole of both aisles, still remain. A new organ-chamber has been built on the north side of the chancel, with cellar for the heating-apparatus beneath. Nearly the whole of the stonework, which was very much decayed, has been restored; and where so much of it had been mended with cement, it has been cut away and replaced with new stone. A noticeable feature was the new carved stone pulpit. The work is estimated to cost about 2,000*l.*, exclusive of the organ-chamber, which cost about 160*l.* The stone pulpit and the whole of the stonework was done by Mr. William Wade, of St. Neot's; the wood-work by Mr. Thomas Edey, of St. Neot's; the tile floors were supplied by Messrs. Maw & Co. The architects were Messrs. Habershon & Pite.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Bow.—A new church has been opened at Bow. The edifice stands opposite the Protestant Church. It is of Kentish rag stone, and the style is Gothic. The building is of considerable size. Mr. Blount was the architect.

DISSENTING CHURCH BUILDING NEWS.

Sheffield.—Broompark Congregational Church has been re-opened. The edifice has been built by two instalments. Some seven years ago the nave was roughly put up as a temporary beginning to a more commodious structure, the transept and ornamental finish being left to some future occasion. That occasion arose when, the Rev. Professor Tyte having accepted the pastorate, Messrs. Innocent & Brown, the architects, were requested to submit completed plans. Their designs have now been carried out, with the exception of a porch and spire in front. It is only fair to the architects to state that those have been omitted, as the criticism to which the exterior of the building is still open might have been disarmed had the full scope of their plans been executed. The effect of the interior is very simple. The church is in the Early Gothic style. The new portions comprise transepts, two vestries, and apse; underneath being a lecture-room for week-night services, which will accommodate 250 persons; with entrance-lobby, vault for warming-apparatus, and other requisites. The building is lighted by coupled lancet windows, with large rose-windows in the transept gables, and smaller ones in the apse, filled with geometrical stained glass. Seats are provided for 450 persons in open pews, 3 ft. wide, of deal, stained, and having crimson cushions throughout. The pulpit and its accessories are of carved wood, by Mr. A. Hayball, from the architect's designs. Messrs. B. & T. Nelson were the contractors for the entire works, which have been carried out under the direction of the architects. The total cost of the completion is estimated at from 2,250*l.* to 2,300*l.*, and of this 1,916*l.* have been raised.

Liverpool.—A new Wesleyan Chapel, which has been erected in Rowson-street, New Brighton, has been opened for public worship. The building has progressed with great rapidity, so as to be opened for public worship in about seven months from the commencement. The architect of the new chapel was Mr. Henry H. Vale, president of the Liverpool Architectural Society, whose designs were selected in competition, and have been carried out by Messrs. J. & T. Mason, of Egremont, builders; the sub-contractors for the joiners' and carpenters' work being Mr. Reddy of Liscaid; for the plumbing, glazing, and staining, Messrs. Cherry & Lawlor, of Little Brighton. The reredos and pulpit were executed by Mr. Rogerson, of Liverpool, who also executed the whole of the carving.

Hull.—The Primitive Methodist Connexion have commenced the building of a chapel and schools in Lincoln-street, Hull. On the ground floor will be a large school and infants school, with six class-rooms, and above these will be a chapel to accommodate 670 persons, and capable of having erected at some future time a gallery to hold 120. The cost of the building is to be about 2,500*l.* It will be in the Gothic style of architecture, and of red brick with Ancaster stone dressings. Mr. S. Muirgrave is the architect, and Mr. George Robinson the builder. Five foundation stones of the building were laid by members of the family of the late Mr. Samuel Hodge, to whose memory the building is dedicated. Several bricks also were laid. The

layers of the stones each gave 20*l.* towards the cost of the building, which with the amounts subscribed by the "brick-layers," and money already raised, represents about one-third of the entire cost.

SCHOOL-BUILDING NEWS.

Scarborough.—The corner-stone of a new school building at Scarborough, to be called the St. Martin's Grammar School, has been laid. A site having been presented by Dr. Cross and Mr. Petch, of Scarborough, together with the sum of 1,000*l.* by Miss Mary Craven, the work will now be soon completed. The site fronts Rams-hill-road, and the building, which is in the Gothic style, comprises school-rooms and class-rooms for boys and girls, and a large lecture-hall above. Mr. G. F. Bodley, of London, is the architect; and Mr. Thomas Petch, of Scarborough, is the contractor.

York Town.—The new National Church Schools, for York Town and Cambridge Town, Frimley, have been opened by the Bishop of Winchester. The schools, which contain every accommodation for the purpose, were designed by Mr. Buckridge, architect, and built by Messrs. Collier & Catchpool, of York Town.

Barboursne.—A meeting of the parishioners of St. George's, Barboursne, was held in the vestry of the church, on Wednesday, for the purpose of considering what steps it would be necessary for them to take in the parish to meet the requirements of the new Education Act. The attendance was small. The following resolution was adopted:—"That the existing schools of the parish of St. George being inadequate to meet the requirements of the new Education Act, and so constructed and so inconveniently placed as not to admit of suitable adaptation to the wants of the parish, it is most desirable that new schools should be built for boys, girls, and infants, in lieu of the existing schools, on a more eligible site, and that a subscription be now opened for that purpose." The meeting appointed a committee for carrying out the resolution.

Hardwick.—A new school for the children of the parish has been opened. It has been built at the sole cost of Mr. Edward Thornton and other members of the family, the materials being carted by the farmers of the parish. The school is built of rock-work faced stone, with Mears Ashby stone dressings to the windows and doors. The roof inside is an open roof, with oiled ribs to principals resting on stone corbels. The timbers are stained and varnished. At the east end of the school is a bell-gable, terminating with an iron cross. The school is lined with best dressed bricks, of different colours, and arranged with arches, and two recesses, with doors, which are intended for a school library. The school floor is laid with blocks of wood. Attached to the school are two cottages, for the schoolmistress, &c. The school and cottages stand on high ground, rising from the street, near the church. They have been built from the plans and under the superintendence of Messrs. Law & Sons. The contractors were Mr. Banks and Mr. Keightley, of Northampton.

STAINED GLASS.

Sedgley Church.—Shortly after the death of the late Rev. W. Lewis, the inhabitants held a meeting, and then determined to perpetuate his memory by placing a stained window in the parish church, where he had ministered for nearly forty years. The window has just been inserted in the south aisle, as close as possible to the place of his interment. The window, which is in two divisions, illustrates the subjects of Christ feeding the multitude, and of little children being taken into the arms of the Saviour. The memorial was manufactured by Messrs. Hardman.

Little Milton Church.—On the death of Mr. E. L. Franklin, of Ascot, in August of last year, it was felt by some of his friends that it would be a gratification to them to erect some memorial in testimony of the high esteem in which they held his character. The parish of Little Milton owes very much of its temporal well-being to him, and as he took an active part in the building of the church, and was afterwards for some time churchwarden, it was thought that a painted window in the church at Little Milton would be a very fitting form of memorial. Consequently a subscription was started among some of Mr. Franklin's friends,

and a west window, by Messrs. Hardman & Co., of Birmingham, has been inserted.

St. Nicolas's, Beaulieu (Warrickshire).—In this church the two-light Decorated south window in the chancel has been filled with stained glass, by Wailes, under the direction of Mr. Hingall, architect, as a memorial of the late George Fayer, M.D., of the adjoining parish of Henley-in-Arden. The subjects selected are, first, an illustration of the text,—"I was sick and ye visited me;" a male figure is bringing medicine to the bed-ridden, and in his left hand is a book with reference to the spiritual consolation, which, as a member of the medical profession, he was privileged to give. The second illustration is of the words,—"I was hungry, and ye gave me meat; I was thirsty, and ye gave me drink." The same male figure is seen relieving the wants of the poor. In the quatrefoil above there is an angel with a scroll, bearing the words,—"Ye have done it unto me." Mrs. Phillips, an aunt of the late Dr. Fayer, who was highly esteemed by his fellow-townsmen, has made this offering; and we hope others may be induced to follow the example in decorating this interesting church, which was restored a few years back by the exertions of the Rev. W. P. A. Campbell, who was in charge of the parish at the time.

Lichfield Cathedral.—A stained-glass window, to the memory of the late Mrs. Spode, of Hawkley Park, has just been placed in this cathedral. There are three principal lights, the centre showing our Saviour on the cross, the right the figure of St. Helena, and the left the Resurrection. The principal subject in the lower part of the window is the Temptation, and the upper part is filled with a variety of subjects, embellished with tracery. The work is from Hardman's, of Birmingham.

Alford Church.—The Marquis of Westminster has erected a stained window in the eastern end of this church, in memory of his father.

Books Received.

MESSRS. LOCKWOOD & Co. have taken Chaucer's fame under their protection. We have from them a second edition of their revised version of his works, fitted for family reading, called "The Riches of Chaucer," with a New Memoir of the poet, by Mr. Charles Cowden Clarke, the whole well printed, and agreeably illustrated; also a second edition of "Tales from Chaucer," by Mr. C. C. Clarke, which makes a very amusing story-book, and at the same time serves to lead to the study of his works in their original poetical dress. We can commend it.—The artist illustrated in the current number of the *Art-Journal*, is Mr. Henry Stacy Marks, a painter yearly making progress in public opinion. Engravings are given of three of his best pictures. An engraving of "The Miracle of St. Mark," by A. Fleischmann after Tintoretto, conveys the spirit of the master remarkably well.—*Temple Bar* for December (Bentley), includes a charming account by Haas Christian Andersen, of "A Visit to Charles Dickens."—*London Society* (also published by Bentley now) has its usual number of amusing stories and engravings. "The Foreign Settlement in Soho," one of the papers in it, gives a truthful picture of the locality. The Christmas number of this periodical includes seven full-page illustrations, and is altogether a good one of its class.—The Christmas number of *English Society*, conducted by Mr. James Hogg, who founded *London Society*, has eight such illustrations, and a considerable amount of amusing writing. The conductor has wisely adopted larger type than that used in the first-named.—We got from a more than ordinarily clever paper about Liverpool, in *Fraser's Magazine*, these lines, which have a wide and weighty application. If they were to sink into the public mind, something would be hatched. They are addressed to

An Egg Merchant.

"What the deuce is your use? You nothing produce,
You never lay eggs. Oh, you're a transmitter,
If A has an egg intended for me,
He hands it to B, B to C, C to D,
D to E, E to me—who pay, after A,
B, C, D, and E, for stopping the way;
For surely 'twere better A's egg and my penny
Changed hands without paying a toll to so many,
Which terribly docks Farmer A of his gain,
While of eggs hardly fresh I often complain."

—The *British Workman*, the *Band of Hope Review*, and the *Children's Friend*, all published by Partridge & Co., pursue their important

course (yes! important), and give for a penny or a halfpenny such wood engravings and such sound good English writing as were not obtainable a few years ago for many times the money.

—Messrs. Cassell, Potter, & Galpin have added to their many educational periodicals the *Technical Educator*, intended to be a practical sequel of their *Popular Educator*, the usefulness of which is considerable. Some of the departments of the *Technical Educator* appear to be in very good hands, but as to others we are not sure. Architecture should be treated by a professional and experienced architect; engineering and surveying by experienced engineers and surveyors; architectural drawing by an architect or under the guidance of one. If this be admitted, then it stands to reason that building construction,—the manipulatory or workman portion,—ought to be treated by some intelligent builder, who, either having been once a workman himself, or having paid peculiar attention to planning, designing, and workmanship, would be able to write practically on the subject. Messrs. Cassell can improve their series much by securing the services of intelligent masters or workmen in the different trades and occupations which they intend to treat of in their work.—Under the title "Christmastide," the conductor of the *Leisure Hour*, Dr. Macaulay, issues for the first time a Christmas part of his popular and good periodical, and a very satisfactory part, or rather whole, it is, brimful of amusing carefully-revised stories, essays, and engravings. Amongst the first we may signalise "A Miserable Christmas and a Happy New Year," by Hestia Stretton; and from the second take "Notes on Nursery Nonsense," by Somerset Herald. The latter is a capital paper, full of quaint suggestiveness, and is artistically illustrated. The circulation of the *Leisure Hour* shows what a large public there is for an amusing safe periodical. The *Sunday at Home* is issued by the same society, and we are told on the best authority that the circulation of the two together is above 220,000, that of the *Sunday at Home* being the larger of the two.

Miscellaneous.

The Metropolitan Board of Works.—This Board has declined not to grant the request of the Bethnal-green Vestry, asking them to open up a new thoroughfare from High-street, Shoreditch—which it is the intention of the Board to widen—to Bethnal-green-road. The improvement would cost nearly half a million of money, not a penny of which Bethnal-green was willing to contribute. The Board were, for the most part, unaffected by the arguments of Mr. Bevan and Mr. Newton, the former of whom proposed an amendment, that the Board should seek Parliamentary powers to enable them at once to set about making the new thoroughfare.

—The Board, alarmed at the large amount paid to law stationers (about 2,500*l.* annually) for fair copying, determined to dispense with the services of the writers employed through the law stationers, and to employ them direct, and pay them by the hour, at the same rate of pay which they received from the law stationers. The persons so engaged, however, have sent in a memorial to the Board, stating that, owing to a rule of the trade, they are prohibited from accepting work direct from an employer, and are therefore reluctantly compelled, unless the work came through a law stationer, to decline the business of the Board. The matter has been referred to a committee for consideration.

St. Leonard's Tower, Bridgnorth.—The re-erection of this tower will now be proceeded with under a contract with Messrs. Estcourt, of Gloucester. At a meeting, held on Friday, the estimate of this firm, amounting to 2,708*l.*, was accepted for the work; but this does not include the cost of the bells, groinings, turret, pinnacle, and other contingencies. The sum already subscribed is 1,769*l.*, leaving a deficiency of 999*l.* to be collected in order to meet the estimated outlay on the tower.

Stone Preservation.—We hear that at the recommendation of Professor Abel the process invented by Messrs. Gay & Co., of Alton, Hants, for waterproofing and preserving stone and other buildings, is, by the order of the Office of Works, to be applied to the decayed stonework of the Houses of Parliament. It ought, perhaps, rather to be said "some" of the stonework.

Death-rate at Blackburn.—The death-rate of Blackburn having been unusually high twelve months ago, on the invitation of the town council a conference of medical men has lately assembled to ascertain the causes of it, with a view of preventing a similar occurrence this winter. Their report was handed in to the town council on Thursday, the 1st inst. The usual death-rate of Blackburn is 28 per 1,000, and it rose to 36 and 38 during the two quarters to which their attention was specially directed. They accounted for the propagation of fatal diseases by—1, the injury arising from smoke; 2, impure water-supply; 3, the condition of surface and underground drainage; 4, the overcrowding of dwelling-houses and want of ventilation; 5, open cesspools; 6, the existence of slaughter-houses and piggeries in crowded districts; 7, the use of organic refuse in filling up hollow spaces; 8, infant mortality; and 9, steam, in relation to its effects upon the health of workpeople employed in mills. The water of the town, on being analysed by Mr. Grace Calvert, of Manchester, was found to contain 10.40 grains of solid residue per gallon, and infusorial life was five times as great as in the water at present supplied by the Manchester corporation.

Decoration of Ospringe Church, Kent.—The chancel of this church has just been decorated by Messrs. Holden & Son, of Lamb-conduit-street, after a design prepared by Mr. E. L. Blackburn, architect. The boarding of the roof is ground in white, with ornamental bands, the rafters and tie-beams being banded in red, white, and blue. Masonry, interspersed with bands of various patterns, forms the decorations on the walls, with Gothic drapery on each side, and the east wall is further enriched with Gothic drapery bearing the sacred monogram. Above the east window are angels in the posture of worship, and on the jambs of the windows are figures of the patron saints, Peter and Paul. The Tudor window on the north side bears the Tudor crest (pomegranate, Tudor rose, and port-cullis) in the blocks of masonry, the other windows and arch having pattern in the blocks of masonry. The sedilia on the south side has been ornamented with a canopy of satisfactory design. The cost of the decorations is the gift of St. John's College.

Hamilton-place and Park-lane.—We must again note the importance of proceeding rapidly with the desired improvement of Park-lane. We are informed that the following is the correct state of the negotiations for the purchase of the necessary property. The freehold of all the houses and land belonged to the Crown, and this has been bought and paid for. The three houses required,—viz., Sir Edward Kerrison's, Mr. Butler Johnson Monro's, and Mrs. Blyth's, all on the east side of Hamilton-place,—were referred to the arbitration of Mr. Clifton, and he gave his award in all three cases on Thursday, the 1st inst. The sales on the east side also have to be altered. The drawings for the contract are approved, and the tender will be delivered next week. There only remain two or three unimportant claims, because Hyde Park is not interfered with, but only a small piece of enclosed land at the end of Hamilton-place, which is included in the purchase of the freehold.

Gravesend Property.—The following prices were realised for freehold property in Gravesend at a sale by auction, at the New Falcon Hotel, last week:—Freehold house, No. 3, Edwin-street, let at 26*l.* per annum, purchaser, Mr. Jennett, 350*l.*; freehold house, No. 78, Edwin-street, annual rental 18*l.*, Mr. J. T. Cooper, 220*l.*; freehold house, No. 33, Parrock-street, estimated annual rental 24*l.*, purchaser, Mr. Pilkinton, 265*l.*; freehold cottage, No. 3, Star-cottages, Clarence-street, with ellip of land adjoining, annual rental 20*l.* 16*s.*, Mr. Spain, 265*l.*; two freehold cottages, Nos. 4 and 5, Star-cottages, Clarence-street, let at 14*l.* 6*s.* and 13*l.* 17*s.* 4*d.*, Mr. Clarke, 270*l.*.

Opening of Cork Cathedral.—The Protestant Cathedral of Cork, erected from the designs of Mr. Burgess, was consecrated on the 30th ult. The cost, to the present time, is stated to be 36,000*l.* The building is of large dimensions, the nave being 162 ft. long. It is built of Cork and Carlow limestone. The chancel is separated from the nave and aisles by eight pillars, of red Cork marble, and seven broad steps of a Sicilian marble lead from the nave to the chancel. A view of the interior will be found in the *Builder*.

Explosion at the Gasworks, Rochdale-road, Manchester.—Two men have been killed by an explosion at the Rochdale-road Gasworks. An inquest touching their deaths has been held. Mr. Henry Lyons, manager of the works, gave evidence, and stated that the explosion was in the first place attributable to the valve of the exhaustor having been sprung by the workmen in a screwing-up process, which converted the plane surface of the valve into an undulating one; and, in the second place, to a leakage at or near the exhaustor. Besides himself, witness said that Mr. Adam Woodward and Mr. Hopkinson, both engineers, and members of the gas committee, were present and fully investigated the matter. He believed they entirely concurred with his view; but on their part the matter was left open for further investigation with a view to prevent anything occurring for the future. After the explosion, one of the men was heard groaning, and the poor man said that while assisting at the valve he thought he smelt gas, and applied a light to the place. The explosion followed. The jury returned a verdict of accidental death.

"The Sanatorium," Weston - super-Mare.—The annual meeting has been held, presided over by Mr. R. A. Kinglake. It appeared from the secretaries' reports, that since the last meeting 320 patients had been admitted, each remaining twenty-three days on the average. Increased accommodation was needed, for the lack of which the committee had been compelled to refuse cases. Office-bearers were elected or re-elected, and other business done. If corporations and local Boards were compelled to do their duty in attending to the sanitary wants of their district, "Sanatoriums" would soon become a thing of the past, like lesser hospitals. Are there not sanatoriums of some kind necessary, too, for the habitual drunkards of all ranks, or, irrespective of grade, would not a few revolutions on the treadmill, daily, restore the patient to sober consciousness and convalescence?

Baths at University College Hospital.—The details of the plans for the new baths have been finally approved, and their erection will at once be commenced. The original estimate for the baths was about 1,000l.; but certain alterations have been considered advisable, and the cost will now be 1,310l. The mercurial and sulphur baths, occupying a space of 15 ft. by 11 ft., with an adjoining hot chamber (7 ft. by 5 ft.) for the disinfection of the clothes of patients suffering from itch and phtheiasis, are quite separate from the other baths, and have a distinct entrance away from the general bath-hall and the Russian bath, whilst the fumes therefrom are conveyed away to the top of the building by a special pipe. The whole of the baths will be warmed by hot-water pipes, the walls cemented, and the floors tiled, so as to be easily and thoroughly cleansed. The architect is Mr. M. P. Manning.

The Ventnor Hospital for Consumption. Considerable efforts are being made in aid of the National Hospital for Consumption, on the separate or cottage principle, erecting near Ventnor, Undercliff, Isle of Wight. The committee, in anticipation of the completion of the third pair of houses, now being erected at the entire cost of two gentlemen, and for the purpose of obtaining funds to defray the expense of furnishing and opening these houses for the reception of patients, have decided to hold, early in the spring, a fancy bazaar in the Duke of Wellington's Riding School, Knightsbridge. We willingly repeat the expression of the committee's hope that any ladies who may be willing to act or have their names placed on the ladies' committee, or who intend to contribute any articles for sale, will communicate their wishes to the secretary, Mr. Neale F. Horne, 2, Adelphi-terrace, Strand, London.

Improvements in Fire-grates.—A patent has been taken out by Mr. John Milne, of St. Andrews, for a fire-grate, which heats air introduced by a pipe either from outside or from the room, as desired, and discharges it, when heated, into the room, instead of allowing so much to escape, as in ordinary cases, up the chimney. Such a purpose has often been the subject of patents, e.g., Welch's patent, and various others, though the means adopted differ.

Royal Institute of Architects of Ireland. The present president, and whose address we printed in our last, is Mr. James H. Owen.

Asserted Encroachments in Hyde Park.—A meeting of ratepayers has been held in the Vestry-hall, Kensington, to consider whether any and what steps should be taken to protect the rights of the public in Hyde-park, Kensington-gardens, and the Kensington-road. The Rev. C. Darby Reade was elected to preside. It was unanimously resolved that the meeting, having heard the statement made by Mr. Dexter and Dr. Dudfield, was of opinion that steps should be at once taken to protest against the rights of the public in Hyde-park, Kensington-gardens, and the Kensington-road being infringed upon, without, at all events, the consent of Parliament. Mr. Dexter explained that the first step proposed to be taken was to get a legal opinion as to the rights of the people in respect to the property in question. This, and protesting against encroachments without consent of Parliament, was all that could be done until next session. Another resolution was passed, appointing a committee to carry out the views embodied in the first resolution. Among the names of the committee mentioned were Sir Henry Hoare, M.P., Dr. Gladstone, Mr. Shaen, and Monsignor Capel. It was understood that the committee should elicit the opinion of the public by means of meetings. It was further resolved that a subscription-list should be opened to meet the expenses of the movement.

Railways and their System of Ballasting.—A letter from Mr. T. Prideaux appears in the *Sheffield Daily Telegraph*, in which Mr. Prideaux says:—"I propose that concrete be used as a foundation for the sleepers to rest upon, and also for the filling up of the same. It is a well-known fact that lime or cement will protect wood, and cause it to last longer than either tar or any other ingredient that has yet been discovered. Concrete forms a very impervious body, and will resist any amount of wet. It is as easily repaired as the loose ballast, of the present system, but with a little more cost of labour. The great difficulty with loose ballast is that the water percolates through it and decays the sleepers. I suggest that when more drainage is required the pipes should be laid at a sufficient depth, in order to provide for a dry bed, and then, if required, a drainage also might be made between the two sets of rails, the slopes being laid with concrete. . . . I think that the ballast commonly used might be formed into concrete with the aid of cement or strong hydraulic limes, and the repairs would cost very little more than ballast does."

Royal Academy Students.—On Thursday evening, the 1st, on the occasion of a supper at Simpson's Hotel, given to Mr. William Holyoake, by the students of the Royal Academy, a testimonial, consisting of a folio of original sketches, and a selection of photographs from the old masters, was presented to that gentleman as a mark of respect for the manner in which he had acquitted himself as curator of the Painting School of the Royal Academy, an office he has just resigned. The chair was taken by Mr. Valentine Prinsep.

Blasting.—At Tregarden Quarry, Luxulyan, Cornwall, the property of the South Cornwall Granite Company, situate in the lands of Mrs. Foster, of Castle, probably the largest block on record ever blasted and entirely removed from its native bed at one time, was performed on the 26th November, by one charge of powder, weighing 20 lb. (supplied by the Cornwall Blasting Powder Company). The rock thus removed consists of fine granite, measuring 41 ft. 6 in. in length, by 34 ft. in breadth, and 8 ft. 6 in. in height, and contains 556½ tons of pure stone.

Proposed Tramway to Watford.—A company has been formed to construct a Tramway from Watford to London. The tramway will, if carried out, commence at a point near the Essex Arms, pass down the High-street over Watford Bridge, and go through Bushey, Sparrows Herne, Bushey Heath, Great and Little Stanmore, Edgware, Kingsbury, Cricklewood, and the Slade to Kilburn, finally terminating near the Cook, at Kilburn. It will then be in communication with the Metropolitan system of tramways.

The Institution of Civil Engineers.—At the meeting of this society on Tuesday, the 6th inst., Mr. Charles B. Vignoles, F.R.S., President, in the chair, the first ballot for the present session was taken, when thirty-seven candidates were balloted for and declared to be duly elected, including eleven members.

The New Police-station, Beaconsfield.—This station has been completed. It is built on land leased for a term of 999 years, at a ground-rent of 5l. per annum, and the cost has been 1,300l. The architect was Mr. Charles Carter, of Great Marlow, county surveyor; and the builder, Mr. William Child, of Beaconsfield. It is built of red brick, with Bath stone dressings to the windows, and over the principal entrance are the arms of the county,—a swan,—carved in stone. The court-room is 37 ft. long, 17 ft. wide, and 20 ft. in height. There is a magistrates' retiring-room, 12 ft. by 10 ft., and a witnesses' room, of the same dimensions. The cells are four in number, the dimensions of each being 10 ft. by 9½ ft., and the height 6½ ft. They are warmed by hot-water pipes, fitted by Messrs. Meaks, of Reading. The guard-room is 16 ft. by 12 ft., and it is 10 ft. high. There is accommodation for a married inspector. Provision is also made for the residence of one police constable.

A Narrow Escape.—At the new Wesleyan chapel in course of erection at Middleton-in-Teesdale an accident happened, which proved all but fatal. The masons are now engaged in finishing the walling above the window-heads, the walls now being full height, and one of the labourers outweighed the scaffold, when it fell, and the man that was standing upon it just had time to seize hold of the top of the wall. He held on in this dangerous position for nearly five minutes, when he was rescued by some of his fellow workmen. Had he slipped his hold, or the stones given way, he would have fallen a height of 50 ft.

Society for the Study of Biblical Lands. A meeting has been held in Mr. Bonomi's rooms to consider the desirability of forming a society having for its objects the investigation of the archaeology, history, and chronology of ancient and modern Assyria, Palestine, Egypt, and other Biblical lands, the promotion of the study of the antiquities of those countries, and the preservation of a continuous record of discoveries now in progress. At that meeting it was resolved that a society having the above-mentioned objects should be instituted, and a committee was formed to prepare the rules of the proposed society. A further meeting to receive the report of the provisional committee, discuss the regulations, and decide upon sundry matters connected with the society, is to be held this Friday evening. Mr. W. R. Cooper is the secretary pro tem.

Schools of the Haberdashers' Company. This Company having determined to make some additions to their Free Grammar School, Monmouth, the foundation-stone of the new buildings was laid on Wednesday, November 23rd, by Mr. W. Hawes, the then master, expressing as he did so a hope that it would prove the first stone of a new series of buildings which would enable the school to rank high amongst similar institutions of the country. A brass tablet on the stone bears this inscription:—"This stone was laid by William Hawes, Esq., Master of the Worshipful Company of Haberdashers, T. Higgs, Esq., W. H. Skyring, Esq., W. Liddiard, Esq., W. Hale, Esq., Wardens, November 23rd, 1870." Mr. Snooks, the architect, presented Mr. Hawes with the trowel and hammer used on the occasion.

Wigan Undermined.—An alarming discovery with regard to the public streets of Wigan has just been made. Under some of the principal streets it has been found that there are, at no great distance from the surface, some old colliery workings in a very insecure state, and the public health committee of the corporation has taken steps for at once securing the safety of the streets lying above the mines, which at present are in a very dangerous condition.

Science in Liverpool.—A conference of gentlemen interested in scientific education was held in the Royal Institution, Liverpool, on Tuesday night, and passed unanimously a resolution declaring the advisability of establishing a Science College in that town, the cost of which was estimated at about 50,000l. A committee was appointed to take steps with the view of carrying out the object.

The Brighton Baths.—The baths in the Brighton building described as,—“made of iron in one piece, and covered with a white enamel, which gives them the appearance of porcelain, possessing the requisite of perfect cleanliness without unnecessary trouble,” are in truth of porcelain in one piece, as designed by his late Royal Highness the Prince Consort, and supplied by Mr. J. Finch.

The Builder.

VOL. XXVIII.—No. 1454.

Architects and the Public.

IN the opening address of the President of the Institute, which we recently printed, the desirability of making some general instruction in the principles of architectural design a part of anything that should be called a "liberal education," was strongly and surely not unseasonably urged. All architects who have had to fight with prejudiced and ignorant clients, and endeavour to persuade them, against their will, to allow of the erection of a truly architectural design, must concur with Mr. Wyatt in bearing witness to the difficulties thrown in the way of architectural progress by popular ignorance of, and

consequent want of sympathy with, architecture as an art. It is quite within the mark to say that not only the mass of English people, but the majority even of that selected class who are called and considered "well-educated," are totally ignorant of the first principles of architectural design, and equally indifferent on the subject. The general remedy for this state of things, suggested in the address referred to, viz., the instruction of non-professional students "in the principles of sound art, whether of architecture, painting, or sculpture," is no doubt, as a broad statement, to be accepted as the right one; though a remedy which cannot be brought into operation, we fear, all at once. In the meantime, there are one or two considerations in connexion with the subject of non-professional appreciation of architecture which may deserve a moment's attention.

A good deal of misconception would be cleared away, and a great deal of absurd pretentiousness put an end to, if the distinction between archaeology and architecture, as objects of study, were once made clear to the popular mind. Since the Gothic revival, what is called architectural study has become an object of some attention, especially with the clergy, and with well-educated young ladies of ecclesiastical propensities. But in fact this almost entirely (with the clergy we may say entirely) takes the form merely of a study of the details and chronological sequence of one style, without any reference to equally important styles of other ages and climes, still less with any recognition of the real principles of architecture embodied in the one style that is studied, or of the constructive basis of the said style. Indeed, the most popular works on Gothic architecture are by amateurs who have themselves no further knowledge than that which they offer to their readers, namely, a superficial knowledge of certain facts connected with the favourite style. Without wishing to say anything censorious of a large and estimable body, we must be allowed to remark that the pretensions to architectural criticism

made by many of the clergy, and the tone in which they speak of Gothic architecture as something specially belonging to them, and upon which they have a right to speak with authority, are simply absurd, and betray an ignorance both of the art itself and of their own position with regard to it. A great deal is done in this way to perpetuate misconceptions and prejudices on the subject of architecture; and it is only a short while since we heard of the delivery, in one of our cathedral towns, of a lecture, eloquent but visionary, in illustration of the old and (as we hoped) exploded notion of the derivation of Gothic architecture from the study of the forms of trees and foliage; and this by Canon Kingsley, a church dignitary whose name is widely known also in the literary world, and whose opinions were probably received by most of his audience with unquestioning faith. It is really too bad that professional architects who are taking some trouble (as a few are) to interest and instruct the public in the true principles of their art, should have their efforts in this direction interfered with, and to some extent frustrated, by persons who assume to be teachers without understanding the subject at all. If these revered gentlemen had (what they seldom have) some notion of the general principles and foundation of architectural design, they would be able, perhaps, to estimate their own knowledge of the art more justly, and not be so ready to dogmatise and lay down the law on matters of which many a student in an architect's office is a better judge than themselves.

Akin to clerical dilettantism on the subject, and perhaps a good deal more inexcusable, is journalistic ignorance and indifference. As a general rule, it may probably be said that there is no class of educated men more indifferent to art in general, and more ignorant of it, than those who are commonly called "literary men,"—that class especially who furnish the columns of our daily and weekly papers with readable articles, and feed the public with food convenient for them. It has dawned upon the minds of newspaper editors, however, that their readers must be presented with passable critical articles on the current productions in music and painting of the day; and in some of our journals articles on these subjects appear which (making allowance for personal partiality) are, in the main, good, and in some few cases deserve the name of art criticism. But even the journals which give the best attention to these things treat architecture with complete neglect. If a concert or an exhibition is to be reviewed, some one competent to review it may be entrusted with the task; but on the rare occasions when an English newspaper condescends to notice a work of architecture, it is considered sufficient if a few neat sentences are strung together, bestowing the proper amount of compliment all round (except to the architect, who must generally be content if he gets his name mentioned, and not always that), and giving a few practical details as to materials and furnishing of the building, jotted down by a short-hand writer from information given by the contractor or clerk of works. This is about the staple of architectural writing in literary journals and newspapers; and as to anything like criticism of the building, the young man on the newspaper staff is not aware that a building can be criticised, or that there is anything to criticise in it. If this were excusable with ordinary newspapers, at least it is not so with those publications which herald themselves as reviews of "literature, science, and art;" but in these cases the only difference is, that the literary form of the contribution is sometimes (not always) better; and (to notice but one instance only) it is but too evident that the articles on sundry of the English cathedrals (York, Lincoln, &c.), which recently appeared in the pages of the *Saturday Review*,

were the mere jottings of some amateur *littérateur*, possessed of a superficial knowledge of Gothic forms and nomenclature, but without any faculty of architectural criticism. One style of notice the architectural profession, however, does occasionally get from the columns of newspapers; namely, when some question is raised as to a large public building, about which it is supposed that a sensational interest may be got up by a well-spiced "leader" or two. Then does even the *Times* bestir itself, and some anonymous writer, seated securely in his study, assumes the license to treat with contempt, and even contumely, the whole profession of architects, and to lecture them *ex cathedra* on matters to which he has never himself given a serious thought, and on which he has no reliable information. These gentlemen probably imagine architecture to be as Hamlet puts it, "as easy as lying." Unfortunately, however, the public in general, who are getting more and more accustomed to take their ideas from the papers, receive this sort of writing for gospel; and there will probably be no cure for this but by educating the readers of the newspapers better: the writers are far too wise in their own conceit to admit that their *dicta* should be called in question.

It is to want of knowledge and perception with regard to what constitutes the art of architecture that we must in a great measure set down, also, the harsh and one-sided treatment which architects frequently receive at the hands of the law. The whole of the misconception and injustice, recently so unpleasantly demonstrative with regard to the architect's property in his own drawings, springs in the main from the total want of understanding on the part alike of architects' clients and their legal advisers, as to what the process of architectural design really is, what part in that process the drawings occupy, and, in fine, for what it is that the client pays. It is, we must charitably suppose, this kind of ignorance (if it be not a determination not to understand) which influenced the judgment of several of our leading judges, the other day, against an architect who wished to retain his own property, but was told in terms of the greatest contempt that his claim was an absurd one. The judges were evidently under the impression that the business of an architect was to draw, and that the drawings were a *sine quâ non* in the matter. A little knowledge of the principles of architecture might have taught those otherwise learned personages to have taken a different view, or, at the least, to have seen that there were two sides to the question, even as a matter of common equity and fair play.

We have noted two or three salient instances of the stumbling-blocks thrown in the way of the architect in pursuing his calling, by the lack of intelligent interest in his profession, on the part of certain classes whose opinion has, owing to circumstances, considerable practical weight with the rest of the public; viz., the clergy, the journalists, and the members of the legal profession. All these are looked upon, or become practically on occasion, as in a measure leaders of public opinion. With regard to the general public, the obstacle is mainly a negative one,—that presented by sheer indifference; and this acts detrimentally to architecture, as an art rather than as a profession, by inducing people either to demand from an architect at the outset a mere piece of archaeological sham, the "counterfeit presentment" of some building which his client has taken a fancy to, or by furnishing excuse for the refusal of the necessary funds for anything like ornamental architecture, and restricting him a design to bare necessities. It is as a remedy for this state of things that the suggestion, once more repeated, of making the general principles of art (including architecture) a part of a liberal education, ought to be at every



opportunity recommended and encouraged by those who have at heart the future dignity and usefulness of their profession. It is really absurd in the last degree, that a man can take the highest honours which our principal universities have to bestow, without possessing the slightest glimmering of a perception as to the origin, history, or æsthetic basis of any one of those arts which, rightly considered, lead to the highest pleasure which the human intellect is capable of receiving. And, without for a moment placing architecture before the sister arts, it may be said, nevertheless, that some knowledge of this art on the part of the public is peculiarly called for, seeing that it is one so closely bound up with our national and social life; and that with regard to its largest and most expensive developments, there are almost always a large number of persons whose interests and wishes have to be consulted, besides the architect and his immediate client; while it is also the only one of the arts which a man cannot have for his purely private possession, even if he would, but which must be open to the view of his neighbours, to their pleasure or annoyance. It will take some time, probably, to persuade our educational authorities to move in the matter, or to recognize it as worth their attention; but one way in which members of the architectural profession might do something by way of awakening a little more public interest in their art, is by taking opportunities of lecturing on the subject from time to time. People will generally come to hear an illustrated lecture, which any lecture on architecture must necessarily be; and there are, probably, many who would be quite capable of taking an interest in it if they knew a little more about it, and who only imagine it to be a dull subject because it has never been properly set before them. On the other hand, we should guard against anything which would have a tendency to encourage dilettantism, so far as that term is taken to mean amateur dabbling in design, and interfering with the architect's work. Every architect knows from experience that there is no more troublesome and worrying client than the one who fancies he knows something about architecture, and who is perpetually wanting him to satisfy some whim or other either in design or plan. "I must keep this book out of the way of my clients," said a prudent practitioner, hiding away carefully a copy of a well-known work on house planning; "if they get sight of it, I shall have no peace." We do not want our clients to be pretending to a knowledge of the details of the architectural profession, on the strength of pickings from works on architecture; and to be obstructing us in our designs by an incessant desire to carry out what the Americans would call "notions" of their own. But we do want the public in general, our employers, to have an intelligent knowledge of the outlines and basis of our profession, to understand what it is that we are about, and to second us not only with the spirit, but with the understanding also. And in this respect the architects will have to do what it has been said all great poets have had to accomplish, to create and foster the tastes whereby they may themselves be understood.

THE LUMBER TRADE OF CANADA.

WHEN the confederation of the British North American Provinces is completed, by the adhesion of Newfoundland, Prince Edward's Island, Vancouver's Island, and British Columbia, to the Union, the Dominion of Canada then, stretching from the Atlantic to the Pacific Ocean, and from the river St. Lawrence and the great lakes to the Arctic Ocean, will contain 3,389,945 square miles, an area almost as large as Europe. It has not such a variety of climate, and it does not contain so large an area of good land as the United States. Still, the climate is healthy, and there are as much fertile land and natural resources as would need ages to develop, and upon its surface a great and free country might be built up beneath the shelter of the British flag. Apart from her agriculture, the lumber trade of Canada is the most important of her industries; and as many of the readers of *The Builder* may desire to learn something of it, with your permission, I will describe for them what I have learned in reference to it, here in the great centre of the trade, by observation and inquiry, and up in the heart of the forest, which, let me state, is very unlike the woods of knotted stems and spreading branches in Old England, where a man on horseback might ride through

them. Here the trees grow quite close and straight, without a branch except towards the top, and very little underwood is to be met with, unless in the neighbourhood of the settled country, where brush and fallen trees are so thick that only on recognised paths can you pass through. Here and there you may meet a red-pine grove, without a twig of brushwood or a clear spot, upon a stream, from which the beavers have cleared the timber, and upon which a wild grass now grows; that is called a beaver meadow. Before the busy hands of man laid the axe to their roots, the forests of Canada extended from the St. Lawrence and the edge of the great lakes far up to the Arctic Ocean; but now that a large tract of country along those shores is studded with comfortable homesteads and well-cleared farms, the forests may be properly said to begin at the foot and on the great range of Laurentine rocks, which, running from the Gulf to the north shore of Lake Superior, forms the basin of the St. Lawrence. This region, high above the level of the sea, is filled with lakes and lakelets, in which the great rivers take their rise that drain all the level country; and, as they often flow over large ledges of rocks, they form cataracts and rapids of rare grandeur and beauty. These rivers run through the most extensive timber territories of Canada, the pine-producing districts of which have an area north of the St. Lawrence of about 287,711 square miles; and that district upon which the finer hard woods are to be found, wholly or in part, is about 22,000 square miles. The best white pine, red pine, and ash are chiefly obtained from the country drained by the Ottawa, 75,000 square miles. The St. Maurice and its tributaries, draining an area of 22,000 square miles, which contains large quantities of white, yellow, and red pine, spruce, birch, maple, and elm. The Saguenay country, 21,000 square miles, is rich in white and red pine, spruce, birch, and tamarac. The Trent Valley, 6,200 square miles, has pines and hard wood. On the northern shore of Lake Huron there are red and white pine, spruce, cedar, birch, and maple. The peninsula of Gaspé, on the Gulf of the St. Lawrence, contains white and red pine, spruce, tamarac, and birch. In the territory north of Lake Ontario there are still uncleared some white pine, elm, and maple; and on the peninsula of Ontario West some oak, elm, and walnut. This district was covered with the finer kind of hard woods, and the settlers, in their haste to clear their farms, cut down and burned millions of cubic feet, which, if they could have found a market for, would have been to them a mine of wealth. Now the principal supply of walnut even for Canada comes from the Northern Indians. In New Brunswick and Nova Scotia the finer kind of white pine is worked from off the land. Coarse pine and black spruce are now the only kinds of timber manufactured, while lumbering, as a trade, cannot be said to exist in Newfoundland or Prince Edward's Island. Over 8,000,000 cubic feet of timber are annually cut down in the forests of Canada, 13,000,000 dollars worth of which is exported to Europe and the United States, Great Britain alone taking 8,000,000 dollars worth. In its manufacture 15,000 men are employed in the forests; and in the saw and planing mills, where it is prepared for exportation, there are 10,000 men employed. In the transportation of that portion of the trade which leaves Quebec, over 1,200 large ships and 17,000 seamen are engaged, and if you add those employed in the navigation of the rivers and lakes, and in the transit of partially manufactured material to the United States, there would be 25,000 men engaged in transportation, or a total of 50,000 men employed altogether. Its freight for shipment is over 1,500,000 tons, and its accessories half as much more; and for the supply of this great industrial army, 26,000 tons of agricultural produce is annually required. The principal part of the forest lands in the Canadian dominion belong to the Governments of the different provinces.

The lumber manufacturer obtains the area upon which he works by bidding the highest price for it, at auction, generally from 1 dollar to 1½ dollar the square mile. It is technically called a timber berth or limits; theoretically, it is 10 miles square, or 100 square miles; but, owing to the topographical features of the country, they are of all sizes, from 2½ square miles upwards. The limit-holder becomes a yearly tenant to the Government at a fixed rent, and in addition pays a duty of one halfpenny per cubic foot of square timber got out, and of 5d. on each standard log of 12 ft. long and 21 inches in diameter. 31,600

square miles of forest were rented in 1867, from which the Government derived a revenue of 361,670 dollars. All the operations connected with the lumber trade are costly. Streams have to be improved, roads, bridges, and chantiers to be constructed, and often large farms cleared for the pasturage of the cattle necessary to haul the timber or saw-logs to the nearest stream. Winter is the period during which the greater part of these operations are carried on. The square timber must be selected with care, nearly perfectly straight, and entirely free from knolls, shakes, or other blemishes. It must be hewed perfectly square, and must carry the same thickness throughout, a very slight taper indeed being allowable. It must be over 30 ft. in length, and square at least 15 in. About one twenty-fifth of the standing pine is available for square timber, and fully 40 per cent. of the remainder is available for saw-logs, the balance, 35 per cent., being under growth or damaged. The loss in the manufacture of square timber is considerable, especially when it is of large growth, and will square over 18 in.; it may be taken at 20 per cent. Very often splendid pieces of timber are left on the ground because they will not square evenly throughout.

Many of the men engaged in the lumber trade have considerable capital, more especially the owners of the large saw-mills, all of which are stopped throughout the winter for want of logs. They send the men up to their limits, to cut down and provide the next summer's supply. In the woods they are furnished by the employer or his agents with all the food, clothes, and other necessities which they require, while their families receive a portion of their wages for their support from the office at home; but the great majority of the lumberers are provided with means for carrying on operations in the woods by parties in Quebec; it is advanced by instalments, the first being used to buy and provide provisions and other necessities, consequently they are soon out of funds, but they must have the men. Some years ago, when emigration was brisk to Canada, the Irish labourers engaged largely in this trade; but now the supply is mainly from the French parishes of Quebec and from the highland settlements of Ontario, with a fair sprinkling of Irish. They flock up to Ottawa in the fall to seek employment in the woods, and as a general rule they arrive penniless; yet they are hospitably received by any of the numerous tavern-keepers who follow this particular line of business. When a lumberer wants men, he goes to one of these hosts, and says, "I want to hire so many men;" the host engages the required number, and, of course, his own lodgers. First, the men are all in debt to the tavern-keeper for board, and often for whisky and medical attendance. The lumberer has no more money left than will convey those men to the scene of their labours, often 400 miles up in the woods; so he gives his due bill for each man's debts and for the men's wages, payable when the timber arrives at Quebec. Should the raft be wrecked or burnt, the tavern-keeper loses his money, and the men lose their wages; or should it be left in the forest by the falling of the water, "stuck," as it is called, and so delayed a year in getting to the market, they have to wait. The butcher, the baker, and the physician, all wait upon the tavern-keeper, who waits upon the lumberer, who waits upon the furnisher, who waits upon the bank, which sits like a spider in the middle of this great commercial net, always sure of its prey. Thus by the issue of notes in Quebec, one of the greatest industries of Canada is carried on, while its requirements give rise to a class of tavern-keepers, who evidently grow rich at the expense of a simple-minded and hard-working class of men. The wages paid to choppers and teamsters are from 14 dollars to 20 dollars a month, with board; and to hewers from 30 dollars to 40 dollars a month, and board. As before stated, the winter is the season during which the principal part of the timber manufacture is carried on; but as early as the middle of September you can meet those men in hundreds going on the Upper Ottawa, the great highway to the forests, I travelled with them almost to its source, and in justice I must state that a more orderly class of men going to such laborious occupations I was never in company with. When arrived at the scene of their labours, their first care is to select a good site for the shanty or log-house in which they are to reside; one by the course of a stream is usually selected, more especially if the ground is high and dry. It is soon erected.

Those are the men to build a log-house, for no man in the world can use an axe with such dexterity, with the timber cleared off the site, which is cut into lengths of about 30 ft., halved and dovetailed on the ends. They are piled one over another, to a height of about 10 ft.; openings are cut for the doors and windows, and the intersections between the logs filled with moss or clay. The roof is equally simple in its construction, on the ridge and furrow principle, formed by splitting logs of bass-wood, and taking out the heart, leaving the hollow sap. These are placed side by side up the roof, like so many gutters, and upon their joints another piece is placed, with the rounded side up. An opening of some 6 ft. square is left in the centre, through which the smoke ascends from a large fire kept always burning. A double tier of bunks for the men to sleep in completes the edifice. At the end of the shanty a store-house is built for the provisions, and stabling for the horses not far off. Thus here, far away from the busy haunts of men, in those grand primeval forests, the solitude of which for ages was only disturbed by the howl of the wild beasts, or the savage Indian in pursuit of game, thousands of honest workers win their bread, more contented and happy than the denizens of your large towns and cities; and as the night brings to a close each day of toil, wrapped up in their blankets, lying in their hard bunks, with their heads to the wall all round, and their feet towards the warm fire, those shantymen enjoy that sweet repose which is best induced by honest useful labour. Each shanty is occupied by thirty or forty, and sometimes as many as fifty men, and is supplied with a cook and assistant to prepare the food,—generally salt beef or pork, with bread, potatoes, beans, or whatever other vegetables can be procured. Breakfast,—tea, a great beverage with them,—is taken before the daylight; dinner, at twelve o'clock; and supper when the day's work is completed. There is no lack of amusements until bed-time, some are playing cards or dominoes, while others laugh or sing, or replace the broken axe-heads. On Sunday, all the washing and mending is done, the letters from home answered, and the newspapers brought from the front by the teamsters read aloud for the whole company. The supply of 26,000 tons of agricultural produce as food for the men and horses employed in the woods is attended with much trouble and expense. Some of the lumberers clear farms on their limits, where they grow potatoes, oats, and hay, and they eagerly buy at high prices all that is to spare in the Border settlements, but the great bulk has to be brought up from the front. When the frozen snow is upon the ground, hundreds of teams drawing heavily-laden sleighs may be seen wending their way along the roads and forest-tracks to their several destinations. During his journey the teamster seldom seeks the shelter of a house, but, wrapped up in his buffalo robe beside a camp-fire in the woods, he refreshes himself and his horses.

When the shanty is built, and well stocked with provisions, the men commence their work, and are divided into gangs of four, namely, one liner, one hewer, and two scorers. Trees of proper size and quality are cut down and marked off with a chalk line to the size they will square, when the scorers cut off the rough, and the hewer, with a very broad axe, makes the sides perfectly straight and smooth. The top is then cut off, the piece is turned over, and the other sides completed. Each gang makes about five pieces a day. Any reasonably-sized tree is cut down for saw-logs, and made into 12 ft. lengths. All the timber made and saw-logs cut during the fall are placed on to large rollers, with oxen, and when the winter's snow is frozen on the ground, and the brush is cut away, they are dragged with teams of horses on the ice of the streams and rivers upon which they are to be floated down. When the whole quantity has been hauled out, which is generally done by the middle of the month of March, and when the ice breaks up, the workmen leave the shanties, and, dividing themselves into gangs, float the timber down the smaller streams to the main river. This is often a work of extreme difficulty and hardship, more especially when the streams are tortuous and narrow. For weeks they trudge on the banks, through mud and brushwood, constantly wet to the skin, and encamping where best they can at night. In the main river the square timber is formed into cribs, of 24 ft. wide, by string pieces and traverses, fastened on by withes made of young saplings, care being taken to avoid injuring the timber by any attachment.

Seventy, eighty, and often one hundred of the cribs form a raft, usually containing about 100,000 ft., and each crib consists of from fifteen to twenty pieces, and contains from 800 ft. to 1,000 ft. The raft, when completed, is manned by fifteen to twenty men, who cook and sleep aboard, and guide and drive, with oars and sails, this mighty mass of wood down the river, until they reach a fall or rapids, which, in all Canadian rivers, are numerous and steep. On the navigable reaches of the river and on the lakes steamboats are now employed to tow the rafts; and, to avoid the destruction and damage which the timber annually passing underwent, the rafts are passed over the falls on inclined planes, called slides, erected by the Government for the purpose. A single crib is passed at a time, so that when all are over, the raft has to be again banded, or re-made. In the construction of these slides great engineering skill is displayed, and the most remarkable of them is the one built at the west end of Ottawa city, to obviate the magnificent Chaudière Falls. About 300 yards above them a certain portion of the river is dammed off, and turned into an artificial channel, down which the waters of the Ottawa river rush with terrific force and speed. As, however, a raft on such a steep incline, and hurried along by such a mass of water, would attain a speed which would destroy itself and all upon it, the fall of the shoot is broken at intervals by straight runs, along which it glides at a comparatively reduced speed, till it again drops over and continues another headlong rush. Some of these runs terminate with a perpendicular drop of 4 ft. or 5 ft., over which the crib goes headlong, and wallows in the boiling water beneath till the current regains the mastery, and forces it on faster and more furiously than before. The crib has a kind of raised bridge for the lumberers to stand on, who, without such aid, would be washed off as the mass drops from shoot to shoot, and disappears some few feet under at each plunge. More than 40,000,000 cubic feet of timber come down the shoots of the Ottawa river every year, from which the Government derives a handsome revenue as slide dues. To go down the rapids of a timber slide is exhilarating: the immense speed, the rush of water, the succession of shoots stretching out before like sloping flights of stairs, the rough long straits into which the crib seems to dive and founder, letting the water up beneath, and over behind, till it is again urged forward whirling madly as if in a swing, the timber snapping and groaning and working like a bundle of reeds, getting a momentary rest with each incline, and again thumping over the straits with sharp uneasy struggles, create such a sensation and whirl as only a run of three-quarters of a mile down the timber shoots of the Ottawa can give. Once below these falls, the raft is re-made for the last time, and gladly do the hardy lumberers glide down the river with their timber safe and sound, not that all danger is past, for miles still to be gone over, and the great Victoria Bridge at Montreal has to be shot through, where recently a raft was dashed to pieces on one of its piers, but almost by a miracle all the hands were saved, two by clinging to the pier, and the others to portions of the broken raft. Thus, often five months after the timber left the woods, it reaches Quebec, where, for miles on either shore above and below the city, the rafts are stowed away in coves prepared for their reception. When the lumberer gets his price, the merchant measures and classes the timber, and should any dispute arise, the Government sends a cutter, whose expenses have to be paid by the party he decides against. The ends of the timber, which, to avoid damage to it, were left pointed, are now neatly squared, and hundreds get employment to put it on shipboard. The lumberers, like sailors after a long voyage, receive their clearance, and, very like them, rest awhile to spend it before they go back to the forest to begin again. The saw-logs either descend the falls singly without a slide, or are passed down after the descent of the cribs on to the large open reaches, where they are enclosed by booms, and towed en masse to the head of the next falls: these operations are repeated until the point of manufacture is reached. Above 1,000,000,000 ft. board measure are manufactured by the mills of Canada, valued at 10,000,000 dollars. More than one-half of this amount is turned out from the mills on the Ottawa river. In this city and its neighbourhood there are twelve large mills, all substantial and well-arranged structures, fitted up with the

newest and best machinery, some of which will cut 150,000 logs each season, and turn out 150,000 ft. of lumber a day, with seven gangs, comprising 175 saws, besides edgers and butters. M. B. Eddy, a Yankee, who came here without a cent in his pocket, has, in addition to three saw-mills, a nail factory and a match factory, that the smallest piece of wood may not go to waste, where he employs 1,000 men and boys, women, and girls. Canada may well feel proud of the development of this trade, which has tended so much to increase her wealth, and to the cultivation of her soil, while it has administered to the wants of older countries, and made homes for some of their surplus populations.

Utica. TROS. CONNOLLY, Stonemason.

YEOVIL, WAKE UP!

A SLOWLY-IMPROVING, yet somewhat busy, town is that of Yeovil. It is pleasantly situated on the Ivel, or Yeo, and it possesses an archaeological interest that compensates for some of its modern drawbacks.

The town knew some civil strife during the Parliamentary wars, and Fairfax, who did goodly work for Cromwell, left memories behind him here and on through to Langport. The fine old church, which passed almost unscathed, presents more of a weather-worn than a war-worn appearance, and it still exhibits much of its whilom splendour. We need not describe it in detail. It is a cruciform structure, in the Perpendicular style, with nave, transepts, aisles, chancel, porch, a fine tower arch, and a well-preserved oriel roof. The roof, which was once covered over with a plaster coating, was bared of its later coating during a late restoration, scraped, and varnished. The crypt underneath the chancel is worth a view, and the canopied doorway evidences skilful treatment. The modern stained glass in the church is what some call rich in colour; but the artistic manipulation is not above criticism, not even excepting that in the tower to the memory of Prince Albert. The ancient font and brass lectern will claim passing notice, and the questionable Latin inscription on the latter may create a smile. The gift of Martin Forester is, however, hallowed by time. Some monumental brasses are scattered about, in memory of local families, some dating from 1519; and there are a few quaint epitaphs. We mounted the tower in quest of undiscovered walls, and we spent some time in deciphering the legends on the old peal of eight bells. The scrutiny turned out a rather tedious one, and not having sufficient time on our hands to twist ourselves through the old framework in the glimmering light we were afforded, we desisted. Two of the bells we examined bear the respective dates of 1623 and 1725.

The clock, which for many years never kept good time, was lately removed for repair. We have not heard that its new movements are more to be depended upon, but we have little doubt that the clock is fast enough for the motions of the present town council in office.

Of the modern churches, that in Peter-street, called Trinity Church, is the only one worthy of honourable mention. It is from a design by Mr. Benjamin Ferrey, in the Early English style.

The architecture of the modern public buildings in the town is mediocre. The town-hall is a somewhat large structure in the Ionic style, with a clock turret, underneath which is the corn exchange and market.

Here and there, through the older portions of the town, may be noticed some very old inns or hostleries, that have long since forgotten the names of their builders, hoary with age, and stoutly struggling against the blasts of time. Here are roofs that never knew of a ridge-board, but were lapped in a dowl unity; windows whose transoms and mullions were shattered, whose lintels under the shot and shell of Fairfax. Yet they live, as it were, defying time.

These old houses, with their projecting windows, heavy gables, long inward passages, curious wainscoted apartments, oaken stairs, lead the mind back to days when curious habits of domestic life and observances dovetailed themselves into the framework of English society, which squared itself with inward thought and outward actions. The Castle Inn and the George Inn may be instanced as specimens of that class of dwellings which are now fast disappearing from the land.

Leaving the past and its memories, let us touch upon the present and its duties. One

want of Yeovil is a good and effective water supply. The present supply is bad, nor is the water of that purity that can be recommended. Sickness was lately prevalent to a large extent. Cases of fever, scarlatina, measles, and other cognate diseases, were prevalent during last spring and summer, and one medical practitioner in the town informed us that he wondered the mortality was not greater. The drainage of Yeovil is very defective; indeed, so far as we examined, we saw the surface drainage finding its ordinary outlet (or perhaps inlet) through the common sinks and traps where it could, taking the rake of the road to some lower level, to be absorbed on its passage wherever it listed. The greater portion of the ordinary sewage is buried in the subsoil; the rest oozes and wriggles riverward. The whole of the sewage matter of Yeovil could be well and profitably utilised, and there exist natural facilities and inducements that ought to urge the local Board to stir in the matter.

The River Yeo is not in a very pure state, it may be guessed. Kid-glove manufacture is carried on extensively in the town and environs, and a large female population, and in many instances whole families, find employment in this local trade. The refuse-matter in connexion with these foci of industry is an item in any consideration of the subject. Sufficient nastiness, in all reason, we could see on all sides, finding its outlet in one way or another into the river. Will the local Board take a hint, and bestir themselves? There is talk of a new Bill for a better water supply. A Bill was once sent before Parliament, but fell through. The idea or plan now recommended is to bring the water from Evershott hills farther south.

The state of the Yeovil workhouse for a long time has been a chronic scandal. We have not space at present to go into detail, but we are safe in asserting that able-bodied youths have been kept for several years in the house, lazily squandering their time from youth to manhood, and at last thrown out upon society, unable to follow any useful occupation. They have been reared up to criminality; we have data to show it. The infant children, it is asserted, have been neglected by their nurses to death, and the old and infirm left for weeks in dirt without a change of clothing. Large quantities of wine, spirits, and beer have been put down to workhouse expenses, and we should like to be informed by the medical officer, who gives us the quantities, who are the consumers. It is heartless work to order stimulants for aged and infirm starvelings, without the certainty that they will reach those who pine and die for the lack of them. Taking the words of a late visiting committee, we are fortified in our remarks; for they stated to the Board that the union was in a disgraceful condition. In the matter of food, drink, and clothing, there has been great neglect, and there has also been a shameful expenditure for articles by which the poor patients have not benefited.

We repeat, and we challenge denial, that the children in Yeovil poorhouse have been hen-cooped and suffocated for want of exercise and air, and that their nurses and the guardians can scarcely be exonerated.

Yeovil is not the only workhouse south where reforms are needed. We have visited a few of them, and we could state facts that might startle the stoutest. If the Poor-law Board desire to effect a reform, we will help it out in the Christian endeavour, and give it and the public pictures of neglected life which vegetates in the land and threatens the future.

A few words more about the town proper. Yeovil is well served with railway accommodation. The South-Western and Great Western have both stations in the town. In the matter of new buildings, we perceived very little indeed in the town or environs. If some new dwellings were erected, a few of the old ruinous edifices of the town could be taken down with advantage. The town council have an opportunity presented to them for carrying out the improving powers with which they are invested but seldom exercise. It is very easy to know by the state of a street, the character of the dwellings that flank it. In Back-street, Park-street, South-street, Vicarage-street, and others, and the lanes and courts branching off, the local authorities would find ample and useful work to do in street paths, yards, channels, and drains. Down in that sluggish hollow, beside the old battressed wall of the church, there is plenty of work for pavior, scavenger, and drain-maker.

Branching off from this quarter, there are zigzag places, dolorous-looking, rife with odours

and rheumatics. Decay is here, within a stone's throw of the fine old "Lantern of the West," but are not some of our grandest Gothic cathedrals and churches encompassed by reeking shambles, and hidden from a proper sight by winding cut-throat kennels and equivocal domiciles? It ought surely to be the pride of the bourgeois, citizens, and inhabitants of any town which possesses an heirloom of architecture, to preserve it, and glory in the possession; and it is also the duty of the local authorities of such towns where such glorious remains exist, to keep the spaces around them open, and render their approaches easy, wide, and ornamental.

There is a field called "The Park" outside the town, but it is merely a green sward, and we hear it is intended for building purposes: so the townsfolk must not indulge in dreams yet awhile of nicely-gravelled walks, fountains, ponds, lakes, or lovers' seats.

The cemetery is tastefully laid out with good approaches, and respectable chapels for burial purposes.

Looking back and looking forward, we are inclined to believe that Yeovil is destined to improve, although she has made but slow progress. Though possessed once of a local manufacture of woollens, in addition to her present glove trade, she need not lament its decay, while she has still resources undeveloped.

In the matter of intellectual enjoyment, the town boasts of a Mutual Improvement Society; but, though useful, its scope is but very circumscribed at present. If it would effect tangible and lasting good, it must widen its range, and not be content with mere readings, odd lectures, and intermittent entertainments.

There is wealth in the town and surrounding country, and a more ambitious effort is required for the rising generation than what we could hear of on our visit. Our parting advice to the local authorities is to do their common duties, vestrymen, churchwardens, poor-law guardians, and others. The first and most necessary step, let us repeat, is the purification of town and river, giving health by good drainage, securing a proper supply of pure water, attending more to the wants of the poor, placing the streets and footways in a better state of repair, and re-modelling the poorhouse system, which is a disgrace to all concerned.

There is capacity enough to do these things rightly in this Somersetshire town; but with a little purse-proud intolerance and ignorance on the one side, and petty huxtering views on the other, the town is crushed, and its public spirit, except on rare occasions, is weak, flimsy, and unproductive.

FROM FLORENCE.

FORTUNE seems to have adopted Italy as her favoured child, and is not wearied in heaping honours on her. Close on the long ardently-wished-for occupation of Rome, has come the offer of the crown of Spain to one of her sons. The deputation from Spain, consisting of the *élite* of her honourable men (after a quarantine of three days outside the harbour of Genoa), arrived on the 3rd, at Florence.

From the station to the hotel, prepared for their reception, the way was lined with infantry, cavalry, and National Guard. The streets were elegantly decorated with alternate Spanish and Italian flags, evergreens, and flowers in abundance. The deputation and suite consisted of 139 persons. The Italians thronged to see them, strangers also, and the *vivas*, which did not burst forth till they had reached their hotel, were loud and hearty. The Spaniards returned the compliment from their balcony, with repeated *Viva l'Italia*. On Sunday, the 4th, the presentation to the king took place, at which the request to offer the crown of Spain to the Duke d'Aosta, was made to the king by Ruiz Zorrilla, the head of the deputation, and after a long complimentary speech in Spanish, and the acceptance announced by sound of cannon, the crown was given to the young prince, who was saluted as "Amadeo I. Re di Spagna."

On Monday, the deputation were at the opening of the Parliament, when the first Roman deputies were present. After being fetted by the king and municipality, and fêted the latter and all the diplomatic circle in return, they go back to Spain. The young king will not take up his residence in Madrid, it is said, until the middle of January, when his queen, whom all concur in pronouncing a clever and promising helpmate in the difficult task to

be undertaken, will accompany him. May both be enabled to render to the long ill-governed country effectual aid in the progress and amelioration of everything it so much needs.

Florence.

MONT CENIS.

OUR correspondent on the spot tells us it is announced now that 113 mètres only are wanting to be pierced to complete the tunnel, and that on the 28th ult. the workmen declared they could hear distinctly the noise of the working on the opposite side. The passing of our Indian mail by the Brindisi route has given the highest satisfaction to the Italians. It is to be hoped the benefit of the Mont Cenis Tunnel, after its completion, may not be long delayed in its realisation.

METROPOLITAN STREETS AND RAILROADS.

THE opening up of new streets, the removal of street obstructions, and the widening of the throats of the thoroughfares of London, are works which make slow progress. Our metropolis has never hitherto been Hausmannised, and is not likely to be. Our Thwaiteses, Laysards, and Ayrtons, are not under compulsion, either to execute great public improvements as speedily as the poor fugitive baron, or compelled to decamp as summarily as that active official did when the collapse came.

Londoners have not occasion to say, however, that the authorities are oblivious to public needs, or inactive in improving our means of communication. The corporation of the city of London have been, and are gradually, doing great things, in the improvement of thoroughfares, in some instances in the City proper, as directed by their engineer, Mr. W. Haywood, and in others in conjunction with the Metropolitan Board of Works. Among the street improvements in the City, either already effected or in progress, may be mentioned the widening of the eastern ends of Leadenhall and Fenchurch streets; the widening of Newgate, Upper Thames, and Mansion House streets; and of the Poultry and Ludgate-hill; of Gracechurch-street in the centre, and of Lombard-street at the east end, and Fenchurch-street at the west end, with gradual widening and improvement of Basinghall-street, Lime-street, Liverpool-street, Threadneedle-street, Throgmorton-street, Seething-lane, and Tokenhouse-yard. All these improvements are not yet accomplished facts, and we may need to exercise the philosophy implied in the proverb of Erasmus, *Festina lente*, but visible progress is being made of a very satisfactory character. The Middle-row of Holborn has been removed, the Holborn Viaduct has been completed, and spacious interjacent streets have been opened, or are in progress, in its vicinity.

The Metropolitan Board of Works, exercising its own powers in some cases, and acting in concert with the Corporation of the City, in others, has also effected great thoroughfare improvements of late, as witness the Victoria Embankment, and its continuation *visâ* Queen Victoria-street, to the Mansion House, with the communications open, or in progress, between the Embankment and Whitehall, and the Strand by way of Villiers and other streets. The completion and opening within the last two years of the new Blackfriars Bridge, the Holborn Viaduct, and the Victoria Embankment, are enough to repel the charge, against the public bodies concerned, of either "masterly inactivity" or supineness.

In connexion with this subject it is gratifying to notice among the schemes for which Parliamentary sanction is to be asked in the ensuing session, one that involves street improvements of an important character; we refer to the Euston, St. Pancras, and Charing-cross Railway Bill. Mr. John Hawkshaw, C.E., F.R.S., and Mr. J. Wolfe Barry, C.E., are the joint engineers of this scheme, which is a revival, in an enlarged and amended form, of a scheme for which an Act was obtained some five or six years ago, but which was burdened with costly and cumbrous provisions, and was not carried into effect. The connexion of the great railway systems having their termini on the north of London with those on the south, has long been an object of desire, and various schemes have been proposed in successive sessions of Parliament to connect Charing-cross terminus with northern lines. The cardinal points of the scheme now proposed are, the con-

nerion of the Midland and the London and North-Western lines, with the South-Eastern system at Charing-cross. The junction with the Midland system, it is proposed, will be with the low-level line which passes under St. Pancras Station. The line, passing thence eastwards, will be joined by two spurs thrown off from the extreme east and west arrival platforms of the London and North-Western Station at Euston. There will be, of course, interchange stations at St. Pancras and Euston, and an exchange station with the Metropolitan at Gower-street. The new line, it is proposed, will pass under the Metropolitan in Euston-road, and bending round to the westward, will be carried behind the houses on the west side of Tottenham-court-road, with stations at Goudge-street and at the junction of Tottenham-court-road with Oxford-street. From this point—Oxford-street—it is contemplated to effect an important above-ground improvement, in a 60 ft. street, from Oxford-street to Leicester-square, where there will be another station. From the south-east corner of Leicester-square to the back of the National Gallery another 60 ft. street will be opened up; the new National Gallery will have one 60 ft. street along the back of the new buildings, and in accordance with the plans of Mr. E. M. Barry, another, passing along the west end of the buildings from Pall-mall East into Leicester-square, a line first marked out in our pages. This street will afford scope for architectural effects, and in conjunction with the other proposed new streets, will give a clear unobstructed run from Pall-mall, Westminster, and Charing-cross, to the North of London. The proposed railway will be carried under the two new streets first referred to, and it is believed that the Metropolitan Board of Works will bear half the expense of making such streets. With the street to the west of the new National Gallery the promoters of the Railway Bill have nothing to do. The plans lodged by the Metropolitan Board for the improvement of Leicester-square refer to the laying out of the space within the rails as an ornamental garden.

Reverting to the proposed railway, it will bend round by the north of St. Martin's Church, and, crossing under the Strand, pass the east side of Villiers-street, which it will cross diagonally, and run into the Charing-cross line, on the level, at the north end of the viaduct. There will be an exchange station on the north side of the Strand, a few yards to the east of the entrance to the present Charing-cross Station.

The proposed line will be almost entirely underground; but all the stations will be open to the upper air, and open shafts will be provided at suitable intervals for light and ventilation.

As regards the probable traffic on such a line as that contemplated, it can scarcely be doubted that it will be of a remunerative character. That the Boards of the London and North-Western and the South-Eastern Companies think so, is manifest from the fact that, in connexion with the North-Western and Charing-cross line before-referred to, for which an Act was obtained, but the powers allowed to lapse, these companies guaranteed a dividend of 5 per cent. on the cost of construction. Since that time there is an opportunity of which advantage is to be taken, of connecting the Midland, as well as the London and North-Western, with the South-Eastern system at Charing-cross. It should also be mentioned that the Great Eastern will be brought into connexion, as trains of that company now run to St. Pancras station. The provision of another station at Charing-cross would also greatly relieve the present station, and afford room for 150 additional trains, or more, daily, from the South-Western and the Brighton systems. A large interchange traffic would be done by the connected lines, and it can scarcely be doubted that direct railway communication between north and south, across the heart of the metropolis, would command a heavy omnibus traffic. At present there are street omnibuses plying, along St. Martin's-lane and Tottenham-court-road, at intervals of less than two minutes, for above fifteen hours a day. The proposed line would set at rest, finally, in all probability, the often-mooted project of a direct east and west London line. This important project is launched under good auspices, and seems well fitted to secure the favourable regard of the Legislature.

Another project, of a different character, in the City proper, is exciting a considerable degree of interest, and, in so far as is known at present, will be unopposed. We refer to the Holborn Viaduct Station. This is a scheme for a terminal

station, on a level with the Viaduct, to be situated between Farringdon-street and the Old Bailey. The frontage to the Viaduct would afford scope for an effective, but not necessarily very costly facade; and the area available, it is asserted, would give room for nine or ten lines of rail, and seven or eight departure and arrival platforms, with space for booking offices, waiting-rooms, luggage registration offices, and the other necessary conveniences. The space at command is of triangular form, and contains above 3 acres. The longest side of the triangle is on the Farringdon-street side; the next in length, on the Old Bailey side; and the shortest, the front to the Viaduct. The apex of the triangle reaches nearly to Ludgate-hill. The Ludgate Station of the London, Chatham, and Dover line is, we believe, quite inadequate to the accommodation of the traffic that might otherwise be brought to it, from that system and from the lines of the Brighton and the South-Western Companies. It has been designed for a passing station and through traffic, and not for a terminus, for which additional sidings and platform accommodation are essential. In the event of this station being constructed, it will be possible for passengers to enter on the street level, register their baggage at the station, and proceed to Paris, without further trouble on account of their luggage; this is assuming, of course, that Paris is again to become a place of resort, and that the delicate *grenouille* is to supplant cats and rats in the *menu* at the restaurants of the now distressed city.

Yet another scheme affecting metropolitan locomotion is of a totally different character from those referred to; it is for a communication by railway between Cannon-street and Broad-street stations. This scheme is engineered by Mr. Rammell, and is intended to be worked on the pneumatic system. This will not, of course, admit of working junctions with the lines at Broad-street and Cannon-street, but interchange stations at these termini, and a connecting line, would probably command a large traffic both locally, from point to point, and from the South-Eastern to the London and North-Western and North London lines, and *vice versa*. Mr. Rammell demonstrated the practicability of his system on the experimental line he built a few years since, and worked in the grounds of the Crystal Palace at Sydenham. His loaded carriage traversed an unnecessarily severe gradient of 1 in 13, which is much steeper, it may be presumed, than anything that can ever be necessitated in actual working. This scheme would have the advantage, as regards cost, that it would be unnecessary to purchase property, excepting for stations, shafts, and engine-house. The gradients might be regulated by the engineer.

Among other new railway schemes to facilitate metropolitan locomotion are the Eastern Metropolitan, and the Fulham, Hammersmith, and City lines, revived from last session; the Harrow, Edgware, and London; and a few others.

The plans lodged for schemes, involving works to be promoted in next session, include thirty-four Bills for street and road tramways. Of these, eighteen relate to London, and embrace many of the principal thoroughfares. Of the streets and roads in the metropolis in which it is proposed to lay these lines, junctions, and sidings, it may truly be said that their name is legion; and, looking to the grasping demands for powers made by the intending petitioners, we venture to think that we may have too much of a good thing. The powers asked for are absurd, and in some instances disregard the essential conditions under which tramways are admissible in cities—long, straight, and wide streets.

AN INDIAN BURIAL.

THE Rajah Murabaga, of Kelapore, who died in Florence, on the 30th of last month, had scarcely reached his twentieth year. His great intelligence and promising character, coupled with his early death, have raised much interest in him. He was travelling for his improvement, and gave great hopes of becoming a useful potentate of the 600,000 people over whom he was to have reigned. He had been brought up at Bombay. Though very dark, he was a fine-looking young man, broad-chested, with singularly expressive and intelligent eyes.

The seeds of the fatal disease were sown while indulging to excess in the new pleasure of skating, at Innsbruck. The intense cold of the country rapidly increased the malady; and on arriving at Florence he was unable to rally.

Two English and two Italian physicians were in constant attendance. He had brought with him the most precious remedies prescribed by the medicos of his people—pulverised pearls and diamonds; and, while recognising those of the physicians around him, precautions as used in India were not neglected.

Domestic animals were kept near the invalid, to attract the malady from the patient and from those who were nursing him. These, according to Indian custom, should have been thrown out of window. This being forbidden, the attendants contented themselves with throwing them into a courtyard from an inconsiderable height.

In spite of remedies and the greatest care, the malady grew worse from day to day: the prince not being able to lie in bed, desired to be placed on the ground, his legs to be crossed; and there he died.

The *side-de-camp* of the Prince, who spoke only English, with the assistance of the English ambassador, overcame the objections of the municipality, and obtained, after some little difficulties, their consent to have the funeral rites performed according to the Indian customs. These took place, an hour after midnight, at the end of the Cascine, by the side of the Arno, thus following the laws of Vishnu. The medical attendants, the head of the municipal police, and other civic authorities were present. The body, dressed in magnificent garments,—the head surrounded with a turban, adorned with the significative signs of the rank of the deceased, the great scarlet mantle, embroidered richly in gold relief, covering it; while the arms were adorned with bracelets, and the neck with a necklace of large pearls,—was borne surrounded by his attendants, in an omnibus to the Cascine. There, in spite of precautions, were assembled crowds of people, including many ladies. The pile prepared was about 2 yards long by 4 ft. high and wide. A betel nut being put into the mouth of the deceased, a Brahmin began praying while manipulating a cake of dough. The Brahmin was clothed in a large linen mantle covering his head. The attendants sprinkled camphor and other perfumes over the pile. The body, carefully arranged, was placed on the pile, the plank on which it had been laid being removed from under it; and fresh perfumes added, the cake placed beside him, wood piled around him until he seemed encased, and bundles of wood placed high around. About two o'clock the whole was ignited in several places.

The plank on which the body had rested was thrown into the river. The Indians continued throwing incense on the pile, and keeping up the burning of the wood till nearly nine o'clock, when water was thrown on the embers. The remains were then religiously collected and placed in a porcelain vase. Every particle of the embers was thrown by two Indians into the river. They descended into the middle of the stream for the purpose. Earth was scattered over the place of the rite in the shape of a heart, around which small vases filled with rice were placed. All the Indians then knelt and prayed, their faces touching the earth. The urn containing the remains was carried away, to be later consigned to the Ganges. Many accessory ceremonies were dispensed with which would have been attended to had the deceased not died in a foreign land.

Florence.

SEWAGE IRRIGATION.

IN his elaborate and important paper on this subject read before the Maidstone Farmers' Club, Mr. J. Bailey Denton says:—

I propose to confine myself to that branch of the subject in the practicability of which the majority of persons concur,—I mean the treatment of sewage by irrigation; and I adopt this course because I believe that, with the exception of villages, public institutions, and isolated dwellings, in which excretal matter may, perhaps, be more suitably removed by a dry earth than by a water system, there is no other treatment open for adoption than irrigation, if we are to do as the Legislature will shortly compel us to do, *i.e.*, keep our streams free from pollution, and at the same time utilise the refuse of our towns in a profitable manner. I am led to this conclusion by the fact that, let the mode of treating excretal matter be what it may, it is not possible, if we are to have proper regard to sanitary arrangements, to avoid some system of underground sewage by which to get rid of the liquid refuse of towns. It is this conviction that is

already obliging even the northern "midden" towns, where to economise water for manufacturing uses, they resist the introduction of water-closets, to resort to irrigation as a means of purifying and utilising the liquid refuse from their sewers.

I hope that the cursory way in which I speak of the dry-earth system will not be interpreted into a condemnation of it. I have adopted it myself, and advise its adoption wherever it can be advantageously brought into use. There is one fact I wish here to mention with regard to the dry-earth system, and that is, that experience has shown that surface earth and clay will deodorise excrementitious matter, and that sand and chalk will not. This cannot but have a bearing when considering what are the most suitable soils for irrigation. It would be wrong, however, not to add that the Army Sanitary Commission in the report of the Madras Government, 1869, are reported to say that "the practical difficulty in the working of the dry-earth system, instead of decreasing with experience, has, on the contrary, increased to such an extent as to oblige the authorities to look to some other mode for the disposal of their refuse."

As far as experience has gone, the quantity of land required for irrigation will vary from the minimum of one acre to every 100 persons to the maximum of one acre to every fifty persons. With free soils, and a full recognition of the advantage of filtration in connexion with irrigation, one acre may suffice to cleanse the sewage from 150 persons, and under the same condition one acre of what are called retentive soils may equally suffice to cleanse the sewage of 100 persons. But these quantities must be enlarged for two reasons—first, because provision must be made for increasing population, and, next, because it is most desirable to have a margin of extra land beyond that which is absolutely required for purification in order to allow of an alternation of cropping, and an occasional rest of the land from sewage. Again, if the sewage is diluted above the standard I have mentioned, as it frequently will be, the farmer will desire to spread it over as wide an area as he can, and he should be provided with land to enable him to do so. If filtration is resorted to at times as a separate process (respective of irrigation), the area required may be reduced considerably. . . .

It will have been understood from what I have already said, that I consider drainage, natural or artificial, a *sine qua non*, and that it should be so conducted in all cases, whether porous or heavy soils, as to secure active percolation down to the very base of the filter, by placing the drains sufficiently near to each other that there shall be no dead earth between them. The drains should be laid with special regard to the surface-carriers by which the sewage is delivered and distributed, and also, in some degree, to the shape and position of the lands or slopes over which the sewage will have to run. Where the drains must pass under carriers they should be made water-tight, and the surface should be prepared so as to prevent the collection of sewage directly over the drains under any circumstances whatever. The absorption of the sewage by the soil should depend upon the uniform porosity of the soil rather than any direct influence of the drains. In the case of a hospital in Surrey, where I have carried out the irrigation works with this point especially in view, the drains are so contrived that no sewage whatever runs over the surface immediately above the drains. The consequence has been that, although the liquid sewage of an average number of patients amounting to 235 daily has been crowded upon 1½ acre of land, the effluent water from the underdrains has been declared by Dr. W. Odling, F.R.S., to be "unexceptionable potable water." In this case the effluent water, when it reaches the level of the drains, mixes with a considerable quantity of subsoil water. The delivery of the sewage from a town to the land to be irrigated forms no part of the subject I have undertaken to speak upon. Before leaving the preparation of the land, I ought to state what, perhaps, I should have stated at the beginning, that the only mode of irrigation now generally acknowledged to be appropriate is that which distributes the sewage on the surface. The plan, however, adopted by Lord Essex, Mr. Mechi, and some few others, of showering the sewage by hose and jet (which is one mode of surface irrigation) is now objected to for three reasons; the first being that the expense is much greater; the second, that it is difficult to apply the sewage in sufficient quantities to saturate the soil while the service is attended with a loss by evaporation; and the

next that it covers the stalks and surfaces of the vegetation with clinging sewage, which has been made a good deal of in consequence of its having been said, though without proof, that parasitic diseases are communicated by the deposit of sewage on plants consumed by cattle. The suggestions that have been made from time to time for subterranean irrigation, on the ground that the sewage may thus be taken to the roots of the plants, to rise up in the soil and saturate it to the surface, have been entirely discarded. A remark made by the late Lord Palmerston on the occasion I have referred to, when, to meet the objections of his tenants who demurred to the loss of their water meadows, it was proposed that the under-drains should be occasionally stopped up, and water let in to them from the River Test, explains the ground of objection. On consulting his lordship whether I should try the experiment, he stated, "You may do so to a very limited extent, and at my cost, but it is opposed to a ruling principle of cultivation. Every good gardener has now rejected the saucer to the flower-pot, because he will not have bottom water. He prefers supplying his plants with water from above, taking care that there is proper drainage below." I need not tell you the experiment was never tried.

THE NEW LAW COURTS.

It is satisfactory, after the long and not quite justifiable delay that has marked the progress, or rather the want of progress, in connexion with the New Courts of Justice, to know that there are at last symptoms of a commencement of the works. On Tuesday last formal notices were received by contractors, inviting tenders for the foundations of the new Courts, to be sent in to the office of the Board of Works, on or before December 28th, at one o'clock p.m.

ART-EDUCATION.

At the annual meeting of the Cardiff Schools of Science and Art, Mr. G. T. Clark (whose papers in our pages on English Castles will be remembered), delivered an effective address. We print part of it that more especially refers to architecture:—

Time would fail me, even were I capable of tracing out this natural law in the whole circle of the sciences, but I will follow in some detail one, the most striking of them, with the examples of which we are all familiar, and the rules of which are continually and very grossly violated under our eyes, and yet an art, success in which may be appreciated by almost any one—I mean architecture. The earliest European architects appear to have preserved in stone many of the features of the early timber houses of rude nations. Then, in Europe, sprang up by degrees the Doric order, so simple and so grand, though heavy and formal. From this proceeded the Ionic, and finally the Corinthian, in which the fulness of majesty is combined with a sufficiency of ornament. The plant had then reached maturity, and all beyond is decay;—decay, often indeed marked with grand features, but evinced by the debased proportions, the excess of ornament, the combination of dissimilar parts, the substitution of the arch for the lintel upon the column, a position for which it is, for mechanical reasons, entirely unsuited. Out of the very depth of this debasement, such as it prevailed in the late Roman empire and in the Roman provinces, as from the disorganised and mouldering remains of a forest, a new growth appeared. It arose rude but original in the midst, and to supply the wants of a rude but vigorous people. It arose with the dawn of modern civilisation—an architecture of a new and original kind, suited to countries which could not command the vast masses of marble which are essential to the classic orders, and under a climate which required the light of the sun, not, as before, to be excluded, but to be admitted as freely and through as many and as large openings as possible. Thus, by narrow and slow beginnings, arose the style generally known to us as Norman, from the energetic race who imported it into this country;—not unlike, in many respects, to the debased remains of the Roman work, but scarcely derived from it, so different is it in the obvious reliance of the architects upon their own resources, in the boldness and originality with which they introduced ornaments drawn from nature, or from their northern mythology, or from their own rude ideas of beauty. The Early Norman is no doubt

rude and inelegant in design, but it is vigorous; not produced by imitation; and it belongs to a rising and not a debased period of art. Very gradual, but very instructive, are the steps by which this earliest style became exalted, by which the heavy masonry of the eleventh century expanded into the grand, though heavy, shafts, and lofty, though massive, semicircular arches, and those rich bands of reduplicate mouldings that produce so solemn an effect, and are still so much admired in cathedrals such as Durham and Gloucester, and constitute the perfection of the Norman style. To this succeeded, by a series of not unpleasing steps, the pointed arch, detached shaft, high-pitched vault, and flowered ornaments, whose elegance, slightly marked by stiffness, characterises the Early English style; that of Canterbury, Westminster, Salisbury, and the Temple, the beautiful window called the Five Sisters in the northern transept of York, and the unrivalled nine altars at Durham. During the Edwardian age the stiffness gradually, but wholly, disappeared; the monastic architects aspired to a lighter style. With a boldness peculiar to themselves, they threw vaults and arches of a loftier pitch and wider span. The narrow opening, with its circles and trefoils and formed geometrical tracery, gave way to those ampler windows and graceful flowing lines, the pride of Beverley, Carlisle, and York, and which still adorn many a rural chancel. The change descended into the details. The mouldings and friezes, with their fine contrasts of light and shade, of ivory and ebony, became bolder and more rich. Buttresses relieve the length of the wall, and the deep niche with its fretted canopy and sculptured saint took its place as a frequent ornament. The interiors are now enriched with grotesque corbels, highly-wrought pendants, and bosses; and those noble tombs were constructed whose shrines and tabernacle-work and their recombent effigies are so beautiful and in such exquisite harmony with the buildings that contain them. To the Edwardian age are due the glorious west front of York, the far-famed lantern of Ely, the stately spire of Oxford, and almost the whole of those unequalled parish churches for which Lincolnshire is so deservedly celebrated. In an age which, if in some respects rude, was yet eminently original, arose those wonderful structures whose designs are so peculiarly English; whose magnitude is lost in the harmony of their proportions and the nice adjustment of their parts; whose vaults and circles are balanced with so much geometrical skill; whose details, alike in style, but differing widely in pattern, so exquisitely finished where least intended to be seen, remind us less of the works of art than of those of nature in their beauty and their profusion. If the production of that high and solemn form of mind which, not itself devotional, forms yet no unfit preparation for religious offices, be regarded as the one great end of ecclesiastical architecture, those who designed our English cathedrals must be allowed to have been perfectly successful. The style of the first half of the fourteenth century is termed technically the Decorated. In the succeeding age were erected many fine buildings, such as the chapel of King's College, Cambridge, that of St. George at Windsor, and of Henry VII. at Westminster; but beautiful as those structures are allowed to be, they lack the graceful but grave simplicity of the preceding style, so pure in the conception of its designs, so free from all morose or morbid ornament in its details. In fact, with the perfection of the Decorated style, Mediæval architecture attained its maturity; and its decay, at first retarded, became rapid. The style of Henry VIII. and Elizabeth, technically the Tudor, produced many fine private houses, but nothing of a very original character, and the reign of the Royal pedant, James, himself an embodiment of bad taste, produced only a mixture of debased Mediæval and Classical details, jumbled together in a most tasteless manner. I have selected architecture as a convenient and complete instance of that natural growth, progress, and decay of which I have spoken. Why this should be so has never been satisfactorily explained. It has been said that the Reformation, by destroying the monastic orders, put an end to church building on a large scale, and that a style of architecture which had grown up for ecclesiastical buildings was unsuited to private dwellings. This is no doubt true, but the decay began long before the Reformation, and some of the finest and most costly Perpendicular churches and halls exhibit symptoms of it. The fact, however, remains, and all will allow that nothing original

and more beautiful is now likely to grow out of the Corinthian order, or to be superinduced upon the Doricated style. If architecture is again to rise, again to display itself in a third and original phase, it must be by the growth of a new era, not by the skilful imitation, or combination of the parts of preceding styles. The introduction of a new material, iron, into constructive art may possibly give rise to such a revival; but Crystal Palaces and gigantic railway stations and viaducts by land, and iron ships of prodigious dimensions by sea, exist in considerable numbers; and though many of these are marvels of mechanical skill, they have certainly not as yet established any eminence as works of genius or displays of the imaginative faculty. But if this be really so,—if it be true that the great efforts of the imagination, painting, poetry, architecture, and the other fine arts have risen, flourished, and died away, and even if reanimated, could not be grafted so as to draw vital energy from the ancient stocks,—what, then, remains for those who live in this latter age of the world? Are we, who inherit the rich treasures of the past, whom the arts of printing, founding, and engraving, and the discovery of photography, have made familiar with the greatest works of ancient and modern times—are we to be content with that inheritance, and to make no attempt to turn it to account? If this be so, why promote schools of art, or encourage students to devote their lives to what cannot be in the highest sense a success? The answer to this melancholy conclusion is happily full, complete, and encouraging. Although, after the age of Velasquez in Spain, of Titian and Leonardo da Vinci in Italy, of Claude, Poussin, Rubens, and Rembrandt in France and the Netherlands, there was a period during which art, in almost all its branches, was in decay, and on the Continent, at the time of the French Revolution, had sunk very low indeed, there remained in each country, and especially in England, the germ of a new era. Vandyke, who, though not English, worked much in England, and had many followers there, degenerated into Kneller and Hudson, and there were days when Thornhill was thought a considerable painter; but at this lowest ebb appeared Hogarth, a painter of great originality and purely English genius, and the founder, if not of a noble yet of a very high style of art, and with or after whom came, in quick succession, Gainsborough, Wilson, and Reynolds, each, especially the first and last, impressing his works with the stamp of originality, each producing an effect never more visible or healthily recognised in British art than at this time, even when we have had, in Constable, and Turner, and Wilkie, artists equally great and equally original. In sculpture, our great names are less numerous and less original. Stone, master mason and architect to Charles II., was more than a mere carver; and Cibber has made himself a name by his famous statues of Frenzy and Melancholy Madness, in the hall of Bedlam. Roubiliac, Ryssbrack, and Scheemakers, though they worked in England, were not Englishmen; but Flaxman, though formed upon classic models, was undoubtedly a great sculptor, a distinction which cannot be withheld from Chantrey, and certainly will be conceded to Gibson. In the subordinate arts of engraving and wood-cutting, Woollet was intensely original; nor should Bewick be forgotten, even with the works of Gustave Doré fresh before us; and in landscape engraving, Wallis and Miller, Goodall and Armitage, should be named. As a carver in wood, Grinling Gibbons is unrivalled for representations of still life. It is uncertain, however, whether he was by birth Dutch or English. He has left behind him also some statues of great merit both in marble and in metal. The English school of etching is of modern date, commencing probably with Turner and Wilkie. In architecture, absolute originality was perhaps impossible, and certainly not attained. Inigo Jones produced a style perfectly distinct from the expiring Mediæval, and which in its combinations of classical details was, in a certain sense, original. Wren, his great successor, was not only our greatest English architect, but the only architect we have produced who was also an engineer, a mathematician, and a scholar—the only architect who, in the grandeur of his conceptions, the purity of his style, and the acrony of his mechanical skill, at all resembles those marvellous and many-sided artists to whom Italy gave birth. Wren, in his St. Paul's, has produced a building which, in all but the important accident of size, surpasses its great rival, St. Peter's, and with it divides the admiration of

the Christian world. Wren left behind him Gibbs, the architect of the charming dome of the Radcliffe, at Oxford, and the superb church of St. Martin's-in-the-Fields. These alone showed in their day what could be done by the adaptation of Pagan materials to Christian art, as after them Chambers employed the same elements in the construction of the palace. Somerset House, the masterpiece of Chambers, is probably the finest palace in the world. Certainly its equal is not to be found in Rome or Venice, or even in Genoa, that City of Palaces. It is a palace worthy of the noble river of which its terrace is the chief ornament—of the great bridge, the masterpiece of Rennie, which seems to spring from under its shadow, and of that magnificent quay which alone is capable of redeeming the taste of our age and country.*

OPEN CENTRAL STREET: TOTENHAM-COURT-ROAD TO CHARING-CROSS.

THE default of open thoroughfares across the ancient centre of London has long been an impediment to traffic, and an insurmountable obstacle to the improvement of those quarters, extending from west to east, between Regent-street and Farringdon-street, and from north to south, between Oxford-street and the line of the Strand, for a distance of nearly two miles.

When first laid out, and extra-mural, the mazy sinuosities of intercommunication throughout this range might have sufficed for the purposes of the time, but the unforeseen extension of the metropolis, in finely graduated and open thoroughfares, has long since shown the necessity for direct traverse lines.

At present there are but three direct traverse routes,—Fetter-lane, Chancery-lane (which are close together), and St. Martin's-lane; unless these be added Drury-lane, which runs in an oblique direction from north-west to south-east. Thus this, the heart's core of the metropolis, containing as it does some open squares—Lincoln's-inn-fields, Gardens, and Inns of Court,—has continued to be sealed up, and approached but by straits or turnstiles.

The new street lately projected in the *Builder*, leading in a right line from St. Clement's Danes, by the New Courts of Law, along the western side of Lincoln's-inn-fields, will redeem the character of this position, making a nearly central aperture in a most important position. But the opening which is most needed for public traffic ought to tend from Tottenham-court-road, the great northern line of intercourse to Charing-cross, which may now be denominated the main centre of London.

This line would be within a point of north and south, and would nearly aligns with Whitehall, having the old abbey as its terminal object. Its beginning should be at St. Martin's Church, with a semicircular at Hemming's-row, opposite the National Gallery, continuing across St. Martin's-court and Cranbourne-street, just at the point where it is crossed by Castle-street, and thence in a right line to the south end of Crown-street. This would be a distance of only 500 yards. The range of four houses backed against the school-house and site for the enlargement of the National Gallery should be demolished, leaving that building open for architectural embellishment, and leaving St. Martin's-lane wholly intact; and here, perhaps, would be the heaviest expense of the undertaking. The continuation should be along Crown-street, which, being but a lane, ought to be widened to the extent of 70 ft. This street extends just 1,000 ft. to Oxford-street; and the increased value of surplus ground and buildings to be purchased would amply recoup the expenses incurred by the valuation and demolition of the old crazy tenements which now stand, at a minimum value.

At the Tottenham-court-road end a circus ought to be formed, equivalent, at least, to either Oxford or Piccadilly Circus; and the unsightly and obtrusive block of shops at the south end of Tottenham-court-road, although no essential portion of this plan, ought to be demolished. These shops have long restricted and degraded this fine open thoroughfare. Their

* In the course of the proceedings, a presentation was made to Mr. Peter Price, the secretary of the Schools Miss Pounce, as the representative of the students, handed to Mr. Price a handsome microscope, in case, and accompanying this was an illuminated address, executed by Mr. Edwin Seward, stating the occasion and the motives of the presentation. Miss Pounce was loudly cheered, as was also Mr. Clark when he read over the list of signatures to the address, and observed that the students appeared to have examined Mr. Price microscopically only to admire him the more.

abatement would lend a grandeur to the design; so that, with Menx's Brewery on one angle, the opening of High-street at its junction with New Oxford-street, and the open continuation of Oxford-street westward, would give a character to this congeneric traverse circus which none of its precursors present.

The length of this entire traverse route would be only 2,500 ft. in all; and the length of the portion to be demolished and cut through the zigzags and windings of old publicans is only 1,500 ft. Now that the Thames Embankment has been completed, new streets (such as Cranbourne, Farringdon, and Victoria) have been formed, Park-lane widened, and other improvements sanctioned, the inaptitude and defaults of the old City become the more palpable and intolerable.

From the energy and activity lately displayed by the Board of Works, there are hopes that London may vie with any other city in modern improvements; and, in fact, there is no other city in Europe possessing the advantages in situation which render it susceptible of the highest degree of embellishment.

St. Martin's-lane may be called a traverse street, and so it is; but its mean width is but 34 ft., and it leads only to Broad-street, and through the impoverished quarter of Seven Dials; and as to the meditated opening out of Berwick-street into Rupert-street, although it would certainly much improve the wretched courts, alleys, and lairs of St. Anne's district, this line, not being near the centre, would be of little public utility, more especially as Berwick-street is not 30 ft. wide in the mean. A leading thoroughfare, to be of any great public utility, should be concentric and straight, connecting large and populous districts, and it should be at least 60 ft., if not 70 ft., wide. Now, the line recommended would bisect in nearly equal parts the block behind Regent-street; and Farringdon-street, having issue from the great leading point of Tottenham-court-road, and exit into Trafalgar-square, between the National Gallery, St. Martin's Church, and Northumberland House, the continuation of the traffic diverging from either end into the most important and populous districts.

It is some years since the *Builder* sketched out the plan of Cranbourne-street, to permeate the hovels of St. Giles's. This has been carried out, as also that of Garrick-street, leading thence to Covent Garden. The completion of these thoroughfares has caused a thorough transformation in these quarters. The line of new street now recommended is quite as much needed in the ranges of Crown-street, and the vicinages intervening, as far as Cranbourne-street, which have stood for generations a sort of intermediate morbid corpus, accessible to everything but improvement.

Imbued with the prevailing spirit of metropolitan improvements, the Corporation of London is now actively engaged on the work; but the withdrawal, for only 20 ft., of a frontage such as Ludgate Hill or of Newgate-street will cost them more than the formation of Crown-street from end to end. It is to them that the population is indebted for the removal of Bars and the enlargement of the now grand Holborn route, as also for the fine viaduct over the former valley, as well as for Thames bridges free from toll.

Frequenter and *habitué* of London have ordinarily little conception of the width of streets; therefore we note down a few known thoroughfares:—Piccadilly varies from 70 ft. to 48 ft.; Regent-street is regular at 80 ft.; Fleet-street is in the mean 63 ft.; Temple Bar only 14 ft.; the strait of Victoria-street (Westminster), 72 ft. from house to house, and 60 ft. between the areas; Holborn varies from 65 ft. to 110 ft. at Farnival's-inn; Whitehall is 120 ft. from Parliament-street to the Admiralty, while the main central duct of the Strand is in the mean only 53 ft.; but Portland-place is 142 ft., and Westbourne-terrace, is even wider, with its inclosures.

From these data some inference may be drawn as to what the width of a great thoroughfare ought to be, and it may also be seen that the height of houses reduces the apparent width of the causeway; and, at the same time, the straight line, with perfect uniformity of structural *façade*, by no means improves the scenic effect of a street. In point of fact, Cannon-street, Moorgate-street, and King William's-street, ranging from 60 ft. to 70 ft., afford ample scope for traffic, condensed as it often is here at its highest pressure.

In whatsoever light the question of a north and south street through this inert though central mass of the metropolis may be viewed, the paramount necessity for a leading thoroughfare cannot be long averted; and as soon as earnest measures are taken for its execution, the rent and value of its worst slums will increase, whilst improved facilities of commerce will enhance the value of outlying vicinities.

Q.

WEST LONDON SCHOOL OF ART.

THE annual meeting for the distribution of prizes to the successful students of this school was held on the 8th inst., at the school, 204, Great Portland-street. Sir M. Digby Wyatt presided, and there was a large attendance of students and their friends. Mr. Stewart, the master, read the report, which stated that during the past year the number of students in attendance was 479, being nearly 100 more than in the previous year. The number of students had been steadily increasing, so that they now occupied the position of the sixth largest school in the kingdom. The success of the school in all competitions was also largely increasing. In 1869 the students of the school obtained forty-eight prizes of all kinds; in 1870, they obtained 112. The character of the work done in the school was also improving. One of their advanced students, Mr. James Rowley, had gained a South Kensington scholarship of 60l. a year.

The chairman said, that on looking over the statistics he found that this school was by far the largest in London, and it would be disgraceful if it were not, seeing that it was in the centre of the district in which the greatest interest was felt in the arts. The only school which offered a complete parallel to it was the Edinburgh school, which had 459 students; and in the rewards which were obtained from the Government, which was the best test after all, they were nearly equal, one school receiving 103l., and the other 116l.; but when they came to the higher prizes, the Edinburgh school was far ahead of this. In comparison with other English schools, and particularly with that of Manchester, this school was far ahead; but the number of students in this school, instead of being nearly 500, ought to be 1,000. Unless there was progress they would not be able to stand competition, particularly against those foreigners who studied constantly and profoundly. He impressed upon the students the necessity of perseverance, and pointed out that it was a mistake to suppose that a few months' attendance at that or any other school would enable a workman to complete his education in art.

Mr. Donaldson (Gillow & Co.) addressed the meeting at some length, urging the necessity for art education, in regard to manufacturers and, in the course of his observations, stated that one of the students of the school had been for some time past engaged in his own establishment, as a designer, and with such satisfaction to his employers that, as soon as the unhappy war was concluded, they intended to send him to Paris, at the expense of the firm, to improve himself in his art studies.

Mr. Peter Graham (treasurer) complained of the little support the school received from the manufacturers and others of the wealthy district in which it is situated. The list of annual subscribers was not what might be expected from the locality.

Mr. Crace and Mr. Hubert also addressed the meeting.

THE SANCHI TOPE.

PRINTED cards have just been issued by the Science and Art Department, inviting the public to a private view of the east of the eastern gateway of the Sanchi Tope, recently erected in the South Kensington Museum. As, however, these cards contain, among other things, the startling announcement that this gateway was erected, B.C. 500, I hope you will allow me space to contradict a statement so utterly subversive of all that is known of the history of Indian art, before it has time to engrave itself, as a fact, on the mind of the public.

As long ago as 1843, in a paper I read to the Asiatic Society, I stated as the result of my investigations, that no stone monument of any kind or description existed in India which could be dated before the reign of Asoka, or B.C. 250. Since then no discovery, no argument has been brought forward to invalidate this conclusion,

and it is now accepted as the starting-point of all inquiries.

There is no inscription, and no architectural feature which enables us to fix the date of the Sanchi Tope itself with precision; but, at all events, there is nothing to lead to the belief that it was erected before Asoka's time. The rail that surrounds it is generally admitted to have been erected at intervals during the 250 years that elapsed between Asoka's time and the Christian Crusade.

But General Cunningham, Colonel Maisey, and, so far as I know, every one who has written on the subject, are agreed that the gateways, of which this is one, were added to the rail in the first century after Christ. The inscription, the character of the art, the story of the sculptures—all tend so completely to form this conclusion, that it hardly seems open to dispute.

The four gateways are not, however, all of exactly the same age, and the eastern is certainly not the oldest. So far as I can make out its date may be from A.D. 50 to A.D. 75; and this is certainly near enough to its true age for all present purposes.

JAS. FERGUSSON.

SALE OF THE FARNESE PALACE.

WE read in the *Opinions*, that on the 22d of this month, a contract was agreed upon, by which the ex-Emperor Napoleon sold to the Italian Government the Farnese Gardens in Rome, with the Palace of the Caesars, the museum, and objects of art found there, for the sum of 650,000 francs (26,000l.), adding an express desire that the excavations should be continued, and that Professor Rosa should be still retained to continue the superintendence of them. The agreement on the part of the Emperor was arranged by Signor Aresse, one of the senators, and Professor Rosa, called in to witness the signing. The latter seeing the letter of his unfortunate friend, the ex-Emperor, became deeply moved. The deed was confirmed by Count Aresse and Sella, the Minister of Finance. It is needless to add that the wishes of Napoleon will be scrupulously carried out.

THE STRENGTH OF SLATE.

WITH reference to the question of "A Mason" in last week's *Builder*, I may say that some years ago I had occasion to make some experiments on the strength of slate slabs, and I found the average results of a considerable number of experiments to be as follow:—

The lengths of bearing of the slabs varied from 2 ft. to 6 ft., the widths from 3 in. to 1 ft., the depths from 1 in. to 4 in.; and the co-efficient in the equation $w = \frac{c b d^2}{l}$ was found to be, for self-faced slabs 2.25, for slabs sawn in the line of the laminae 2; and for slabs sawn out of a block 1, where

w = the breaking weight in cwt. applied in the centre,
 l = the length of bearing in feet,
 b = the breadth of the slab in inches,
 d = the depth of the same in inches,
 and c = the co-efficient above named.

What portion of the breaking weight ought to be taken as the safe load will depend on the nature of the load. I assumed one-fifth to be a safe load in the cases I have given, where the load was a quiescent one.

C. S.

ARCHITECTURAL EDUCATION.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the last meeting of the Institute (the 5th inst.), the President, Mr. T. H. Wyatt, in reference to a letter received from Mr. L. W. Ridge, honorary secretary of the Architectural Art Classes Committee, stated that the committee were still in want of funds to complete their undertaking, and that although the Institute had recently voted 50l. for the purpose, he trusted the members would not fail to give the scheme their individual support by private subscriptions.

Mr. A. Waterhouse, Fellow, as chairman of the committee, observed that additional expenses had lately been incurred by recent improvements in the accommodation provided for architectural art students at the Museum in Bowling-street, Westminster. To meet this expenditure donations to the extent of eighty

guineas had been promised, but 70l. more were still required. Mr. Waterhouse added that four art classes had already been established under competent supervision, viz., for figure drawing, architectural ornament, perspective, and modelling. He trusted that Fellows of the Institute would interest themselves in the scheme by inducing their pupils to join these classes.

Mr. J. Hebb, associate, called attention to a work recently presented to the Institute, viz., a report compiled by the Institution of Civil Engineers on the Educational Statistics of that Profession (already reviewed in our pages), and suggested that the Council might consider whether it would not be desirable that a similar report should be issued by the Institute, on the subject of architectural education.

Professor Donaldson remarked that the matter had, in various forms, been frequently discussed. Inquiries had been made abroad, and much information had been obtained by the Institute before the present voluntary architectural examination scheme had been established. Some valuable suggestions to professional students as to their proper course of study, &c., would be found appended to the book of rules for the examination.

The President promised that Mr. Hebb's suggestion should receive the consideration of the Council.

BATHING IN THE DRINKING PLACE.

SIR,—Having just received a copy of the *Tunbridge Wells Journal*, of the 8th ult., in which are set forth the proceedings of the Improvement Commissioners, at their meeting of the 7th ult., I cannot refrain from sending you a copy of a letter received by them from the Tunbridge Wells Bathing Association. Being a native of this fashionable town (although absent for many years), I am aware of the many reputed "valuable qualities" of its waters, but it certainly never occurred to me that the town possessed commissioners of such a speculative turn of mind, that they should actually let their reservoirs for bathing purposes, "at a nominal rent." But such is the march of economy in the present day, that I can only imagine the Tunbridge Wells Commissioners as being deacons of leading the van; or possibly the members thereof, who are of a scientific turn of mind, have discovered some extraordinary and improved value in the medicinal effect of their local waters being applied cautiously before being taken into the system.

ROBERT COLLINS.

A GLANCE AT PART OF EDINBURGH.*

THE reconstruction of the Bank of Scotland is a success. What was once a clumsy, ill-proportioned blot upon the scene is now an imposing and attractive structure. But an advantage in one direction is often a disadvantage in another. The increased importance given to the dome diminishes the effect of the fine open crown of the tower of St. Giles's, as seen from some points of view. In passing, why are the Bank directors, after behaving so liberally, stopping short at the last pennyworth? The four statues, or groups, upon the pedestals of the loggia remain unexecuted, whereas groups are placed in positions where it is requisite to employ a telescope to see them.

Arrived at the head of the mound, how magnificent is the scene before us,—to the north-west, the castle on its rock, the gardens below bordered by the line of Princes-street, the tower of St. John's, the dome of St. George's, the towers and turrets of Donaldson's; the Orphans', Stewart's, and Fettes College, in the middle distance; and beyond, the wooded heights of Corstorphine and the glittering waters of the Forth. The only objectionable feature here is the bulky mass of St. Cuthbert's, lying at the western extremity of the gardens, a most unfortunate position for so ugly a building. May the pickaxe of the labourer some day soon erase it; if not, may fire destroy it. Turning to the north-east, we have the remaining half of the gardens in the foreground, with the Gothic canopy of the Scott monument on the terrace, the eastern half of Princes-street, the spire of St. Andrew's, the Malville column, the flat dome of the Register-house, the Calton Hill, with its monuments, the castellated prisons, the classic High School, and Burns' monument; Arthur's Seat, Salisbury Craigs, and again the waters of the Forth, out of which rises the island of Inch Keith, with its light-house; and closing the vista, the varied outline of the Lomonds. Often do I pass this spot, and seldom without pausing for a moment to admire.

Opinions differ as to the position of the Scott monument. So far as the monument itself is concerned, it is seen to advantage, but it is not

* From a paper by Mr. W. G. Shiells, read before the Edinburgh Architectural Association, on the 30th ult.

in keeping with the surroundings, and detracts from their importance. It is a building which would have been better placed in a square, surrounded by gabled houses, or else apart by itself in a park.

Let us now proceed up Bank-street. The houses to our right are old, and possess no architectural features. As the site is a valuable one, there is every probability that building operations will be in progress here ere long. If new buildings were carried out in a similar manner to the savings-bank and the adjoining building, the result would be a happy one; but the chances are rather against it. In continuing this thoroughfare southward, the back elevation of the County Buildings has been brought prominently into sight. For half a century this hideous deformity has stood unaltered; and it says little for the public spirit of our county magistrates that such is the case. The glimpse down Victoria-street reveals a picturesque group of buildings, such as old Prout would have delighted in sketching. It is an example of how the picturesque in architecture is produced by the accidental combination of the works of different men. The formation of Chambers-street, and the completion of the Museum of Science and Art will give quite a new character to this neighbourhood. It must always be a subject of regret to us that the university was placed in the midst of a crowded locality. The want of a college-green is much felt. Had this building been erected on the north side of George-square, not only would the architectural effect have been fine, but the meadows would have been at hand as recreation-ground for the students. Such errors as this should be carefully guarded against in the future. The university authorities are, it is said, negotiating for the purchase of the old Infirmary, on the site of which it is proposed to erect additional college buildings; but, unless the row of shops between that site and the university is removed, the architectural effect cannot be satisfactory.

A new city poor-house has been built in the suburbs, and the old one is for sale. Here is an opportunity for doing something fine. It would form an excellent site for a town-hall, a building which Edinburgh is much in need of. To give proper effect to such a structure, the few buildings on the triangular space in front would have to be cleared away. Were this done, and Bristol-street widened southwards to St. Patrick-square, it would provide a useful and convenient thoroughfare to Newington and the south.

Had the Grange Cemetery been formed to the east or west of the ground it occupies, one of the finest avenues in Europe might have been made, as a continuation of the Meadow-walk, onward through the Grange estate, which is now covered with villas. This would have been a natural result involving no extra cost: it is an opportunity lost for want of foresight. It is a pity that Warrenden Park is being laid out in streets and terraces: the suburban character of the district will be disturbed; but I suppose it will pay better than if given off for villas. We have one item of consolation, however: the work is in good hands, and the elevations show a deviation from the stereotyped style, the sky-line being varied by the introduction of gables.

It is a remarkable fact that in this country we are very careless in regard to the accessories of our public buildings. Having erected an edifice of some importance, it is left without any attempt to combine it in an architectural manner with the ground upon which it stands. Those who have visited Paris will understand what I mean. As a notable example of the practice I refer to, I would call attention to the small place bounded by St. Giles's, the Signet Library, the County Buildings, and the High-street. The architects of the library and county buildings seem to have bestowed small thought on the levels. From the High-street to the library there is an inclined plane, which forms an awkward angle with the County Buildings. Now, I fancy that such a spot in Paris would have been treated somewhat after this manner; the ground would be excavated to a uniform level, a line of balustrades, with flights of steps at each end, would be formed to screen the sunk area from the High-street, and a parapet wall would take the place of the iron railings which do not screen the basement of the County Buildings. Probably a small garden or a fountain would adorn the centre, but that would be too much to expect here. Of course this arrangement would abolish the cab-stand, but the east side of the church would be equally convenient for cabs.

The newly-erected terraces at Dumbiedikes

are very ugly. Here was an opportunity of producing a fine effect at small cost. You have something like the proper thing at the park end of Heriot Mount, and the fine mansion of Arthursley, designed by Mr. Lessels, is the right thing in the right place.

What city in the empire possesses a park like this? In parts you may fancy yourself far from the haunts of men, away amongst the mountains. A few trees introduced here and there would, in my opinion, add to its beauty, thick belts being used to screen off the gaasworks and other unsightly erections, and small groups of two or three Scotch firs on this height, an elm and a pine on this knoll, half a dozen planes in that hollow.

Would it not be a mistake to place the Albert Memorial in this park? A group of statues here would look like intruders, giving an artificial character to a scene, the charm of which lies in its natural features. The proper place for such a monument is in the city, with architectural surroundings, and what more appropriate site could be found than in front of the Museum, the laying of the foundation-stone of which was the last public act of the Prince in Scotland. It would be seen to great advantage when the new and wide thoroughfare is opened from east to west, and would be in perfect harmony with the buildings surrounding it.

We shall now proceed, by way of York-place, to St. Andrew-square. As we turn up North St. Andrew-street we notice a valuable plot of ground lying waste. When the square was occupied as private dwelling-houses there was some sense in keeping an uninterrupted view to the north, but now the city has extended far beyond, and what was then an advantage is now an eyesore. It is surely worth while for the proprietors to enter into an agreement as to the disposal of this valuable site. The garden in the square has been much improved of late, and will assume an air of grandeur when the promised groups of statuary are placed at the angles, but they are "lang o' comin';" one was ordered several years ago, and at that time it was said to be modelled. Our sculptors cannot make the complaint, so frequently advanced by architects, of insufficient time being allowed them in which to mature their designs. This square might be another Forum were the buildings carried out in the style of the British Linen Company's Bank. It unfortunately is but a fragment, but the National Bank next door might carry out the design. This last bank has spent as much in tinkering up their premises as would have gone a considerable way towards carrying out such an enterprise.

There are few finer architectural vistas than that of George-street; its length and breadth are well balanced, but the majority of the buildings on either side are deficient in height and dignity, a defect which is gradually being remedied. The dome of St. George's forms an admirable termination; the position of St. Andrew's Church is, however, unfortunate: the eye looks for a spire on the opposite side, as this is one of the instances where balance is requisite, in order to the satisfaction of the artistic mind. The effect of this fine street has been somewhat marred by the grasping disposition of a few of the proprietors, who have thrust forward their buildings in advance of the others. It is singular that the exterior of the Assembly-rooms should be of the most dingy and forbidding description; a building set apart for gaiety and pleasure should surely wear a gay and inviting aspect. We are an austere people, it is said, and probably this was done with a purpose. (?)

Charlotte-square is, upon the whole, the best example of domestic city architecture we possess. There are an elegance and propriety, combined with a certain piquancy, about it which remind one of a gentleman of the old school. An attempt has been made to destroy the integrity of the design, and to convert some of the dwellings into warehouses. This, I am happy to see, has been vigorously opposed; but it is doubtful if our civic authorities have the power to frustrate the design. Should such be the case, it is time that additional and stronger powers were granted to them. It is monstrous that any one individual should have it in his power to destroy the architectural effect of a whole neighbourhood. St. George's Church is very disappointing, when seen close at hand. The side elevations are broken up in a stupid sort of way, and the detail is hard and insipid. The original design shows clock towers flanking the dome. It is doubtful whether, if erected, they would add to the effect of the building, as seen from a distance;

but this could be tested by the erection of wooden models, a course which might be more frequently followed.

Moray-place is too heavy and monumental, to my taste, as a place of residence. It is suggestive of cold pride and hauteur, not very agreeable qualities; but I can bear testimony to the fact that such is not the character of all the residents in that quarter.

Here we are on the Dean Bridge, a noble bridge, with light and graceful arches spanning a deep, rocky gorge, down which the turbid waters of the Leith flow. From here you see five of the stately educational establishments endowed by those emulous of the fame of George Heriot. One of these, the Fettes College, is just completed. In architectural embellishment it is the richest, and in general design one of the most successful, buildings we possess. It is not so dignified as Donaldson's, but far superior in detail. Close at hand are some of the newly-erected terraces: does not an inspection of them bear out my remarks as to the paucity of artistic ability displayed in the designs? Comfortable residences they doubtless are, but we, at least, look for something more. Trinity Church occupies a fine site. I would like to see another similar church (better in detail) on the other side of the roadway: the effect would be fine, whether seen from north or south. The remark has often been made that had the houses to the south-east faced northwards the effect would have been grand with the wooded slope in front; as it is, however, the back elevations are not unpleasant, and are gradually being enlivened by the introduction of balconies and oriels.

At the west end of Melville-street we are to have a cathedral. It is not often that such are built now, and, large as the fund is, it falls far short of that lately spent on the mere restoration of some of those erected in the Middle Ages; we cannot, therefore, expect to cope with them, but still, with the funds at command and an admirable site provided, we may reasonably look for the production of a church far superior to any other in the city; for, indeed, our ecclesiastical structures are nothing to boast of.

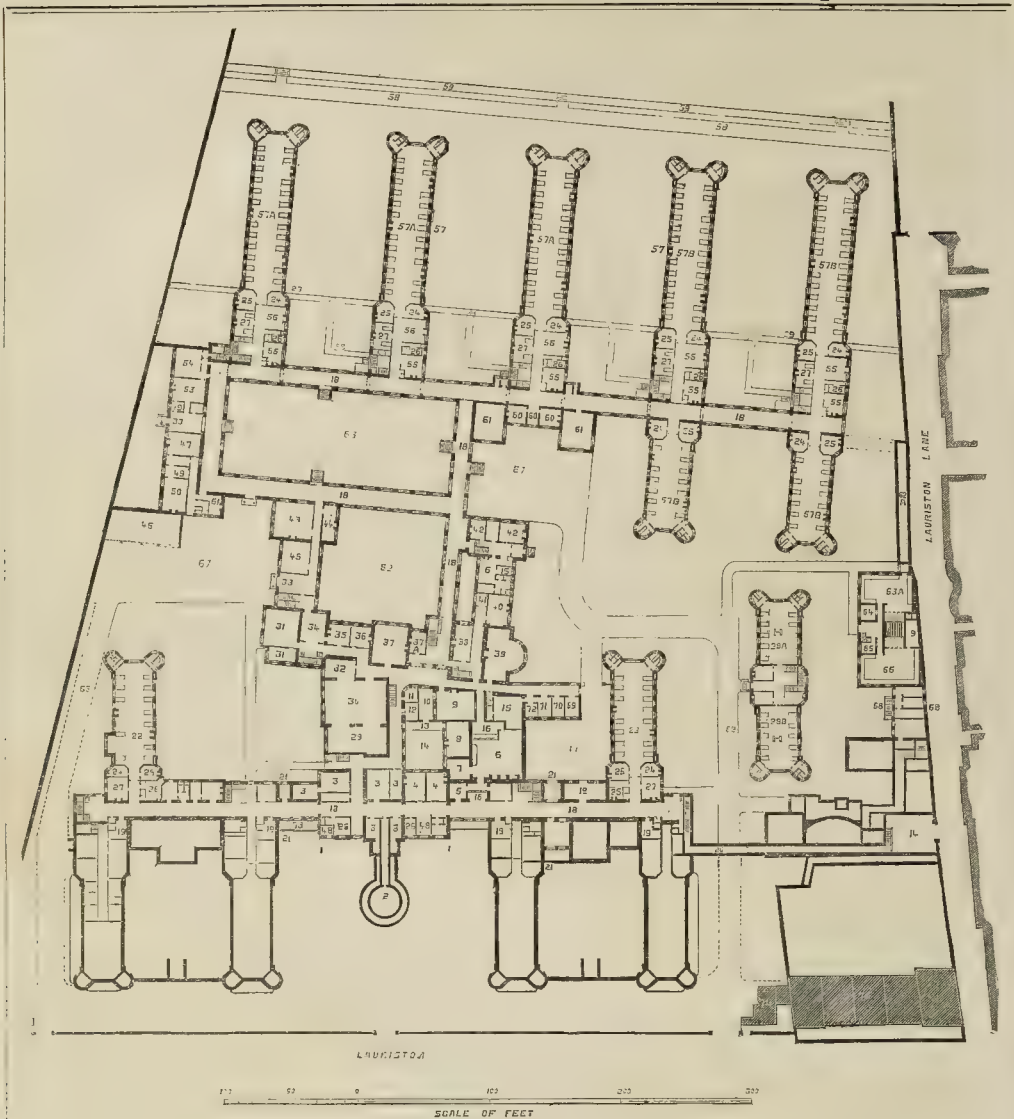
The levelling up of the Lothian-road is a decided improvement; to make it a complete success the thoroughfare should be widened onwards to Toll-cross, but we cannot go on here as did Haussmann in Paris. No one, I suppose, regrets the removal of the buildings which occupied the site of the Caledonian Railway Station; but it is to be regretted that a temporary station has only been built, although it is not so ugly as some permanent buildings of this kind.

Would that we had more citizens like Councillor Gowan. Look at the spirit he has displayed in the laying-out of Castle-terrace. You may object to the style of the buildings; but, peculiar as they are in detail, they are picturesque in outline, and far more pleasing to look at than the stale inanity of their neighbours.

The Grass Market is a quaint old place, wonderfully like a country market-town. This was hardly the place where to erect an Italian palazzo; the new Market-house is quite out of keeping, and is, moreover, inappropriate for the purpose to which it is applied. The effect is startling and far from pleasing, when, as you pass close to it, you see through the windows a ridge-and-furrow glass roof rising to less than half the height of the front elevation. Recent erections in this locality are in excellent keeping; indeed, if the improvements of the old town go on as they have lately, it will far surpass the new town in architectural interest.

During our ramble I might have called your attention to sanitary matters; but the subject is an unpleasant one, and I shall conclude by a general observation that, though much has been done, yet more is required of us. The main thoroughfares are well attended to; but some of the closes are in a sad state; and, what more intimately concerns you, the interiors of some of the newly-erected tenements are far from what they should be, having water-closets without means of external ventilation, and dark bed-rooms in the centre of a block, which must be very unhealthy places in which to count repose. I know that this sort of thing pays; but do pray endeavour to use any influence you may possess with your employers to check such practices.

We are proud of our city; we may have still more reason to be so. It may be in the power of many of you to give material aid to its improvement. See that you do so in no careless spirit, but earnestly and to the best of your ability.



NEW ROYAL INFIRMARY, EDINBURGH.

Plan of Principal Ward Floor, Medical Hospital; and Basement Floor, Surgical Hospital.

REFERENCES.

- | | | |
|--|------------------------------------|---|
| 1. Surgical Hospital. | 22. Fever Hospital — | 53. Out-door Patients' Waiting Room. |
| 2. Ice House. | A. Female Ward. | 54. Dispensary. |
| 3. Beer and Wine Cellars. | B. Male Ward. | 55. Ward Kitchen. |
| 4. Porters' Rooms. | 29. Nurses' Linen Store. | 56. Convalescent Room. |
| 5. Housemaid's Closet. | 30. Patients' Linen Store. | 57. Medical Hospital — |
| 6. Kitchen. | 31. Store Room. | A. Male Ward. |
| 7. Cook's Store and Office. | 32. Linen Store for Officers. | B. Female Ward. |
| 8. Probationer Nurses' Dining Hall. | 33. Entrance. | 59. Walk. |
| 9. Servants' Hall. | 34. Hall. | 60. Sloping Bank. |
| 10. Shoe Place. | 35. Mending Room. | 61. Wards. Special Cases. |
| 11. Weighing Place. | 36. Work Room. | 62. Class Room. |
| 12. Brushing Place. | 37. Matron's Office. | 63. Watson's Hospital Dress Ground. |
| 13. Covered Passage. | 37A. Grocery. | 62A. Underground Passage from Mortuary to |
| 14. Court. | 38. Bread Store. | Medical Hospital. |
| 15. Scullery. | 39. Nurses' Dining Room. | 63. Garden or Dress Ground. |
| 16. Service Place. | 40. Matron's Dining Room. | 63A. Washing House. |
| 17. Kitchen Court. | 41. Pantry. | 64. Dirty Clothes. |
| 18. Corridor 12 ft. wide. | 42. Sick Students' Rooms. | 65. Clean Linen. |
| 19. Coals. | 43. Museum. | 66. Laundry House. |
| 20. Tunnel for conveying Dead Bodies from Surgical Hospital to Mortuary. | 44. Curator's Room. | 67. Gravel Space. |
| 21. Space for Cross Ventilation. | 45. Preparing Room. | 68. Upholsterer's Department. |
| 22. Ward for Poni Discharges. | 46. Covered Standing or Carriages. | 69. Larder. |
| 23. Erysipelas Ward. | 47. Male Reception Room. | 70. Milk Store. |
| 24. Doctor. | 48. Lavatory. | 71. Butter and Eggs. |
| 25. Sisters, Nurses. | 49. Examination Room. | 72. Vegetables. |
| 26. Bath. | 50. Female Reception Room. | 73. Area for Light. |
| 27. Private Ward. | 51. Infectious Room. | 74. Lodge. |
| | 52. Drive. | 75. Wharton-place. |



NEW ROYAL INFIRMARY, EDINBURGH.—MR. DAVID BRYCE, ARCHTCT.

W. M. MASON, SC.

NEW ROYAL INFIRMARY, EDINBURGH.

THE new Infirmary for Edinburgh, recently commenced, is being built from the designs of Mr. David Bryce, architect. The design is arranged upon the pavilion principle, and consists of Surgical and Medical Hospital, as well as of a separate Fever Hospital. We publish in our present issue an external view of the buildings, and a plan of the principal ward floor of the Medical Hospital, which also shows the basement floor of the Surgical Hospital. The wards are placed to stand south and north, so that the sun, in passing round them, will give a portion of its rays in turn to each side of the ward. The size of the wards, and the space between the pavilions, can be obtained from the plan.

The Surgical Hospital has sixteen wards, besides private wards, and contains 260 beds; being also provided with three reserved wards, containing forty-eight beds, the latter wards to be used when the ordinary wards require to be cleaned or vacated.

The Medical Hospital has fifteen wards, besides private wards, and contains 340 beds; being also provided with four reserved wards, containing 100 beds; thus making 600 beds in the two hospitals, exclusive of those in the reserved wards.

The Fever Hospital is designed to hold forty beds, in addition. Provision is also made for a pathological department, mortuary, washing-house, laundry, and workshops.

The Surgical Hospital is placed on the north portion of G. orgo Watson's Hospital grounds, facing Lauriston; the Medical Hospital is to the south of George Watson's Hospital, which will be retained for administrative purposes.

As from Lauriston-place, where the principal entrance to the Surgical Hospital will be, to the south end of the Medical Hospital there is a fall of no less than 35 ft., which includes a fall of 7 ft. immediately on entering, it becomes necessary that the floors of the three buildings,—viz., the Surgical Hospital, Watson's Hospital buildings, and the Medical Hospital,—should be on different levels. To obviate the difficulty occasioned by the difference of levels, as well as to connect the three buildings into one homogeneous arrangement, the principal floor of the Surgical Hospital will be raised as much above the level of the street at Lauriston as will afford proper height for a basement or ground-floor under the whole of the Surgical Hospital, which floor will be on the same level as the principal floor of George Watson's Hospital, and a few feet below the level of the second floor of the wards of the Medical Hospital. It is intended to raise a portion of the central court between the centre pavilions of the north front to the level of the street, so as to admit of carriages being driven up to the principal entrance door.

Close to the entrance are situated the principal staircase and board-room. The side flights of stair lead up to the second floor of the surgical wards, and the central flight leads, through a wide corridor with additional steps, down to the principal floor of Watson's Hospital, which will be appropriated to administrative purposes. From this level the second ward floor of the Medical Hospital will be reached on galleries formed on the roof of the piazza or corridor of the first story of wards of the Medical Hospital. Another flight of steps leads to the basement floor of Watson's Hospital, from which, by a piazza, the principal floor of the Medical Hospital will be arrived at. It is proposed to make the space enclosed by these corridors or piazzas, which is 140 ft. long by 80 ft. wide, into a garden, and to use the piazzas as exercising places for the patients.

A gate and lodge are to be at either end of the north front of the Surgical Hospital, entering from Lauriston. At the east gate, both patients and students will enter and descend by a road having about the same fall as the Meadow Walk, and leading to both Surgical and Medical Hospitals.

The entrance to the reception and examination rooms for surgical patients is situated below the east portion of the Surgical Hospital, and the reception and examination rooms for medical patients are placed in a building, along which runs the piazza at the east end of the garden. On this, the basement floor of the Surgical Hospital, is placed the students' hall, situated between the two eastmost wards. By descending a flight of steps from the drive in front, the hall can be approached, as well as by entrance at the east end.

The nurse's apartment will be over the block of buildings at the end of each ward, and those of the probationer nurses in the upper part of the west wing over the chapel of the present Watson's Hospital. The present master's house in this hospital will be occupied by the officers of the establishment and students when sick, and the central portion by domestic servants, while the two upper stories of the east wing are intended to be the apartments of the resident surgeons and physicians. An immediate access from the Surgical Hospital to these apartments is obtained by a corridor beneath the gallery of the operating theatre, and from the Medical Hospital by a passage leading from the piazza. Electric bells from the various wards will be provided for these apartments.

The wards will be 28 ft. wide, and 15 ft. 6 in. high. The beds will be placed 9 ft. apart from centre to centre, having a window between them, and the fireplaces will be in the side walls of the wards. Each ward is provided with a private ward of two beds, having bath-room and water-closet attached, as well as a doctor's room, a sister's room, a ward kitchen, and a convalescent room, the corridor forming part of the latter apartment, an arrangement which will give direct light and air to the corridor. The wards are also provided with lifts for patients' food and coal, as well as dust-shoots, and closets for airing patients' linen, &c. At the end of each ward are placed two circular turrets, the one containing the water-closets and urinals, and the other the baths and lavatories, in both cases separated from the ward by passages 4 ft. 6 in. wide, with a window at either end for fresh air.

The main corridor, which is 12 ft. wide in each hospital, is continuous only on the principal and ground floors, and the windows are to be made so that they can be thrown almost entirely open. The arrangements will be such that each pavilion can be completely isolated, with a view to prevent infection from spreading. On the second floor of wards, the pavilions are connected by galleries formed on the roof of corridors. More free circulation of air is thus obtained, while the communication is preserved.

The Surgical Hospital is provided with two class-rooms and a great operating theatre. The Medical Hospital is also provided with two class-rooms. In both cases they are designed so that clinical lectures can be given, and they will accommodate about 130 students each. On the reserved floor of the Medical Hospital (which is below the principal floor) is placed a ward for the detention of noisy patients. The laboratory is placed on the ground-floor of the eastmost pavilion of the Medical Hospital, communicating with the dispensary, which is in the building at the east end of the garden. A ward is also formed in the upper story of the central block of the Surgical Hospital. Passages are provided in connexion with the long corridors in each hospital, for conveying bodies to the mortuary. The spare ground to the south of the Medical Hospital is to be laid out as pleasure-grounds.

The references to the one plan we are able to give will afford some additional information.

THE ROYAL ARSENAL SCIENCE CLASSES.

On Wednesday night Prince Arthur was present at the distribution of prizes to the successful students connected with the Royal Arsenal Science classes. His Royal Highness presided, and distributed the prizes, and Professor Ruskin delivered an address appropriate to the occasion, in the course of which he touched upon the question of public education. He noticed that, independent of what the Government Education Act was likely to produce, there had already existed throughout the United Kingdom very extensive provisions for education; but he was sorry to have to acknowledge that those provisions had not been either faultlessly dispensed or wisely availed of. The great thing to be avoided was a bad education. There were at present all kinds of education. They may be classed, however, under two divisions,—viz., good and bad. He knew, from his own knowledge, that children of rich people, who could afford to pay the very highest price for instruction, received the very worst education, and the children of poor people often got the best education for nothing. What had to be decided was, where a good education could be had, and who were to be the teachers. As soon as this was well considered and decided, then, and then

only, could they commence with good results the foundation of a valuable education. The professor cited a good many mythological and other stories, and drew from them good homely morals, which he recommended to his audience for their future guidance and happiness.

QUANTITIES AND TENDERS.

THESE much-discussed subjects require some still further investigation. One correspondent thinks that builders ought not to have any voice in the nomination of quantity surveyors. I cannot agree with him as matters stand at present. A large number of the bills of quantities which come under my notice from time to time, are so erroneously described, or carelessly taken out, or, shall I say, executed by those of the profession who know but little how to take them, that I am not surprised that builders should claim the above privilege.

The difficulty would seemingly be avoided if the architect would select a thoroughly practical man to prepare the quantities, and ask such builders as were to tender for the works, if they had any objection to the person selected. I venture to assert they would undoubtedly reply in the negative, if they were satisfied that he was thoroughly practical and competent, and would deal fairly for both client and builder; or would, I prefer saying, take out the quantities exact.

Then comes the question, whom would the builder think a competent person? Certainly not the man who openly declares by publication that his quantities contain mistakes, or one that your correspondent says takes them out full; meaning, I suppose, one who would put down more than he finds. I take that to mean, that he does it for fear of being short in the total, in consequence of omitting other items which he knows not how to take properly. But the competent person, to my mind, is he who by a thorough practical knowledge of every item of labour and material required, can measure the exact amount, and no more or less, and can give a detailed description of every item that cannot be misunderstood. If such a person were selected by the architect to act between the client and builder, no objection, I believe, would be raised. But when we find quantities supplied, and the specification stating the builder is to make good any deficiency without payment beyond his contract, and at the same time he is necessitated to base his tender on the quantities supplied, which the very specification condemns,—it speaks very badly for the system. Unless, by the assistance of the architect, the practical and honest quantity surveyor is put in the aforesaid position, builders will still have cause to make complaint of injustice. This arrangement would put the quantity work into the hands of the best men that are now in the background, in many instances.

Then there is the wide tendering matter,—what is to be said of that? Errors sometimes occur in the estimates themselves; but there are these very unsatisfactory facts, which account for much of it.

Firstly. When quantities are not to be supplied for works about to be executed, one or two surveyors will endeavour to get the builders who are to compete to do so on their quantities, and, having gained the consent of one or two or more builders to estimate from their quantities, will take them out on that speculation. Not unfrequently, two sets are prepared for the same work, by different people, and the builders take them, some one and some the other, while a few will have nothing to do with either. It can be seen at once, if the quantities are not alike, one must be the highest, and the builder who prices them at a fair price has the largest amount of surveyor's expenses to add to swell up his amount, while another builder, who tenders from his own discretion, will endeavour to get the work at the lowest figure he can without losing; and, not having any surveyor's charges, &c., to add, he very naturally succeeds in getting low down the list, or perhaps at the bottom, while the amount of his unfortunate friend at the top appears to ask an absurd price.

Secondly. There is the fault of the architects asking a large number of builders to tender—twenty-five to thirty. Some of them, on finding out that fact, at once decide that the chance of getting the work is too small, and they therefore get a price from some other party, who puts them out of the reach of danger,

and the tendering is really not tendering, but a price is merely sent to prevent giving offence to the parties who have asked them. If a less number of tradesmen were put in competition, the results would be that tenders would be legitimate.

Thirdly, and lastly, there comes the patent fact of bad, or short, quantities, which get into the hands of builders not infrequently. The difference not being discernible, or never looked after by many who estimate, they price them at their usual low prices, with the desire of success in getting the job; while the more careful estimator, seeing the loss which must be sure to come if he does the same, looks at the drawings, satisfies himself that he cannot put his usual prices, and, rather than get too low, he raises his price, feeling sure he will not get the job, and does not want to do so. Thus you have another wide difference produced. None of these differences, arising from such circumstances as these, can be much wondered at.

The right man in the right place builders would be glad, as a rule, to see; and there would then be a chance in such a state to bring credit again on the profession, which it seems, at the time being, to have lost, and of restoring that former confidence between builder, architect, and surveyor which one of your writers last week talked of. Until that time arrives, it appears to me that much that at present is bad will remain so.

JUSTITIA.

TRAFALGAR GRAVING DOCK, WOOLWICH.

STR.—In your interesting review of the Autobiography of an Octogenarian Architect, the following curious statement occurs, no doubt arising from a *lapsus memoria* of the author of the book.

After referring to the failure of the graving dock (constructed of Ranger's concrete, south of the western tidal basin, at the extreme west end of Woolwich Dockyard), your article says,—

"Mr. Walker was called in, who prescribed granite for a first-class dock, but he ultimately took fright at the subterranean springs that had proved the masters of the concrete. The dock was abandoned, and a large basin only formed."

I accompanied Mr. Walker on the 10th of February, 1838 (on our way to Dover), when he inspected the concrete dock; and we were met by Sir Charles Adam, then First Lord, and Mr. Laing, the master shipwright.

We subsequently had numerous interviews with Mr. Laing, resulting in a cross section being adopted for the dock, parallel to the midship section of the *Trafalgar*, 20-gun ship, one of Mr. Laing's pet productions, and from which the dock, erected on the site of Ranger's Dock, took its name; for which I prepared the contract drawings, specifications, and estimates, and which was constructed by Messrs. Grissel & Peto, under contract for some 80,000*l*.

This dock, constructed within a coffer-dam, next the tidal basin, is 265 ft. in length, 80 ft. in width at coping level, and 26 ft. deep, formed entirely of granite, 3 ft. to 4 ft. thick, upon brickwork, in pozzolano mortar, and backed up with concrete, the entire interior surface formed of a series of altars or steps, for strutting from up to the ship's sides, which are so graduated as to height as to be available as stairs for the workmen at any point of the dock, with one "broad altar" halfway up, and the sides are intersected by two timber slips, or plain channels, sunk through the altars, for letting down timber, &c., of such a width that they can be stepped over. At the head of the dock is a spacious staircase, of easier incline, bounded by two timber slips. The granite bottom of the dock is an inverted arch, the abutments being the superimposed side altar-walls, on a platform of brickwork, in pozzolano mortar, which set so hard that in some alterations of level, in removing some of it, the bricks were more destructible than the mortar. The whole rested on a mass of concrete, 9 ft. deep in the solid Thames gravel ballast, the spring waters being conveyed away by a series of drainage-pipes to a deep pumping-well. The gate platform is of timber, on a mass of bearing-piles, all driven down to the gravel, with three rows of sheet piling.

The gates, 60 ft. wide, were at first proposed to be formed of oak; but, after due inquiry at all the royal dockyards, it was found no timber of sufficient length, scantling, and camber could be procured for the purpose, and cast iron was adopted for the heel and meeting posts and for the ribs, which were graduated in reference to

the depth from high water, and the leaves of the gate were close-planked on each side. It was at first proposed to fit small pumps in the heel-posts, to get rid of the leakage. This, however, was found unnecessary, the whole of the work being so well put together by the contractors for this portion of the work, Messrs. Hunter & English, of Bow.

A large pumping-engine for emptying the dock was also erected.

Mr. Richard Townshend, who afterwards superintended the extensive works at Keyham Dockyard, was resident engineer. The present chairman of the Rivers Pollution Commission, General Sir William Denison, R.E., was in the yard at the time, constructing a granite dock, at the east end of the yard. Sir Morton Peto was also daily in the yard, superintending these and other massive constructions for the Government of the day. Either or all of these gentlemen would, I am sure, willingly substantiate the above.

This is one of those "fixtures" that could not well, in these days of retrenchment and dismantling, fall beneath the hammer of Messrs. Fuller & Horsey; and a fine water-colour drawing of the dock, seen from the gate platform, with the gates in course of erection, presented by the contractors, Messrs. Grissel & Peto, may be seen hanging in the library or reading-room of the Institution of Civil Engineers, 25, Great George-street, Westminster.

J. B. REDMAN.

CAUDEBEC LADY CHAPEL.

MR. COHEN notices (p. 943) a section of the vaulting of this chapel as being given in Gwilt's "Encyclopedia of Architecture," and wishes to learn from whence it was obtained. It occurs on p. 593 of my edition (1867) of that work, as taken from the supplement originally written by Mr. Gwilt. On p. 1012 of the same edition he will find a section and a plan of the chapel, in the essay on "Proportion," written by Mr. Crey, for his "Encyclopedia of Civil Engineering." Both of these sections are reduced from that given in the valuable publication, Britton & Pugin's "Architectural Antiquities of Normandy," 4to., 1828, plate 64. The date of the nave, choir, and the chapels around it, is about 1426-56. G. Le Teller, who died in 1484, having been master of the works there for upwards of thirty years, may have designed it.

WHAIT PAPWORTH.

THE BELLS AND QUARTER CHIMES OF THE NEW PALACE AT WESTMINSTER.

THE lofty eastern tower of the Houses of Parliament, or New Palace at Westminster, is furnished with a set of four chime-bells, a great hour-bell, and a clock, of which I will endeavour to give the most trustworthy account.

Before describing the present bells, however, I may remark that in the month of August, 1856, a great bell was cast from the design of Mr. E. B. Denison, Q.C., by Messrs. Warner, of Jewin-crescent. The following are the particulars:—Diameter at the mouth, 9 ft. 5½ in.; height, 7 ft. 10½ in.; thickness at sound bow, 9½ in.; weight, 15 tons 18 cwt. 2 qrs. 20 lb.; Note E. The weight of the clapper was 18 cwt. This bell, having been suspended under a massive frame of timber, erected for the purpose at the foot of the clock-tower, was called "Big Ben," in honour of Sir Benjamin Hall, then Chief Commissioner of the Government Board of Works. And every Saturday, at one o'clock, it was tolled for about half an hour. But at last, in October, 1857, "Big Ben the First" received a death-blow.

I now come to the present bells in the tower. The four chime-bells were cast by Messrs. Warner, in 1857-8. The following are their several diameters, weights, and notes:—

	Diameter.	Weight.	Note.
1st Bell.	3 ft. 9 in.	21 cwt.	G sharp.
2nd Bell.	4 ft.	28 cwt.	F sharp.
3rd Bell.	4 ft. 6 in.	35 cwt. 1 qr. 6 lb.	E.
4th Bell.	6 ft.	3 tons 17 cwt. 3 qrs. 24 lb.	B.

It may be well to mention that the notes of these four bells are at the same proportional intervals—reckoning downwards—as those of the 1st, 2nd, 3rd, and 6th of a peal of ten.

The great hour-bell, "Big Ben the Second," was cast under the direction of Mr. Denison, by Mr. George Meares, of Whitechapel, on the 10th of April, 1858. Here are the particulars:—Diameter (mouth), 9 ft.; height, 7 ft. 6 in.;

thickness (sound bow), 8½ in.; weight, 13 tons 10 cwt. 3 qrs. 15 lb.; Note E, an octave below the E of the third chime-bell.

The great clock was made in 1854 by the late Mr. Frederick Dent, from the design of Mr. Denison, and fixed in the tower in 1859. "It reports its own rate electrically," says the latter, "to Greenwich twice a day, and the curator of it receives Greenwich time at the tower to enable him as well as the Astronomer Royal to see how it is going. . . . It has seldom varied more than a second in a week or ten days. . . . It contains a special contrivance for making the first blow of the hour strike exactly at the right time."

This clock chimes the quarters on the four bells above described (à la Great St. Mary's, Cambridge), thus:—

First Quarter	1, 2, 3, 4.
Second Quarter	2, 1, 2, 4; 3, 2, 1, 3.
Third Quarter	1, 3, 2, 4; 4, 2, 1, 3; 1, 2, 3, 4.
Fourth Quarter	1, 2, 4; 3, 2, 1, 3; 1, 3, 2, 4; 4, 2, 1, 3.

The hour is, of course, struck on the great bell.

In conclusion, it remains to observe that on or about October 1, 1859, certain cracks were discovered on the surface of the present great bell, and consequently it was not allowed to proclaim the hours again for a considerable time. As to the cause of the cracks, the author of this article publicly expressed his opinion in 1865. I may, however, say here that the principal crack in the bell was found to be diametrically opposite to the hammer. In order, then, that the metal might be partially relieved from the strain at the places intersected by the cracks, the bell was turned about 3 ft. "with the sun," and a new clock-hammer not exceeding 4 cwt. was substituted for the old one of about 8 cwt. The result is, "Big Ben the Second" certainly speaks out in a more agreeable tone than he ever did when struck by the old monster hammer. Nevertheless, his voice is still imperfect. His fundamental note proper is never distinctly heard as it ought to be. The upper tones being chiefly inharmonic, a discordant and somewhat gong-like sound first strikes the ear. Then the octave of the fundamental note predominates in a more agreeable tone, and, being remarkably prolonged, is heard at a greater distance.

THOMAS WALESBY.

THE SEWAGE QUESTION.

Cheltenham.—The Cheltenham Commissioners having recently completed work, and purchased a farm for the disposal of the town sewage, by irrigation, the first yearly letting of the irrigation land has just been effected by auction. The land is all ordinary grass land, to which, as yet, the sewage is but imperfectly applied, and comprises 110 acres. It was divided into six lots, which let at prices, varying from 5*l*. 18*s*. to 8*l*. 13*s*. per acre, and realising a total of nearly 900*l*. The yearly cost to the town for interest and repayment of loan in thirty years, is 1,100*l*.; so that, if the rent of land should remain stationary, the town would only be put to a cost of 200*l*. a year, and own the farm free, at the end of thirty years, as against an expense of nearly 1,000*l*. a year, before incurred, with very unsatisfactory results, for deodorising. But, in addition to the rent of the land, the Commissioners apply the sewage to adjacent farms, at a certain charge per acre, and have reserved for experiment several acres of their own land which have been broken up for rye grass, and are expected to realise a profit of at least 20*l*. an acre; so that the farm will probably be conducted without loss even during the first year.

Crewes.—At a meeting of the Local Board, the deputation appointed to visit Warwick, Rugby, and Banbury, reported the result of their observations of the sewage farms in those towns. Rugby, it was stated, has fifty-three acres under cultivation, irrigated by sewage amounting to 250,000 gallons per day, which is run over the land four times during the summer. Various vegetables and Italian rye grass are the crops produced. The farmer stated that he and his family, though living in the centre of the farm, enjoyed good health and experience no nuisance from the sewage. After visiting Leamington, where the A B C process is in operation, the deputation expressed an opinion that after the sewage had passed through the process, the effluent water is not pure enough to satisfy the complainants respecting Crewes. It was stated

that the Leamington authorities are about to abandon the A B C process in favour of irrigation. At Warwick, a farm of 108 acres of stiff soil was found under cultivation with rye grass, mangolds, potatoes, and other vegetables. When the farm was laid the land was drained, but as the drains proved injurious to the system they have been destroyed. The effluent water was found to be beautifully clear, and, in the opinion of the deputation, it was devoid of all chemical impurities. Here again, the farmer reports that he and his family enjoy good health. At Banbury, 136 acres of stiff soil are under cultivation. The cost of plant was about 5,000l., and the crops of the present year realised 1,400l., after five horses had been kept out of the produce. Although the land was drained, it was the opinion of the town officials that the drains were of no use. The report concluded by stating that the result of the visits was a confirmation of the report of the Royal Commission appointed to inquire into the subject, and the visitors expressed their opinion that irrigation is the only safe and permanently satisfactory method of dealing with town sewage.

Doncaster.—Mr. Rawlinson, C.E., who has been called in by the corporation of Doncaster, to consult with Mr. B. S. Brundell, C.E., of that town, as to the best means of applying the public sewage to purposes of irrigation, has visited Doncaster, and with the members of the estate committee, made an inspection of the several sites proposed. There were three in number, all within two or three miles of Doncaster, and all on estates the property of the corporation. Mr. Rawlinson, who was required to consider a report made by Mr. Brundell, as to the means of pumping and conveying the sewage, approved of that report in every respect save as to the lands to be irrigated. Mr. Brundell recommended a site on low ground at Sandall as involving the least cost. Mr. Rawlinson, however, expressed a strong preference for a site of about 100 acres, at Wheatley Hills, which he regarded as one of the most suitable he had ever seen. He will, however, make an official report. The scheme will involve a cost of nearly 20,000l., but the corporation appear fully reconciled to the outlay; indeed, it was Mr. Rawlinson's opinion that they would, in comparatively few years, reap a full return for their money. The work must necessarily be commenced almost at once.

Ashford.—A long report on the drainage of the town from Mr. Baldwin Latham has been read at a special meeting of the local Board. The existing sewerage was unhesitatingly condemned by Mr. Latham, and a new system recommended that would cost 10,500l., which, spread over thirty years, would involve an annual outlay of 640l., besides 250l. a year for pumping. About 400l. would be received for the sewage matter, which would leave 500l. to be made good. On the present rateable value of the property in the town this would be covered by a rate of 4d. in the pound. It was resolved to adjourn the consideration of the subject, and in the meantime the report of Mr. Latham is to be laid before the ratepayers, and a public meeting called to take the opinion of the town thereon.

Macclesfield.—In reference to certain remarks complimentary to the sanitary state of this town, delivered by local gentlemen at a lecture there, by Dr. Lankaster, on the laws of health, the *Macclesfield Courier* tells his townspeople some wholesome truths on the subject. The *Courier* says:—

"It is a very cruel awakening from such a dream of sanitary perfection to wake up and find such facts as the following staring them in the face:—

"Among the towns of highest mortality are Macclesfield, Runcorn, Kidderminster, Stoke-upon-Trent, Manchester, Wigan, Bolton, Huddersfield, Luddes, Swansea, where the mortality ranged from 235 in Reading to 270 in Exeter, and 318 in Halifax. These high rates of mortality should be inquired into by the local authorities." *Register General's Report for quarter ending June, 1871.*

The *Courier* has an article on the subject of the public health, based on these returns, and Macclesfield is again mentioned amongst the towns that have an unenviable notoriety for showing a high average death-rate. These remarks are, we hope, a too severe, comment on the congratulations of our local orators. It is pleasant to rob our town in a mantle of perfection, but justice demands that on so vitally important a question as the public health the truth should be known. There are three streets all thickly inhabited, and in the very centre of the town, where the drainage is so defective that the ground upon which the houses are built is alleged to be literally saturated with the sewage. If this is the case, and if the germ theory of disease to which our attention has recently been directed by Dr. Lankaster, is correct, the consequences to be apprehended from such a state of things is sufficiently serious. It is assuring to know, however, that the streets to which we have referred are the exception to the general system of

drainage of the town, which years ago was greatly improved, and placed upon what was then considered to be a satisfactory footing. The greater reason, therefore, that immediate attention should be given to the streets in question, so that the fair fame of the town shall not suffer from such exceptional blot upon it."

Ealing.—During the past twelve months a series of experiments has been carried on at the Ealing Sewage Works, to test the system there adopted for the purification of the sewage of Ealing. These experiments have been carried out by Mr. Jones, the local surveyor, under the superintendence of Professor Way, who, after paying more than thirty visits, has drawn up a most favourable report, which has been published by the Local Board authorities. The sewage of Ealing is dealt with by means of filter-beds. The precipitants employed are lime and a cheap salt of iron, the latter made on the premises by a process suggested by himself. With the lime is used a preparation of tar, but the chief effect in the clarification of the sewage is due to the lime and the iron salt. The water passes by upward filtration through two filter-beds. It is not for a moment asserted that the effluent water at the Ealing works is pure, and the only question is whether it is rendered so far free from offensive matter as to allow of its discharge into the Thames. Since the system has been in good working order he has considered the results to be very satisfactory.

Maldstone.—A lecture on "Sewage Irrigation" has been delivered before the Maldstone Farmers' Club, by Mr. Bailey Denton, C.E. With the exception of villages, public institutions, and isolated dwellings, where the dry-earth system may be adopted with advantage, Mr. Denton considers that there is no other treatment open to adoption than irrigation, if we are to do as the Legislature will shortly compel us to. We give a separate abstract, however, of Mr. Denton's paper on another page.

COLESHILL BUILDINGS, PIMLICO.

Sir,—I do at least expect fair play from the editor of the *Builder*. And I respectfully submit to your sense of justice that I have not had fair play rendered me by your report of the Colehill Buildings, Pimlico; for in the first place you state that my patent stone, which was used for chimney-pieces in the first built houses I erected for the company has been discontinued,* and in the next place that the stairs at Palmerston Buildings, four or five years old, appear much worn; statements evidently leading the public to believe that the company had been induced to abandon the use of the material as mantelpieces, and that the use of it as steps had proved a failure. In the first place, I may state that, so far from discontinuing it, I am still using my patent stone for chimney-pieces in the buildings for the company I am now constructing at Bethnal-green, and the opinion of the company respecting my material is thus expressed in the report that was distributed at the opening of the Colehill and Ebury Buildings. "One of the chief features in the construction of the Buildings is the use of the patent stone manufactured by Messrs. Allen & Son, of Tabernacle-walk, Finsbury. This material, which answers its purpose admirably, is used as lintels, arches, chimney-pieces, stairs, window dressings, and sills, &c." Regarding the wearing away of the steps in Palmerston Buildings, I must tell you that it is not my patent stone that has worn away, in the New York Herald, I recollect that I was requested to put in all the first buildings I erected for the company that have worn away, while my own material is as little worn as when it was first placed there. That this is a fact you can satisfy yourself by inspecting the first eight steps of the first block of the buildings in question, for they happen to be altogether composed of my patent material, and have the words "*Allen's Patent*" impressed thereon, and these very steps were used in the approach to the cottages at the late Exhibition, which were erected by the Central Cottage Improvement Company, and they are not the least worn, though, from being the lower steps leading from the street, they must necessarily have had the most traffic on them. I must also inform you that the company now have their steps altogether composed of my material, instead of being nosed with stone.

And now, passing from the stone material to the construction of the buildings, I beg to inform you that I am not disposed to relinquish my claim to the merit, or demerit, of being the originator of the general plan and arrangements of all the buildings hitherto constructed for the Company, and which may be best forwarded as the architects of them. If the design, plan, and construction of a building give any one the right of calling himself its architect, I respectfully submit that I am that one with respect to these buildings. In making my assertion is a true one, I beg to quote a passage from a speech made by Sir Sydney Waterlow, last year, at the Mansion House:—

"It was right he should explain that all the buildings hitherto erected had been conceived by Mr. M. Allen, the designer and builder of the first block of Langbourn's Buildings in 1863, the model upon which all the subsequent buildings had, with minor variations, been constructed. He was glad to be able to acknowledge publicly the obligations he was under to Mr. Allen for the unremitting attention he had given to the work of the Company since its formation, and for the great talent which he had consistently displayed in arranging the details of the buildings, prompted at all times solely by a desire to promote the interests of the Company, by increasing the economy and convenience of the tenants, frequently at increased cost to himself."

The buildings in Colehill-street are upon the same

* This is certainly the case in Colehill Buildings.

general plan Sir Sydney referred to, and which may be proved by examining the buildings I have built for the company from the first to the last, with the exception of a few minor details that Messrs. Beck & Lee have thought fit to add, such as the towers on the roof and their plan of ventilation.

I hope you will do me the justice of inserting this letter,
MATTHEW ALLEN.

ARCHITECTS CHARGES AND TERMS.

Sir,—As a contribution to the discussion respecting the property in architects' drawings, I send you a copy of the printed form of account I have used since the controversy commenced, and have added words in manuscript, which, in consequence of the decision in Ebdy v. McGowan, I shall insert in future accounts.

F. R. I. B. A.

N.B. The following charges are on the supposition that, according to the usual custom, all drawings and specifications (except those specially charged for to depositors), and the copyright thereof, remain the property of the architect. Or if you prefer it, they will be given up to you on payment of an additional 1 per cent. commission; £ s. d.

Preparing designs, contract and working drawings, and specifications, for the above undertakings; superintending the works, and adjusting the accounts, 5 per cent. commission on the total outlay, including the value of any old material reused, and of any material, labour, or goods supplied, which do not appear in the accounts	2	0	0
Negotiating and ordering painted glass not designed by me, 2 per cent. on cost	0	0	0
Preparing designs, contract drawings, and specifications, and obtaining tenders for works not carried out, 3 per cent. on the amount of lowest tender	0	0	0
Preparing designs, contract drawings, and specifications for works not tendered for, 2 per cent. on the amount of estimate	0	0	0
(N.B.—If employed to carry out the works mentioned in either of the last two clauses, the drawings will be at your disposal for the use of the builders, and the above charges relating thereto will be credited you as part of the full commission; or, if you prefer it, the drawings, &c., will be given up to you on payment of an additional 1 per cent. commission.)	0	0	0
Preparing bills of quantities for works not carried out which would have been paid for by the builder if carried out, 2 per cent. on the outlay, and cost of printing	0	0	0
Preparing drawings and notice to deposit with Boards of Health	0	0	0
Preparing drawings and notice to deposit with Society	0	0	0
Making alterations in drawings, &c., after being approved	0	0	0
Paid travelling expenses of the architect	0	0	0
Postages, parcels, telegrams, agreement, stamps, &c., will be given up to you on payment of an additional 1 per cent. commission.)	0	0	0
Payments on account of the work, as per vouchers	0	0	0

By cash received

Balance due

THE QUESTION OF QUANTITIES.

Sir,—In 1868 I sold ground for a public building, and tendered for the creation of the building on the same, under a City architect, Mr. E., who appointed a quantity clerk to take out the quantities in his office. The amount being more than the architect's estimate to the committee, on account of the amount of ball, were had recourse to. The work was proceeded with under the contract, and schedule list for the additions and omissions, with an understanding, that, on the completion of the job, the quantity clerk would measure up the work, and add or deduct as the case might be. On my applying to him, to know when he could come to measure up the work, I was told he could not until ordered to do so. I then, for the first time, asked him for the dimensions of the quantities, when he told me they were at the architect's office, where they were taken out, with the assistance of the architect's head clerk. I have made several applications, and my solicitors have written several times for these dimensions without any effect, and the only alternative I have is to use the quantity clerk for the deficient amount. This is the first time I ever was refused the dimensions or key to quantities, such refusal cannot surely be defended.

W. L. V.

METROPOLITAN RAILWAY SITES COMPETITION.

Sir,—Your correspondent "J. D. M." in your last week's issue, justly points out the waste of labour on the part of several of the competitors in sending detail plans and elevations which even they themselves cannot expect to be carried out, even should their general plans be adopted.

There is another fact, however, of much greater importance, to which the attention of whoever makes the award should be directed, namely, that some of the competitors have included in their plans adjoining properties which do not belong to the company.

In preparing plans for laying out estates like these, it is very convenient and easy on paper to shift a boundary a few feet more or less here and there, where necessary to obtain a good approach, or get over an inconvenient right of light or other difficulty; but it is needless to state that such plans are utterly useless for practical purposes, though acting greatly to the disadvantage of plans in which the proper boundaries, with all their attendant inconveniences are honestly adhered to.

It may be pleaded in excuse that "it is proposed that the additional property should be purchased;" but even should the company have the will (which at present I

should think very unlikely) and the powers to do so, I maintain that this is beside the question, the object being to obtain plans for laying out and utilising the surplus lands as they exist, or, in other words, to make the most of what the company have now got, and not go in for more extended land speculations, the success of which can easily be judged when the land has to be bought under compulsory powers, as would be necessary in this case.

L. N. G. A.

HALIFAX BUILDING SOCIETY'S OFFICES COMPETITION.

SIR,—I have refrained from writing concerning this matter, waiting to see what the directors' explanation of their conduct to me could be; and now I see what excuse they intend making for not only breaking faith with me after instructing me to prepare the drawings and specifications, but resolving to set my plans aside, without allowing me the opportunity, or even the drawings, to obtain tenders. I have received no remuneration, nor have I been satisfied in any way whatever; but have placed the matter in the hands of my solicitor.

F. W. HAGEM.

MEMBERS OF THE INSTITUTE AND THE PROFESSION.

SIR,—Will your esteemed correspondent oblige me by stating, in your next issue, whether he considers that "taking payment from builders for quantities" is an infringement of the rules of the Institute, which he is prepared to bring before the Council, on production of proof?

This would be no difficult matter; but to obtain positive evidence of taking commissions is much more so, as it is almost always done "under the rose," though, I have reason to think, it is more common than Mr. Donaldson appears to believe.

E.

RAILWAY COMPENSATIONS.

TODD V. THE METROPOLITAN DISTRICT RAILWAY COMPANY.

The plaintiff in this case (Court of Common Pleas) was a builder, and he sold to the defendants fifteen houses in Eccleston-place, Picnic, and also Stanley House, Milner-street, and the line was carried through this property in a cutting. The purchase-money was paid, but the plaintiff afterwards claimed further compensation upon the ground that his adjoining property had been "injuriously affected" and the compensation jury awarded him 200l. The present action was to enforce this finding.

Mr. Francis appeared for the plaintiff, and Mr. H. Lloyd, Q.C., and Mr. Harrison for the defendants.

It was stated that in making the railway pumping-engines were set up, and a large quantity of water was drawn off, and the consequence was that a settlement took place in the adjoining houses. The question was whether the plaintiff could legally claim compensation in respect of this settlement. One of the agreements stated that the sum originally paid was to be in full compensation for damage by severance and injury to adjoining land of the vendor, and "for otherwise injuriously affecting such adjoining land," and the other contained similar words.

After some discussion, it was agreed that the question was one of law, and it was arranged that a verdict should be entered for the plaintiff for 357l. 5s. 2d., subject to the opinion of the full court.

Mr. Francis hoped that as this claim was a small one the case would not be allowed to be carried beyond the Court of Common Pleas, for otherwise the plaintiff might be put to enormous expense.

Mr. Lloyd said that he could not consent to this course, because the question was a most important one, and the decision would affect many other claims.

His Lordship (Mr. Justice Smith) said that he could place no restriction upon the defendants.

TO REMOVE PAINT FROM STONE.

SIR,—I see in your last issue a question as to removing paint from stonework. During the past summer, in restoring a church, under Mr. Norton, I had to clean a pulpit and sedilia in which the carving and tracery were almost filled up with successive coats of paint. I was informed that common washing soda, dissolved in boiling water, and applied hot, would remove it. I found that 3lb. of soda (cost 2½d.) to a gallon of water, laid on with a common paint-brush, answered the purpose admirably, softening the paint in a short time, so that it was easily removed with a stiff scrubbing-brush; afterwards, on adding a few ounces of potash to the solution, it softened more readily than with soda only. The stone in both cases was a fine freestone, not unlike Caen. If your correspondent will give this a trial, he cannot fail to be satisfied with the result.

S. B. BURTON.

SIR,—If your correspondent, "N.," can place the font, &c., in a solution of pearlash, or common potash, he will find the paint softened in a few hours, which must be carefully cleaned off, and the font placed in the solution again if necessary. The time and expense depend on the number of coats of paint to take off; if the solution be applied hot so much the better. I have had it used to clean paint off fonts and other stonework, several times effectually.

J. E.

TOUTING.

SIR,—A letter received by a client, which I inclose, has led me to consider whether the "trade" of an architect is not capable of still further development than the writer seems to imagine.

The announcement of periodical visits, with "plans of all kinds ready prepared," might be improved by having, as is the custom with many travelling artists in the circus and show line, an agent in advance, who might have some striking illustrations (not to say placards), to prepare the public mind for the arrival of the great principal, with his sample-sheet of plans.

AN ARCHITECT.

SIR,—Having occasion to travel by the Railway every fortnight into Pembrokeshire, I am in a position to undertake professional work in your district, and properly superintend it, and so save my clients running up the always unwelcome and sometimes heavy extra account for "travelling expenses."

An experience of some fifteen years in restoring churches, and erecting houses and schools in various parts of England and Wales, will enable me to furnish (if desired) plenty of references. Any information, too, respecting the dates of my journeys I shall be happy to furnish on application.

As I cannot write many of these letters, perhaps you will kindly acquaint your neighbours with the chance afforded them now, I suspect, for the first time, of securing cheaply all the advantages commonly resulting from the employment of a "resident architect."

As to schools,—

"I have plans of all kinds ready prepared."

* * We have received a copy of this letter from four correspondents.

THE BINGLEY SEWERAGE SCHEME.

A BRADFORD local journal thus writes of what it terms "A Novel Sewerage Method" :—

"The Bingley Local Board of Health have been placed in a peculiar position by the Home Office. The Board experienced some difficulty in providing for the drainage of the town, and brought their difficulties under the notice of the authorities in London. A memorial was prepared, and in it a suggestion was made that it was desirable to hold a local inquiry in order to reconcile certain differences of the parties interested. The Home Secretary sent down Mr. Robert Morgan in September last; and he has reported to Mr. Bruce that sewers should be constructed throughout a good part of the town at a sufficient depth to prevent all sewage matter from entering the streams or watercourses, such sewers to convey all sewage matter to land suitable for its utilisation by irrigation. The Bingley Local Board have decided to carry out the scheme."

We would remind our friends in Bingley and elsewhere that the above "novel method" is in no ways novel. We will repeat that, until all sewage matter is kept clear from dilution by the ordinary surface water and rain-pour of our towns and cities, the wild waste of valuable fertilising agents will go on unchecked, and sewage can never be properly or profitably utilised for irrigation purposes.

HOTELS.

THERE are two classes of hotels; the one class devoted to purposes of recreation, the other to those of business; the former situated more particularly at seaside or inland watering-places, the latter in towns. It is with the first of these two classes, in their arrangements and administration, that the following remarks propose to deal.

During the last few years large sums of money have been spent in the erection of hotels, the sites being chosen with the nicest discrimination, so that the natural beauties of the situations may be seen to their greatest advantage; and the utmost facilities have been offered by railways for getting to them. Internally all the modern appliances for ensuring comfort have been adopted, and Art has lent her aid to throw a charm over the whole, in order that the most fastidious taste should be gratified. Now, how is it that, possessing all these undoubted advantages, the shareholders in these concerns, in such a large proportion of instances, have such a meagre return for the money they have invested?

One fundamental error which runs through the whole is that of taking a wrong model for a basis on which to work out the design. This model is that of the club. A very short consideration shows that the two establishments, the club and the hotel, have in their purposes very diverse requirements. In the one case all the members are, or can be, known to one another. Not so in the other: a permanent as against a temporary interest. The same social status of the members in the one; not generally

so in the other. Publicity in a club; privacy in a hotel, all the more urgent in this case, where females, either with their families or without them, may be inmates. In a club, too, a home for one large family, so to say, is the guiding principle; whereas, in a hotel, it is that of distinct homes for many families accidentally brought together. This distinction in principle gives an advantage to the treatment of a club façade in its simplicity and in the dignity it derives from its suite of state rooms, these qualities being entirely wanting in the hotel. Here we have a vast aggregation of small rooms, with small window openings, possessing neither dignity nor repose.

The windows look like pigeon-holes in contrast with the bulk of the façade, and looking more and more so as the size of the elevation is increased. This appears bad enough in towns, but in the country, among scenes of beauty, it is intensely discordant. And as there are so many shareholders in these concerns, it is sad to reflect that for so many a shadow must be cast over some of our fairest scenes, when perhaps in turning from the contemplation of some old ruin or glorious landscape, their eyes should alight on the gaunt mass of the "Hotel Company, Limited," their day-dreams vanish, and they are brought down to the sordid cares of life again in reflecting how, to raise this pile, so much money has gone from their pockets, which "place shall know it no more for ever."

Now this obtruding of itself so prominently, one might almost say vulgarly, in the landscape is a great eyesore, and ought to be remedied, and the direction the remedy ought to take should be towards the principles which prevail in the development of villages. These are never an eyesore, but lend a human interest to every scene. In fact, these institutions should be pleasure villages, not palaces. Upon this principle, too, we should avoid over-building, as unfortunately happens much too frequently at present, as if indeed numerous rooms could bring numerous customers. Like villages, they should grow as the requirements of visitors demanded. Of what earthly use is an empty hotel? Its internal arrangements are not such as to suit a private family, however large or important. We have one now in our recollection which was typical, being grand and nearly always empty, and those who have experienced it only know how dreadfully depressing these large hotels are when in this condition. One feels subdued and ready to apologise to the waiters for bringing them through such a long perspective of corridors to wait on our insignificant selves, and when the bill comes we hesitate to demur to a few pounds extra charge, from a feeling that we should be out of keeping with the surrounding magnificence. Well, this hotel's ultimate destiny was frequently canvassed, and being at a port, the only thing that looked at all feasible was to make it a granary.

How many of these evils would be avoided if in designing these establishments the palatial style were abandoned and a more rural one adopted? They should be built in independent sections, to form houses or suites of apartments, but all united with one central department. This department should contain the hotel coffee-rooms, reading and billiard rooms, smoking-rooms, baths, &c., and the enjoyment of these should be at the option of the tenants. Parties should be able to take apartments or houses, with service from the central department or of their own bringing, as they wished. It should be competent for them to buy all necessities at the central department, instead of having to seek them at a distance, and have all cooking done at their own place or at head-quarters, as they should prefer. Many, too, resort to hotels to be restored to health, because there they find many conveniences which the ordinary frowny lodging does not possess; but it would facilitate their recovery if they could enjoy these advantages without at the same time participating in the noise and bustle of the surroundings.

This mode of arrangement would likewise be of great advantage to those who like a "little place out of town," who, overworked in town, like to get away for a little quiet at odd moments and for short periods, but who find the cost and care of such a place, when temporarily unoccupied, a great bar to its enjoyment; it would enable them to take apartments or a house permanently, and to furnish it themselves; and when unoccupied, it might be left in charge of the central administration. No notice need be given of their intention to occupy their places,

as they would be always in a fit state, and, of course, meals, stores, &c., could be had on the spot. There is no doubt, too, that much is lost by the absence of that personal intercourse between customer and landlord which existed at the old inns. This intercourse might be revived by sub-letting the house to others who would take them as a matter of speculation, and who would naturally do their utmost to work up a connexion, and by personal exertion and courtesy induce their customers to repeat their visits. Above all, the surroundings should be more homely: people pay for recreation, not magnificence, when they take their holidays. But as it is at present, empty rooms, unused furniture, unemployed servants must be paid for somehow; and if the money is not got out of grumbling customers, it must be out of grumbling shareholders. The hotel system as at present developed is manifestly not suited to the English character, and it is with a view to suggesting a way by which these two might be brought into harmony that the above remarks have been written.

I.

LETTERING ON STONE.

Your correspondent, "J. M.," if living in a large town, would probably do best to buy his black paint ready prepared for lettering, it being kept by many oil and colour men; and, as far as my experience goes, is the custom. To prevent the oil running into the stone, let him give the letters a coat of gold size before blacking them. If marble, isinglass should be used.

S. B. B.

THE "BUILDER" LIFEBOAT.

SIR,—I was pleased to see in your paper of last week, a letter from a correspondent, suggesting that a fund should be raised, amongst those connected with the building trade, for the purpose of purchasing a lifeboat, to be presented to the Royal National Lifeboat Institution. As he says,—"Lifeboats have been presented to it by many leading professions and trades, and as the building trade is so largely represented, I sincerely hope that his project may be fulfilled. The cost of a lifeboat, boat-house, transporting, mooring, and all appurtenances, is about 700*l*."

The present fleet of lifeboats now belonging to the Institution amounts in value to 223, and the expenses of keeping it up are of course considerable. N. W.

A BUILDER'S CHARGE FOR MAKING ESTIMATE.

THE case heard at the County Court, *Lewes, v. James Peerless v. Countess De Noailles*, was a claim of 50*l*. on the part of Mr. James Peerless, builder and surveyor, of Eastbourne, against the defendant, occupying Holywell Lodge. Mr. Campion Cole was for the plaintiff, and Mr. Stiff for the defence. It appeared that last year the Countess was desirous of making some alterations to her house; and, in consequence, her architect, Mr. Rumble, waited on the plaintiff with instructions for him to prepare a detailed estimate. He did so, but the work was not given to him; it was carried out by Mr. Houseman. Consequently, plaintiff charged for his labour in preparing the estimate some per cent. on the proposed outlay, which, with some minor charges for other matters, amounted to 50*l*. Mr. Stiff said he could prove that the plaintiff sometimes prepared estimates, and made no charge, whether he got the work or not. The judge, Mr. Furner, said if plaintiff chose to do so that was entirely at his own option. He had, no doubt, a right to charge a fair sum for his labour. Mr. Rumble, Mr. Henry Card, County Surveyor for East Sussex, and Mr. Charles J. Berry, surveyor, of Lewes, were called, and proved that they had looked over the estimate, and considered 2 per cent. to be a fair and moderate charge. The judge gave an verdict for plaintiff for the amount claimed, except 4*l*. paid into court.

THE LATE MR. DALE, ARCHITECT.

SIR,—As an old and constant subscriber to your valuable journal, and being to a certain extent connected with a subject which has lately engrossed the attention of some of your correspondents, culminating last week in an editorial comment on Mr. Dale, the architect, of St. James's Gate, St. James's Park (as also connected therewith), I consider it my duty to apologise you that, to the great grief of his family and a large circle of friends, that gentleman, after a short, painful illness, departed this life on Saturday, the 10th inst., at his residence in Warwick-square, S.W. He was at

business up to the middle of the week, although very unwell, when his medical advisers enjoined perfect rest, quiet, and freedom from any excitement; but it was in vain. To me, in a business view, it is a source of considerable trouble and anxiety, as he was most active, energetic, and attentive to the matters he had in hand in all their details.

I have, Sir, myself refrained hitherto from all participation in the recent correspondence on the so justly called "Erroneous Estimating," but hope to have your permission to join in it when the proper time arrives.

HENRY R. WAGNER.

17, Palace-street, Buckingham Gate.

LES DEUX CHEVAUX DE BRONZE.

AN OVERTURE.

The humble petition of the two Horses appointed to bear the effigies of our beloved Queen and lamented Prince Consort respectively, of late established in front of the building known as St. George's Hall, in the borough of Liverpool, to the most respected the Editor of the *Builder*, sheweth:—

That your petitioners understand that they are placed in their present position by the Town Council.

That they are unaware of the nature of a Town Council, but suppose it to be a contrivance for putting up statues; only in that case they wonder it has never been used for putting up any on the building behind them, which they hear say is woefully bare of such adornments.

That your petitioners, being loyal quadrupeds, will say nothing touching the aspect of the Royal images which they bear, opining, indeed, that there is very little to be said thereon; but that as regards themselves, being conscious that they are but shady-looking brutes, of unconscionable size and questionable anatomy, they feel acutely that they have been made unwilling agents in defacing the aspect and obscuring the view of the noble building against which they are backed.

That your petitioners are placed upon unsightly pedestals so high that any one coming near enough to examine the features of the Royal effigies can see nothing of your petitioners but the under part of the belly, &c., and that your petitioners have a decided objection to being studied from such a point of view.

That your petitioners' tails are switched out behind in an absurd and preposterous manner.

That your petitioners are on these grounds the subject of comment and ridicule on the part of all sensible people.

That your petitioners have heard of the lion lying down with the lamb, but respectfully submit that this is no precedent for two horses standing up with four lions, all of row.

That your petitioners are altogether in the wrong shop, and feel excessively foolish.

That in view of the foregoing facts, your petitioners humbly beg that you will graciously use your influence, which they understand is considerable in such matters, to the end that the aforesaid Town Council may be made use of in transporting them to some suitable situations, where they may appear as the principal objects of attraction, instead of being eclipsed by a great building behind them, and getting abused for spoiling its appearance; and that they may be placed upon fitting pedestals of a decorous height.

And your petitioners shall ever neigh, &c.

Given from the Menagerie, in front of St. George's Hall, in the borough of Liverpool.

THE ROYAL ACADEMY MEDALS.

ON Saturday evening, the 10th inst., Sir Francis Grant, as president, gave the medals to the successful students as follow:—Painting from the life, Mr. Frederick Cottman; drawing from the life, Mr. Douglas Miller; drawing from the antique, Mr. E. Hughes; best restoration from the antique, Mr. Abel Thorneycroft; best copy from a painting from an old master—Reynolds's Sir William Chambers—Mr. William Gair; architectural travelling studentship, Mr. Walter Lonsdale, for a design for a national mausoleum; best architectural drawing, Mr. Henry Hall; best model from the antique, Mr. Abel Thorneycroft; and the premium of 10*l*. for the best drawing from the life done at the Academy during the present year, Mr. F. Cottman.

In the course of his address, the president

expressed regret that the year's work, in the opinion of the council, was not up to the mark; the contests for most of the prizes were disproportionate to the numerical strength of the schools of the Royal Academy. Still, several of the students' efforts were of a highly creditable description. It was lamentable that one of the architectural prizes should have failed to induce more than one student to compete. The president then adverted to the forthcoming exhibition of the works of the old masters as one to which the students ought to pay frequent visits. It would far surpass the previous exhibition, interesting and successful as that had proved. Her Majesty had graciously promised to contribute some of the choicest of the works contained in the Royal Galleries, and the exhibition would be further enriched by contributions from the Earl of Dudley, the Marquis of Westminster, and other gentlemen. The exhibition would also contain a number of noble works by deceased members of the Royal Academy.

SCHOOLS OF ART AND OF SCIENCE.

The Leeds Schools of Art and Science.—The proceedings in connexion with the annual distribution of prizes and certificates gained by the students took this year the form of a *conversazione* and public meeting in the Mechanics' Institute, Cookridge-street. In carrying out the former the picture-gallery and the whole of the spacious class-rooms were called into requisition for the exhibition of works of art and antiquities. The attendance of the students and their friends, and of the general public, was exceedingly large, and the greatest possible interest being manifested in the exhibition. The public meeting for the distribution of prizes was held in the hall of the Institute. Amongst those present on the platform were Lord Houghton, Mr. J. D. Lubcock (president of the institution), Sir Andrew Fairbairn, Mr. E. Baines, M.P., and others. Lord Houghton took the chair. The report said:—

"The committee have pleasure in presenting the following particulars of the art and science classes during the past year:—

The art classes have made great progress under Dr. Puckett, and the number of pupils has considerably increased.

	1869.	1870.
Number of pupils who have attended during the year	255	328

showing an increase of 71 pupils. These numbers are exclusive of those pupils taught in the day schools. The number of pupils at present under instruction in art in the boys' school, 90; girls' school, 146—total, 236: thus making a total of 562 pupils under instruction of the art masters in this institution. The average attendance in the School of Art during the past quarter has been 120. The number of students who have entered for the present quarter being 210, against 165 in the same quarter of 1869—an increase of 45 pupils.

The science classes have been held in inorganic chemistry, organic chemistry, metallurgy, mathematics, and theoretical mechanics, in addition to the subjects taught in the School of Art, practical, plane, and solid geometry, machine construction and drawing, and building construction.

	1869.	1870.
No. of students obtaining certificates	38	41
No. of Queen's Prizes	8	15
No. of Certificates	76	97
No. of Medals	silver, bronze silver bronze	
	2	1

Lord Houghton said:—In the prizes which I have to distribute this evening, I would lay especial stress upon those which have regard to the study of science, because what we call science is, in fact, knowledge. The words are really the same. The entire difference between a boy who presents himself at any one of your great manufactories and asks for employment, and who has had, say, a scientific education, and one who has not, is, that the one who has had a scientific education even of the most elementary character knows where to put his hand; he knows the relation—at least, if he does not know all the circumstances connected with the machine that he sees before him, he has got elements from which practice will make him learn, and he has the foundation of thought, and the habit of connecting one fact with another. I have also to distribute prizes connected with art; and here you get into a totally different order of thought, and a totally different series of objects and of purposes. You see a picture or a drawing before you, and you ask, "What is the use of it?" The only way to show the use of it is to suppose there is something in the human mind, some interest which is natural to mankind, which makes this thing matter of use. I have no doubt to an Ashantee savage there would be no use whatever in a picture except the peculi-

arity of bright colour which might please his eye; and therefore a picture in which there was nothing but bright reds and yellows would be the thing he would like the best. But art grows up in the human mind with civilisation. It grows up very unequally. Some nations develop it very early, and develop it in the most extraordinary manner, as the old Greeks did—a little people—the whole population not much larger than that of the town of Leeds, and yet who developed in a couple of hundred years or less more art than has been developed in the whole world perhaps before or since, and has left models which you have got in your room there, and which you look upon every day with pleasure. But this sentiment of art remains perpetual in the human breast. The young poet, Keats, who you know was a chemist's apprentice, a man of no particular culture or education, except what his own wonderful development gave him, began his greatest poem with this line, "A thing of beauty is a joy for ever." The line was laughed at very much at the time. All the fine critics said it was a ridiculous thing. The poor boy was hunted down. He had a bad constitution, and he died young, and was said to be "done to death" by the critics. Not that I believe that, for he was rather a brave fellow than not. But one day when I was at the Manchester Exhibition, where were collected together all the most wonderful works of art that England could produce, it struck me as very interesting that the gentlemen who collected together that great exhibition could find no better sentence to put over the great gateway of it than the first line of the poor young chemist boy's poem,—

"A thing of beauty is a joy for ever."

And the reason why that line will live as long as the English language lasts is that it is thoroughly and simply true.

The Peninsula School of Science and Art.—The numerous friends and patrons of this school, with relatives and well-wishers of the students, assembled in the studio at Regent House, to witness the ceremony of giving prizes to the pupils for the past year. The mayor presided. The report said:—

"Your committee have pleasure in stating that, after having paid off the contract for enlarging the school accommodation, they find the school-treasury is but £7.2s.6d. in debt to the treasurer—a debt which it is trusted will soon be discharged."

The number of students slightly decreases from the reporting of last year, but the same ought perhaps to be accounted for by a remembrance of the remarkably fine season through which we have lately passed; the influence of which certainly did not tend to compact school-classes. At present, the head master states that the classes are filling up exceedingly well.

In art, the number of prizes is the same as that of last year, but in science, though we have to report only one prize taken, yet, on the whole, the result is satisfactory."

The Bristol School of Art.—The prizes and certificates awarded by the Science and Art Department at the last examination of this school were publicly distributed at the Fine Arts Academy by Mr. Gambier Parry, of Highmore-court, near Gloucester. Mr. P. W. S. Miles presided, and there was a very large attendance. The president remarked that the school had done exceedingly well during the past year, two Queen's and many other good prizes having been gained by the pupils, whilst the works of twenty pupils had been retained at Kensington to be put in competition for the gold medal. He said the institution was hampered with a debt of £50L, and that whilst schools of art were assisted in other towns by the municipal authorities, nothing was done for that school by the corporation. Mr. Parry then delivered a very able address upon the advantages of art study. He spoke strongly of the necessity of studying art thoroughly, as calculated to benefit England morally and pecuniarily; and, in reference to our schools of art, said the system that had been adopted was very good up to a certain point: the elementary teaching was very good, but the advanced teaching was very inferior, and the highly advanced almost non-existent. France and Germany had entirely beaten us in the matter of art, because they had gone more pertinaciously on to a thoroughly complete course. They had laid great stress on the technical elementary beginning of art, and had gone at once into the higher branches. It was to this, if the English as a nation would excel, that they must pay attention. After the distribution of the prizes, thanks were voted to the president, to Mr. Parry, and to the head-master of the school, Mr. Smith.

Newcastle-under-Lyne School of Art.—The

annual meeting of this institution was held in the Guildhall, the Rev. L. T. Stamer, bart., presiding. The seventeenth annual report of the school was read by Mr. Earl, the secretary. It spoke satisfactorily of the advance of the school, an increase both in attendance and results being recorded. The pecuniary support given was, however, so small as to greatly cripple its efforts, and diminish its usefulness; and so long as the income barely met the expenses the committee would be unable to offer local prizes, and would have to depend entirely upon the Science and Art Department. The financial statement showed a small balance in the treasurer's hand. The report of the master stated that the school continued to progress, and that at the annual examination in March last, 22 students were examined, of whom 11 passed, and three won prizes. The drawings of 39 students were forwarded in April, in national competition, of which those of 37 were satisfactory, and 4 prizes were awarded. In addition, H. Baggeley obtained a free studentship, and W. P. Rhodes a national scholarship. This school competed for the bourses offered by the Department to the schools which had made the greatest progress, 100 schools competing, and Mr. Bacon, the master, received an award of 10L.

CHURCH-BUILDING NEWS.

Chaldon.—The ancient parish church of Chaldon, after undergoing a restoration, has been reopened by the Bishop of Winchester. As was announced some time ago, when the work was commenced, some wall paintings were discovered in the west end of the chancel, representing the future world. They are supposed to be some of the finest in England, and, under the care of the Surrey Archaeological Society, have been carefully preserved.

Tunbridge Wells.—The new church of St. Stephen has been opened, by special license from the Archbishop of Canterbury. The building has been erected by the Rev. H. W. Hitchcock, as a mission church, in which the founder himself will minister. The architecture is what may be termed Domestic Gothic, and the edifice contains about 230 sittings, the contract price being £70L, but this does not of course represent the whole cost, inasmuch as there are the fittings, the organ, and other addenda. The church is composed of red brick with tile facings; it has an arch-timbered roof, and it is lighted with dormer windows at the sides, and two large ones at both ends, consisting of cathedral glass,—rough British plate. The east window is of stained glass, by Messrs. Heaton, Butler, & Bayne, and is of an ornamental character, in which the central figure is the Redeemer, portrayed as the Good Shepherd. All the seats, which are of stained deal, are free. The building is heated by means of a stove (by Parrett), which is placed underneath the centre aisle. The nave is 44 ft. long and 24 ft. wide. There is a chancel, the roof being painted with an occasional text of Scripture introduced. The pavement is of Maw's tessellated tiles. The gas-fittings were supplied by Messrs. Hart & Co., of London. The church, which is in the form of a cross, was built by Messrs. Edward Wheatley & Sons, of Tunbridge, from the designs of Mr. A. C. Blomfield, of London; Mr. Wright being the resident architect.

Highclere.—As we announced some weeks ago, the new parish church at Highclere was consecrated and opened at the end of last month.

Bristol.—The corner stone of the new church of St. Mary, Tyndall's Park, has been laid. When erected, it will take the place of the iron structure in which the Rev. W. F. Bryant has ministered during the last few years. Under the present contract only a portion of the work will be proceeded with. The contract price for this section of the building, which is to be erected by Mr. J. Diment, is £80L, and it includes the chancel, the transept, and two bays of the nave, besides a vestry-room for the clergy, and a vestry for the choir. The church will be built in the Decorated style of the middle of the fourteenth century. It will accommodate 720 persons comfortably, which may be increased to 750 by the introduction of chairs when extra accommodation may be required. The whole of the sittings will be free. The edifice will consist of a chancel, 40 ft. in length, a transept on each side of the chancel, and a nave, which will have two aisles. The nave will be 84 ft. 6 in. long, and 26 ft. wide. The aisles will be 12 ft. wide. The great inequality of the ground towards the south affords

means for introducing a couple of vestries, a priests' vestry, and a choir vestry, underneath; and a wide staircase will be provided at the east end of the church, which will bring the clergy and choir up to the south transept, from which they will pass into the chancel. The transepts will be at right angles with the choir, and there will be a considerable clearstory and a steeple at the west end of the north aisle. It is hoped that funds will be forthcoming to commence the second part of the building immediately after the completion of the first; but as the total cost of the church will be between 8,000L. and 9,000L., the period of the completion of the edifice is problematical.

Great Burstead, Billericay.—An improvement has been effected in the interior of the parish church. The long-condemned gallery, in which the organ was placed, has, with the pews underneath it, been removed, and the organ has been renovated and re-erected beneath in an organ-chamber, elevated about two feet from the ground, and a little in advance of the western arch, by Messrs. Bryceson & Co., of London. It is hoped that this first step in the right direction will be followed, if not by the repewing of the church, at any rate by the cutting down of the present high pews, and the placing of the pulpit and desk in a more eligible position.

Arncliffe Hall.—The foundation-stone of a new church at Arncliffe Hall has been laid by the Bishop of Ripon. The building is to replace a temporary one erected under the auspices of the Leeds Church Extension Society, and will cost between 3,000L. and 4,000L.

Duffryn, near Neath.—The foundation-stone of the new church of St. Matthew, for the benefit of the outlying parts of the parishes of Cadoxton and Skewen has been laid.

Radcliffe.—The parish church has been reopened for Divine service. In the spring of this year the roof (an open-timbered one), had given unmistakable signs of being in a dangerous state, and the churchwardens determined upon its restoration. The clearstory walls were also in a dilapidated condition, and it was found necessary to rebuild them. The dilapidated condition of the clearstory was in great part due to the interments which (most of them long ago) had taken place around the nave pillars, by the graves being actually below their foundations. Care has been taken to preserve, where practicable, the ancient features of the roof. It consists of four "principal beams," panelled and moulded, having in the centre angles with outspread wings, and holding the emblems of Faith, Hope, Charity, &c. The plumber's work has been executed by Mrs. Colley, of Radcliffe Bridge, and the masonry by Messrs. Hall & Ogden, of Bury. The work has been carried out under the superintendence of the architects, Messrs. Medland & Henry Taylor, of Manchester.

Woodlesford.—At Woodlesford, near Leeds, a new church, dedicated to All Saints, has been consecrated by the Bishop of Ripon. The church is in the fourteenth-century period of Gothic, and from the hill on the south and east is a very conspicuous object. The tower is on the south side, adjoining the transept, with stone staircase to bell-chamber, containing peal of six bells by Messrs. Mears & Stainbank, of London. The spire rises to 140 ft., including iron vanes. The material used is Oulton stone. The interior is divided into nave, chancel, north and south transept, vestry on the north side, adjoining the north transept, organ-chapel under the tower, and south porch. The east window is a four-light, the head being in three quatrefoil openings, and is filled with stained glass by Ward & Hughes, of London. The north and south chancel windows are each two-light with trefoil heads, and are filled with stained glass by Lavers, Barrard, & Westlake, of London. The transept windows are three-light, with rose windows over. The windows to nave are two-light with tracery heads, &c. The west window is three single lights, with trefoil heads, and rose windows over, and are filled with stained glass. The entrance is through the south porch. Massive arches, supported on Caen stone caps and corbels, and red Devonshire marble shafts, separate the chancel and nave, and nave from transepts, organ chapel, and vestry. The nave roof is open-timbered, boarded, stained and varnished; and the curved principals are supported on Caen stone caps, red stone octagonal shafts, and carved Caen stone corbels, with figures of the prophets, &c. The chancel roof is similar to the nave, and the principals are supported on Caen stone caps, red marble shafts

and Caen stone corbels of the evangelists, &c. The chancel and sacristy are laid with encaustic tiles by Minton, Hollins, & Co. The seats to nave and transeps are of deal, stained and varnished. The choir seats and priests' stalls are of oak. The chancel is faced with cleaned stone inside, and the nave and transept walls are plastered and colour washed. A Caen stone low wall, pierced with quatrefoils, divides the nave from the chancel. The screens to the vestry and organ are of pitch pine, varnished. The pulpit is of Caen stone, with carved caps, red and green shafts of Irish marble, bases, moulded and carved cornice. There are five panels, three of which are sculptured, representing the Transfiguration, Christ's Charge to St. Peter, and the Pelican and Young. The font is circular, of Caen stone, with moulded caps and bases, and red and green marble shafts, and has four circular carved panels, the chief one being the Agnus Dei. A raised gilded text runs round the font. The carved corbels to chancel arch are angels playing harps and trumpets, which are gilded. The general carving, and font and pulpit, were executed from the drawings of the architects, by Mr. Charles Mawer, of Leeds; and all the interior carving is in Caen stone. The brass fittings were supplied by Hart, Son, Peard, & Co., of London. The general contractors were:—Mason, Thomas Burton, Methley, Joiner, George Lockwood, Woodlesford; slater, Watson & Wormald; plumber, Joseph Lindley; painters, Wood & Son; plasterer, James Brantnor, all of Leeds. The church is heated by hot water. The organ was executed by Radcliffe & Sagar, of Leeds. The cost of all, including organ, was £4,500. The architects were Messrs. Perkin & Son, of Leeds.

Stourbridge.—St. Mark's Church, Stamberhill, has been consecrated. Mr. T. Smith, of Stourbridge, architect, prepared the plans for the church, with 400 sittings, which plans were adopted, and the estimates of Mr. Hurton, builder, of Brierley-hill, were accepted. The cost of the work was estimated at under 2,000l., but the extra expenses attendant on the site, levelling, building boundary walls, warming and lighting, &c., brought the total to 3,000l. in round numbers. The memorial stone was laid by Lady Lyttelton in November, 1869. The fabric is of brick, with freestone facings. It has a nave with aisles, and an apsidal chancel, with vestry on its north side; five pointed arches on each side of the nave separate it from the aisles, which arches are supported by iron columns with Early English foliage on their caps. A series of small cinquefoil windows ranges along at the spring of the nave roof, and the ceiling throughout is of open timber-work, deeply pitched, and bound with iron rods to protect it from any settlement which might be occasioned to the building by the mines in the vicinity. In the aisles are single-light windows, while those of the apse are two-lights, the central east window being of stained glass, by Messrs. Ward & Hughes, of London. It represents the Crucifixion and Resurrection, the Good Shepherd, and the Sower of the Seed. The other windows of the apse will, no doubt be, by and by, similarly adorned, and the blank walls beneath covered with a reredos and mural painting. The seats are of varnished deal and open, and red and blue tiles are laid on the floor. The principal porch is on the north side of the nave, and there is a door at the west end, and one to the vestry.

FROM IRELAND.

Dublin.—New offices have been built for the English and Scottish Law Life Assurance Company, at No. 41, Lower Sackville-street, by Messrs. Coakburn & Sons, builders, from designs by Mr. William Sterling, architect. The style adopted is Italian. The materials used are Portland and Bath stone. The treatment of the ground story was suggested by the advantages to be derived by the throwing back of the main offices from the footway, and thereby relieving the officials from the noise and interruption attendant on being brought too close to leading thoroughfares. The basement story is divided into well lighted and ventilated offices, which a distinct entrance is gained by a flight of steps. This was effected by making a Doric column of Portland stone support a main front wall, and thereby leaving a porch, within which the eastern windows of the principal offices and the hall door are placed. The chimney-pieces, superb gas-fittings, grates,

&c., were supplied by Messrs. Hodges; the encaustic tiles and embossed glass were procured at the establishment of Messrs. Sibthorp. The cost of the structure was 4,000l.

Holywood.—The Belfast News Letter reports the laying of the foundation stones of a Methodist church and school-house, in this small town. The new church is to be erected in the modern Gothic style of architecture, of fine red brick, with Scabro string-courses or facings. It is to be 60 ft. in length by 40 ft. broad, and will accommodate 380 sitters. The fittings and internal arrangements are to be constructed on the most improved system. The cost of the building is estimated at 1,800l. The plans and specifications were provided by Mr. Jas. Kendal, the builder being Mr. William Nimmo.

Books Received.

A Book of Memories of Great Men and Women of the Age, from Personal Acquaintance. By S. G. HALL, F.S.A. London: Virtue & Co. 1870.

WHEN Mr. Carter Hall first gave the public, from a lecturer's platform, some of his recollections of the many eminent men and women he had known during a long and laborious literary life, we told our readers of the deeply-interesting nature of his discourse, and pointed out the exceptional circumstances which had enabled him to speak of so many with intimate knowledge. The lectures were elaborated, and were published in the *Art Journal*. Still finding favour, additional memories have been recorded: the previous notices enlarged, and, illustrated with portraits and numerous other illustrations, they have now taken the shape of a beautiful volume, full of interest, and destined to live. Let us dip into it for a few quotations. Mr. Hall is always happiest when he is praising. Thus, when speaking of Moore,—"His stern independence might have yielded to temptations such as few receive and very few resist: he preserved it to the last, under circumstances such as any of his many great and wealthy friends would have called 'poverty.' Of luxuries, from the commencement of his career to its close, he had literally none. His necessities were at times severe, but they were never published to the world,—nay, were never obtruded even on those who could, and certainly would, have made them less. In all the relations of life he was faithful, affectionate, and considerate. 'At home' he was ever loving and beloved; there he was happiest by rendering his limited circle happy. Let it be inscribed on his tomb, that ever, amid privations and temptations, the allurements of grandeur and the suggestions of poverty, he preserved his self-respect; bequeathing no property, but leaving no debts; having had no 'testimonial' of acknowledgment or reward; seeking none,—nay, avoiding any; making millions his debtors for intense delight, and acknowledging himself paid by the poet's mead, the tribute of a smile." Never truckling to power; labouring ardently and honestly for his political faith, but never lending to party that which was meant for mankind; proud, and rightly proud, of his self-obtained position; but neither scorning nor slighting the humble root from which he sprang."

We read with regret that a marble slab recording the date of the poet's birth, and placed by Mr. Hall on the front of the house, No. 12, Angier-street, Dublin, where the poet was born, has been taken down by the present occupant! It is just now proposed (let us say by the way), if a small sum of money can be raised, to erect a memorial window to Moore in Bromham Church, under the shadow of whose walls his remains, with those of his wife, now rest.

Mr. Hall records the burial of Thomas Campbell. In the Jerusalem Chamber, famous for centuries—memories inscribed on every dark oak panel of that solemn room for the mind's eye to read, they waited the coming of the dead!—illustrious mourners many of them, whose own resting-places were freshadowed there under the fretted roof of England's proudest mausoleum of her heroes of pen and sword. It was a dark and gloomy day,—

"The sun's eye had a sickly glare."

There was solemn and impressive silence—every footfall had a sound—as they followed the poet Milman, who read the touching burial service for the dead. And in Poets' Corner they placed

Thomas Campbell. A lengthened pause preceded the words, "Ashes to ashes, dust to dust;" there advanced from the throng a Polish officer, one of the many of his unhappy nation there assembled. He dropped upon the coffin-lid some earth gathered for the purpose from the grave of Kosciusko. The effect was startling; but it became a thrill—the hearts of all there present beating audibly—when immediately afterwards, as the venerable dean uttered the words, "I heard a voice from heaven," a thunder-clap shook the old Abbey—aisles, pillars, and roof. He paused; the pause continued full a minute, and as the awful sound subsided, the assembly heard the sentence finished—"they rest from their labours!"

"When I first knew Thomas Hood," says our author, "his star was but rising; when I saw him last, he was on his death-bed; his forty-six years of life from the cradle to the grave having been passed in so weak a state of health, that day by day there was perpetual dread that at any moment might 'the silver cord be loosed, and the golden bowl be broken.' Continual bodily suffering was not the only trial to which this fine spirit was subjected. The world heard no wail from his lips; no appeal for sympathy ever came from his pen; his high heart endured in silence; and, without a murmur of complaint, he died. Yet it is no secret now that for many years he had a fierce struggle with poverty; enjoying no luxuries and few comforts; his 'means' derived from 'daily toil for daily bread.' A skeleton stood ever beside his bed, mocking his 'infinite jest and most excellent fancy,' converting into an accession of sobs those 'flashes of merriment that were wont to set the table in a roar.' At the time when nearly every drawing-room, attic, and kitchen,—when every class and order of society, was made merry and happy by the brilliant fancies and genuine humour of Thomas Hood, he was enduring pain of body and anguish of mind." Nearly all his quaint conceits, his playful sallies, and his sparks from words were given to the printer from the bed on which he wrote, propped up by pillows; continually, continually, it was the same, up to the day that gave him freedom from the flesh. Yet it was a tenement of clay. Although his existence was a long disease rather than a life, he was singularly free from all cumbances of bitterness and harshness. Feeling strongly for the sufferings of others, he was entirely unselfish, ever gracious, considerate, and kind. Though perpetually dealing with the burlesque, he never indulged in personal satire. We find no passage that could have injured a single living person. Never did his wit verge upon indelicacy; never did his facetious muse treat a solemn or sacred theme with levity or indifference.

Lady Morgan had an idea that she might be the means of bringing together in fraternal intercourse the aristocracy of rank and the aristocracy of talent on a more extensive scale than was possible in her *maisonnette*. We remember the occurrence, and must condense Mr. Hall's account of it. Mr. Mackinnon, of Hyde Park-place, had a large house, a suite of rooms capable of "entertaining" many, and, in partnership with that estimable gentleman, Lady Morgan's plan was to be carried out. He was to issue cards to ladies and gentlemen of his order; she to those who were eminent in literature, science, and art. The cards were printed accordingly. They expressed that Lady Morgan and Mr. Mackinnon desired to be honoured with the company of so-and-so, on the evening of Wednesday, July 16th. It was certainly somewhat startling to read the names thus joined; it was known that the one was a widow, the other a widower; and there was consequently no just cause or impediment why they two should not be joined together. "We received our invitation from her ladyship's own hands, and accepted it. On the evening of the 16th, we duly entered the drawing-room at Hyde Park-place. We heard titles of all degrees announced; but hardly a name eminent in literature, art, or science greeted our ears. There were present perhaps 200 people of rank, but, excepting ourselves and three or four others of our 'calling,' Lady Morgan had no followers to fraternise with those of Mr. Mackinnon. Speculation was in vain as to the cause of so appalling an effect. The lady was evidently irate; there was no way of accounting for the humiliating fact; and, as may be supposed, the evening passed off with amazing dullness, for the co-operation of no other lions had been sought."

A few days afterwards the mystery was explained. Mr. Mackinnon had agreed to direct such cards as were to go to his own friends, Lady Morgan undertaking the transmission of such as were intended to lure the magnates of her own craft. The cards, properly addressed, she handed to Mr. Mackinnon's butler for the post; but either that functionary forgot his duty, or grudging the postage: at all events, they were subsequently found safe in his desk, where they had been in comfortable seclusion from the day when Lady Morgan placed them in his hands.

Our author has a warm word for *Sydney Smith*:—"As he was one of the wittiest so was he one of the soundest, as he was one of the wisest so was he one of the best, of men. His censure was always generous, his sentences ever just. Prudent, considerate, charitable, and humane, he was the very opposite of those professional wits who seldom speak except to stab; of those political reformers who have no toleration for virtue—in adversaries; of those social ameliorators who are good Samaritans in words, omitting only the penny and the oil at the inn and by the wayside."

Speaking of the artists he has known, Mr. Hall sketches the position of painters at the commencement of his career and now. Forty years ago—nay, thirty—there was little or no patronage for native art. Portrait-painters, indeed, were rich; but historic painters, rarely received commissions; and landscape-painters had their remunerative employment chiefly from the publishers, as illustrators of books. One of the greatest artists of the nineteenth century, Hilton, never had a commission, and did not sell six pictures of size all his life. Prout, Harding, Copley Fielding, Dewint, Barrett, David Cox, these are names of but a few of the masters in landscape art, who produced drawings which were paid for at the rate of little more than a shilling for every square inch. Leslie sold his picture of "Sancho and the Duchess" to Rogers, for 74*l.*; it was bought by a dealer, at the sale of the poet's goods, for 1,120 guineas. Wilkie's "Errand Boy," a canvas measuring 1 ft. 2 in. by 1 ft. 7 in., brought at Christie's the sum of 1,050 guineas; probably Wilkie received for it the odd fifty. Mr. Hall has done much to help bring this about, and artists owe him a large debt of gratitude.

We should do injustice if we did not mention that the value of the volume is greatly increased by the additional Memories of Mrs. Hall: the book is full of interest from beginning to end, and we cordially bespeak for it a large circulation.

VARIORUM.

WE understand that the publication of the late Mr. Papworth's "Ordinary of British Armorial," which was suspended by a long and painful illness, is about to be resumed upon different terms under a competent editor; and that the new terms of publication will be such that even those subscribers who discontinued their subscriptions early will be able to obtain the remainder of the work at a reasonable price.—"The Children's Sunday Album of Short Stories for Sunday Reading," by the author of "A Trap to Catch a Sunbeam," &c. (Cassell & Co.), is a very pretty little book, and something more. To each of a hundred and eight engravings Mrs. Henry Mackarness has prefixed a fitting text, and appropriate little story, the whole to a certain extent connected. It is charmingly written, will give much pleasure to the little ones, and do a vast deal of good.—"The Publishers' Circular for December (Sampson Low) is full of pictures from the illustrated books of the season.—"Everybody's Year-Book: 1871. This fourth annual issue of "Everybody's Year-Book" contains much useful and amusing matter. Besides the usual Almanac material, there is a great variety of tables, Parliamentary and other lists, postage regulations, &c. Amongst the more amusing matter are anecdotes and a collection of national and patriotic songs, including the English translations of the Marseillaise, the Rhine Watch, Fatherland, the Danish National Song, several American ones, and others,—the British, of course, inclusive. Although this is an extraordinary sixpennyworth, it will be all the more wonderful if it be in every respect accurate; and towards that end we may add an item of correction. The minimum fare for a cab, "if taken from a regular cab stand (is not) one shilling for any distance within and not exceeding a mile," as stated, but for any distance within and not exceeding two miles.

Miscellanea.

Newcastle Society of Antiquaries.—At the monthly meeting of the members of this society, held last week, Mr. Clayton read a paper, entitled, "Notes of a recent Excavation on the Roman Station of Cilurnum." Towards the close of the last century there was discovered in the station of Cilurnum (the sixth per lineam valli) an arched vault entirely underground, which was reached by a descent of stone steps, and its entrance was secured by an oaken door, strengthened by plates of iron. In connexion with the same station a building has recently been discovered, having a frontage of 86 ft., containing masonry of a very finished character, through which there are three openings or passages, each of them 13 ft. wide. Behind this front is a range of five apartments, in one of which the vault is placed. These passages, of 13 ft. wide, must have been used for chariots and horses, and not merely for the purpose of access to dwellings. It is not improbable, remarks Mr. Clayton, that this masonry was originally a part of a forum or public building, and the shape of the ground around seems to support that conjecture. Among the ruins has been found a considerable quantity of glass, the paucity of which in the ruins of Pompeii is another proof of the difference of climate, that of the Bay of Naples and the valleys of Northumberland. In one of the rooms, and in the vicinity of stones which had suffered by the action of fire, was found a considerable quantity of mineral coal, apparently deposited for consumption.

Income-Tax on Houses and Land.—The assessment to income-tax in Great Britain, under Schedule A (in respect of the property in lands and houses) in the financial year 1869-70, shows 34 out of the 40 counties of England assessed at more than a million sterling. The annual value assessed to the tax under this schedule in Middlesex amounted to 18,062,185*l.*; in Lancashire, 12,098,829*l.*; Yorkshire, 11,036,434*l.*; Somerset, 3,229,421*l.*; Warwickshire, 3,166,588*l.*; Staffordshire, 3,139,443*l.*; Gloucester, 3,329,005*l.*; Worcestershire, 1,713,189*l.*; Wiltshire, 1,654,206*l.*; Oxfordshire, 1,191,096*l.* In Wales, Glamorganshire was assessed under Schedule A at 1,084,440*l.*; each of the other 11 counties was under half a million, though Carmarthen reached 453,168*l.*, and Denbigh, 476,289*l.* In Scotland, Lanarkshire was assessed at 2,723,440*l.*; Edinburgh county, at 1,661,015*l.* Most of the counties show a larger value assessed than in the preceding year, but several show some decrease. By far the most remarkable difference occurs in the instance of Gloucestershire, where the value assessed under Schedule A was 2,580,572*l.* in the year 1868-9, and only 1,929,005*l.* in 1869-70; and under Schedule D, 1,627,789*l.* in 1868-9, and only 1,133,848*l.* in 1869-70.

Arbitrator's Award.—In the Court of Exchequer an application was made on behalf of the Ambleside Sewer Authority to set aside an award made by Mr. Hogarth, land surveyor, Kendal, on the ground that it had not been made within the prescribed time, and, further, that it had been made without notice having been given to the applicants so as to enable them to be heard or give evidence. It appears that, some time ago, the Sewer Authority, in carrying out some sewerage operations at Ambleside, carried two drains across a narrow grass-plot belonging to Mr. Sprout, who claimed 30*l.* as compensation for injury done. The Sewer Authority thought the charge excessive, and the matter was referred to two arbitrators, who, not agreeing, sent it finally before Mr. Hogarth. The latter allowed the agent of Mr. Sprout to put in documents, but did not extend the like privilege to the Sewer Authority, and assessed the damages and costs at 41*l.* 3*s.* 6*d.* The Court made the rule absolute for setting aside the award.

Falling in of the Ceiling of Staines Church.—A large portion of the ceiling of the parish church of Staines has fallen in. It was on a Sunday evening it fell, but after divine service. The huge flat ceiling was composed of plaster. Workmen are busily engaged in repairing it. The churchwardens, it is said, some months ago recommended the removal of this ceiling, to improve the ventilation of the church, of which many complain. Why not do it now, and not endanger the lives of church-goers any longer?

The Hydraulic Lift Graving Dock Malta.—The last of thirty-two presses belonging to the hydraulic dock now in process of construction at Malta has just been successfully cast at the Liverpool works of the contractors, Messrs. Emmerson & Murgatroyd. These presses or cylinders are cast perpendicularly and in one piece of 36 ft. in length and 14 tons in weight; and are especially remarkable as forming part of a dock admitted by engineers to be one of the most perfect applications of hydraulic power yet devised. For the vertical casting, a pit some 37 ft. deep was sunk in the red sandstone of the Mersey bank; in this was fixed the mould, or, as it is technically called, the casting-boxes; two ladles containing 10 tons of iron each were swung over the pit and emptied into the mould, the magnificent outpour of the molten ore being a sight worth seeing. All has gone well on each occasion. After four days' cooling, the columns have been out the proper length, tested to a pressure of 30 cwt. on the circular inch, and stacked ready for shipment. Their surface is so smooth that one might think they were turned instead of cast; and the metal is so tough that the surplus ends, each weighing a ton or so, had to be turned down almost to nothing before they would break off.

An Agricultural Hall at Watford.—A building on the principle and for the various uses of the Agricultural Hall at Islington, has been erected in Watford, on a site near the High-street end of the Clarendon-road. The gateway for carriages is 16 ft. wide, and there is a side gate leading to a wide pathway for foot-passengers, which runs along the front of the building, communicating with Beechen-grove by gateway there. The hall faces towards the station, and has three entrances in the centre of the front, and a fourth in the side is arranged as an exit at the termination of all shows. The interior is, in the centre, 45 ft. high and 127 ft. 4 in. long. It is formed in three divisions, the centre being 52 ft. 8 in. wide, and the sides 15 ft. 8 in. The length is formed in four bays of 24 ft. each, and two of 15 ft. 8 in. This arrangement, therefore, admits of a gallery 15 ft. 8 in. wide round the entire building, and approached by spacious staircases. The architect was Mr. F. F. Peck, of London, and the builders were Messrs. Jackson & Shaw.

Worcester Guildhall.—At a recent meeting of the town council, the Mayor read the following communication from Sir E. Lechmere:—"At a meeting held on the 30th ult., Sir E. A. R. Lechmere, bart., in the chair, for the purpose of considering the desirability of increased public accommodation in the Guildhall, it was moved from the chair and unanimously resolved:—"That in the opinion of this meeting the accommodation afforded by the various rooms in the Guildhall is insufficient for the public purpose for which it is required; and that, as the Corporation are now contemplating the restoration of the building, this meeting is of opinion that the present is a suitable opportunity to secure that accommodation, and would invite the Corporation to confer, through some members of their body, with a committee of this meeting, as to the possibility of some means being adopted for rendering the Guildhall more adequate to the increased requirements of the public." The letter was referred to the Survey Committee.

Restoration of Exeter Cathedral.—The monetary difficulty with respect to the commencement of the restoration of Exeter Cathedral is at an end. The sum of 3,000*l.* was wanted to make up the 15,000*l.* required for the choir alone. The Rev. Chancellor Harrington has announced his intention of adding 3,000*l.* to his previous gift of 1,000*l.*, in order that the restoration might at once be proceeded with, in accordance with Mr. Gilbert Scott's plans. It is probable that the contract for the alteration and re-adornment of the choir will be signed shortly. What the cost of the restoration of the whole cathedral will be has not transpired, but it is sure to exceed 50,000*l.*

Compensation in the City.—On Saturday a jury awarded the sum of 13,500*l.* to the Merchant Taylors' Company, as compensation for a piece of land to be taken from them by the Metropolitan District Railway Company, under the powers of an Act of Parliament. The site was in Cannon-street, upon which it had a frontage of 55 ft., and near the end of Great Trinity-lane. The value at which it was estimated by the Merchant Taylors' Company was 41,304*l.*

Smithfield Church.—According to *The Lock*, the "Martyrs' Memorial" Church, near Smithfield, will be consecrated on the 30th inst. As much as 3,000*l.* is still needed to complete the building and leave it free from debt.

The Builder.

VOL. XXVIII.—No. 1455.

Sculpture in England.



THE object in selecting this subject for our remarks is to consider the present condition and future prospects of sculpture; and to inquire, without prejudice, whether the influences under which it is exercised are of a kind to insure its satisfactory development.

in the sense of high-class fine art. If the inferior quality, generally, of modern sculpture were put forth as the reason for this inquiry, it might be objected that it was begging the question. It might be contended that the present state of the art shows no decline, and that, compared with its practice in other countries, the sculpture produced among us holds no inferior position.

Though this is not the question, yet, in order to avoid controversy on these points, it will be advisable to commence the inquiry in a wider field, and to examine, first, what is here intended to be implied in the term Sculpture, as a fine art; and, at a later stage, to consider its present practice and condition.

To argue fairly this question in both its phases, it will be desirable to establish at least two starting-points. One will be the standard by which the art is to be measured or judged, and the next to determine whether its practice is conformable to such standard. It will not be sufficient to inquire what the artists who exercise the art propose to do, and whether they fulfil this object, but whether the direction of their efforts is a right one.

Stated broadly, the function of sculpture or of the sculptor is to imitate objects by form, and the measure of success will be the degree of accuracy of the imitation. But this view involves only the most material or mechanical estimate of the art, and entirely excludes all consideration of its pretensions and mission as a fine art. The comparison to which it will be subjected, in order to test its claim in this latter sense, will be with those productions of art which, by the universal testimony and judgment of the best qualified judges, have been pronounced the most perfect examples of sculpture. These are the works of the sculptors of the fifth and fourth centuries before our era.

It may be objected here that this is an arbitrary limitation, and that the real standard is, or should be, Nature, not Greek sculpture. But Greek sculpture, in its best aspect, is taken merely as the truest and most faithful transcript of Nature in her highest perfection. The tests are therefore, after all, identical: Nature is still the standard; and the finest examples of Greek sculpture are the most perfect exponents of

Nature in her happiest manifestations. Indeed, it is this admitted excellence alone that gives Greek sculpture its exceptional position as compared with all others,—a subject that might be usefully enlarged on, but which does not strictly form a part of the present inquiry. Taking this, then, as a ground of departure, it is to be seen how far modern sculpture may, when measured by such a standard, be considered to be in a satisfactory condition. Before drawing the conclusions to which the above remarks may be supposed at once to lead, it will be fair to take a more comprehensive view of the very important, and, indeed, vital question of imitation, as a, or the, function of imitative art.

If the practice of sculpture is confined simply to its material exercise,—that is, the reproduction or representation of objects by absolute form only, and not by the semblance of form, as in painting and drawing on a flat surface,—the only criterion of excellence in the art, whether it is exhibited in modelling or carving, will be the exactness or truthfulness of the representation. It will be estimated simply as an art of imitation, claiming no higher position than a mechanical exercise of skill. The greatest success in it will be attainable by any practitioner who may unite close observation with facility of hand in copying, and, so far, the whole and sole merit of the artist's production will consist in the scrupulous accuracy of likeness to his original, and quite independent, of course, of the nature or character of the object he may have taken as his model. The value or importance of the objects selected would have no place in estimating the merit of the art, for the lowest equally with the highest class of form would belong to the same category, the test of excellence being simply the more or less ability shown in copying. There has been a large and influential support of this exercise of art, in late times especially. The strength of the argument in its favour is in the unquestionable truth that where the very essence of imitative art consists in the conscientious rendering of an object, this quality should be insisted on as a *sine quâ non*. It is in the application of this truism carried out to its extreme to all forms of art, that possible danger to sculpture may be apprehended.

Without at all impugning the essential value of the doctrine, it may be permitted to show in what way its extreme observance may act detrimentally to the interests of the higher forms and practice of the art under review. There is sculpture and sculpture. There is the mere bald representation of objects by form, the clever handiwork, it may be, of the mechanic, the modeller, or carver; and there is the mode of working out the same purpose, representation, which elevates the practice into a fine or refined art, and which stamps its author as a real artist. It is the non-appreciation of this distinction which must affect, more or less, the position of sculpture as a fine art. In the one case it is little other than a trade-calling; in the other it is an exercise requiring, in those who are to excel in it, in addition to the imitative faculty, the cultivation of the taste in selecting and adopting both subjects and forms for their art, and the intelligent treatment of these as modes of illustration and expression. Before entering upon these subjects of selection and artistic treatment, it will be necessary to consider the important preliminary question of the capabilities of certain arts, and the laws by which they are governed. Even as imitative arts, both painting and sculpture are limited in their power. The former, commanding a wide range, may represent certain objects, and especially aspects of nature, which are utterly beyond the reach of the sister art; but painting is equally powerless to make even her most happy and admirable scenes and effects complete by the accessories essential to their accurate reproduction.

For instance, in the representation of a storm, painting cannot give the rush of the clouds or the noise of the thunder; nor in a waterfall or rippling brook the essential characteristics of movement and sparkle that give to flowing water its life and charm; nor in portraying the piping shepherd and his group of dancing nymphs, supply the tones of his tuneful reed, or the motion of the dancers, and the gay fluttering of their drapery. Still, lacking this, painting can effect what sculpture,—an art strictly of form,—has no means of attempting. Where the subjects chosen may be in themselves unattractive, possibly coarse and repulsive, painting has resources of a compensating character which are denied to sculpture. Such are colour, aerial perspective, atmospheric effects, chiaroscuro, and picturesque accidents depending on time, as day, night, or dawn; these are, in the hands of the painter, powerful aids to give force to imitation, to gratify the taste of the lover of art in particular phases of practice; and last, not least, even to withdraw attention from what may be objectionable, in the subject represented, to passages of more pleasing character. How often the poverty of invention, or the meanness of the subject, or the faults of bad form and drawing have been compensated by the mastery shown in harmonious colouring, or the powerful effects of *chiaro-scuro*, need not be dwelt upon. Every student of art knows that endless examples of this exist in the paintings of the Flemish and Dutch schools especially.

Sculpture has no such advantages; and in discussing this art it is of the utmost importance that clear notions should be entertained of its capabilities, and of the laws by which its practice should be ruled. Its power is limited to representation by form, and form only; and the law by which the sculptor is, or should be, governed prohibits all accessorial assistance out of this pale of direct formal imitation. He may, by certain modes of treatment, increase his effects, and by skilful manipulation of his materials, by contrasts of surface-execution, and, within proper limits, by the imitation of various textures in the drapery, give both variety and force to the representation; but it must all be effected by form only. Attempts have been made to realise sculptural imitation by adding colour to the marble. There is no instance of its success, even were it a legitimate practice; but it is obvious that, however it may be exercised or advocated, it is not sculpture. It has passed into the category of painting, and, for the most part, bad painting. The best examples of this hybrid art—painted sculpture—are found in some Spanish works so treated; but here the characteristics of sculpture are so entirely subordinated to the painting, that they may be said to be absorbed by it; and, though the realism of the figures is even startling, for they look like living objects, the exhibition is rather suggestive of the toy-shop than of the labours of a real artist. At any rate, it is not sculpture pure and simple, and cannot be fairly judged as sculpture. Whether painters will allow such works to be considered pictures, and legitimate examples of their art, is a question that need not be discussed in this place.

Two eminent and popular sculptors of this age strongly advocated this practice, and introduced it occasionally in their works. One declared candidly his object was to give greater truth and completeness to the imitation; the other, a devoted disciple of the ancient Greek school of sculpture, professed to have adopted it because he had read or been told that the ancients coloured their sculpture. It is not worth while to argue the matter as respects the productions of these artists. Their fanciful practice had no marked influence on the art of their time, and neither of them has left any work so treated that can be referred to as even a partial success. With respect to the supposed

authority of the ancients for the practice, it need only be said that though it may have been done exceptionally, there is no evidence of its having been the custom of the sculptors of the best period of art to use it in their most celebrated works in marble. There are accounts handed down of accessories of barbarous finery being supplemented to votive and similar productions, where the richness of the material was supposed to give value to the work dedicated, or to express more prominently the devotion of the donors; but this affords no fair ground for saying that, as a rule, all ancient sculpture was painted. Such practices were, no doubt, common in the earlier ages and among barbarous nations, before sculpture took its position as a fine art; and in the decadence of the art,—and it is one of the proofs of decline,—it is known recourse was had to every kind of meretricious trickery by which the public fancy could be attracted; and painting, tinting, gilding, the use of variously-coloured marbles, and even real stuffs for drapery, entered into the sculptor's practice. But none of this was sculpture in its proper sense.

Assuming, now, in continuation of the inquiry, that the best standard of sculpture is to be found in the great schools of the fifth century B.C., and of which the most perfect examples may be seen in the British Museum, in the series of sculptures brought from the Parthenon at Athens, it will be useful to endeavour, in a few words, to define the principles upon which the art was then conducted. There will be less difficulty in arriving at a satisfactory conclusion here, because the problem can be solved by reference to existing authorities, the works themselves. The speculative opinions, as to probable dates, and schools, and subjects, propounded by dilettanti scholars and antiquaries (who, usually, have but little practical knowledge of art) are of no value here, where works are to be judged on their merits, and not on the archaeological ground of their age or history. The requirements for this judicial power are an intimate acquaintance with the anatomy, character, and capabilities of all classes of human and animal form, a knowledge of the laws of beauty, and a power of appreciating various (purely technical) refinements of execution, which those only who have been educated in the practice of the art can thoroughly possess. With these qualifications, united with fine taste—a combination, it must be admitted, but rarely to be met with,—the judge will recognise in the monuments referred to the most perfect and the noblest examples of sculpture that have reached modern times. The main principles which seem to have directed the sculptor of the time, were, first, the choice or selection of the class of form best adapted to express the idea, or the subject conceived; and, secondly, the truthful reproduction of these forms. The æsthetic reasons for the selection of certain types need not now be discussed, but their consideration will be found of no small importance to the student who desires to extend his inquiry as to the causes of the superiority of Greek sculpture. The sculptures of the Parthenon supply the student with the following material marks of excellence,—material because the spirit and exaltation that gave the impulse to the authors of these objects of their veneration, the statues of divinities and heroes, cannot be realised, even faintly, in modern times, by any effort of the imagination. The material points, then, of value to the student are, first, the thorough knowledge exhibited of the construction of the forms, both human and animal, as shown in its external or superficial anatomy, and of the capability of action in the several forms; and next, the perfect organisation which is expressed in the beauty of these forms. Their further recommendation is the wonderful executive treatment of the sculpture, where may be seen the utmost care and refinement of surface-finish without littleness or sacrifice of breadth. But too generally the extremities of the figures have been injured, both by time and intentional ill-usage; but where the surface is perfect, the supreme mastery of all the legitimate means of producing the desired effects is as edifying as it is obvious. The large and noble treatment of the naked, enhanced by the skilful management of the drapery, wherever the two come into contact, exhibits the thorough acquaintance of their authors with all the available resources for giving increased effect by contrast; while the busy and varied action of human and animal life in the metopes, and more especially in the Panathænic procession, supply the most valuable canons for

the proper treatment of sculptural composition in relief. Again, the forms throughout, though selected for their normal excellence, and therefore free from all coarseness, exhibit the utmost truth to nature, even in the most minute particulars, as is seen in the care bestowed on the distinctive execution of flesh, bone, and tendon, in the human and animal figures. This refinement is especially observable in the heads of the horses, and in the treatment of the joints throughout this wonderful composition. It is to be regretted that, owing to bad arrangement, both as to position and light, those, the finest examples existing of Greek sculpture, can only be very inadequately seen and studied.

One cause of the beauty of the forms in the Greek sculpture may no doubt be attributed in great measure to the purpose to which the art was applied. It was essentially, it may almost be said exclusively, employed in the service of religion; for, even when the statues were not strictly representations of the divinities—as was the case with the *æonic* or portrait statues of those who had been three times crowned in the Olympic Games—yet, these latter, being dedicated with great honour and placed in the temples, partook of a *quasi* religious character. When Phidias and his contemporaries illustrated Greece with their performances, the appropriation of sculpture to the noblest objects was the rule. The study of the highest class of form was, therefore, essential to the development of the idea that the gods and heroes should be represented only under such types as would express the assumed perfection of the divine and heroic nature. And that this comprehensive ideal should not be lowered, it is remarkable that no portrait statues are known of this period. It was, no doubt, thought that this practice would have too much individualised the art, and interfered with the general normal forms, considered fitting and appropriate to the grandeur of an art devoted to the service of the immortal gods. In the subsequent periods of the exercise of sculpture in Greece, even as early as the fourth century B.C., the strict principle above referred to had ceased to direct the sculptor's practice. The greatest possible attention was still given to the truth of imitation, and to the refinements of execution; but the speciality of the great school which has stamped its character on sculpture, in the choice of the noblest class of forms, in all the varieties required for the illustration of the most elevated myths or histories, no longer constrained or exclusively guided the sculptor.

The first step in the deterioration of the ideal of sculpture was the change from the highest sentimental or religious art to its making its appeal to the sense. The nude female figure under the name of Venus or Nympha, the young Bacchus, Cupids, and similar subjects of a sensuous character, and recommended by the most exquisite execution, were now the favourite objects of the sculptor's art. Soon after this, portrait was introduced, of which it is believed with good reason that no examples are known previous to the date of Alexander the Great. The moment this innovation was admitted, a deterioration or lowering of standard was inevitable. The new practice naturally attracted attention; and from its realism and the interest attached to portrait, from the appeal it makes to personal feelings, it soon caused a sensible diversion from the more limited, though noble application of the art. The particular and individual now began to occupy the attention of the sculptor, instead of, as heretofore, the general or normal; and as there was less occasion and temptation to study the nobler class of forms, a lower standard, both of art and of artists, supervened.

This is a part of the history of sculpture of great interest and importance. Here it is only cursorily glanced at, as one of the causes which affected the healthful progress of the art. It is curious, and should be instructive to observe, how rapidly after this sculpture declined in almost every particular that constituted its greatness as a fine art; and for this reason, the facts are here brought forward for the importance they have exercised on all subsequent attempts to restore a fine school of sculpture. The position of the art, from the time of Alexander the Great and the dismemberment of the Macedonian empire, has been uncertain and unsatisfactory. It has never been exercised on any general principle. The art has been practised to suit the varying fashions and tastes of the day, sometimes affecting and imitating the ancient forms, but without their spirit; sometimes busied with portrait; sometimes attempt-

ing the combination or adaptation of modern forms with ancient accessories; and sometimes only aiming to represent more commonplace objects to catch passing attention and to secure patronage.

It is from this point, then, that the position and prospects of all sculpture have to be judged, since the period when the fall of the art in Greece became a fact; and when the Roman conquests suppressed the exercise of sculpture in what may be termed its native home. An extensive immigration of Greek sculptors into Italy then took place, and Rome itself was filled with artists driven from their country, who exercised their calling only in order to obtain a livelihood. It ceased to be practised on any higher ground than that of expediency.

It must, however, be admitted that works of great material excellence were produced at this time, and *replicas* and repetitions of celebrated statues were multiplied to adorn the public places and squares of Rome, and to decorate the palaces of rich nobles, whose patronage of the arts was, however, attributable rather to a love of display than to any remarkable sensibility to their value or beauty. This trade-exercise of sculpture prevailed with more or less activity during the reigns of the earlier emperors; but many anecdotes of the time show that there never was any great feeling for it among the Romans. The most favourable opportunity for its attaining a high status was at the date of the Antonines, and especially in the reign of Hadrian, but this passed away with that liberal promoter of art, and subsequently the interest exhibited in it by some few of the possessors of sovereign power was rather a fashion than a real art-impulse, and was confined to making collections of ancient statues for decorative purposes, and as objects of mere show. The position of sculpture as a fine art became daily more and more depressed. To follow its waning practice through the different phases of its decline, would scarcely repay the trouble. It is sufficient to say that, as a fine and noble art, such as it was in the age of Pericles, and under the direction of Phidias, Polyctetus, and the great sculptors of the schools of Athens, Argos, and Sicily, sculpture had ceased to exist. When it did rise partially from the abject state into which it had fallen, it scarcely could take any very high rank. The chief condition of its excellence, practice on the human figure, was denied it in the absence of all opportunity for its display. This great advantage could not be looked for in modern times, and therefore, to that extent, the excellent discipline and education afforded by study of the human form was lost both to the sculptor and the public. Among the Greeks, the people were not only accustomed continually to see this freely exhibited in the public games; but, from the care taken to develop the physical powers, they became competent critics and judges of what constituted the highest perfection of form.

It would be as inconsistent as useless to attempt now a return to the classical style of sculpture as it existed in ancient Greece, when none of the conditions essential to its success exist. Without public sympathy with its subjects, without that poetical impulse which gave life to classical invention, without education in the principles of beauty, and with the habits and feelings of a people inhabiting a cold, northern climate, utterly opposed, both from considerations of delicacy and comfort, to the exhibition of the undraped figure, no such restoration could be thought of as likely to have successful results. When occasionally such reproductions are seen, they are rather academical exercises than the expression of original thought or feeling, nor are they calculated to interest popular sympathies. However meritorious they may be, as imitations and reminders of Greek sculpture, they never can take other than a secondary position; and yet, in point of execution, the best of them are frequently as good as, and may be better, than the general run of the works of the Greco-Roman period. It is not their want of merit so much as their unreality, their being only imitation-art, that condemns such works to eventual obscurity and neglect.

But it is no reason because sculpture representing Greek myths and subjects, in the Greek mode, cannot be successfully revived in these days, that the art may not be practised in a manner to afford opportunity for very noble results. Recognising as a fact beyond dispute that in one important condition of excellence in sculpture,—the free treatment and exhibition of the nude human figure,—modern art is exercised

at a disadvantage, compared with its practice among the Greeks; and that this circumstance has interfered with a most important function of art,—that of educating the public to understand and appreciate the highest class of beauty, yet this drawback does not necessarily preclude sculpture from asserting itself, under other aspects, as an art of great power.

It is to this subject, of such vital interest to the life and success of modern sculpture, that attention will now be directed. But, as this part of our task will necessarily involve a survey of the productions of many widely-differing schools, its proper consideration will require more space than can here be given it.

ISAMBARD KINGDOM BRUNEL.*

A FAITHFUL account of the life and labours of Isambard Kingdom Brunel would constitute an important, though a brief, chapter in the history of Human Progress. The regard of the student, who has pondered the biography of the men whose memories are most illustrious, has been too often dazzled and perverted by the splendour of military success, or by the adroitness which has made the mastery of human weakness the stepping-stone to power, to wealth, and to fame. The men who have spent their lives in conflict with physical difficulties, or in the unremitting effort to penetrate the secret counsels of nature, are fewer in number, and more modest in the record they have obtained, than the host of the vulgar great. Yet what rightly-balanced mind can value the blood-stained laurels of Cæsar in comparison with the gifts won for, and handed down to, the entire human race by such men as Pythagoras, Archimedes, and Aristotle? In this noblest school of human intelligence Brunel was a hereditary pupil. A glance at what he actually effected, during a life as short, measured by years, as it was long, measured by labours, is enough to show that his name will hereafter occupy no inferior rank among the servants and the benefactors of mankind.

It has been with no slight anxiety that the small and rapidly diminishing number of those who had the advantage of personal acquaintance with Mr. Brunel, have looked forward to the appearance of his Life, written, as a maiden effort, by his eldest son. The charming volume in which Mr. Richard Beamish, well known as an assistant of Sir Marc Isambard Brunel, has told the story of the engineer of the Thames Tunnel, and of the block machinery of the navy, led some of us to hope that we should receive from the same facile pen a memoir of the noblest result of Sir Marc's care and labour—the cultivated genius of his son. The difficulties which lie in the path of a biographer, too profoundly interested in the character of his subject, are well known to all persons acquainted with literature. In the natural fear which a sensitive mind may well entertain of falling into that style of treatment which has earned for Boswell a spurious immortality, lies the danger of being driven to the production of a cold, bloodless, mechanical chronicle. It is, therefore, with no little pleasure that we find the volume before us such as in no way to lead us to regret the silence of Mr. Beamish. While speaking with a modesty—we may say a hereditary modesty,—which does credit to a biographer, Mr. Brunel has not been betrayed into the fault of lessening the grand outline of his father's character, although he may be said to have given it only *en silhouette*. His method has been safe, for it has been historic. It is from the works, and the letters, and reports of Isambard Kingdom Brunel that we are enabled, by his son and historian, to form some imperfect idea of what manner of man he was. When we look at a picture in which, not only has the author sought to "nothing extenuate nor set right down in malice," but where thought and action are displayed with a very truthful simplicity, we are but the more convinced of the magnitude of a loss which none who knew the man have ceased to deplore.

The method of the volume, consisting of 568 closely-printed pages, is one suggested by the nature of the biography which it attempts to trace. A brief chapter is given to the early life of Mr. Brunel, involving, of necessity, some account of part of that of his father, especially with reference to that great sub-Tamesian work which as yet stands alone in the history of engi-

neering. Mr. Beamish's life of Sir Marc Brunel is here quoted by that great inventor's grandson. (The two volumes,—the life of the father and of the son,—should stand side by side among the books of constant reference in the library of every engineer.) Fourteen chapters are then devoted to the successive works executed by Isambard himself, the history of the several undertakings being traced in clear and distinct order. While we have thus to travel more than once over the same ground, in point of time, a much clearer grasp of the subject is attained than if a merely biographical order had been followed; as in extracting the notes of a diary. We have then an important and valuable chapter on Mr. Brunel's professional opinions and practice; one, which we could wish had been much longer, on his private life; appendices, containing reports on two of the great points of his professional warfare—the broad gauge and the screw-propeller; and the essential, but too often neglected, labour of an index.

In a work, which we regret to find limited to a single volume, Mr. Brunel has not spared room for such a brief summary of his father's career as might find place in a biographical dictionary. From the materials which he has furnished, aided by personal recollections, we must therefore endeavour to present such a sketch to our readers. Yet let them remember that, high as the engineer must rank in the opinion of all competent to appreciate his merit, the man claims even a warmer tribute.

Like so many of those men to whose ingenuity England is in no small degree indebted for her mechanical excellence, Isambard Kingdom Brunel was of French blood. His father, Marc Isambard Brunel, was a native of Normandy. The grand old baptismal name, borne by the three generations with which the volume before us is concerned, dates from Carolingian times; and is either identical with, or closely allied in its etymology to, that borne by the ancient Seigneurs de Bourbon, before that lordship came by marriage to the seventh son of St. Louis. Marc Isambard, a consistent Royalist, fled from the Republican order. He settled in England in 1799, and, after some adventures of romantic interest, married an English lady, whose family name was borne by his son. The first great work undertaken by Sir Marc in this country was the machinery for making blocks, which he designed and erected for the Government at Portsmouth. He also designed suspension bridges for the Isle of Bourbon; and carried out the most important engineering work that up to his time had been attempted in England,—the tunnel under the Thames at Wapping.

Isambard Kingdom Brunel, only son of Sir Marc Isambard, was born at Portsmouth on the 9th of April, 1806. For a time he was a pupil in two schools in England, and for two years a student at the Collège Henri Quatre, in Paris; but the main part of his education was derived from the care of his gifted father, who taught him Euclid before he was eight years old. As early as the age of four, his facility in drawing attracted attention. From his seventeenth year he was regularly employed in his father's office; and before he was twenty, on the occasion of the sudden and alarming illness of his father, the works of the Thames Tunnel were left under his direction. He subsequently held both the nominal and actual post of resident engineer of the Thames Tunnel, up to the time of the suspension of the works in consequence of the interruption of January, 1825; by which disaster he was seriously injured, very narrowly escaping with his life. In 1831, he was appointed engineer to the Clifton Suspension Bridge, after a double competition, in which his design was preferred to that, among others, of the veteran Telford. In the same year, he made designs for docks at Monkwearmouth, a portion of which he commenced to build in 1834. In 1832, the directors of the Bristol Dock Company consulted him as to the improvement of their Floating Harbour. In March, 1833, he was appointed, by a committee formed of members of the corporation of Bristol, and of other public bodies of that city, engineer to carry out the project of a railway to London. He prepared the plans and surveys for this line; and out of fifty-four days' contest in the Committee of the House of Commons in 1834, eleven were occupied by the cross-examination of Mr. Brunel. The Bill, having passed the Commons, was rejected by the Lords; but received the Royal Assent on the 31st of August in the following year. From that time Mr. Brunel held a position second to no man in his profession. He constructed railways in England,

Ireland, Italy, and India, to an aggregate length of upwards of 1,200 miles; one of his main lines extending from London to the Land's End, and another to the extremity of South Wales, at Milford Haven. From 1835, the year of the passing of the Great Western Railway Bill, to his death in 1859, he was also engaged in the design and execution of vessels which effected an entire revolution in ocean steam navigation. The *Great Western*, his first steam-ship, started on her first voyage to New York on the 8th of April, 1838, and struck soundings off Newfoundland on the ninth day, with nearly 200 tons of coal still on board. This was Mr. Brunel's answer to the "demonstration" by Dr. Lardner, of the impossibility of the undertaking. The *Great Western* had a measured tonnage of 1,340 tons, and a displacement of 2,300 tons. She was followed by the *Great Britain*, which sailed from Bristol for London in January, 1845. Her tonnage measurement was 3,443 tons, and her displacement, 2,984 tons. The third of Mr. Brunel's steam-ships, the *Great Eastern*, was launched on the last day of January, 1858. Her extreme length was 693 ft.; her breadth, 83 ft.; her gross tonnage, 18,915 tons; her displacement, at 30 ft. draught, 27,419 tons; and her nominal horsepower, 1,000 horses for the paddle engines, and 1,600 for the screw engines. Mr. Brunel was also the means, having been consulted, without receiving any fee, by the Board of Admiralty, of introducing the screw into the Royal Navy. He executed dock and pier works at Bristol, Plymouth, Briton Ferry, Brentford, and Milford Haven, between 1848 and 1857. The immense facility to be obtained in the conduct of traffic, no less than in the execution of works, by the use of the electric telegraph, was first grasped by Mr. Brunel; his plans embracing applications of this mode of communication reaching from the working of a railway to the steering of a ship. In a very different province, the water-towers of the Crystal Palace, 254 ft. high, were his design. To the questions of the best mode of rifling guns, of the construction of the most efficient floating batteries, and, we may add, of the improvement of explosive projectiles, he gave a degree of attention, of the fruit of which, most unfortunately, the Government neglected properly to avail themselves. It is not too much to say that, had Mr. Brunel lived and been consulted, such a disaster as the loss of the *Captain* could not have disgraced our Admiralty. More anxious to mitigate human suffering than even to improve the armament of the country, Mr. Brunel, from February, 1855, gave an unstinted amount of time and exertion to the design and erection of the Rensko Hospital, on the Dardanelles; which rendered that establishment as superior to all previous buildings for the purpose, in minute arrangement of every detail no less than in general design, as was the case in regard to almost every subject to which the great engineer directed his conscientious and inexhaustible energy.

In 1858, Mr. Brunel was ordered, by Sir Benjamin Brodie and Dr. Bright, to spend the winter in Egypt. He returned to England in May, 1859, and in September of that year sank under an attack of paralysis.

The loss to the country and to the world, at the early age of 53, of a man who had crowded so much into the brief term of the third of a century, may be regarded as the penalty paid for the one great error of his life. Gifted with a frame that seemed almost unaffected by fatigue, Mr. Brunel allowed himself, for many years, neither adequate rest nor due relaxation. For nights together he frequently never went to bed. During the construction of the Great Western railway, on his journeys along the line, he was accustomed to make his appointments according to distance, without any reference to the hours of day or night. To a given point his horses would take him in so many hours; and at the time thus indicated, whether morning, noon, or night, those who had to transact business with him in the locality had to meet him. His only sleep, on these occasions, was taken in his carriage. It may be questioned, however, whether he did not in these journeys actually pass more time in slumber than when he kept his silent and industrious vigils in his house in London.

Connected with this unsparring devotion of the whole energy of the man to the calls of duty, must be remarked a special peculiarity in his mode of conducting work. Mr. Brunel's rule was to see to everything himself. It is no doubt true that, in almost every matter to which he bent his mind, he found how far and how

* The Life of Isambard Kingdom Brunel, Civil Engineer. By Isambard Brunel, B.C.L. London: Longman, Green, & Co. 1870.

feebly the best assistants that he could engage limped behind his own fiery and unexhausted energy. Yet his sound common sense,—a quality predominant, if any single virtue were predominant, in his intellectual organisation,—should have taught him that he was endeavouring to overpass the powers of human nature. Could he have ensured a century of life, without needing slumber or relaxation, he might perhaps have fully discharged the tasks which he so inexorably demanded from his brain. Thus, not only did he shorten his natural term of activity, but he inflicted on himself hours,—nay, years,—of acute suffering. He would work on, regardless of neuralgic pain under which most men would have sunk, deriving a strange solace from a constant use of tobacco that would have clouded any other brain. This incessant labour, this anxiety to see for himself to every detail,—prevented the formation of such an organised staff as would not only have lightened his labour and prolonged his usefulness, but, in some cases, secured greater success in the execution of his schemes. His assistants scarcely took the rank or shared the responsibility of those attached to other eminent engineers. Some of them were but incompetent men. The ready kindness of their chief softened their shortcomings, and made up for their imperfect work. But the result was, that, with the exception of the one assistant who latterly occupied a position resembling that of a chief of the staff, and, perhaps, one or two others, Mr. Brunel's subs were little more than clerks or inspectors. Indeed, in some instances, mere inspectors, by dint of minute and vexatious adherence to the letter of the very stringent specifications prepared by Mr. Brunel, made themselves persons of more importance than their commanders, and exerted a pressure upon contractors that had an unfavourable effect on the conduct of more than one important undertaking.

In his dealing with contractors, it may also be greatly questioned whether the position invariably claimed by Mr. Brunel did not involve a certain inconsistency. It was his will always to be absolute. With regard to his directors, his opinion was, that unless he possessed their entire confidence, they had better employ some other engineer. No one could hold a more lofty, or we think a more just, opinion of the duty he owed to his profession in this respect. But then, as between the directors and the contractors, he claimed to be the sole arbiter. He thus constituted himself at once executive and judiciary. His love of justice, no less than his mechanical genius, no doubt enabled him to fill this double rôle with a success which few men could hope to imitate. But still the question suggests itself,—Was it right for any man to be placed in such a position? Men of the highest authority have held that it was not. In the earlier specifications prepared by Mr. Brunel, arbitration by an engineer, to be named by himself and the contractors, in case of dispute, was provided for. Any attempt, however, to enforce these clauses was always resisted by their framers; and from the later editions of his general specification,—to the revision of which he gave continual attention,—these clauses were removed. It was his intent that his authority should be unquestionable. It was, there can be little doubt, not the vulgar love of power, but the desire that everything should be done in the best possible manner, that made him insist on this rule. His position was thus as exceptional as his genius; but it may be concluded that his hands would have been stronger, his comfort greater, and his valued life prolonged to the period due to his iron constitution, had he not so perseveringly accumulated all functions on himself. He might—and those who knew him best thought he could—perform every duty better than any subordinate he could find. But it was a fatal deduction from this premises to hold that he could better perform them all.

Of the magnitude of what he actually effected, we have little space to speak. He doubled not only the speed, but also the convenience of transit, both by sea and by land. Alone among the great names of his day, he made provision for the requirements of the future. To make railway carriages broad enough, and steamers large enough, to convey, with increased economy, and at augmented speed, the traffic of the future, was but the outcome of his provident forethought. We are not about here to open the question of the broad gauge, which is very temperately referred to in Mr. Brunel's Life. But it cannot be doubted that the limit of the carrying power on the most busy narrow-

gauge lines is now attained. Week after week we have fatal proof of this fact. We will not assert that a double broad-gauge line, if carried out according to Mr. Brunel's ideas, would do the work of a fourfold narrow-gauge line,—but, at all events, it would afford a much greater margin for the economical development of an increasing traffic. As to the size attainable by ocean-going steamers, Mr. Brunel fought the battle single-handed. There can be no doubt as to the victory he obtained.

No part of the volume before us is of more service in enabling the reader to form a correct view of Mr. Brunel as an engineer, than the patient and accurate detail of the launching of the *Great Eastern*. A painful, dim, suspicion that some unexplained want of success attended that unprecedented operation is dispelled by the simple record. We see what had to be done, what obstacles arose, and how, one by one, they were vanquished. The financial non-success of the atmospheric system is also fairly and honestly set before the reader. The only point in which we are disposed to differ from the author is, that we hold the opinion, which was shared by Monsieur Eugène Flachet, who gave much study to the subject in France, that the loss arising from the irresistible rush of calorific into the rarified air bore a much higher ratio to the leakage of the valve than Mr. Brunel allows,—that, in fact, the mechanical difficulty might have been surmounted, but that the physical difficulty was more serious. Nor does this physical difficulty appear to have been anticipated by any one.

We could wish that more space had been devoted to personal anecdotes. Those who have been accustomed to regard the engineer of the *Great Western* as a species of orer active intellectual machine,—a man who lived only in and for the execution of novel and stupendous work,—have formed but little idea of the buoyant gaiety, the indomitable patience, the exquisite taste, and the inherent kindness, of Isambard Brunel. His stature was low, but so knit and proportioned as to laugh at fatigue. The engraving, at the commencement of the Life, gives a somewhat conventionalised view of his face; the nose, especially, being too heavy. There is a very speaking photograph taken of him, as he leant against the chains employed in the launch of the *Great Eastern*; in which, however, the chimney-pot hat, of which he was a steadfast advocate, hides the perfect curve of the head. His eyes were rapid and piercing in their glance; and the modelling of his lips betokened a refined, and even an imperious taste. This quality found appropriate expression in his works. The old canal type of bridge, and the unrelieved shed roof, were thought adequate for our public works before Brunel introduced features as novel as they were striking. In the station at Swindon he first adopted a graceful Italian ornamentation, to displace the barrack style previously in vogue. In the *Great Western Station* at Paddington, he has produced by far the finest work of the kind in Europe; a building as superior to the unnecessarily costly wagon-roofs that disgrace the Thames-side stations, as it is to the carpenters' sheds at Euston-square. While turning night into day at his desk, he would find time to pick up a rare bit of china, or to floor an opponent in conversation by an apt quotation from Mr. Micawber. To these genial qualities testimony is borne, in the volume before us, by his old friends Mr. Burke and Mr. Hawes. His admirable qualities as a negotiator, and his unrivalled success as a witness, were well known. In cross-examination, he was unapproached. On one occasion the case of a line, which did not look very brilliant on the close of the examination in chief, was so thoroughly established by Brunel's replies to the opposing counsel, that he dryly remarked to that barrister, as the committee broke up, "So-and-So, our directors had better retain you to cross-examine me next time."

On one occasion only can we remember his having been taken aback. In 1852, during a visit to South Wales, his second son, a bright intelligent lad, who accompanied him, asked some question as to the Barrow rails, which were then being laid on that line. Mr. Brunel replied that they were an experiment. "What, papa," exclaimed the boy, "do you mean to say that all the South Wales line is one great experiment?" The engineer winced, and for once was deaf.

If one quality more than another should be held up to the admiration of those who would emulate the career of Isambard Brunel, it is his unhesitating, unflinching conscientiousness.

His moral courage scarcely fell short of his utter physical fearlessness. No toil was spared, no cherished project was clung to, when he found that fresh light was to be obtained on the subject. To arrive at the truth was his main passion, and for that reason he obtained a deeper insight into mechanical law and practice than almost any other man. His genius none can imitate,—it was the gift of God, and was the more remarkable for appearing in the second generation. But in patience, candour, energy, labour, command of temper, kindness of disposition, love of justice, and regard for duty, he set an example all would do well to study. His character was one to be admired in all that was native, and to be imitated in all that was acquired. His monument is conspicuous in the noble works which he executed. His memory is dear to all who knew him. His biography, as published by his son, is a contribution of no ordinary value to our professional literature, and displays an instructive example of the manner in which the rarest natural gifts may be improved by the most unremitting culture. His remains rest, in "the holiest of our holy places," near the dust of those most famous in our history. It would be difficult to point out a tomb which commemorates the name of a more faithful and illustrious *Natura minister et interpres*.

ENGLISH AND WELSH ABBEYS, CASTLES, AND HALLS.*

IF Mr. Pickwick, or the philosopher whom Sam Weller puzzled at Clifton with the intermittent gleam of his dark lantern, had proposed to himself to write a book upon the structural antiquities of their native country, it is possible he would have produced exactly such kindly, old-fashioned, unquestioning volumes upon the subject as the two that have just been completed by the well-known author of "The Curiosities of London," Mr. Timbs. The sceptical note that appears in the modern antiquary's eye is not in his; neither is he afflicted with a subversive beam. The delightful old legends that engird so many of our ancient castles, abbeys, and manor-houses, have as fresh a charm for him now as they had sixty years ago; and he tells them with as firm a faith as though they had never been dissected on the library-table of the modern archæologist, and found wanting. It is no pleasure to him to detect the absence of a vertebra, and see the tremble and fall of the subject he is examining. He summons up his ghost-stories tenderly, and dismisses them with care. Let any one gainsay it who chooses, we were in need of such a work treated in such a manner. Already our lip-lore has decreased to a shred in these matter-of-fact days; and if we are to have nothing but winnowing and weeding of our old legends we shall some day find ourselves without any.

Mr. Timbs does not pretend to have visited all the buildings whose "popular history" he relates. Such descriptions of them as he occasionally gives are taken from accepted authorities, though, perhaps, in some cases, from authorities that were accepted in days when topographical surveys were rare. Hence, for architectural details we must not look. But as they are not promised, we cannot justly complain of their absence. Here and there this sketching in the library instead of upon the spot, however, leads to a little shortcoming in the matter of bringing down the history of a building to the latest events. Looking to the account of Stowe, for instance, we see Mr. Timbs says, by way of conclusion to his remarks:—"Of the many instances of fallen fortune to be found in human history, the sad fate of Stowe and its possessors presents us with the most melancholy lesson,—to lecture us with its fallen grandeur, and to impress us with the virtues of contentment, and teach us that 'not a vanity is given in vain.' " Now, if Mr. Timbs had happened to take a return ticket to Buckingham, he would have found that Stowe is in the process of rehabilitation, and is gradually becoming as well stored as it was before the memorable sale. Or, turning to Berwick, we find no word of the fact that the Castle has been displaced there to form the railway-station; or to mark there is nothing to indicate that the noble castle is down, leaving only a mound as its site. Similar want of

* Abbeys, Castles, and Ancient Halls of England and Wales; their Legendary Lore and Popular History. By John Timbs. London: Frederick Warne & Co., Bedford-street, Covent Garden. New York: Scribner, Welford, & Co.

posting-up in recent facts to be detected here and there might lead to the impression that the blemish was one that pervaded the whole work. This is by no means the case. In many instances Mr. Timbs has availed himself of the most recently published information. If not, he would have attributed the carvings at Chatsworth to Grinling Gibbons, as was formerly the rule, instead of the Watsons. And in the main, in his bright pen-and-ink sketches there is much to admire and be pleased with.

Mr. Timbs tells us that Harlech Castle was originally called Twr Brownen, from Brownen, the ancient British princess, who was the daughter of Llyr, and sister of Bran, the father of Caractacus. This would have been a good opportunity to relate what is known of the history of this "fair-bronzed" beauty. The fifth of the Welsh Triads mentions that a blow given to her by an Irish Prince, Matholwch, was one of the three luckless blows of Britain, and the cause of war; and the Mabynigion records that she was buried on the banks of the Alaw, in Anglesea; and about forty years ago, on the banks of the Alaw, at a spot known as Twys Brownyn, was found a square list, with a funeral urn in it, supposed to be that of the princess in question, which urn is now in the British Museum. But our cheery and good-natured antiquary leaves the lady alone, and records instead the plucky defence of the old fortress by a Welshman named Dafydd ap Ierón ap Eionin, in the fifteenth century. "I held a castle in France," said this brave Taffy, "till all the old women in Wales heard of it, and now I will hold this Welsh tower till all the old women in France hear of it." And so he held it through a long siege by the Earl of Pembroke; the earl's brother and a large force encircling it, and his garrison suffering fearfully from famine, till at last the most honourable terms were offered to induce him to surrender, and he gave up the castle, after keeping it for nine years, against Edward IV. Even his foe became his friend; and when Edward at first refused to stand by the terms he had made in his name, Pembroke swore, "Then I will put Dafydd and his garrison into Harlech again, and your highness may fetch him out again by any one who can; and if you demand my life for his, take it." of which generosity we hope all the old women in France heard too. Silver-grey, wind-worn, and frayed are the remains of Harlech Castle, with Plantagenet shoulder-headed windows, and great pointed archways side by side, with narrow arrow-slits, scarcely 10 in. high, that were part and parcel of old Welsh valour; and between the castle and the sea lies spread a low, green, oozy marsh. Mr. Timbs thinks it "overhangs" the sea, as Bamfborough and Dunstanborough, on the north-eastern coast, literally do; but there is this low-lying tract of marsh at the foot of the steep on which it stands. This little uncertainty about the site is, however, scarcely worth mentioning.

Mr. Timbs has gone over a field that is too vast to be minutely explored single-handed with complete success. If he has made slips that local historians can put their fingers upon, as when he gives Alnwick to the Percies by the exclusion of a natural son of Antony Bee, Bishop of Durham, he must, on the other hand, be accredited with great care, generally, and much taste. Here is a pretty landscape, with Ludlow in the foreground—

"The old town of Ludlow,—in itself an object of considerable interest,—stands upon a knoll, and to the westward, on the heights of a steep line of rocks, rise the grey towers of Ludlow Castle, which at one time must have been impregnable. From this point the view is, perhaps, unsurpassed in all England. Eastward is Titterton Clee Hill; on the north is Corve Dale, and a series of hills which stretch as far as the eye can see, the beautiful valley of the Teme lying immediately below you, with the Stratton Hills as a background; to the west is a line of forest; while, looking back, the Teme, prettiest and tiniest (in some places) of rivers, disappears in a narrow ravine, 'formed' (says a contemporary writer) 'by some convulsion of the ancient world, which cut off the knoll on which now stand the castle and town, and gave it its picturesque character.' So beautiful, indeed, is the surrounding country, that Ludlow has been called by an enthusiastic admirer (probably a Salopian) the queen of our inland watering-places."

Much in this manner, we are shown between three and four hundred remarkable places, famous either in song or story. This selection by no means exhausts our national store. In the provinces, some of his readers will consider their particular lions, which may be omitted, as worthy of recognition as others that are inserted. Northumbrians will miss Ford Castle, for instance, close to Flodden field, where James IV. of Scotland, "the champion of the dames," spent the last few hours of his life before the

great battle, fascinated with the beauty of the wife of the owner, "Sir Hugh the Heron bold," as painted so gorgeously in Marmion; Bothal Castle, Chillingham Castle, Harbottle Castle, all famous, and Brecknock Priory, among others. Durham men will look in vain for Lambton Castle with its legend of the famous Worm, or for Bishop Auckland Castle, now the residence of the Bishop of Durham, built by the fighting bishop, Anthony Bek, implicated in the transfer of the De Vesecies' estate to the Percies, though not in the manner narrated; Warwickshire readers will consider Arbury Hall, with its ruddy and sunny courts and grey and green terraces, alighted; Kentish folks will wonder why Saint Radigan's Abbey was not added to the rest; and so on through the counties. We recommend the book as a pleasant, chatty companion for a leisure hour, that tells, agreeably, of many an odd and out-of-the-way place, as well as of the chief country-seats of the ancient nobility. We have all read of hiding-places, recesses within walls, and of the magical appearance and disappearance of individuals upon the scene by their means; and here we are given minute particulars of two of the most remarkable halls containing them. Ingatstone Hall and Hendlip Hall. Holy Sepulchres, i.e., the empty arched recesses in chancels, where, in old times, a crucifix or effigy of the Saviour was placed on the evening of Good Friday, have a chapter; Stamford Bull-runnings have another. Lady Godiva, Queen Eleanor, Arabella Stuart, Elizabeth, Queen of Bohemia, Amy Robsart, Tennyson's Countess of Burghley, and other dames of whom we are never tired of hearing, sweep across the pages; as well as more ghostly personages. The Boscombe Oak, beehive-houses, curious caves, celebrated fields, subterranean chambers, the Star-chamber, Avebury, Stonehenge, historical stones, such as King Arthur's Stone at Gower, rocking-stones, and the Stone of the Arrows, near Aber, where the old Welsh princes sharpened their spears and arrows, are, among miscellaneous matters, introduced, that do not come, strictly speaking, under the heading of abbeys, castles, or halls, and yet have stories belonging to them that are part of English history. They form, indeed, a relief to the scores of oak-floored and panelled chambers, hung with historic portraits, and enriched with coffered ceilings and carved chimney-pieces of ancient country-seats. We get tired of a noble avenue if there is too much of it; and it is possible to have too many haunted corridors, even though it be Queen Katherine herself, with her crown and train, that glides adown them, as at Kimbolton; and to meet with the same personages too often. Hence, it was wise in Mr. Timbs to sprinkle his spectres sparingly; and to interpose between the numerous halls and castles in which Mary Queen of Scots was confined, those visited by Cardinal Wolsey; these in which Queen Elizabeth was entertained; and those in which Charles I. and Charles II. met many of their fortunes face to face, some such contrasts as he has introduced. Even mysteries, like that of Minister Lovel, or myths, like that of Midridge, or the blind beggar of Bethnal-green himself, are welcome, after a long course of the last-named illustrious personages, unless, indeed, they are graced with startlingly new treatment.

Turning over page after page for a suitable specimen of Mr. Timbs's manner, we light upon this sketch of Fair Rosamond's Bower:—

"In the middle of Oxfordshire there existed from the Saxon times almost to our own age, a Royal palace, fraught with memories grave and gay, and chequered with light and shade of the most picturesque scenery. Not a vestige of the palace now remains; but its site is denoted by two sycamore-trees, whose wide and spreading limbs point amid the solid silence to the spot where kings in days of yore have dwelt. . . . The Bower, or Maze, which the king had built for Rosamond, consisted of vaults underground, arched and walled with brick and stone. It is thought to have existed before the time of Rosamond, and remained after her death, since all pleasures, or games, in the Middle Ages had this adjunct. . . . How the Queen discovered her is variously told. It is commonly said that she was taken to Rosamond by a churl, a thrush or a silk, and so dealt with her that she lived not long after."

And then Mr. Timbs gives all the other versions of the story known, with an account of Godstow Nunnery, where some authorities state Rosamond was buried; while others affirm she lived as a nun for twenty years after her supposed death. Those who admire our ancient fabrics, and enjoy their legends, will find in the volumes he has prepared a large amount of enjoyment, and will unanimously admit that he has well carried out his object, which he avers was to add to the attractiveness of famous sites and scenes.

NEW BUILDING FOR THE POST-OFFICE, ST. MARTIN'S-LE-GRAND.

THE corner-stone of the new building for the General Post-office, in course of erection opposite Sir Robert Smirke's building, in St. Martin's-le-Grand, was laid on the 16th inst. by the Chief Commissioner of Works, Mr. Ayrton, M.P.

It is stated that the new building will be of four stories, and have four fronts, two each 286 ft. in length—one towards St. Martin's-le-Grand, and the other in Bath-street; and two each 144 ft. long—one in Newgate-street and the other in Angel-street. It will be faced with granite to the height of 5 ft. above the pavement, and the superstructure will be of Portland stone throughout. The first two stories will be ornamented with Doric pilasters, and the two upper stories with Corinthian pilasters. The principal or centre entrance, in St. Martin's-le-Grand, will consist of a Doric portico, surmounted by columns and an entablature of the Corinthian order. The estimated cost of the structure is 129,700*l.* odd. It is being erected by Mr. William Brass, contractor, of Old-street-road, from designs by Mr. James Williams, architect of the department of the Board of Works. The erection of the edifice is under the superintendence of Mr. Trickett.

Mr. Ayrton, in his address, said the new building would be a remarkable illustration of the advantages to be derived from the study of economy, combined with utility, in the erection of a public building. He was happy to add that no edifice had been recently designed in which so much convenience and accommodation would be obtained from so small an expenditure of the public money, yet consistently, at the same time, with such an amount of ornamentation and elegance as was requisite in a public building of that importance. Undoubtedly, it would not present what some people would call the grand features they might expect to see in a public edifice; but it should be borne in mind that the department with which he was connected was not engaged on this occasion in erecting a Grecian temple, but a place of business; and therefore it had sought to subordinate architecture to convenience. However desirous people might be to encourage mere beauty, his department was bound to remember that architecture was not to be regarded as the master of the public, but rather its servant. It might, indeed, be compared to a handmaid of fair proportions ministering to the wants and luxuries of her mistress; but when worshipped, it becomes an inexorable thing, compelling every one to submit to its dictates.

Mr. Ayrton is right in principle, but he must not push it too far. "Fitness, Commodity, Dignity," is the order in which the purpose of a building has been wisely stated. The authorities who ignore the last quality altogether will stand but ill with posterity. Moreover, beauty is not necessarily costly:—

"Taste, never idly working, saves expense."

It is scarcely to be denied that the design of the New Post Office, as published, is of a commonplace type. Unless good architectural skill be brought to bear on details, the general proportions, and the profiling of mouldings, we may have a damaging eyesore that will last long years.

THE STATE OF THE STONE RELICS ON IONA.

MR. JAMES DRUMMOND, R.S.A., read a paper, entitled "Notes of Early Monumental Art in the West Highlands," at the last meeting of the Society of Antiquaries of Scotland. He visited Iona, and found the stone relics in a sad state of neglect and decay; indeed, some of them he did not find at all. They had actually been claimed by various persons, on one pretence or another; one because his grandfather had paid seven bolls of barley and seven milk cows for it,—to whom is not said, and no one had any right to sell it:—

"Now, surely [says Mr. Drummond] this system of appropriation ought to be put a stop to, and that by the strong hand; for it is an utter impossibility that the monuments of these old chiefs and ecclesiastics can be the property of these people, many of whom hardly belong to the island. No better illustration could be given of the utter indifference and carelessness, not only of custodians, but of all connected with this neglected region, whose duty it is to protect from destruction these precious illustrations of monumental art of a bygone time, than the M'Leod memorial stone, over which the turf was allowed to grow; and so thick was this covering, that the very position of it was forgotten; and yet this was one of the interesting and most perfect remaining. Close by this I

uncovered another, over which the turf had been allowed to grow. On it is a cross, a sword, and the usual scroll-work. It has often been asked—Is there no way of preserving these invaluable relics? I should say no difficulty whatever, seeing the old order has been departed from, and as no stone is now in its original position, there can be no delicacy in the matter if the powers that be would only move in the matter or sanction some scheme. In such affairs the simplest plan is always the best, and the object would be gained if a simple stone bench, about 1 ft. high and 3 ft. wide, were built round the base of St. Oran's Chapel, and on this, ranged against the wall, the feet of the alabs, those of figures, being placed at the east end, and in front of all an iron rail, to prevent inquisitive people from meddling, but let no sacrilegious hand put a roof on this chapel, as has been proposed. Let the more common specimens lie still inside the barriers."

Mr. Drummond also visited and speaks of the remains in Cantyre and elsewhere.

PROFESSIONAL QUESTIONS.

NORTHERN ARCHITECTURAL ASSOCIATION.

THE President of this Association (Mr. Thomas Oliver), in his opening address on the 17th inst.* said:—Perhaps the most important duty that we have to accomplish—a duty that underlies the entire ramifications of our professional practice—is that of securing public confidence. It would be useless to shut our eyes to the events of the last few years, whether caused by the short-sightedness or conservatism of metropolitan practitioners, or by the craving for change, or the want of information on the part of the public; but to all observing minds it must be evident that a change for the worse has taken place in regard to this most desirable state of things. It is said the late Prince Consort remarked on one occasion that he could get along well enough with civil engineers, but when he came to consult with architects, they almost invariably threw obstacles, such as precedent, in his way. And our present Government has certainly shown in most arbitrary terms and actions their unequivocal intention to throw over precedent, both in the appointment of their professional advisers and in regard to the established customs of such advisers. The cause of this, like the cause of the terrible war now raging on the Continent, will very probably ooze out, bit by bit, as personal quarrels, secret negotiations and apprehensions of individual aggrandisement, develop themselves, through blue-books or otherwise, to the outer world. To ignore the fact, however, will not meet the case; we must meet it face to face. If we have habits to throw off, let us do it manfully; and if we have habits to learn, let us set to work to learn them cheerfully. This, however, we must have, and that is, that the public shall believe in our honour and good faith; shall have confidence in our capability to perform what they require, and shall implicitly trust our word as regards the expenditure of their funds.

Behind the cloud, however, there is even here the silver lining. The public have confidence in our taste. Royal engineers may possess constructive talent "almost amounting to genius," as Mr. Cole remarked of the designer of the hideous structure for the last Great International Exhibition, in Cromwell-road; or ephemeral architects of the Paxtonian school may gild their one idea, and take the world aback for the moment; but in all cases the cultivated and life-educated architect has to be called in, either to give the artistic touch or illuminate with brilliant colour the ill-proportioned blocks of material, and transform them into that subtle and beautiful thing recognised by all cultivated minds as architecture.

There are two questions at the present time agitating the architectural profession, the first, though least in importance, being the ownership of drawings; and the second, the diploma question.

The question regarding the ownership of drawings involves the question of copyright. As there is no law in our favour, as in the case of book-making and picture-making, those engaged in palace, church, or house making must, I suppose, be content to have their ideas plagiarised, until architecture, as an art, and its application into original forms, becomes looked upon by the public as an invention. Have I not as much right to take out a patent for my original designs for baths and wash-houses, or model chapel design, or convalescent home design, as the person who builds

a turret war-vessel, and sells it to the Government; or the person who makes a steam-engine, and disposes of it to a railway company; or a person who makes a chimney-pot, a washing-machine, or a porcelain bath?

The question of the ownership of drawings, however, has two or more phases, two being at the present time prominently before the public.

The architect, in furnishing to the builder selected by his client, which every architect must do, a copy of the whole of the original drawings and details to work from, actually gives to the manufacturing agent of the proprietor that which he seems to consider his right, viz., the drawings that are practically worked from; and surely if the architect chooses to keep his own copy, the proprietor has no right to claim that copy as his also. Such is the fact, however, and such is the claim that is being made. Doubtless many of the builders' drawings get destroyed and lost, but this is through no fault of the architect. Suppose an architect did not furnish a copy of the drawings, but sent his office copy out for the builder to work from, what position would the proprietor be placed in? The whole of the drawings might be lost, in case of dispute. They could not help being damaged; and as documents forming the most important part of the contract, they would be entirely at the mercy of a too deeply-interested party. I need scarcely say that nothing but confusion would be the issue. Again, if an architect has to give up his own copy of the drawings to the proprietor, in addition to the copy given to the proprietor's contractor, he would, for his own almost necessary future use, have to prepare another copy, making in all three copies, which, I maintain, his present commission or charge would not permit of his doing to be remunerative to him.

ON A NEW METHOD OF PRODUCING DURABLE MURAL PAINTING BY FICTILE VITRIFICATION.

THIS was the title of a paper read at the Society of Arts, by Mr. Alan S. Cole, on the 14th inst., when Mr. Ayrton, M.P., presided. We must confine ourselves to that portion of it (and the whole was very interesting) which describes the new mode. Mr. Alan Cole said,—

A somewhat new process is now in use by Messrs. Minton, Hollins, & Co. and Messrs. Maw & Co. It is remarkable, as the tesserae are mechanically produced. The idea of these tesserae originated with Mr. Prosser, and was worked out by the late Mr. Herbert Minton. They are made by compressing into metallic moulds powdered play with such a force that the atoms of the clay bind themselves together, and retain the shape of the moulds sufficiently that they can be manipulated and carried to the kilns, where, once fired, they become homogeneous and imperishable bodies. The colours given to these tesserae are, in the main, produced by metallic oxides, principally oxide of iron. The scale of them is limited to a certain extent, though much progress in making new colours is being effected by Mr. Michael Hollins, head of the firm of Messrs. Minton, Hollins, & Co. To this kind of mosaic I propose to give the name *opus anglicorum*. I believe this term has been applied to certain English needlework. I think it is more appropriately applied to mosaic work than to needlework, so that I trust that some other name may be given to be regretted. And now I get to Mr. Campbell's process, which I suggest should be named *opus fictile pictorum*, and considered as a sub-section of the *opus anglicorum*.

To Mr. Arnoux, the scientific juror and reporter upon pottery shown at the various international exhibitions, I am indebted for many most valuable explanations and notes upon Mr. Campbell's invention.

Adopting the principle of the late Mr. Prosser, in 1840, to which I have alluded, Mr. Campbell produces tesserae, by compressing a composition of stone and clay into metallic moulds. I have here specimens of such unfired tesserae. By this means the greatest economy in time and in workmanship is insured. By using ordinary clay in a plastic state, several days must elapse before it becomes dry enough to be placed in the oven. The advantages of this system of compressed dry pulverised clay are so manifest, that it has quite superseded the former modes adopted for the making of tesserae or tiles.

These compressed tesserae are then removed to the oven, where, by virtue of the components of the material, they become vitreous bodies.

The hexagonal shape was adopted in the first instance at Mr. Ayrton's suggestion. The agglomeration of a regular hexagon produces a network of lines generally accepted as being more pleasing in effect than the union of squares.

Plaques may be formed with facility. These plaques are of small and convenient size, thus rendered free from the ordinary risks of firing large plaques. In the first instance, the tesserae are cemented at the back by a species of mortar, and then fired. This operation concluded, their surfaces are covered with a stanniferous flux, which fills up any spaces which may occur between the tesserae. Again, they are fired, and upon issuing from the oven are ready for the artist's use. I must here tell you that each individual tessera is a vitrified body impervious to any effects of damp. These tesserae cemented together therefore produce plaques whose nature as one body is identical with the imperishable nature of each of its tesserae. The cements at the back and the flux on the surface cannot be injured by any atmospheric effects. Thus, I repeat, the plaques are, so far as science of the present day can teach, perfections of imperiousness to any evil effects from damp, dirt, gas, &c. Now, by placing the plaques together, it is obvious, for the artist who likes to have a large space before him, he may thus obtain an acre of tessellated canvas to work upon if necessary.

The artist can make his preliminary blocking-out or sketch with charcoal or pencil, and with the same ease as he effaces his work from canvas can he rub it off the Ceramic plaques. When he has completed his sketch, he may then proceed to the colouring of his composition.

The detrimental effects of light upon vegetable colours, the hurtful results of the exposure of colours composed of metallic oxides or their salts, to the action of oxides of carbon, of ammoniacal gases, sulphuric acid, sulphurous acid, and carburetted hydrogen, precluded the adoption of such materials. The use of the various essential oils and varnishes seemed likewise forbidden by the well-known volatile character of such fluids.

Again, the mural paintings, by means of mineral colours, worked with alkaline silicates as a pigment (such, for instance, as have been tried in Berlin some twenty-five years ago), require for their execution considerable practice and study, and a delicate manipulation. This process cannot be said to have yet received the sanction of time, and it appears they have already suffered from their exposure to the atmosphere; at all events, it is not proved that they can resist the action of the nitrate of potash, which the capillary attraction of the wall is sure to bring to the surface.

Thus it will be seen that there seemed to be obstacles in the way of the right species of colours to be used; however, Mr. Campbell's resources have enabled him to contrive a complete palette of vitrifiable colours almost quite similar to the ordinary oil colours. The artist can apply them to the plaques in precisely the same way as he would oil colours to his canvas. The plaques, when painted, are fired, and upon withdrawal, should the artist desire to make alterations, he can do so by painting in his corrections, which may be fired into the composition. The number of firings is quite immaterial, and may be multiplied without damage to the plaques. If you will examine the finished specimen exhibited, you will see that the actual strokes and touches of the artist remain as they do in oil paintings. The texture, if I may so call it, is identical to that of an oil painting. Herein, therefore, is a most valuable feature.

I wish to make one remark upon the durability of the colours. Their nature, like that of the tesserae, is vitreous. By the heat of the kiln a fusion between the colours and the plaques takes place. The vitreous components in both combine, and the result is an endurable and imperishable work.

I would sum up, therefore, the virtues of Mr. Campbell's process thus,—permanent painting, upon a true and level surface, illimitable, if necessary, in its size.

A very valuable discussion followed, in which Mr. Cope, R.A., Mr. E. M. Ward, R.A., Mr. Poynter, A.R.A., Mr. Redgrave, R.A., Mr. J. G. Crace, Mr. Westmacott, R.A., Professor Donaldson, Mr. Fisk, Mr. Hyde Clarke, and the Chairman took part, and which want of space alone prevents us from reporting.

* At this meeting, a paper, by Mr. F. R. Wilson, "On Old English Statutes" (to which we shall return), was read. The election of officers also took place. Mr. Wilson, Alnwick, was elected president; Mr. M. Thompson, vice-president; Mr. James Hogg, treasurer; and Mr. F. Charlton, secretary.

WORK, WORK, WORK!

CIRENCESTER SCHOOL OF ART.

At the distribution of prizes, last week, in connexion with this school of art, Mr. S. O. Hall delivered an excellent *extempore* address to the students, a portion of which we report. Never, he said, let your time be idly spent when it can be profitably employed. Take my advice,—work, work, work. Consider that idle time is not only evil in its influence and effects, but leaves a seed that will surely have as pernicious fruit as any evil planted on earth can have. My lads, you must consider that every hour of your time, that you can spare from your employment, you must apply to art, which is profitably spent, and not only for its immediate gain, in furnishing and strengthening your minds, but in the actual profit to be obtained at no distant period. Remember that he who is intelligent is sure to make better progress than the man who is stupid. Remember the great advantages foreigners have over us, which is attributable to the education they receive in the art departments, and which is profitable, not only for enjoyment, but for actual pecuniary advantages. The skilled workman is a better workman than he who is unskilled; and his master can afford to pay him a much larger sum than to him who works without intelligence. If you had been through the French manufactories, as I have been, you would have seen that the meanest artisan knew perfectly well what he was about; he was not a mere mechanic, to copy slavishly what was submitted to him, but he thought and considered, and the result was a better design in taste, form, ornamentation, and colour. They produce a better design than we do, with all our energy, and under circumstances always more favourable, excepting that they understand what they are about, whilst we labour on in ignorance of the principles required. It would be only going over the old ground again to tell you that in every position of life art has its charms. There is no man so utterly uncultivated—not even the savage—who does not derive some enjoyment from art. It is the highest recompense of civilisation as it is the largest reward to the uncultivated. But if enjoyment was the only object of art, it would not accomplish a very small portion of its task. It is a very great pleasure and a great teacher, and whether found in the palace or cottage it is sure to bring recompense with it, whenever encouraged. I trust that these boys, however humble, surround their rooms with bits of art, which indeed are silent but valuable instructors. They can easily acquire that which, when I was a boy, cost pounds, for perhaps pennies. Some of the most beautiful engravings are now to be had almost for nothing. I ask you to look at a publication called the *British Workman*, which contains some of the most beautiful works of art. Some large prints in it are as excellent in drawing and engraving that no money can produce better work. You can have to-day the best achievements of the painter multiplied by the engraver, which in my young days were confined only to the wealthy. Get them then, I say, in the name of goodness; surround yourselves with these beautiful things so easily to be obtained. I have every reason to congratulate my countrymen on the change that has taken place in England during the last thirty years. These schools of art are certainly the main instrument to achieve that high and holy purpose which no other science can fulfil; and let us promote it by every means in our power. When you place an illustrated book, or print, before any of your young people or children, you know as well as I can tell you that you are thereby cultivating a taste not only to soften and elevate the mind, but to have an additional comfort and advantage for them. How many of your cottages are decorated with these silent instructors? Show me the cottage that contains some half-dozen or more of these prints, which are to be had for almost nothing, and I will show you a better master of the household, and mistress, too, be it ever so poor a cottage,—in other words I will show a father and mother more fit to bring up children than are to be found in many circles of higher society. What influences a desire to enjoy home more than cultivating a love of art? Art is a public instructor, aiding in the virtues taught by the Holy Book. One of the best auxiliaries which a clergyman can have, when he puts a Bible in the hands of his flock, is a love of art. One art will assist others, and it

will lend its influence towards virtue, equally with as good effect as any of the teachings of a good clergyman can give us. Be not under the impression that you can learn without work, that a lesson is to be acquired without labour: you must do that which other men have done who have achieved eminence in any position, in any grade or calling. You must remember that toil is the only road to excellence, and that to achieve success you must labour to earn it. My young friends, bear in mind,—and I leave it to you as my legacy,—to work, work, work, with thought; cultivate your intelligence, and do not be satisfied simply to use your hands; but use your brain and cultivate your mind, and you may be sure that the more you think over these subjects the more you cultivate art. I impress upon you to labour to attain eminence in it; the more surely you will be laying up for yourselves prospects of happiness hereafter, not only in the actual recompense distinction will bring to you in the reward of a pleasant and profitable science, but in the reward of your conscience in feeling that you have done that which you ought to do, and to which it has pleased God to call you. I know that among you there are many who are the sons of men in trade here, in this town of Cirencester; I have been told of this and that person whose father and other members of the family are working in trades, and who can only be spared occasionally,—perhaps not for more than an hour in the evenings; but in that time they have undoubtedly shown the good results of work. Well, then, make the most of that time, and be assured that if you do not accomplish all you desire to accomplish, and rise to that eminence which some of your young men have attained at Kensington, each will have his reward according to his degree of merit, will have a recompense for his thought and labour, well employed and well bestowed.

IN RE YEOVIL.

TYPES OF CIVILISATION.

"A WORKING MAN" furnishes a Crewkerne local paper with some fever facts about the villages of Chinook and asks what the Nuisance Committee of Yeovil are about? He says:—

"The cottage in which Robert Lacey lives, and where he has lost his wife and one child, besides having had another child and himself attacked very severely, has no less than five privies and a pigsty all within a few yards of the house! One of the privies at the back is touching the house, and has an open cess-pit! It is no wonder, therefore, that fever should break out in such a place. It cannot be supposed that the medical gentleman who attends the place has not reported this state of things in the proper quarter. Out of the five cottages at Quarry Farm, three have had fever in them. None of these cottages have back doors, and they are built against a damp hedge. They cannot be healthy, as it is impossible to wash the floors. There are also two cottages at Richy, not far from Lacey's cottage, which are a disgrace to the parish on account of the shameful state in which the poor occupants are allowed to live year after year. I venture to say that children who have to live in such wretched places cannot be healthy, what they will learn when sent to school. What is the Nuisance Committee of the Yeovil Union doing that some step is not taken towards the spread of this fever? Perhaps, by and by, when some of the richer inhabitants of the place are attacked, some stir will be made."

We may add that the three villages of Chinook East, West, and Middle, require looking after. They have never, to our knowledge, been long free from disease and sickness; the habitations of the poor out and about the parish are not much better than pigsties. A little distance north of East Chinook is the notorious and unfortunately-situated village of Chiselborough, which attracted so much attention some years since. The inhabitants are affected by maladies which are said to arise from the defective ventilation and the mild climate of the neighbourhood. In the year 1851, in a letter to Lord Ashby, Dr. Guggenbuhl thus described the inhabitants of the village of Chiselborough:—"Three German feet high, corpulent and bloated, with misshapen heads, turgid lips, and noses flattened like the negro's." Whether the situation of the village in a narrow valley, enclosed by lofty hills, has such an effect on the temperature of the climate, and, in turn, so affects the villagers of Chiselborough as to produce the maladies known as goitre and cretinism, we are not prepared to say. But with the additional evils and surroundings that such homes as those which the villages of Chinook and those in the Yeovil district exhibit, we fear that these repulsive peculiarities will not soon wear out. Dirt is the parent of many crimes, and badly-housed human nature cannot improve in physical strength or moral power. There is

no standing still; mankind must either go on improving or deteriorating. Pure air, pure water, in sufficient quantities, and comfortable and well-constructed homes, are the very least requirements that are absolutely necessary for the health and existence of civilised human beings.

THE "CRITERION TAVERN" COMPETITION.

MESSRS. SPIERS & POND proposing to build a tavern and restaurant on a plot of land in Piccadilly, just past the Circus, with a frontage of 79 ft., and extending through to Jermyn-street (a depth of 151 ft.), where the frontage is about half that in Piccadilly, graciously permit fifteen respectable architects, selected from a longer list of suing applicants, to arrange plans and prepare designs, in hope of being appointed to carry them out. In the basement, or lower, the instructions say, there is to be a hall capable of holding 1,000 people, with a gallery and a stage; on the ground-floor, a buffet and dining saloon for 150 people; above these must be a grand hall and orchestra for public meetings and concerts, and the top part of the building is to be prepared for a photographer, and have a fine-art gallery. The cost is to be about 20,000*l.*, exclusive of decorations and fittings. The premiums offered are:—150 guineas for the first best, 100 guineas for the second, 75 guineas for the third, 50 guineas for the fourth; and all the rewarded drawings are to be the property of Messrs. S. & P. No design is to receive a premium unless a contractor will undertake to carry it out for an amount within 10 per cent. of the architect's estimate. The Firm may reject the whole as not meeting their views (their decision is to be final and conclusive), or they may take from one to four of the designs at prices named above and hand it or them to their own architect to carry into execution. If, however, they should think it expedient to select one of the competitors so to act, he is to receive a fee of 1,000*l.*, for which he is also to supply drawings for the decorations, any premium to which he might have become entitled merging into that amount.

This is all very unsatisfactory. We have no desire to find any fault with the respectable firm, who have made the offer, and who, as times go, will probably be thought liberal; but look what it really means. By fully carrying out their offer of premiums the proposers may obtain four complete sets of designs and estimates, the pick of a picked fifteen, for much less than they would have to pay any one of the competitors, if employed in the regular way of business, for a single set of designs and estimate,—for less, indeed, than any properly-qualified respectable surveyor would charge for legitimately making an estimate of the cost of carrying out one of the designs selected; and yet there are fifteen architects, or firms of architects, who think themselves lucky in being allowed to buy a ticket, and at a heavy price, too, in this lottery, which, after all, if Messrs. Spiers & Pond please, may be a lottery of all blanks.

DISTRIBUTION OF PRIZES, SOUTH KENSINGTON.

The Lecture Theatre at the South Kensington Museum was well filled with the pupils and their friends on the 16th inst., when Sir Francis Grant, P.R.A., distributed the prizes to successful art students of the South Kensington District Schools. Mr. Baroche, the head-master, read a report, and called up the students one by one to receive the rewards obtained:—

"Since the last distribution of prizes eight students had been recommended from these schools for admission to the Royal Academy, and a total of twenty-two had been admitted by drawings made in these schools. Besides the regular prizes and distinctions, occasional prizes had been offered by the department and by manufacturers during the year, some for general competition, and some only for this school. By the Department 22*l.* were offered, in eleven prizes, for fans, the competition being limited to female students. Eleven students of this school competed, and Messrs. Nott & Brooks obtained the first and third prizes, to the value of 7*l.* The Worshipful Company of Plasterers offered prizes of 25*l.* for designs for a 'capital of a pilaster' and a 'diaper for wall decoration,' limiting, however, this school to one subject. Two students, Messrs. Gali and Marshall, obtained the prizes of 8*l.* 8*s.* and 4*l.* 4*s.* respectively. A prize of 5*l.* was offered by Mr. McCrum, of Milford, Armagh, Ireland, for designs for table damask. For this there were twenty-six competitors and thirty-four designs. The prizes were won by Messrs. Marshall and Wilkins, of London. Prizes of 2*l.* 8*s.* and 1*l.* 1*s.* were offered for the decoration of a tramway car. Thirteen designs were made, and the prizes were obtained by Messrs. Clausen and Harris. A steady and progressive success continued to mark the career of the school in which these honours and rewards had been won."

The gold medallists were Mr. A. F. Brophy, Mr. G. Claussen, and Mr. T. M. Rook; and two of them had won gold medals on the last occasion. The prizes presented to them were large shields in electrotype; and Mr. Cole, C.B., explained that an arrangement had been made whereby the successful gold medallists were at liberty to have an electrotype copy of that great work of art, the shield purchased at the Paris Exhibition by the State. Mr. Redgrave, in the course of some remarks, pointed out that the judges, in making their awards, did not look so much at the finish of any works as their truthfulness to art principles. He reminded the students of the coming Exhibition, and urged them to prepare works for that.

Amongst the lady students Miss Kate Karr, Miss M. Mansell, Miss E. Montalba, and Miss F. L. Sothorn, took silver medals.

Sir Francis Grant, in the course of an earnest address, with which the proceedings closed, spoke of the coming exhibition of works of the Old Masters at Burlington House as being likely to exceed in value and interest the first. In past times England had certainly lagged behind the nations of the Continent in taste and skill, studying the useful to the neglect of the ornamental, but things were now changing. He had been greatly pleased with what he had seen in the schools, and more especially to observe that painting in monochrome had not been lost sight of.

BURLINGTON HOUSE.

On turning over the leaves of a book, entitled, "Round about Piccadilly and Pall Mall," by Henry B. Wheatley, and published during the current year,—a book as amusing for its fiction as for its facts, I find at page 67, in an elaborate, but by no means accurate, account of Burlington House, the following extraordinary jumble:—

"Samuel Ware, the architect of Chesterfield House, who had been apprenticed to a chimney-sweep when a boy, was the architect employed by Lord George Cavendish."

The nobleman here referred to was Lord George Henry Cavendish, who came into the bulk of the fortune, about 800,000*l.*, of his relative, Henry Cavendish, the chemical philosopher. With this handsome sum, although not stated in the book, his lordship acquired Burlington House, about the year 1818, and determined to restore it in a thorough and princely manner. For this purpose, he certainly did select Samuel Ware, F.R.S., F.S.A., &c., surveyor to the Duke of Portland, and architect to the Duke of Devonshire, who frequently employed him at Devonshire House, and at Chiswick, but never at Chatsworth, where Wrayville ruled the day. So much for the fact; now for the fiction. Chesterfield House was built in 1748, long before Samuel Ware was born, or thought of. This is admitted at p. 205 of the same work, where Isaac Ware is stated to be the architect. But how about the jumble? I have read the paragraph quoted over and over again, and for the life of me I cannot make out whether the author intends to convey the idea that "Samuel Ware," or "the architect of Chesterfield House," was "apprenticed to a chimney-sweep, when a boy!" But in faithful remembrance of my past master, Samuel, I beg most emphatically to deny that such apprenticeship refers to him. He was the son of a leather factor in St. John's-street, having a handsome villa in Southwood-lane, Highgate, and associating with the Longmans and other wealthy members of his class.

By dint of great talent, industry, and excellent judgment in his investments, Samuel Ware accumulated a large fortune, the bulk of which he bequeathed to his nephew, Mr. Charles N. Cumberlege, who has assumed the name of Ware.

If old Isaac Ware, whose folio on Palladian Architecture I well remember, was ever among the sweeps, and dancing on May-day, I should like to know. I do not believe it. I cannot conceive how a mind so brought up should be able to design and carry out such a beautiful work as the façade of Chesterfield House, which even Samuel in all his glory never accomplished. Can some of your readers enlighten me on this point?

Samuel Ware had the good taste not to meddle with the architecture of the grand court of Burlington House, or with the Piccadilly wall, except putting a new iron railing in front; but he reconstructed the back front, put on a new roof containing numerous bedrooms (not shown

in Mr. Wheatley's engraving), and altogether spent about 50,000*l.* on the works. The grand staircase was wholly his, the proportions of which have been much spoilt by the present R.A.s; so also were the ceilings, decorations, and gilding, which I refer to because the author actually states that they were so well done by the original architect, about 120 years ago, that the learned society which took possession of the grand ball-room was agreeably surprised to find that the gilding only wanted a little cleaning to bring it out as fresh as ever it was in Lord Burlington's time.

Can any one imagine that Lord G. H. Cavendish spent so large a sum and contented himself with whitewashing his ceilings? No. They were Mr. Ware's. So were the chimney-pieces and stoves, the carved doors, pediments, skirtings, shutters, &c.

It is not correct to state that Mr. Ware's first proceeding was to take "sketches" of the house. Every architect will see that this is an absurdity. The most accurate plans, sections, and elevations were taken, and are still in existence, in possession of Mr. C. N. Ware, who, I trust, will present them to the Institute.

Burlington Arcade was a "happy thought" of Mr. Ware's, though not for the purpose of giving employment to young females, as stated. It was designed solely with the object of shutting out the hundreds of windows in Old Bond-street, which flanked the whole extent of the gardens, destroyed their privacy, and created an intolerable nuisance. The outlay amounted to about 30,000*l.*, and the first letting produced his lordship 14 per cent., besides curing the evil of which he complained. Drawings were subsequently made for the erection of a solid screen wall on the east side of the garden, in order to shut in the windows of the chambers in the Albany; but, after many interviews with the parties interested, this scheme resulted in a compromise, whereby the Albany retained some light and air, but no possibility of view over the ground, and his lordship avoided a large, unproductive outlay.

HENRY BAKER, F.R.I.B.A.

EXHIBITION IN AID OF THE FRENCH PEASANTRY.

We mentioned the endeavours that were being made to collect works of art as contributions in aid of the distressed peasantry of France. The collection is now on view in three of the galleries of the Society of British Artists, Suffolk-street, together with a number of pictures lent by the Queen, the Duke of Wellington, Miss Coutts, and others. Some of these are of rare interest,—"Christ on the Mount of Olives," by Raffiello, and Lady Eastlake's "Virgin and Child," by Bellini, for example,—and the collection, as a whole, is remarkably interesting. Some very charming works have been given by their respective authors, and a large sum (above 1,800*l.*) has already been realised by sales.

THE STRENGTH OF SLATE.

SIR,—In reply to the inquiry of "A Mason," I should say that a good sound slate slab, of the dimensions given, and supported as described, would bear any weight that could practically be laid upon it. Experiments have shown that, to break slabs of equal dimensions, it required:—For Yorkshire stone, 2 cwt. 2 qr. 22*lb.*; for slate, 11 cwt. 1 qr. 25*lb.* Slate has also been found to bear a greater pressure than any of the granites. Although I have registered the results of many experiments upon rectangular slabs, I fear the problem now propounded is so difficult, complicated, as it is, through the slab being round, and a hole being cut in the centre, that no one could estimate the exact weight it would carry. To give some idea of the great strength of slate from the best quarries, I will quote one example. A 2 in. slab, 2 ft. 9 in. wide, with 2 ft. 9 in. bearing, was weighted uniformly, and the breaking-weight was found to be 9 tons 8 cwt.

ALFRED BRADY.

You printed in the *Builder* of last week the results I sent you of some experiments made on the strength of slate slabs. Allow me to apply them to the inquiry made by "A Mason." It was found that with slabs self-faced on both sides, the co-efficient *c* was 2.25; for slabs self-faced on one side, and planed on the other, the co-efficient was 2; and for slabs sawn out of

a block, 1. There was a difference also in the strength of slate from different quarries, but those above given were of the strongest kind.

The practical conclusion I draw is, that if the slab of slate described be of a quality corresponding with the first of those above named, a safe load for it would be 18 cwt.; if with the second, 15 cwt.; or if with the third, 7½ cwt.

With materials of the strength of which we have extensive knowledge, as of timber and iron, a fourth, or even a third, in some cases, of the breaking weight may be a safe load; but with such a material as slate, it might not be safe to reckon upon more than a fifth.

C. S.

THE BLOCK-BOOKS.

As the many questions of interest connected with these celebrated books have once more attracted public attention, with a view, I trust, to their being finally settled, I have ventured to believe that notwithstanding the subject may be familiar to the greater number of your readers, there may nevertheless remain many among them to whom the "Block-books" still remain a mystery, and to whom, therefore, a concise explanation of their object and meaning, as well as the principal points in dispute relating to them, may be acceptable. For the purpose, therefore, of affording that information, I will now state what is meant by the term "Block-book," as well as mention the main questions in difference between the upholders of the old system and myself, and upon the correct solution of which the future position of the "Block-books" in literature will mainly depend.

A "Block-book" consists of an indefinite number of sheets of paper, upon which are impressions taken by means of a block of wood, upon the surface of which letters or engravings, or both, have been carved or cut, and from which, by pressure or friction, any required number may be printed at an exceedingly trifling expense.

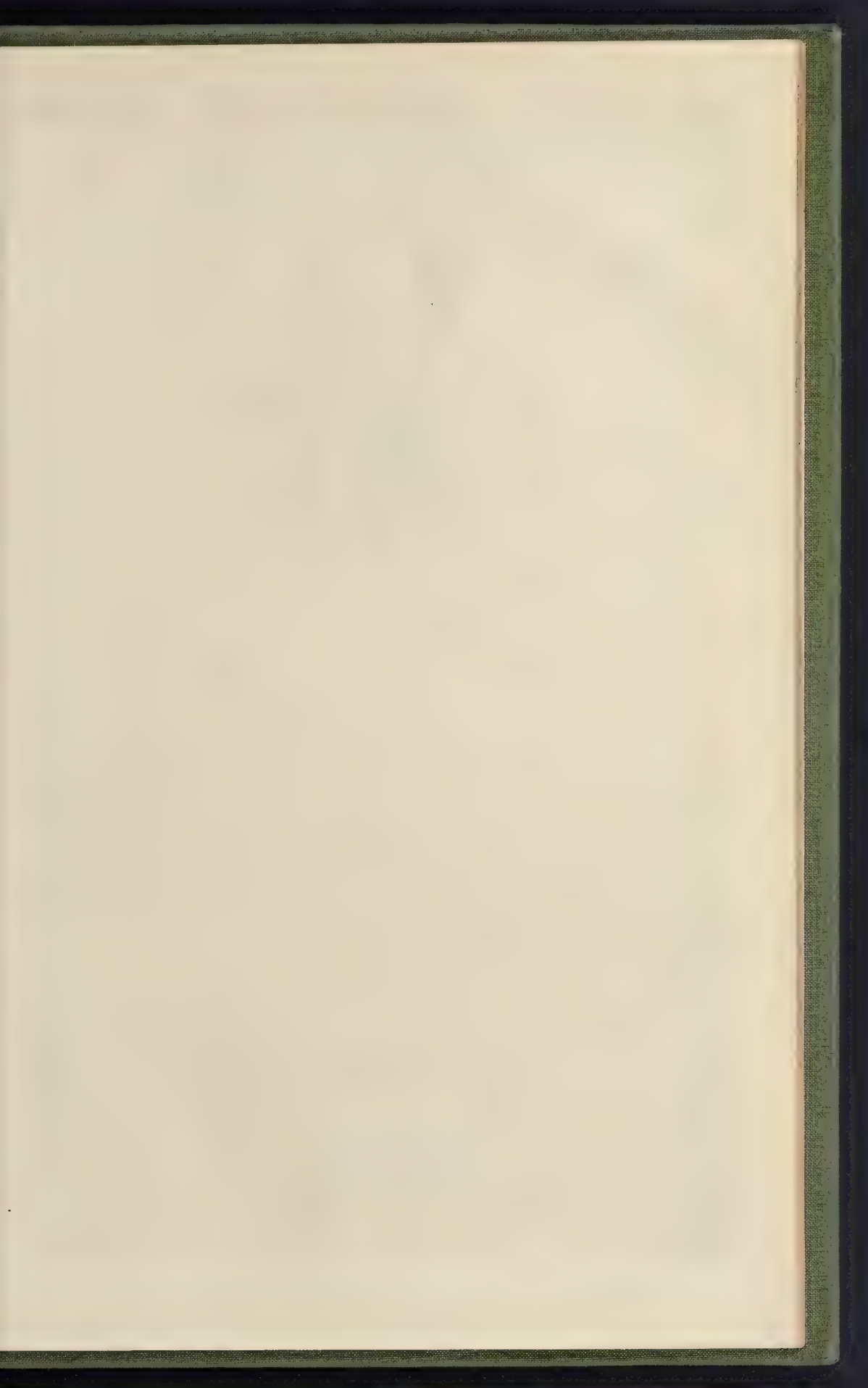
The number of these books now known to us is very limited, and, with very few and trifling exceptions, they relate to religious subjects. The three principal and most important of them, however, are ordinarily recognised and described as the "Biblia Pauperum," the "Canticum Canticorum," and the "Speculum Humanae Salvationis"; and whenever any difference of opinion has heretofore arisen in connexion with "Block-books," it has almost invariably been in immediate relation to one or other of these three works, which may therefore, for all practical purposes, be accepted as the representatives of the system of "Block-books," and by the true date of which, when ascertained, all the rest will necessarily be bonded, as being altogether secondary to the principal works I have mentioned. So far I believe I am correct in stating that no difference of opinion exists; but here we reach the point of divergence.

The advocates of that I have called "the old system" have positively insisted that the "Block-books" are the production of the beginning of the fifteenth century (some of the most enthusiastic among them having, indeed, even ventured to declare they were known in the latter part of the fourteenth century), and that they consequently led up to and preceded "printing with movable types."

I, on the contrary, utterly deny this theory, and insist that printing with movable types preceded the "Block-books," as well as engraving on wood in Europe, and (notwithstanding the dates which appear upon certain of those "Block-books") I affirm that literature is unable to prove the possession of a single "Block-book" prior to 1486, in any of the numerous public libraries which then existed in Europe; without which proof I have (those which I believe to be) good and substantial reasons for utterly discarding all "dated" Block-books prior to the period I have named.

Thus this dispute now stands; and impugning the statements so promulgated by the professors of the old system, of which Mr. J. Noel Humphreys and Mons. J. Th. Berjeau are the latest representatives in England, I have, on such grounds alone, selected them as being among the best calculated to uphold it, and have therefore appealed to them to publicly state the authorities upon which they rely as a justification for the several positive declarations that "Block-books and wood engraving" preceded "printing with movable types," which appear in the works they have respectively published on the subject.

HENRY F. HOLT.





MR. EDMUND SHARPE, M.A., Author of "Architectural Parallels."

BEDFORD DRINKING-FOUNTAIN.

A HANDSOME drinking-fountain was generously and unostentatiously given to the town of Bedford last week. The foundation consists of a bed of concrete, 18 ft. square, and 4 ft. deep; upon this are placed three tiers of York steps, the upper one forming a landing, 2 ft. wide, on which rests an octagonal basin, 9 ft. in diameter, cut and moulded out of Portland stone, with dog-troughs projecting from the sides, and from the centre of this basin rises the superstructure in Ancaster stone, which is designedly monumental in character, and 23 ft. in height, square on plan. This is intersected by an upper octagonal basin, 6 ft. in diameter, which serves as a filter, and divides the superstructure into upper and lower portions. Each side of the lower portion is formed into a panel, with moulded and crocketed gables, enriched with ball-flower ornament, the apex terminating with richly-carved finials, and the bases united by deeply-cut foliated bosses supported on polished Aberdeen granite columns, with moulded bases and carved capitals. The spandrels of this compartment are filled in with diagonal diaper work. All the upper portions of the panels are ornamented with inlaid work, majolica tiles, and polished marble bosses. From the north and south panels project jets of wrought metal, to which drinking-cups are attached. On the east panel the following Scripture is incised:—"Jesus answered and said unto her, Whosoever drinketh of this water shall thirst again: but whosoever drinketh of the water that I shall give him shall never thirst; but the water that I shall give him shall be in him a well of water springing up into everlasting life." (John iv. 13, 14.) On the west the following Scripture:—"In that day there shall be a fountain opened to the house of David, and to the inhabitants of Jerusalem, for sin and for uncleanness." (Zechariah xiii. 1.) "And let him that is athirst come. And whosoever will, let him take the water of life freely." (Revelation xxii. 17.)

The outer edge and soffit of the upper basin is composed of a large O G moulding, decorated with cut pattern and conventional carving. The upper portion of the monument is formed with panels, similar to the lower, with gables, buttresses, and finials; the whole terminating in a pyramidal form, with handsome wrought metal finial. The water is laid on from the main with tin-cased lead pipes, and passes from the higher jets into the upper basin, where it is filtered, and thence through the lower jets into the large basin, and afterwards into the dog-troughs.

The whole structure is Gothic, and in character with the work of the fourteenth century, and occupies a prominent position at the south-east corner of St. Paul's-square. The total cost is about 200*l.*, which has been defrayed by a professional gentleman of the town. The architect is Mr. John Usher, Bedford. The mason, Mr. John Hinton; the plumber, Mr. George Small; the carver, Mr. Willis; and the metal-work is by Messrs. Hart, Son, Peard, & Co., London.

COMPETITION.

Gateshead.—In reply to the advertisement for designs for Gateshead Congregational Church and Schools, fifty-five designs were sent in, and the premium has been awarded to the one bearing the motto, "Labor et Spes," by Mr. Fritchett, of Darlington.

ST. PETER'S, BOURNEMOUTH.

ST. PETER'S CHURCH, Bournemouth, has been built in the old-fashioned way of building by degrees. First of all, a south aisle was added to a poor modern chapel of ease, then a north aisle, then a chancel, so that the old chapel gradually disappeared. After this, in the year 1863, a very costly chancel with aisles was built. This is groined in stone, and has a sumptuous

painted and sculptured reredos, the walls on each side of it being lined with charmingly-designed groups of angels painted on tile by Messrs. Morris & Marshall. On each side of the eastern bay of the chancel are double screens of marble and alabaster, which form two ranges of sedilia. The two aisles on each side of the choir seats are occupied by lofty metal screens, which, as well as the chancel screen, are the work of Mr. Leaver. In the wall on the north side of the chancel is a sculpture of the Crucifixion, whilst opposite to it is a sculpture of the Annunciation, and over the vestry door another of the Charge to St. Peter. The vestry, on the east side of the north transept, is three stories in height, with a newel staircase. Below is the heating chamber, on the church level the clergy vestry, and above this the choir vestry. Almost all the windows throughout this part of the church are of stained glass, and most of them executed by Messrs. Clayton & Bell.

Latterly it has been found that the church was not large enough, and an addition of a somewhat novel kind is now proposed by the architect; viz., a western transept, beyond which is a steeple. The steeple is already built up to the top of the tower, at a cost of about 4,800*l.*, and the western transept will, it is expected, soon be built, so as to connect the steeple with the church. The tower is 25 ft. by 25 ft., and 103 ft. high to the top of the parapet. The height of tower and spire will be 188 ft. The lower stage is groined in stone, and the belfry is being provided with a heavy peal of bells, cast by Messrs. Taylor, of Loughborough.

A large churchyard cross, with sculptures on the base, and a lych-gate, of stone and oak, are also being erected in the beautiful churchyard. The extreme length of the church, when complete, will be 180 ft.

The contractors for the tower, which is now just completed, are Messrs. Dove, of Islington. The whole of the work, with the exception of a portion of the south aisle wall, has been done from the designs of Mr. G. E. Street, A.R.A.



ST. PETER'S, BOURNEMOUTH.—MR. G. E. STREET, A.R.A., ARCHITECT.

REFUGEES' BENEVOLENT FUND.

WE have a very strong impression that England has now done enough in aid of the wounded victims (French and German) of the war. Probably not less than 400,000, has been sent out of the country for this purpose, in one shape or another. Some of it has been wasted or misapplied; but much misery has, nevertheless, been relieved by its means; and what have the sacrifice and our neutrality brought us from abroad? The abuse, if not the hatred of both countries. However, we have done our duty, and that may be our reward. An enormous amount of distress exists in our own country, and we ought now to look at home. If Germany and France are insane and wicked enough to go on cutting one another's throats, on them the punishment must fall. We advocate no further subscriptions of money to send abroad. We would say one word, however, in favour of aid originally by Mr. Frazer & Co., to aid those fugitives who have reached this country. Great distress prevails amongst them, and we shall be glad if we induce any of our readers to assist the society. Would that England could see her way to any steps likely to bring about peace. As "F. B." writes to us, and we endorse:—

O Europe, lift your mighty voice,
And bid the carnage cease!
From out thy sea-walled outlet,
O Denmark, plead for peace!
Plead for the helpless, homeless ones,
Childhood and hoary years;
Plead for the orphan's piteous cry,
The wailing widow's tears!
Republic, Council, Kaiser-King,
Forget not this broken thing,
Each loving life we must destroy,
Heaven will demand of thee!
Command, O God, Thou King of Kings!
Break angry passions down;—
That PEACE, and LOVE, and BROTHERHOOD
May all the nations crown!

THE PLANNING OF SMALL HOUSES.

On two recent occasions have the weaknesses and discomforts of the small suburbs been pointed out in your columns. It must not, however, be overlooked that with such meagre materials, and in such a restricted area it is a very difficult task to attain under such unfavourable circumstances to a favourable result. Where in another case a foot or two of space either in contraction or augmentation is of no account, and the occurrence of an unmeditated vacancy may be easily shaped into a useful cupboard, in this it means discomfort and an unprofitable space. There, a not altogether unwhished for superiority of service may make the condensation of work, or the amount of it, immaterial; here service is an encumbrance, and its amount and economic condensation are of the utmost importance.

The hindrances to perfect planning are not diminished if we have to design, in addition for "one (according to "S. H. I."), who, in spite of moderate means, must and is determined to be a 'gentleman'." In fact, in the whole range of architects' duties, I know of none more difficult than this undertaking. Another cause of failure is that the solution of this difficult problem is attempted by those who, from their associations and training, are not competent to decide on the specialities of a "gentleman's" abode. In these small houses, to insure domestic comfort the isolation of the service is of even more importance than in larger houses, where it can be placed at a distance. The unpleasantness of constantly crossing the path of a cantankerous cook with a month's warning, and at such close quarters, is very great. Nevertheless, I think the attempt to improve this class of house should be made, and, were the result satisfactory, would pay well. The plans are only measurably and not sufficiently studied in its relation to the frontage, and the capability this affords even by a slight extension to insure the comfort of a house. A piece of ground is scarcely sufficient, with frontages, say of 15 ft., 25 ft., or 30 ft. they not inches of 17 ft. 6 in. or 28 ft., or 31 ft., if by so doing an uncomfortable house could be rendered comfortable? The increase in the ground-rent would be unappreciable. Property would become more valuable if greater brain power were expended on it, than if the value be measured by the amount of bricks and mortar, &c., that has been accumulated on it. Most of these plans seem to have been projected on india-rubber, and by the application of an ingenious

process exhibited a few years since, by a more or less amount of stretching, may be made to do duty now for a 25 ft., now for 35 ft. or 40 ft. frontage, as desired. The moderation in the amount of rent one wishes to incur depends not on the simplicity of your demands, but on the amount of discomfort you are willing to put up with in living in the reduced rooms and offices of a larger house. Man differs from the lower orders of creation in nothing more than in that whereas the type of dwelling of these he ever remained stationary, and has never varied from that form dictated by their original instincts, that of man has developed concurrently with his progress from having had everything originally but size in common with the inferior creatures, it has arrived at such a phase of development that every function, meal, duty, pleasure, business, originally carried on in the same space, has now its separate sphere. The utilitarian has developed into dining and breakfast rooms, &c.; the ornamental or social into drawing, ball, and music rooms, parlours, picture and sculpture galleries, and libraries; the study, library, law, &c.; the claims of decency and humaneness into bedrooms; the primitive fire-heat for household purposes into the kitchen, with its elaborate apparatus for cooking, scullery, and a host of subordinate offices. As regards the preservation of health, from no sanitary regards or conveniences into w.c.s, soil and water drainage, baths and washhouses, infirmary, and so on. Now a man, in building or choosing a house, should clearly indicate to what extent he wishes this principle of development to be carried out in it, beyond what the requirements of our social life now absolutely demand. For example, if he be a man with a large family and moderate means, or of moderate means without the large family, he will require but the simplest utilitarian accommodation; with more means more of the social and ornamental will be required; and so on for a variety of combinations to suit every degree of taste from simplicity to luxury, which wealth or its absence might dictate. What I would, therefore, advocate would be, to start from the cottage and develop it to a greater or lesser extent to suit the purse or the requirements of life, in preference to contrasting a larger plan in itself, with offices, and squeezing the poor indiscriminately into it, as should be had some diversity and variety of domestic life instead of the present uniformity. What wonder, indeed, there should be uniformity: we live in similar houses, among similar furniture, in similar rooms with the same patterned paper; read the same papers and books from the circulating library; all come home by the 4.40 or 5 o'clock train; in fact, we do our utmost to make one the counterpart of another, J. I.

GENERAL CONDITIONS FOR BUILDING CONTRACTS.

At a meeting of the London Builders' Society held December 20th, 1870, it was unanimously resolved as follows:—

"That the members of this Society do agree that after the 1st of February, 1871, they will not tender for any works in competition, the quantities of which have not been taken out by a surveyor agreed upon by the builders, at a meeting of the competitors.

They further agree that they will not sign any legal contract for works obtained in competition that does not contain a full and fair arbitration clause.

They also agree that no contract shall be undertaken by any one of them which has been declined by any member of the metropolitan building trade, on account of its containing inequitable conditions, unless the committee of Builders' Society shall decide that the objectionable conditions may reasonably be assented to.

That the general conditions for building contracts, based on the agreement of this Society with the Royal Institute of British Architects be recommended for general adoption."

The general conditions are subjoined.

1. The contractors are to provide everything of every sort and kind which may be necessary and requisite for the due and proper execution of the several works included in the contract according to the true intent and meaning of the drawings and specification taken together, which are to be signed by the architect and the contractors, whether the same may or may not be particularly described in the specification or shown on the drawings, provided that the same are reasonably and obviously to be inferred therein, and in case of any discrepancy between the drawings, and the specification the architect is to decide which shall

2. The contractors are to conform in all respects to the

provisions and regulations of the Metropolis Local Management Act and the Metropolis Buildings Act, and to the regulations and by-laws of the Metropolitan Board of Works and of the local authorities, and they are to give all notices required by the said Acts to be given to any local authorities, and to pay all fees payable under any of the said Acts to any such authorities or to any public officer in respect of the works.

3. The contractors are to set out the whole of the works and during the progress of the works to amend on the requisition of the architect any errors which may arise therein, and upon request are to provide the necessary appliances or furnish the necessary vouchers to prove that the several materials are such as are described. The contractors are to provide all plant, labour, and materials for the execution of the works, and to employ the best materials and workmanship being the best of their respective kinds; and the contractors to leave the works in all respects clean and perfect at the completion thereof.

4. Complete copies of the drawings and specification signed by the architect are to be furnished by him or by the measuring surveyor or the contractor for their own use, and the architect is to retain a complete set of the buildings in charge of a competent workman, who is to be constantly kept on the ground by the contractors, and to whom instructions can be given by the architect. The contractors are not to sublet the works or any part thereof, nor to employ any other workmen than those named in the contract.

5. The architect is to have at all times access to the works, which are to be entirely under his control. He may require the contractors to dismiss any person in the works, or to suspend any person, if he considers that the contractors employ any person unworthy to be employed, or if he considers that the contractors are not complying with such requirement.

6. The Contractor is not to vary or deviate from the drawings or specification, or execute any extra work of any kind whatsoever, unless the same be required to comply with any of the provisions of any of the Acts of Parliament, regulations, bye-laws, herebefore mentioned, or unless the same be authorized by the Engineer or be shown by any order in writing, or by any plan or drawing expressly given and signed or initialed by him, as an extra or variation, or by any subsequent written approval signed or initialed by him. In cases of day-work, all vouchers for the same are to be delivered to the Engineer at the close of each day, and the following conditions in which the work may have been done, and only such day-work is to be allowed for, as such, as may have been authorized by the architect to be so done, unless the work cannot from its character be properly measured and

7. Any authority given by the architect for any alteration or addition in or to the works is not to vitiate the contract; but all additions, omissions, or variations made in carrying out the works for which a price may not have been previously agreed upon, are to be measured and valued, and certified by the architect, and added to or deducted from the amount of the contract, as the case may be, according to the schedule of prices annexed, or where the same may not apply at fair measure and value.

8. All work and materials brought and left upon the ground by the contractors, or by their order, for the purpose of forming part of the works, are to be considered to be the property of the employer, when payment shall have been made of the amount of any certificate in which the value thereof shall be included, and in such case the same are not to be removed or taken away by the contractors or any other person without the special license and consent of the architect; but the employer is not to be in any way answerable for any loss or damage which may happen to the same by reason of any such work or materials, either by the same being lost or stolen, or injured by weather or otherwise.

valuable for the cause. The architect is to have full power to require the removal from the premises of all materials which in his opinion are not in accordance with the specification, and in case of default the employer is to be at liberty to employ other persons to remove the same without being answerable or accountable for any loss or damage that may arise or happen to such materials; and the architect is also to have full power to require other proper materials to be substituted; and in case of default the employer may cause the same to be supplied, and all the costs which may attend such removal and substitution are to be borne by the contractors.

10. Should any of the works be, in the opinion of the architect, executed with improper materials or defective workmanship, the contractors are, when required by the architect during the progress of the work, forthwith to re-execute the same, and to substitute proper materials and workmanship, and, in case of default of the contractors in so doing within a reasonable time, the architect is to have full power to employ other persons to re-execute the work, and the cost thereof is to be borne by the contractors.

11. Any defects, shrinkage, and other faults which may appear within months from the completion of the building, and arising out of defective or improper materials or workmanship, are, upon the direction of the architect, to be amended and made good by the contractors at their own cost, unless the architect shall decide that they ought to be paid for the same; and, in case of default, the employer may recover from the contractors the cost of making good the works.

12. The contractors are to insure the building against loss or damage by fire, in an office to be approved, in the joint names of the employer and contractors for half the value of the works executed until it shall be covered in, and thereupon until completion, in three-fourths of the amount of such value, and are, upon request, to produce to the architect the policies and the receipts for the premiums for such insurance. All moneys received under any such policies are to be applied in or towards the rebuilding or reparation of the works damaged by fire. In the event of request, the employer is to be at liberty to insure and deduct the amount of the premiums paid from any moneys payable to the contractors.

13. The building, from the commencement of the works to the completion of the same, is to be under the contractors' charge; they are to be held responsible for, and are to make good; all injuries, damages, and repair, occasioned or rendered necessary to the same, by fire or by causes over which the contractors shall have control, and they are to hold the employer harmless from any claims for injuries to persons, or for structural damage to property happening from any neglect, default, want of proper care, or misconduct on the part of the contractors, or of any one in their employ, during the execution of the works.

14. The employer is at all times to have free access to the works, and is to have full power to send workmen upon the premises to execute fittings and other works not included in the contract, for whose operations the contrac-

stress; and whereas the Mountsorrel and Markfield granites are both excellent macadamising stones, yet the Bardon Hill, which has a higher specific gravity than Mountsorrel, and nearly the same as Markfield, is very inferior to both.

That in a printed table circulated by the Charnwood Granite Company, showing the resistance to crushing stress of various granites, as certified by Mr. Kirkaldy, it is shown that Guernsey granite crushed at a pressure of 15,062 lb. per square inch, which is far below that of the other granites. If, therefore, the crushing stress is any guide to the quality of the material, then Guernsey granite is weaker than any of the Leicestershire granites, while its specific gravity is 2.841, or a very little heavier than Markfield granite, which, according to Mr. Kirkaldy, is capable of sustaining about one-third more pressure. This theoretical result is useless to any practical man who has metalled roads and paved streets with Guernsey and Leicestershire granites, and finally disposes of the specific gravity theory as applied to road materials.

That I find from practical experience that the quality which gives strength and durability to road metal is toughness, not hardness, and that the former quality may be found in rocks with either high or low specific gravities.

That in my Report to the Improvement Commissioners of Cambridge, above quoted, I showed that the intrinsic value of Guernsey granite is much greater than any of the Leicestershire granites, but that the cost of carriage effectually prevents its adoption for places any considerable distance north of London.

That I do not question the honesty and accuracy of Mr. Kirkaldy's tests. Doubtless they are correct as far as they go, but the fallacy lies in presuming that a steady pressure by machinery on a perfectly plane surface will give a result which shall be an index of the probable behaviour of the same material when subjected to the ever varying conditions of two years' exposure to frost, sun, and water, under the wear and tear of the traffic on a town street or turnpike-road.

R. REYNOLDS ROWE, M. Inst. C.E.

BUILDING GRANTS FOR SCHOOLS OF ART.

The following information will be interesting to those who are looking forward to the probability of a grant. The regulations are in accordance with the Minutes of the Science and Art Department, revised to May, 1859, and are published by order of the Committee of Council:—

Preliminary.—1. The Lords of the Committee of Council on Education, believing that the provision of a suitable building is essential for giving permanence to local efforts in establishing a School of Art, and that no part of the fees received for instruction should be absorbed in payment of rent, are prepared, subject to the conditions hereinafter set forth, to aid in—(a.) Erecting buildings for Schools of Art. (b.) Erecting suitable rooms as parts of, or additions to, buildings to be used for other purposes. (c.) Purchasing suitable building already erected. 2. All applications for building grants towards the erection of Schools of Art, or additions to the Secretary of the Science and Art Department, South Kensington, London, W. 3. All applications for grants out of the Parliamentary Vote for any year must be sent in on or before the 16th of November in the year preceding. 4. No grant will exceed 2s. 6d. per square foot of internal area, and no grant will exceed 500l. 5. No grant will be made unless their lordships are satisfied—(a.) That there is a population in the neighbourhood which requires a School of Art. (b.) That the School of Art is likely to be maintained in efficiency. 6. The site, plans, estimates, specifications, title, and trust deed, must be satisfactory to the Committee of Council.

The Site.—7. A plan of the site must be forwarded, drawn to a scale of 1-8th of an inch to a foot, and showing the boundaries, approaches, and abutments. 8. The site must be—(a.) In situation, not unhealthy, nor noisy. (b.) Within convenient distance of the home of the students. (c.) In tenure, free from any incumbrance or rights reserved over the surface, or reservation of minerals.

The Plans.—1. The following dimensions are suggested as a guide, and are not to be taken as a rule for all students. Proportionately increased accommodation must be provided for greater numbers. (a.) One elementary room, 20 ft. by 80 ft. This room should be east and west, and should be not less than 16 ft. high, and should be lighted from above. (b.) One painting-room, 20 ft. by 16 ft. This room should be lighted from the north side, and should have a top light in the roof over and in continuation of the side light. (c.) One modelling-room, 20 ft. by 16 ft. (d.) One master's room, 12 ft. by 15 ft. This room should also be lighted by a side light, from the north if possible. (e.) One cloak-room for females, 12 ft. by 16 ft. (f.) One kitchen and bed-room for the attendant, each 12 ft. by 10 ft. (g.) The rooms for study, except that which is specified in section a, should be not less than 16 ft. high, and the wall plate, if ceiling flat, or 12 ft. high to the wall plate if ceiling to the collar-beams or to the common rafter. (h.) The windows should be large, free from mullions or small panes. (i.) The classrooms should, as far as possible, communicate with each other directly as well as by passages. Where there are more stories than one, the staircase should give access

to all rooms without passing through rooms; also to cloak-rooms, lavatory, &c. The arrangements for lighting with gas, for warming, drainage, &c., should be complete. The rooms should be well ventilated by the admission of air at the floor level, with an ample outlet above. (k.) Water-closets, urinals, and a lavatory must be provided; the accommodation for female students must be separate. (l.) The external walls of the school, if of brick, should not be less than one brick and a half in thickness; and, if of stone, not less than 20 in. in thickness. All the roofs must be either tiled or slated. Gutters and drains to carry away the roof water must be provided. (m.) If the roof be uncased to the tie-beam or collar-beam, there must be ceiling to the rafters. Rooms which are over-lighted should in all cases be called to the common rafters, in order to give increased height, and all tie-beams or other heavy roof timbering should be avoided, and iron tie-rods used where practicable. 10. In the case of the purchase of buildings already erected, they must be certified by an officer of the Department to be suitable in all respects for the purposes of a School of Art. 11. The plans (with specification and estimate) when approved and sealed, may be returned to the promoters for use, but must be lodged in the Science and Art Department before a grant is paid.

There are other clauses with reference to trusts, deeds and payment of grants, &c.

CAUDEBEC LADY CHAPEL.

SIR.—Mr. Papworth does not explain the seeming improbability of which I speak; he only transfers the responsibility of it to some one else's shoulders. That Mr. Pugin actually measured the vousoirs of this vault I cannot understand, seeing that he must have had it taken down to do so. That he is approximately correct in his drawings there is not much doubt, the geometrical principles on which the vault is designed being so very evident.

One has only to look at the section shown on page 1012 of Mr. Papworth's edition of Mr. Gwilt's Encyclopedia to become aware of all the difficulties attending such a piece of measurement.

JOHN E. COLES.

DEFECTIVE DRAINAGE OF WESTMINSTER.

SIR.—The Royal city is far behind the commercial centre of our great metropolis in respect of its sewerage. Passing the other evening from Charing Cross towards Westminster Bridge, I met with three huge oceans of muddy water between Scotland-yard and Richmond-terrace, which had formed a kind of kennel on the left-hand side of the road to the depth of 4 in. or 5 in.; and through which the crawling, unheated, and soot-laden water, splashing their way, thereby inundating the footpath, and sprinkling the pedestrians.

It appears that this unpleasant effect is always produced when a heavy rain falls about the time of high tide; and the anomaly is, that the evil has much increased, so it is said, since the construction of the main-drainage works along the Victoria Embankment.

It is truly marvellous to find such a gross nuisance permitted in this leading thoroughfare; in close proximity to our chief Government offices, and adjoining the private residences of some of the chief magnates of our land.

A. H. GENT.

THE NEW WORKHOUSE AT ST. ERMIN'S HILL, FOR WESTMINSTER.

At the usual meeting of the St. George's, Hanover-square, Union Board of Guardians, on Wednesday, Mr. H. Seymour, in the chair, a report was read from a special committee respecting the purchase of land at St. Ermin's-hill, for a new workhouse. The report recommended that negotiations for the purchase be re-opened, and that a piece of land in Snow's Rents be secured. Colonel Haggard, in support of the report, said that it was a question of 250l. The committee, who had offered 1,750l. for the rents, were now asked 2,000l. for it. Mr. Dugby seconded the motion, observing that it was very desirable to have a public building on the site, and that the building of another workhouse, and moved as an amendment that no further steps be taken at present; Mr. Fleming seconded. Mr. Mitchell also objected to the new house, and remarked that the expenses of the Union were increasing year by year. The Chairman observed that the old Board of Guardians had bought the land at St. Ermin's-hill to build the new house, and it would be very desirable to have this piece of land in Snow's Rents. Mr. Dugby added that, under the orders of the Poor Law Board, the Guardians were bound to build the house. After this Mr. Seymour withdrew his amendment, and the report was adopted.

THE TRAFALGAR GRAVING DOCK.

SIR.—Touching Mr. Redman's remarks respecting the Trafalgar Graving Dock at Woolwich, I regret very much having stated that the idea of a dock was abandoned, seeing that a noble one has been constructed on the spot named.

Mr. Walker was called in by the Admiralty in 1835 at my recommendation, on the failure of Mr. Ringer's concrete dock, which was caused by his consenting to lower the floor of the dock (after it was constructed) 4 ft., whereby the springs prevailed.

Mr. Walker observed, "Nothing but a granite dock will do," and made designs for the same, which I understood were carried out so far as specifications and preparation for a contract. I was then informed, on what I considered reliable authority, that the idea of a dock was abandoned. I have not seen the spot since.

I have no doubt that Mr. Walker, or rather the Board, hesitated to encounter the expense of a granite dock. But in 1839 it appears, as so well described by Mr. Redman, that the Board then visited the yard with Sir Charles Adam and Mr. Laing; the dock was resolved upon, for which he prepared the contract drawings and estimates. The contract being taken by Griesell & Peto, amounting to "some 50,000l."

While I again express my regret at my inaccurate statement, I am glad to have given Mr. Redman the

opportunity of describing how a first-rate granite dock should be, and was, constructed from his drawings, estimates, &c.

I may also express the great regret generally felt that this fine dockyard, with its noble and useful buildings and long river frontage, should be abandoned, as the public papers announce it is, seeing that in all probability it may or will be again required.

"THE OCTOGONARIAN."

ARCHITECTURAL INSTRUCTION AT THE ROYAL ACADEMY.

In a letter which I addressed to you three weeks ago I promised to send the particulars of the proposed course of instruction in the architectural classes of the Royal Academy, when determined upon by the council of that body. I am now authorised to state them in general terms, promising at the same time that as the establishment of this school (the first of its kind in this country) will be necessarily attended by certain difficulties which which experience alone can make us acquainted, modifications may be introduced where found requisite.

The instructions I forwarded to you referred only to the preliminary drawings to be sent in by each applicant. These, with the certificate mentioned, will be submitted to the council; if deemed satisfactory, their authors will be admitted as probationers to study in these architectural classes and to attend the lectures on anatomy, painting, sculpture, and architecture. The lectures on perspective will be attended by probationers only when there is sufficient room for them and the students as well.

When admitted to the architectural classes, the probationers will be expected to execute one drawing shaded in Indian ink, one drawing from the east, and one complete architectural design within the six months, and towards the end of this term to attend at the Academy on two days (to be fixed beforehand). On the first day they will have to execute a design of a subject which will be given at the time, and be of such a nature as to be easily worked out in six hours; on the second day, a portion of this design will be drawn to a larger scale, and a time-sketch, made in three hours, of some piece of ornament from the round. All these drawings will be submitted to the council, and if deemed satisfactory the probationer will be admitted as a student of the Royal Academy for seven years. In the event of a probationer not succeeding in the first time, he will be allowed to continue his studies as before. The classes will be held on Tuesday, Wednesday, and Friday evenings, from 6 p.m. to 8 p.m.

COURSE OF INSTRUCTION.

Probationers.

1. Architectural Drawing.—The delineation of some of the best specimens of antiquity, either Classic or Gothic; first in line drawing, and then shaded in Indian ink in graduated and flat tones. (This is the universal method adopted in France and Germany, to acquire care and accuracy in drawing, and to teach facility in the use of the brush. Its main object, however, is to enable the student to recognise in a geometrical drawing the relative value of the various projections either of the wings, or masses of the building, of cornices, string-courses, or other decorative features, without being obliged to have recourse to a perspective drawing.)
2. Drawing from the Ornamental Cast.—
3. Architectural Design.—A subject will be given out two months or six weeks, and worked out at home; the drawings will be submitted once a week to the master; taken home, and altered after his criticism. At the end of the two months or six weeks, finished drawings, not too elaborate, will be brought back, and sent in as probationers' work.

Students.

1. Architectural Drawing.—Similar to probationers' work, except that the shading will not be from copies as before, and the geometrical projections of shadows will be taught.
2. Drawing from the Ornamental Cast.—(Same as before, except that, as architects' drawings are only the means of communicating certain forms to the sculptor or carver, they should not be too elaborately finished, but, though carefully drawn, rapid and effective.)
3. Architectural Design as above, but of a higher class.—(Here, as with probationers' work, text-books will be pointed out to the student, in which he may find the best examples of the particular style of his design. Some of these books will be kept in the architectural room for reference; as, for instance, Stuart and Revett's Athens, Vitruvius, Bathurst and Carracci's "Brandin's" "Analysis of Gothic Architecture," Viollet le Duc's "Dictionnaire Raisonné," Latournerie's Rome, and Sauvage's or Bery's Introduction of Francis I., &c.)

As experience may dictate, the following courses will be introduced:—

4. A course of study, consisting of the delineation and projection of vaulting and grooving from the early barrel vaults of the Romans, tracing its development through the Middle Ages down to the sixteenth century.
5. An occasional course, in which designs will have to be worked out in accordance with certain perfected styles.
6. An occasional course, involving the restoration of portions of certain well-known examples of antiquity.

(These two courses, archaeological in their tendency, are adopted in France by the professors of the schools there, their object being to instil into the student's mind

an academical knowledge of precedent as the best foundation for the acquirement of a knowledge of architectural design.)

7. A course of composition in ornamental design. The medals will be awarded as before. These are as follow:—

A gold medal and a scholarship of 25*l*. tenable for two years, for the best architectural design worked out at home.

A travelling studentship of the value of 100*l*. for one year, for the best architectural design executed in one month in the Architectural Class-room of the Royal Academy.

A silver medal for the best series of measured drawings of some building; and in alternate years, in addition, a silver medal, with books.

And a silver medal for a perspective drawing and a specimen of sciography.

It is to be hoped in future that the competitors will be more numerous. There was only one competitor for the silver medal for measured drawings this year, and none for the perspective medal; while the books of the Academy show that, during the last seven years, from 25 to 28 per cent. only of the students have ever competed. Now, however, that the Academy have placed the architectural students on the same footing as the painter or sculptor, there is no reason why the number of competitors in both classes should not be equalised.

R. PHENE SPIERS,

Master of the Architectural School of the Royal Academy.

SCHOOL FOR FIFTY CHILDREN AND RESIDENCE FOR TEACHER, FOR 160*l*.

Sir,—There has been built in my parish of Wyalst Nottingham, for the sum of 160*l*., a school for fifty children, with residence attached, and offices. The dimensions are as follows:—

School.—Length, 26 ft. 3 in.; width, 16 ft. inside; walls, 11 ft. high; roof open, 17 ft. high. The school contains four windows, 5 ft. high by 4 ft. wide. There are also porch and chimney. The floor is boarded.

The House.—Two lower rooms: Front, 12 ft. 6 in. by 11 ft.; kitchen, 12 ft. 6 in. by 6 ft. 1 in.; height, 8 ft. Bedrooms: Front, 13 ft. by 11 ft., with recess in addition. Back, 9 ft. by 8 ft.; height, 8 ft. 6 in. All the outer walls are 1½ in. thick. There is ample room for pantry under staircase. There are separate offices, with dust-bin between, not yet finished.

The whole material and workmanship, and proper painting for the above, have been found, and done for 160*l*. The parishioners do carting without charge. I am architect and clerk of works. Mr. William Bryans, of Wyalst, is builder. It is so important to assist parishes to build voluntary schools, that for twenty-four stamps I will send two photographs of building, with printed specifications and instructions.

JOHN PARKER, Vicar of Willoughby and Wyalst.

"MEMBERS OF THE INSTITUTE AND THE PROFESSION."

Sir,—In reply to "E's" inquiry, whether "taking payment from builders" is an infringement of the rules of the Institute, I beg to refer him to the sheet of "professional practice and charges of architects," published by the Royal Institute of British Architects. The concluding paragraph is in these words:—"It is not desirable that an architect should supply to builders quantities, on which to form tenders for executing his design; but, in case of such being done, it should be with the concurrence of the employer, and the architect should be paid by him and not by the builder."

THOS. L. DONALDSON.

Sir,—A question was put to me a short time ago, which I was unable to answer; I therefore venture to ask for the required information. Is it usual to insert the following clause in specifications:—"The builder to pay to the architect the sum of £ (in the present instance) six guineas for the preparation of contract, and for copies of drawings and specification to attach to same, to be paid by builder at the time of execution of contract?" I think it is a pity that the name of the enterprising traveller by railway into Pembroke every fortnight should be withheld from the public.

X. Y. Z.

DOMESTIC CHAPEL, SANDBECK PARK.

A new domestic chapel has been built at the north end of the mansion at Sandbeck Park, the seat of the Earl of Scarborough.

The body of the chapel is 22 ft. wide by 51 ft. long, the chancel and apse being 21 ft. 6 in. long by 15 ft. wide. The structure is from the designs of Mr. Forrey, F.S.A., architect, and is of the Early English style, and built of the beautiful stone from the Roche Abbey quarries. There is a north porch and doorway for the tenants and others, and on the south side an entrance for the family, visitors, and domestics. The nave is divided into four bays, lighted by handsome couplet windows on the north side, filled with glazing, and arranged in geometrical patterns. The roof is of massive pitch-pine timber, ornamented with pierced spandrels, &c.; the principal trusses and purlins being carried upon bold stone arches, with deeply-sunk mouldings, each

arch supported by attached triple wall-shafts, the capitals and corbels carved. In the western gable there is a circular window, with radiating mullions, filled with painted glass, by Hudson, of London. Beneath is a small oblong window, in which is preserved some glass from the old domestic chapel, painted by a former Lady Scarborough.

The west end is peculiar in its arrangement, there being a small stone gallery carried upon projecting corbels in connexion with a stone arcade, and treated as a constructional part of the building. The owner enters this gallery from a door on the south side, communicating with the private apartments.

The chancel-roof is wagon-headed, and ornamented with carved ribs, springing from small columns at each angle of the chancel and apse, the whole coloured, studded with stars on a blue ground, and the larger spaces filled with the Evangelists' emblems. At the springing of the ceiling is the following inscription:—"Erected to the Glory of God, and in memory of a beloved Son."

The five lancet windows contain painted glass by Ward & Hughes, of London. Under there is an ornamental wall arcade, having shafts of Derbyshire marble. The chancel arch is lofty, carried on marble columns, which are supported by corbels elaborately carved. The floor of the chancel is laid with encaustic tiles, enclosed in geometrical devices of Derbyshire marble; the chancel steps are of black marble.

The stone pulpit stands at the north corner of the nave, which is fitted up with open benches of pitch pine, the gangway being laid with encaustic red and black tiles.

The chapel makes a handsome feature at the north end of the garden terrace, the apse and small bell-turret on the east gable of the nave forming an agreeable group. The roofs are covered with green Coniston slates, and the general facing of the walls is of rough stone laid in random courses, which contrasts with the dressings of Roche Abbey stone.

HEAT AND DAMP.

Sir,—1. What is the best method, other than the use of felt, of obviating the effect of sun's heat on the roofs of houses when building?

2. Is a bed of concrete under the floor effectual in keeping down damp likely to rise when building on a clay soil, or is there a better plan?

D.

. An air-space between the outer covering and inner lining of roof is the best moderator. Whitewash on the slates or tiles (in the case of farm buildings, &c.) serves to lessen the effect of sun's heat.

A bed of good concrete under floor will keep down damp: a layer of asphalt on a thin bed of concrete does so more effectually still.

THE LATE MR. PATRICK McDOWELL, R.A., SCULPTOR.

MR. PATRICK McDOWELL, R.A., the eminent sculptor, has just died, aged 71. He was elected Royal Academician in 1846, and had just resigned his fellowship before he died. He was a native of Belfast, where he was born on the 12th of August, 1799. His father having met with some reverses of fortune, he at the age of eight was sent to a small school in Belfast, where the first tokens of his genius displayed themselves in the direction of art by the copying of such models as chance threw in his way. At twelve he came to England with his mother, who apprenticed him to a coachbuilder in Hampshire; but the bankruptcy of his master set him free, and, fortune having made him acquainted with a French sculptor, he found an opportunity of improving his talent. He could hardly have been of age when we find him engaging a studio near Euston-square, and setting up as a sculptor on his own account. After some previous attempts, which were only partially successful, he made his first essay on an ideal subject, which he took from Moore's "Loves of the Angels." The first commission with which he was entrusted for a group in marble was from Mr. E. S. Cooper, formerly M.P. for Sligo. The subject was Cephalus and Procris; and the conception and style of execution were such as to fix at once Mr. McDowell's position in the world of art. The work which fully established his fame, however, was his charming figure of "A Girl Reading," which was afterwards repeated for the late Lord

Ellesmere. He had scarcely completed his first large group for Mr. Beaumont, when that gentleman, desirous that the sculptor should visit Italy, supplied him with the necessary funds. After an absence of eight months, he returned to England and completed his "Love Triumphant." To this succeeded "A Girl at Prayer," "Cupid," "Early Sorrow," "Psyche," "The Death of Virginia," and "Eva," all of which formed leading attractions in the International Exhibition of 1851. In 1846, Mr. McDowell was entrusted by the late Sir Robert Peel with the execution of one of the national statues of British Admirals (Lord Exmouth) for the decoration of Greenwich Hospital. He also executed those of Pitt and Chatham for the House of Lords.

THE TRANSVERSE STRENGTH OF STONE.

Sir,—A Mason, or any other person who has the information, would greatly oblige myself, and no doubt many of your readers, if he could give some formulae for calculating the transverse strength of stone slabs and beams of, say, the various descriptions of Yorkshire stones and the collets most commonly used in London building. In all the tables to which I have access I can find nothing else than the crushing strength of stone columns.

H. A. C.

CITY OF LONDON UNION NEW OFFICES COMPETITION.

THREE designs have been selected from those sent in. A writer in the *City Press* says:—

"One of these designs shows a board-room no more than 40 ft. by 30 ft., and this for the accommodation of ninety-three guardians, the public, and the press."

A second design shows the Assessment Committee-room, whose appeals will be held, no more than 17 ft. by 15 ft., while there is no separate waiting-room and clerk's office, as required by the conditions to be attached to this committee-room, unless a little box partitioned off the general office can be called a clerk's office.

The remaining design has a board-room on the second floor (the real first floor being dubbed a mezzanine). There is no waiting-room for the public, who will have to stand on the landing outside the board-room door. The committee-room is 15 ft. by 12 ft. 6 in. The access for guardians to the relief committee-rooms is by going out of doors, across a dark public passage, and through one of the rooms into the other.

Ancient lights will stand greatly in the way of the realisation of some of the designs.

THE PROFIT AND LOSS ACCOUNT OF THE PUBLIC HEALTH.

WE have often pointed attention to the actual money loss to the community incurred by defective or bad sanitary arrangements. The following remarks by the *Times* on this subject, while drawing attention to Mr. Simon's report to the Privy Council, merit quotation.

Sanitary reforms are now impeded in their work chiefly by ignorance; and to obtain and diffuse knowledge of the conditions of spreading of local epidemics would certainly remove many of the local difficulties in the way of reform. In a few years it will be possible to show that the prevalence and fatality of every disease bear a distinct relation to the presence of local conditions; that a row of cottages draining into their own wells causes an annual expenditure in poor-rates nearly equal to the absolute value of the property in fee-simple, and that it would pay the parish to buy them and pull them down, if the erections of others with like defects could be prevented. It is only by pressing home facts of this class in the districts where they occur that the waste of lives and money incidental to our present laxity will be made apparent to any general body of ratepayers; and there can be no doubt that a proper appreciation of this waste will be the first step towards much-needed reform. A county or union sanitary Board, charged with investigating the facts about the presence and the effects of nuisance within its jurisdiction, would certainly in no long time bring the public mind to a practical sense of the enormity of those evils which sanitarians with one consent deplore, but which uninstructed people are too apt to consider either mythical or unnecessary. The average middle-class inhabitant of a

provincial town cannot now be made to believe that several hundreds of his neighbours die unnecessarily every year,—as much murdered by the absence of the care necessary to preserve human life in communities as if they were hanged in the market-place as sacrifices to the genius of incompetence. But when it is made apparent that typhoid fever, or scarlet fever, breaks out in several successive years in the same tramps' lodging-house; going always to the same row of cottages; that it follows the onward course of the brook into which these cottages drain; that on reaching the house of the landlady it starts afresh to visit the whole circle of her customers; that it produces every year an aggregate of so much mortality and of so many cases and days of sickness; that it leaves so many widows and orphans, so many lame and blind, to be maintained at the public cost; and that this sequence of events is invariable,—the result not of accident, but of law; surely the most typical *epicure* in his time arrive at the conclusion that the lodging-house, and the related cottages, and the polluted brook, are costly and hurtful luxuries, and that money will be well laid out in modifying or abolishing them. In this way, and probably in this way only, will it be possible in no long time to obtain a sanitary law that will at once be an adequate expression of scientific knowledge and a natural growth of public opinion. All that can as yet be done is to provide machinery by which the required knowledge can be collected and diffused, and by which any powers that may hereafter be conferred may be efficiently and discreetly exercised.

A "LIGHT AND AIR" CASE IN CHANCERY.

THE case of *Ladyman v. Grave*, in which the plaintiff sought an injunction against the defendant for having built some back walls of cottages so as to obstruct "ancient lights," has been heard before Vice-Chancellor Stuart, in Lincoln's-inn. The plaintiff is Mr. Samuel Ladyman, of Portinsale, Crosthwaite, Cumberland; and the defendant is Mr. John Grave, the Mayor of Manchester. It appeared that the defendant built certain cottages, the walls of which were raised to such a height as to obstruct the plaintiff's light. The question before the Court was whether the plaintiff had the "ancient lights" that he sought to protect. Voluminous evidence was gone into, and the Vice-Chancellor, in giving judgment, said the case was attended with very great difficulty, both in law and fact. Upon the evidence, it seemed to him that the weight of evidence was in favour of the plaintiff, and that the defendant had not proved that there was a unity of possession within twenty years after the house was completed before the filing of the bill. Cases had been quoted to prove that it was necessary for plaintiff to prove enjoyment of access of light for twenty years next before that on which the bill was filed. His Honour was of opinion that that applied only to cases within the statute of William IV., and not to cases of lights that had become "ancient lights" by an enjoyment for the prescribed period anterior to the passing of the statute. If that were so, then the plaintiff had established his case. His Honour was satisfied that it had not been proved that there was a disturbance of plaintiff's possession; and therefore the plaintiff was entitled to the injunction prayed for, and he must have the costs of the suit. Judgment accordingly.

MELTON MOWBRAY.

THE new cattle Market here has been opened, and is now used by the public. The pens for beasts and sheep are constructed of wrought and cast iron entirely, and are very substantial. The beast-pens are paved with Mountsorrel squared granite, the sheep-pens with asphalt, and the avenues are of the same material. The general roads and avenues of beast-pens are macadamised and covered with gravel. On the east side of the market, contiguous to the sheep-pens, is a large covered shed, fitted up with wrought-iron pens for pigs, and a similar shed is placed on the west side, contiguous to the beast-pens, for calves. In the centre of the market is a conveniently-arranged settling-room and office for clerk of the market, at the back of which are closets and urinals; and still further back is the public slaughter-house, which has fasting-pens and the usual appliances, and the walls of which internally are lined with white-glazed bricks, giving

it a cleanly appearance, and offering every facility for rapid cleaning after it has been used. Over these buildings is a large wrought-iron tank, from which the water is laid on to various points to supply the market. The market is divided from the adjoining paddocks by a wrought-iron fence, with gates, at intervals, to admit of the paddocks being used at fairs in connexion with the market. There are two entrances, at each side of the market, both opening into important public thoroughfares, and these have massive stone piers, and very strong ornamental wrought-iron gates. MacFarlane's urinals are placed in different parts of the market. There is also a convenient loading-stage for sheep and pigs. The drainage, which is of an elaborate character, comprises nearly a mile of glazed piping, and is carried into the main sewer belonging to the town. A large refreshment-room is now in course of erection in the market.

The contract for the general works was taken by Messrs. Weaver & Son, of Melton; and that for the ironwork by Messrs. Richards & Co., of Leicester; and the work has been well and substantially carried out from the plans and under the superintendence of Mr. R. W. Johnson, architect, of Melton Mowbray, the total outlay being about 5,000*l*.

The new Wesleyan Chapel and Schools have been commenced, the first stone having been laid by Mr. J. S. Badgett, of London, with the usual ceremony. The new building comprises a lofty school-room and class-rooms under the chapel. The chapel itself, which is raised some 6 ft. above the ground, to enable the basement to be well lighted, has side aisles and two transepts at the east end, and galleries round three sides. The organ-chamber is at the back of the pulpit. The principal entrance is from the west front, which has two towers at angles, containing the staircases to galleries and schoolrooms. The building, which is Gothic in character, will be of red bricks, with stone dressings, and will have a high-pitched open roof. Messrs. Winkles & Kellett, of Leicester, are the contractors, the amount of their tender being 2,400*l*., subject to a deduction for old materials, under the direction of Mr. Johnson.

THE SAXON CHURCH, WHITTINGHAM.

THE upper stages of the Saxon tower of the church at Whittingham, in Northumberland, illustrated by Rickman, were destroyed in a restoration of the church, which took place in 1840. The works undertaken at that period at this interesting church did not comprise the chancel, which was erected in the most debased style *temp.* Queen Anne. Lord Ravensworth, whose seat, Easington Park, is in the parish, has resolved to restore the chancel in a manner commensurate with the extent and dignity of the rest of the fabric. Approved designs have been made by Mr. F. R. Wilson, architect, Alnwick, and the works are to be forthwith carried out.

CRYSTAL PALACE COMPANY.

THE thirty-first ordinary general meeting has been held, Mr. T. Hughes, M.P., in the chair. The Chairman, in submitting the usual confirmatory motion, referred, in terms of regret, to the loss the company had sustained by the death of the late manager, Mr. Bowley. Rock-hills, the late manager's residence, it was hoped, would be taken by the refreshment contractors at a rental. It was to be regretted that the receipts of the past year had been about 5,000*l*. less than in the previous year, viz., 138,000*l*. as against 143,000*l*, owing to a falling off in the number of visitors, and a decrease of 980*l*. in the receipts from rental, while the expenditure had increased 400*l*. in rates and taxes and for water; but, on the other hand, 3,700*l*. had been saved in the cost of attractions. The expenditure in permanent repairs remained heavy, and would do so for some time to come. The general result of the year's working was that on an expenditure of 97,000*l*. the net earnings had been 43,000*l*. As to the future, they must expect that the Music-hall at Kensington and the Alexandra Palace would compete with them; but there was no reason, having regard to the new attractions,—the aquarium amongst others,—and the new railway facilities from the east and other parts of London and the suburbs, to doubt that the progress of the company would be satisfactory. The surplus land at the lower part of the grounds had been advantageously let, and would ultimately bring in a ground rental of 1,300*l*.

Some doubts were expressed by shareholders as to whether the special attractions were profitable, considering the great cost of producing them. Mr. Dean said in decreasing revenue and increasing expenditure cause not only for discouragement, but alarm. A long and desultory discussion took place, ending in the adoption of the report, and a dividend of 1 per cent. was declared.

DISCOLORATION OF PAINTED COMPO FRONTS.

SIR,—About a fortnight ago, the lower front of my house, which is compo, painted, became in a few hours covered with unsightly blotches and streaks, just as if some dirty fluid had been thrown at it. The whole front had been painted in the last spring: so I called on my painter to explain so extraordinary an effect. He attributed it to effluvia from drains.

This opinion has so much alarmed me that I shall be much obliged by any of your professional readers giving their opinion as to the cause of the appearance I have described, and still more so if they will suggest a remedy.

My house is situate close to Portman-square, where I observe several compo-painted fronts presenting similar unsightly indications.

INQUIRER.

** The occurrence at certain periods of these blotches on painted cement was discussed at some length in our pages a few years ago.

ITEMS OF VALUATION.

A EMPLOYE B to do some work of alteration, fitting up, &c.: no agreement or contract. Work done, B sends the account, without any items or particulars, but claiming a lump sum for the job.

A demurs, and asks for items; B refuses. The work is eventually referred to valuers.

A's valuer reduces the sum claimed by 20*l*.; B's valuer reduces it likewise, but only 5*l*. B's valuer, at the same time, refuses to compare valuations with A's, and as such they do not agree.

A third valuer is called, and he confirms B's valuation save a few shillings, but, at the same time, does not give items or show how he has arrived at the sum.

What I want to know is:—1st. Is B's valuer justified by law (not custom) in refusing to compare valuations? 2nd. Is the third valuer also justified by law in withholding the particulars of his valuation from A? For be it understood, up to this time, save only from his own valuer, A is called upon to pay a large sum of money for work done, but has had no items of their particular cost. The work consists of bay-window, door, frontispiece, wardrobe, counters, shelves, &c.

** Under the apparent circumstances of the reference, a bill of the items could not be insisted on.

DATE OF THE SANCHI TOPE.

SIR,—The following is the statement issued by the Science and Art Department, from which it appears there is no great difference of opinion between Mr. Fergusson and the Department on the subject. General Cunningham, now Archaeological Surveyor-General in India, fixes the date of the Tope at B.C. 500, which the Department adopted. Mr. Fergusson says B.C. 250; and this is supposed to be the date of the stone railing round the Tope.

"The Tope is situated on the top of a sandstone hill above 300 ft. above Sanchi. It consists of a solid dome of stone and brick, 121 ft. in diameter and 62 ft. in height. This is surrounded by a stone railing at a distance of 9 ft. 6 in., and four stone gateways were added to it. The dome dates from about 500 B.C. The stone railing is probably 250 years later, and the gateways were erected about the commencement of the Christian era. The votaries of Buddhism far outnumber those of other creeds, excepting the Christian; and this ancient monument is one of the earliest records of the growth of a religion which now owns not a single follower in the cradle of its birth, India, but can count in other countries 222 million adherents.

This cast was made in the winter of 1869-70, under the direction of Lieut. H. H. Cole, R.E., Superintendent of the Archaeological Survey of India, North-Western Provinces, by Sergeant Bullen, R.E.; Corporal Jackson, R.E.; Corporal

Heath, R.E.; and nine native modellers. The party left Calcutta 10th of December, 1869, and Jubbulpore on the 13th, where the materials, tools, plaster of Paris, &c., weighing in all 28 tons, were transferred to country carts drawn by bullocks. Sixty carts were procured at Jubbulpore, and on the 20th of December the march was commenced to Sanchi about 180 miles distant. On 7th January, 1870, Sanchi was reached, and the work of casting commenced. The cast was completed on the 21st February, 1870, and reached London, via Hoshungabad, Bombay, Suez Canal, and Liverpool, early in June. Three copies were then made by October of the same year. The process of making elastic moulds with gelatine was employed both at Sanchi and in the repetition of copies in London."

It seems that on the card of invitation, to "a private view of the cast of the eastern gateway of the Sanchi Tope from Central India (erected 500 B.C.)*" Mr. Fergusson read the date of 500 B.C. as applicable to the gateway rather than the Tope itself.

ASIATIC.*

ST. PAUL'S CHURCHYARD.

It is anticipated that the proposed improvement at St. Paul's Churchyard, by throwing open the enclosed area at the western end of the cathedral, will shortly be carried into effect. The Dean and chapter offered the ground to the Commissioners of Sewers for 20,000l., and the latter body applied to the Metropolitan Board of Works for a contribution towards this amount; but the Board declined to make any grant unless the dean and chapter consented to throw open the roadway on the northern side of the cathedral for carriage traffic. The finance and improvements committees then intimated to the chapter that, under the circumstances, they were prepared to recommend the commissioners to pay 15,000l. for the ground instead of 20,000l. Before coming to any conclusion on this proposal, the cathedral authorities have written to inquire whether they are to understand that, in the event of their assenting to the opening of the roadway on the northern side for carriage traffic, the Commissioners of Sewers will be prepared to provide the larger sum, viz., 20,000l.; and the finance committee recommended that this question be answered affirmatively. The Commissioners of Sewers have approved of this recommendation.

MANUFACTURERS' NAMES IN ARCHITECTS' SPECIFICATIONS.

SIR,—I wish you would lend us your powerful assistance in sweeping away the above practice, as a pernicious relic of bygone days—wrong in principle, and seldom justifiable in actual practice. I believe professional men of the metropolis have advanced beyond this stage, and do not bind their builders to any one name, but insert provisional clauses for good quality, which are just as efficacious, and far more just.

In the country it is not so. I could name five or six architects in one town (and the leading men as well) who copy, in stereotyped form, specifications one after another, and have so copied them from their early youth upwards with a most serene indifference or ignorance of the progress of manufactures for the past ten years or more.

This should not be. The results are—1. That the maker named charges more than the fair competitive price, for which the employer and not the builder pays. 2. That the practice opens the road to bribery, or at least the imputation of bribery, which the profession should avoid. 3. That it is in itself opposed to the English notion of justice and fairplay. 4. That the system is opposed to free-trade and the improvement in manufactures. 5. That it leads architects to rely on a name, instead of making themselves acquainted with the properties of the article itself, and thus narrows their practical knowledge. 6. That it is not necessary in the present day, as, with the exception of recent patents, few makers are so pre-eminent in any manufacture as to be entitled to a sweeping preference in opposition to the principles before mentioned.

Let a standard be adopted, or a sample sub-

* In Mr. Fergusson's communication, for "Christian Crusade," read *Christian Era*.—ED.

mitted, that the competition may be open and fair to all.

I trust these remarks may induce some architects to reconsider their position in this matter. A MANUFACTURER.

STAINED GLASS.

Christchurch, Fulwood.—Three memorial windows, according to the *Sheffield Independent*, have been placed in this church, in memory of the late Mr. Wm. White, and formally inaugurated. Mr. White was a prominent Freemason, and the founder of several lodges, the members of which have testified to the high admiration and esteem in which they held him by raising this tribute to his memory. The windows selected are the central three of the five on the south side of the church, immediately under which lie the remains of the deceased. The subject of the centre window is King Solomon, crowned and in his royal robes, holding in the right hand a sceptre, and in the left an orb. Each of the other two windows contains three Masonic emblems,—the golden double-headed eagle, the triple tau, the double triangle, the pentalfa, the pelican, and the lamb on the book of seven seals. The windows are from the manufactory of Messrs. Heaton, Butler, & Bayne, of London; and the cost will be 100 guineas.

Queensbury Church.—A memorial window has been placed in this church, in memory of some of the family of the late Mr. John Greenwood, of Queensbury. The window, which is by Messrs. Ward & Hughes, of London, has been appropriated to the three Resurrections,—viz., the raising of the widow's son, the raising of Jairus's daughter, and the raising of Lazarus.

Roman Catholic Church, Warwick.—Three stained windows have just been executed for this church, by M. Dury, artist, Warwick,—one of St. Joseph, in the chancel, and two others in the west end of the church, representing the Annunciation and the Nativity. These, in conjunction with two others by the same artist, of the Repose in Egypt and the Life in Nazareth, form a series representing the Infancy of our Lord.

Trinity United Presbyterian Church, Greenock. A large stained-glass window for the south end of this church, now approaching completion, has just been finished by Messrs. Ballantine & Son, of Edinburgh. The window consists of five upright lights, with extensive and elaborate top tracery. The five leading compartments contain illustrations of Scripture history, consisting of Moses with the Tables of the Law, Samuel anointing David, Christ's Sermon on the Mount, the Angels announcing to the Marys the Resurrection of Christ, and Paul Preaching at Athens. These subjects are all surmounted with elaborate canopies, and in four of the base panels are emblems of the Trinity, while in the central panel beneath the illustration of Christ's Sermon on the Mount is an angel bearing a scroll with the inscription, "Come unto me, all ye that labour and are heavy laden, and I will give you rest." In two leading forms of the top tracery are illustrations of the Sacrifice of Isaac and of Elijah Raising the Widow's Son. There is no enamelling, all the colours being pot-metal. The ornamental portions are all architectonic, and in harmony with the Early English Pointed style of architecture of the building. The draperies and grouping of the figures, with the expression of the countenance are treated in the mosaic style.

Bapchild Church.—A stained-glass window, the gift of Mr. James Lake, of Newlands, has been inserted in the west end of this church. It is in memory of the donor's father, Mr. John Lake. The subjects represented are St. Peter and St. Paul, on either side respectively, and the Patron Saint (Lawrence) in the centre.

Christ Church, Moss-side, Manchester.—The interior of this church is being enriched by the insertion of two sets of memorial windows, which fill the lights of both transepts. The windows are in memory of the late wife and daughter, and two daughters-in-law, of Mr. William Wilson, of King-street and St. James's-square, and of Grove House, Greenheys. The three lights in the south transept form one monument in memory of Mrs. Wilson, comprising groups emblematical of the three Graces—Faith, Hope, and Charity; and those in the north transept are separate monuments in memory of the three younger members of the family, being scriptural representations of Affliction, Belief, and Obedience, as illustrated by leading scenes in the lives of Ruth and Naomi, Mary of Bethany,

and the Virgin Mary. The designs are by Mr. Linklater, of the firm of Price & Linklater, architects, and the work has been executed by the Messrs. Edmundson. The windows have been presented by Mr. Wilson.

Books Received.

Victoria: Patents and Patentees. Vol. III. *Indexes for the Year 1868.* By W. H. ARCHER, Registrar-General of Victoria. Melbourne, 1870.

Victoria: Abstracts and Specifications of Patents applied for from 1854 to 1856. Ac to Bu. By W. H. ARCHER. 1870.

THE second of these blue-books contains abstracts of the patents for building materials, the most numerous division of which relates to bricks, mantelpieces, tiles, artificial stones, &c.; and the next to cements. The Indexes for 1868 are divided into three parts,—a subject matter index, an alphabetical, and a chronological index.

VARIORUM.

CASSELL'S "Technical Educator" has the following remark on "the study of the beautiful, and its practical value."—"At the very outset we must recognise the fact that the beautiful has a commercial or money value. We may even say that art may lend to an object a value greater than that of the material of which it consists, even when the object be formed of precious matter, as of rare marbles, scarce woods, or silver, or gold. This being the case, it follows that the workman who can endow his productions with those qualities or beauties which give value to his works, must be more useful to his employer than the man who produces objects devoid of such beauty, and his time must be of higher value than that of his less skilful companion. If a man, who has been born and brought up as a "son of toil," has that laudable ambition which causes him to seek to rise above his fellows by fairly becoming their superior, I would say to him that I know of no means of his so readily doing so, as by his acquainting himself with the laws of beauty, and studying till he learns to perceive the differences between the beautiful and the ugly, the graceful and the deformed, the refined and the coarse. To perceive delicate beauties is not by any means an easy task to those who have not devoted themselves to the consideration of the beautiful for a long period of time; and of this be assured, that what now appears to you to be beautiful, you will shortly regard as less so, and what now fails to attract you, will ultimately become charming to the eye."—"The City Diary," published by W. H. & L. Collingridge, of the *City Press*, has again made its appearance. In addition to the matter ordinarily given in a diary for the desk, it contains much official information with regard to the City. It is a complete guide to the various business offices of the Corporation and City generally.

Miscellaneous.

The Baptist Mission-house, Holborn.—This new building is situated in Castle-street, Holborn, and has been erected from the designs of Messrs. Searle & Son. On passing through the vestibule, the main office is to the right. It is about 30 ft. square. To the left of the lobby are the secretaries' rooms. Immediately opposite there is a large and comfortable waiting or reading room. Fronting the entrance is the library. This is about 48 ft. long by 30 ft. wide. It is surrounded by a gallery. Bookcases occupy all the bays formed by the piers on which the roof rests. The room will accommodate 300 persons. Ascending the stone staircase, we first come to the doors, which admit to the gallery of the library. On the main landing is the committee-room, about 37 ft. by 22 ft. There are other offices above this landing. Five offices, together with the housekeeper's apartments, occupy the second floor, and the top floor is wholly devoted to rooms of a domestic character. The site for the new premises cost 4,500l., and the estimate for the structure is 8,347l.

The Bradford Gasworks.—The Bradford Gas Company have agreed to sell their undertaking to the corporation for 210,000l.

To Take Plaster Casts of Natural Objects.—At the Manchester Literary and Philosophical Society, Mr. Boyd Dawkins exhibited a number of casts in plaster of Paris of various objects of natural history, and explained the process by which any one can make them for himself. The material of the mould is artists' modelling wax, which is a composition akin to that used by dentists; and, as it becomes soft and plastic by the application of heat, though in a cold state it is perfectly rigid, it may be applied to the most delicate object without injury. As it takes the most minute markings and striations of the original to which it is applied, the microscopic structure of the surface of the original is faithfully reproduced in the cast. This method is briefly this:—1. Cover the object to be cast with a thin powder of stæatite or French chalk, which prevents the adhesion of the wax. 2. After the wax has become soft, either from immersion in warm water, or from exposure to the direct heat of the fire, apply it to the original, being careful to press it into the little cavities. Then carefully cut off the edges of the wax all round, if the undercutting of the object necessitates the mould being in two or more pieces, and let the wax cool with the object in it, until it is sufficiently hard to bear the repetition of the operation on the uncovered portion of the object. The stæatite prevents the one piece of the mould sticking to the other. The original ought to be taken out of the mould before the latter becomes perfectly cold and rigid, as in that case it is very difficult to extract. 3. Then pour in plaster of Paris, after having wetted the moulds to prevent bubbles of air lurking in the small interstices; and if the mould be in two pieces, it is generally convenient to fill them with plaster separately before putting them together. 4. Then dry the plaster casts either wholly or partially. 5. Paint the casts in water colours, which must be fainter than those of the original, because the next process adds to their intensity. The delicate shades of colour in the original will be marked in the cast by the different quantity of the same colour, which is taken up by the different textures of the cast. 6. After drying the cast, steep it in hard paraffine. The ordinary paraffine candles, which can be obtained from any grocer, will serve the purpose. 7. Cool, and polish the cast by hand with stæatite. The result of this process is said to be far better than that obtained by any other.

An Ancient Bronze Plate, with Runes found in Ireland.—An interesting antiquarian discovery has been made on Lord Rathdonnell's estate at Gormanstown, county Louth. In an ancient mound, consisting of the materials of an old sea-beach, were found mingled some charcoal and many broken and half-burnt bones, &c. About 11 ft. from the surface, or top, of the mound the excavators came upon a small bronze plate lying upon what the finder likened to an edging of snuff-coloured dust or burnt paper. This plate on being carefully cleaned, was found beautifully ornamented on one side in silver tracing, with the inviolated "whorls" and twistings so common on the very ancient Irish monuments, and particularly at Monasterboice, formed by the interweaving of a triple cord. On the other side it bore, in clear and well-defined Runic characters, an inscription which has been translated as follows:—"Tomr (or Tomr) of Solahof owns this sword." The snuff-coloured powder lying about the plate was entirely the remains of the sword-belt. The plate has been transmitted to the Society of Antiquaries in Copenhagen; and the opinion of the best Runic scholars is to the effect that it belonged to "Tomar of the Torque," of Dublin, Earl Tanist to the King of Lochlainn, in the ninth century of the Christian era, and the Danish chieftain alluded to by the poet Moore as having the collar of gold torn from his neck by King Malachy. The question has been started, why was Tomar interred at ancient Drumcath, or how came a portion of his sword to be found there? The subject is to be brought before the Archaeological Society of Kilkenny.

Surveyorship, Croydon.—The surveyorship of the borough of Croydon having become vacant, by the resignation of Mr. Albert Latham, the Local Board of Health requested their consulting engineer, Mr. Baldwin Latham, C.E., to nominate five gentlemen from whom a selection might be made. From these the Board, at their last meeting (20th instant), elected Mr. Thomas Walker, borough surveyor of Rochdale, to fill the same office at Croydon.

The Salt Library.—A public meeting of the inhabitants of Staffordshire, convened by the high sheriff, has been held at the Shire-hall, Stafford, for the purpose of publicly thanking the widow of the late Mr. Salt, of the firm of Messrs. Stevenson, Salt, & Co., bankers, London, and Stafford, for her munificent present of books, engravings, antiquarian works, and very costly documents relating to Staffordshire, collected by her husband at an expense of upwards of 31,000*l.*, and to determine the best mode of raising an adequate fund for their preservation and utilisation. The high sheriff, Mr. J. Hartley, presided, and there was a very numerous and influential attendance. The Earl of Harrowby moved a resolution affirming the advantage of retaining within the county the splendid collection of Mrs. Salt. The resolution was seconded by Colonel Bagall, and carried unanimously. The Earl of Dartmouth moved the appointment of a committee, consisting of the Duke of Sutherland, the Earls of Lichfield, Shrewsbury, Bradford, Harrowby, and Dartmouth, Lords Hatherton, Wrottesley, and Bagot, Viscount Sandon, M.P., and many other influential inhabitants, with a view to considering in what way the conditions which Mrs. Salt attached to her gift might be best complied with. The mayor of Stafford (Mr. H. Gillard) seconded the resolution, which was carried unanimously. Lord Hatherton, in moving that a subscription be at once entered into, observed that Mrs. Salt's wish was, that the library should be safely deposited in a building erected especially for the purpose, or some appropriate existing institution either at Stafford or Lichfield, and that a librarian should be appointed. Mr. A. Sparrow seconded the resolution, which was cordially agreed to. The Earl of Lichfield moved that, with a view to providing a fitting memorial of the late Mr. William Salt, by the erection of a suitable building for the library and the endowment of a librarian, the meeting should pledge itself to take immediate steps to raise a sum of not less than 7,000*l.* He considered a building worthy of the library would cost at least 4,000*l.*, and a further sum of 3,000*l.* ought to be raised as the nucleus of an endowment fund. Mr. Cartwright seconded the resolution, which was carried with acclamation. A subscription was entered into, and about 1,000*l.* were promised in the room, including the Rev. Walker Sneyd, 105*l.*; the Earl of Lichfield, 100*l.*; the Earl of Dartmouth, 100*l.*; and the Earl of Harrowby, 100*l.*

Gas Fires and Stoves.—Mr. J. O. N. Rutter, of Black Rock, Brighton, gives the following, with other particulars, as to useful forms of gas fires and gas stoves. The gas fire consists of pumice (usually called pumice-stone), broken into tolerably small pieces, packed together to the height of the bars in an ordinary fire-grate, and heated to incandescence by gas. The pumice being carefully arranged, and the gas properly applied, in a few minutes there will be a brilliant fire. Here will be nothing to disturb our old-fashioned notions and susceptibilities about the cheering effects of an open fire,—a fire which can be seen as well as felt. The cost of materials and workmanship is very trifling,—only a few shillings; but the cost of keeping up the fire is greater than that of a coal fire. Taking the cost of a coal fire at 3*d.* per hour, that of a gas fire will be about $\frac{1}{3}$ of a penny. This must be taken into consideration when estimating the advantages of a gas fire. The pumice rapidly gets into a glow, and is nearly indestructible, without dust or other nuisance, and the fire gives good heat and can be diminished or increased at will. Mr. Rutter also thus describes a gas stove:—

"During the last twelve winters I have had the enjoyment of a stove which is isolated as respects the room in which it is fixed. The air which supplies the means of combustion to the gas-jets is conveyed from out-of-doors, underneath the floor, and through the bottom of the stove; and the exit-flue communicates with the chimney of an adjoining room. The perfection of warming by gas is thus attained. Any required temperature can be maintained without varying one degree for any required period. . . . A room which has no chimney, nor one near enough to be available, can be effectually and healthfully warmed; and a room with a chimney, but useless by reason of a down-draught, may be made as comfortable as any other in the house."

With such a chimney a gas fire does not do well.

Cottage Hospitals.—Mr. Sotheron-Escount has just presented to the Devises Corporation a site for the establishment of a cottage hospital at that place. The gift has been accepted, and funds are being raised to defray the cost of the erection. These institutions have spread since we first began to urge their value.

The Education Movement.—Last week the Lord-Lieutenant of Warwickshire, Lord Leigh, presided at the College, Binswood, Leamington, on the opening of the new boarding-house, which now forms the western side of the quadrangle of the extensive building, in this fashionable inland watering-place. The headmaster, the Rev. H. G. Woods, Fellow and Tutor of Trinity College, Oxford; J. E. Thursfield, B.A., Fellow and Tutor of Jesus College, Oxford; and other well-known educationalists took part in the proceedings. A number of scholarships were awarded to the most successful students, the annual speeches made, and prizes given. The new boarding-house has the residence of a master attached to it, under whose management it will be conducted. The basement and ground-floor contain various requisite offices, also a dining-hall, a school-room, as well as several private studies, which will be placed at the disposal of the most diligent boys. The upper floors contain forty dormitories, bath-rooms, and other apartments; also separate rooms for invalids. The whole is heated with hot water.

The Rating of Government Establishments.—It is understood that it is the intention of her Majesty's Government to introduce a measure into Parliament for the purpose of removing the exemption which exists in the case of Government property from the payment of parochial rates in connexion with other exemptions. Believing that the other exemptions (under which comprehensive head charities, parks, and other things are included) are likely to give rise to so lengthened a discussion in the House of Commons as materially to retard the settlement of that which is in itself a very simple and pressing question,—viz., the rating of the public works, which, being established for the benefit of the whole nation, ought in all their collateral charges to be a burden upon the nation, and not upon any particular locality. The Premier is being urged to deal with this subject by a separate Bill, which would be almost certain to command the support of all parties in the House of Commons. We hope the suggestion will be early acted on.

Property Sales.—Mr. Parker Tomlinson offered for sale, at the Red Lion Inn, Retford, a property situated in South Leventon, and Treaswell. All the lots were ultimately sold. Lot 1, a farmhouse, orchard, &c., and three closes of grass land, in all 12*a.* Or. 12*p.*, was knocked down to Mr. T. Smith, for 1,050*l.* Lot 2, 3*a.* 2*r.* 8*p.* of grass land was purchased by Mr. Smith for 95*l.* per acre. Lot 3, a close of arable land, 3*a.* 2*r.* 22*p.*; Mr. Turner was the last bidder at 54*l.* per acre, but it was reserved for 58*l.* Lot 4, 7*a.* 2*r.* 13*p.* of arable land was purchased by Mr. J. Bomford for 54*l.* per acre. For lot 5, 4*a.* 1*r.* 23*p.* of grass land, Mr. J. Q. Wells was the last bidder at 92*l.* per acre,—reserved at 95*l.* Lot 6, 35*a.* Or. 4*p.* of arable land, was purchased by Mr. George Scott at 68*l.* per acre.—Mr. Sheppard sold at the Bull's Head Inn, in Loughborough, in two lots, a freehold estate, situated in the parish of Hooton, and containing 44 acres. Lot 1, 30 acres of land, with farmhouse and buildings, realised 92*l.* per acre. Lot 2, 14*a.* 2*r.* 21*p.*, sold for 96*l.* per acre. Colonel Packe was the purchaser.

The Bridge over the Severn at Welshpool.—The mayor of Welshpool and the town clerk have had a meeting with Mr. John Naylor, at Leighton Hall, with reference to the proposed bridge over the Severn. Mr. Naylor said he would give them the ground on both sides the Severn, for the abutments and necessary approaches to the bridge, and also "the ferry," which brings in 40*l.* a year to Mr. Naylor at the present time. The mayor has opened a subscription list, and has been promised between 300*l.* and 400*l.* already. The bridge is intended to be toll free. Thirteen lives have been lost, within the last fifteen years, by persons attempting to cross the Severn at Leighton Ford, the site of the intended bridge. Lord Powis has promised to give the subject his best consideration. We believe the total cost will be about 3,000*l.*

New Schools, Newport, Salop.—We are informed that in answer to advertisement thirty-four sets of plans were received by the committee, and that they have awarded the premium to Mr. John Ladds, of Chapel-street, Bedford-row, and have instructed him to prepare specification and details for carrying out the works.

Arbitration Case, Bolton.—Mr. Isaac Holden, of Manchester, sat as umpire in a dispute between Messrs. Day & Raby, joiners, of Crown-street, Bolton; and Messrs. Ellis & Hinchliffe, builders, of Manchester, arising out of a contract for the carpenters' and joiners' work for the new County Court buildings in Mawdsley-street. The amount claimed for extra works by Messrs. Day & Raby was 934*l.* After several meetings, we understand that the case has now been settled by the umpire awarding to the plaintiffs the sum of 14*l.* 5*s.* 10*d.*; the costs, which we understand amount to 300*l.*, being divided equally between the disputants. Mr. James Lomar, surveyor, of Bolton, was arbitrator for Messrs. Day & Raby; and Mr. Thomas Taylor, surveyor, of Manchester, for Messrs. Ellis & Hinchliffe.

Instruction in Science and Art for Women.—In the eleventh (the last but one) of his course of lectures on the elements of physical science, or "Physiography," delivered at the South Kensington Museum, Professor Huxley examined the geological features of the basin of the Thames, and pointed out some of the climatic and physical changes which, in common with the rest of Britain and Northern Europe, it must have undergone in the course of past ages. In the Thames basin were found remains of the aurochs, musk sheep, bison of America, and rhinoceros of Asia, which also has been found "in the flesh," frozen up in floats of ice for thousands of years.

Sanitary Improvements in St. Pancras since 1855.—There has been printed, by authority, the copy of a letter from the Metropolitan Board of Works with a series of questions as to the sanitary and general improvements effected by the vestries from the passing of the Metropolis Management Act, 1855, with the replies given on behalf of the vestry of St. Pancras. From this document it appears that the total amount expended in sewerage, paving, and other improvements in the parish since last January, 1856, including the cost of public lamps to Lady-day, 1870, is 884,774*l.* The present mileage of streets and roads in the district is about eighty miles.

The Holborn-circus Branch of the Union Bank of London.—This building, on the Viaduct, occupies a site of 132 ft., with a depth of 68 ft. The design of the building is Italian in style, and the material used in the elevation is Portland stone. The basement is to be used for the reception of safes and as strong rooms. The ground floor will be devoted to the purposes of the bank, and a large portion of the building will be let out as offices and for general business. Mr. F. W. Porter is the architect. The floors are on Messrs. Fox & Barrett's principle, with blue lime concrete of Mr. W. Lee's manufacture. The contractors for the building are Messrs. Holland & Hannen. The carving is being executed by Mr. Kelsey, and Mr. Brodie is clerk of the works.

Royal Academy of Music.—The competition for the Westmoreland Scholarship and Potter Exhibition took place on Monday, the 19th instant, at the Institution in Tenterden-street, Hanover-square. The results were as follow:—Westmoreland Scholarship—Miss Mary Crawford (elected), Miss Pocklington, Miss Rebecca Jewell, Miss Frith, and Miss Goode (highly commended). Potter Exhibition—Miss Agnes A. Channel (elected), Miss Field, Miss Taylor, Miss Gardner, and Miss Waite (highly commended).

Condition of Liverpool.—We have already mentioned that Professor Huxley, as President of the British Association, was requested by the Town Council of Liverpool to nominate two gentlemen to report on the propriety of using asphalt refuse as the foundation of new houses in Liverpool. We understand the Professor has named Professor Parkes, of Netley, and Dr. Sanderson, of University College. The Town Council have further resolved to take the opinion of these same gentlemen on the sanitary condition and ventilation of the sewers.

The Working Men's Exhibition.—A workman complains that a model sent by him, and exhibited in the Agricultural Hall, was returned to him damaged, and not in his own case. Exhibitors must make allowances for officials in such circumstances. The wonder, perhaps, is that the committee were brave enough to take upon themselves the onerous duty of returning objects exhibited.

Sturston Church, Norfolk.—This church having just been restored and a new aisle added, the builder, Mr. George Grimwood, gave the men in his employ a dinner. Upwards of sixty sat down. The chair was occupied by Mr. Grimwood, supported by Mr. William Boatwright, of the firm of Jecks & Ranson. Mr. Johnson and Mr. Gostling responded for the carpenters, and Mr. Rust and Mr. Middleton for the bricklayers, who spoke to having served Mr. Grimwood for twenty-five years, and they hoped to serve him by many more. The architect was Mr. R. M. Phipson.

Architectural Association.—On Friday evening, the 16th, a paper was read by Mr. S. Salter "On the Arrangement and Ventilation of Hospitals." After referring to the several plans upon which hospitals were constructed, and pointing out the advantages of the pavilion system, he proceeded to describe more particularly the arrangements adopted in the new St. Thomas's Hospital by Mr. Curry; the Small-pox Hospital, at Sockwell, by Mr. T. H. Wyatt; and the Fever Hospital, also at Sockwell, by Mr. Marrable; several drawings of which, showing the construction, plan, and ventilation, were kindly lent for the occasion by the architects.

Improvement of Park-lane.—A correspondent, "J. A. A.," proposes a plan, similar to one we illustrated in the early stage of the discussion, for obtaining a better thoroughfare by commencing it on the west side of Apsley House, and running into Park-lane at Stanhope Gate. It would be worse than useless now to reopen the question. All the arrangements are made for effecting the desired improvement by means of Hamilton-place.

Early Settlements.—During the operations for draining off a tarn at Egheside, near Egremont, Cumberland, the remains of an ancient British settlement have been discovered. Stone and flint implements, such as axes, knives, and chisels, have been found in large numbers. Some pieces of oak are cut in lengths, evidently from massive full-grown trees such as have not grown in that locality for many ages.

The Tower of St. John's, Chester.—The state of this tower having been found to be very dilapidated, a meeting of parishioners has resolved to take immediate steps for its repair; and to that end a committee has been appointed to obtain an architect's report on the state of the tower.

British Archaeological Association.—At the next meeting, on Wednesday, January 11, 1871, Mr. W. F. Holt will read a paper on "The Tames of Fairford."

Works at Marlborough House.—A "Looker on" sends us a somewhat mystical letter as to the terms on which the men are employed by the builder at Marlborough House.

TENDERS.

For building a thirty-quarters malthouse at the Queen-street Brewery, Rungate, for Messrs. Tomlin & Son. Mr. Benjamin Adams, architect. Quantities supplied by Mr. Thomas M. Rickman:—

Smith & Son	£2,938 0 0
Wilson	2,698 0 0
Epps	2,665 0 0
Harrison	2,630 0 0
Osborn	2,362 0 0
Shrubsole	2,347 0 0
Snell & Rayte	2,347 0 0
Adcock & Rees	2,313 0 0
Saunders	2,229 0 0
Hayward (accepted)	2,145 0 0
Woodcock	2,087 0 0

For the erection of bakehouse, oven, and other buildings, at Canebalton, Surrey, for Mr. Dyett. Mr. Bunker, architect:—

Cutb	£318 0 0
Noble	239 0 0
Richardson	237 0 0
Keal (accepted)	235 0 0

For gasfittings and ventilating tubes at the new Infirmary, St. Luke's Workhouse. Mr. H. Saxon Snell, architect:—

Pontill	£379 10 0
Turner & Co.	329 0 0
Garnett	285 0 0
Crabb & Vaughan	284 0 0
Jeal	259 0 0
Abercrombie	232 8 0

For alterations and repairs to the house, No. 65, Upper Marylebone-street, for Mr. Alfred Yates. Mr. A. Baker, architect:—

Hatchman & Son	£235 0 0
Houghton	527 14 0
Hyde	490 0 0
Scrivner & White	493 0 0
Watson, Brothers	423 10 0

For new factory, &c., at No. 402, Hackney-road, for Messrs. W. Williams & Son. Messrs. Lee & Walton, surveyors:—

Axford	£280 0 0
Ramsay	674 0 0
Blackmore & Morley	625 0 0
Shurnar (accepted)	464 0 0

For engineering works, gasfittings, laundry-fittings, electric apparatus, &c., for the workhouses of the Woolwich Union at Plumstead. Messrs. Church & Rickwood, architects. Quantities supplied:—

Rosser & Russell	£3,578 0 0
Deane	3,525 0 0
Jeakes & Co.	3,511 0 0
Fraser & Sons	3,370 0 0
May	3,308 0 0
Benham & Sons	3,010 0 0
Stiff (accepted)	2,432 0 0

For dispensary and relief offices at Woolwich for the Woolwich Union. Messrs. Church & Rickwood, architects. Quantities supplied:—

Crockett	£2,940 0 0
Stiff	2,894 0 0
Sollett	2,885 0 0
Perry & Co.	2,797 0 0
Hart	2,778 0 0
Heathshaw	2,774 0 0
Kirk	2,759 0 0
Stephenson	2,743 0 0
Eaton & Chapman	2,697 0 0
Nightingale	2,626 0 0
Wright, Brothers, & Goodchild	2,599 0 0
Longergan	2,582 0 0
Avard	2,550 0 0
Tongue	2,400 0 0
Wilson	2,413 0 0
Hurst	2,373 0 0
Crabb & Vaughan (accepted)	2,290 0 0

For new dead-house and post-mortem room, All Saints', Poplar. Messrs. A. & C. Harston, architects:—

Abraham	£295 0 0
Riddall	264 0 0
Coleman	263 0 0
Kodges & Robinson (accepted)	260 0 0

For the rebuilding of No. 304, Strand. Mr. J. H. Rowley, architect. Quantities supplied by Mr. Green:—

Sharpe & Cole (accepted)	£398 0 0
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The Builder.

VOL. XXVIII.—No. 1456.



Eighteen Hundred and Seventy.

THE year 1870 closes a decade more eventful than almost any period of equal length in the history of the world. Its opening was marked by the outburst of a civil war, unprecedentedly sanguinary in its conduct. It witnessed revolutions in Greece and in Poland. It saw the unscrupulous spoliation of the gallant little kingdom of Denmark. It beheld the extinction, on the field of Sadowa, of the hopes of the House of Hapsburg to revive the dignity of the Holy Roman Empire, after its downfall at Austerlitz. It has watched the slow consolidation of Italy; the collapse of the historic second empire in France; the blas-

phemous claim to divine honours grasped at by the Pope, and the overthrow of the temporal power wielded by that Pontiff for eleven hundred years. It has seen Germany reconstructed as an empire, and aggressive France prostrate, but still unsubmitive, at her feet. It has measured the influence, on two rival nations, of a cycle of eighty years of constant revolution, compared with that of an equal period of careful culture under firm monarchical rule. It has seen the metropolis of civilisation cut off from the outer world by a circle of steel and of fire, and only giving signs of its existence by means of balloons and pigeons. It has so exhausted our capacity for wonder, that our ears no longer tingle at the most unexpected or most disastrous news.

The thunderbolt of war burst, in a serene sky, as the sun declined from the summer solstice. As he passes that of winter, obscured by eclipse (and, the wisdom of our ancestors would have added, in portentous conjunction with Saturn, and square of Mars), it is hard to tell in which portion of the horizon to look for hope or for promise. The two master forms of evil, which were thought to some extent to displace one another, now reign unchecked, in unholy wedlock. Violence and deceit walk hand-in-hand. The successive rulers of France have each eclipsed their predecessors in mendacity. The long series of rapacious robberies by which the House of Hohenzollern has risen from the burgrave of Nuremberg to the headship of Germany, is now gilded by the lustre of the crown of Charlemagne. The doctrine of the duty of fidelity to treaty, up to the moment when it is convenient to break faith, has been avowed with the like cynical shamelessness by the ministers of both the great Northern powers. A war, in which attack and defence seem now alike objectless and wanton, is sapping the life-blood of Germany and of France; nor have we

any ground for belief that our own military or naval preparation is such as to render us wisely indifferent to the menacing unfriendliness of nations envious of our insular wealth.

The year 1870, thus one of the most eventful of this eventful decade, has left no trifling marks of its passage on the face of our island. For the first time since the introduction of the sham and stucco of the regency, London has of late burst the fetters of negligence and of bad taste. While yet leaving much to be desired, she has, at a single stride, assumed no inferior place among the architectural capitals of Europe. And if the year has afforded to the architect, the man of taste, and the friend of education, ample material for regret, and even for humiliation, it has not been without compensation in its monumental gifts.

Eighteen hundred and seventy has witnessed the completion, or the first opening to public traffic, of national works of the first magnitude, and of considerable, if not unqualified, merit. The close of the preceding year removed the long-endured reproach of Holborn-hill, and bridged the Thames with an elegant successor of the dilapidated structure at Blackfriars. The completion of the road along the Thames Embankment, and the opening to the public of this esplanade, must be regarded as a complement of the City improvements. The broad straight line pierced from the Bank and the Mansion House, towards the commencement of the Embankment road, is another link in the improved internal communication. At the same time the underground story occupied by the Metropolitan Railway, has given a facility to the intercourse between the two great centres of metropolitan life, which we are only beginning to appreciate. When the inner circle is complete, punctuality will be possible in London, and the time-honoured trouble of a block in the streets will lose its terror for the man of business.

The directors of the Metropolitan Railway deserve honourable mention. Their free and liberal treatment of the public, especially in the case of return-tickets, contrasts in a striking manner with the gripping policy of the Charing-cross and Cannon-street management. The division of the line into sections, and the permission for a passenger to use the same ticket over the same section without extra charge (as, for instance, if he has taken a return-ticket from Charing-cross to Kensington, he may return with it to the Temple), will be fully appreciated by the public.* Add to this the very wise provision which Mr. Fowler has made (by the introduction of the ponderous engines which are as well adapted for this duty as they would be extravagant for any other) for almost instantaneous stopping and starting, and the absence of the ill-advised running of line athwart line, which renders the distance between London Bridge and Cannon-street more easy to pass on foot than by railway, whenever a fog comes suddenly on. There can be no doubt that the Underground Railway will, on its completion, monopolise the main traffic between Westminster and the City.

With the facility afforded to the metropolitan traffic by the opening of new lines, both of street and of railway, must be coupled the relief afforded to the residents and occupants of certain parts of the City itself from a curse which is even more heavy than that of smoke,—the noise of London. The winter will, no doubt, severely test the durability of the asphalt laid down in Cheapside, Threadneedle-street, and some other localities. But unless it cuts up into impracticable ruts in a manner not at present threatened, this asphalt appears likely to super-

* This contrasts forcibly with the extra charge imposed on the traveller who arrives at London Bridge from Charing-cross with a Cannon-street ticket, although he has paid the fare demanded for a London-bridge ticket. A short-sighted piece of iniquity.

seede the more ancient and noisy method of metropolitan paving. The relief to the nerves accomplished by the substitution must add even to the durability of life, by ministering to its comfort. Let any one who doubts this view take a seat in an omnibus at the Mansion House, and allow himself to be driven westward. The explosion which will stun him when the vehicle comes upon the stones near the black effigy of Sir Robert Peel will be a better measure to his senses of the value of a quiet road than he will gain in the converse case of leaving the rattle for the calm.

The proposal to complete the internal decoration of St. Paul's Cathedral met with a response, the cordiality of which has slackened as the subscriptions were brought to book. Only about an eighth part of the large sum asked for has yet been offered. The public has not yet been hit in the right place.

The degree of success which has attended the opening of a Workmen's International Exhibition at Islington has not been such as to lead to the confirmation of the opinion that the leaders of the working classes are yet in a position to take the reins of power. Of that Exhibition we speak in all sympathy and kindness. Its object, so far as it had a distinct and avowed object, was good. Men remarkable for influential position, or estimable for noble qualities, spared neither time nor trouble to insure success. Shrewd, sensible, practical men, worthy representatives of the industrial classes, laboured as honorary secretaries and committeemen. The Queen paid a pre-opening visit, at the cost of not being able to open in person the most ornamental public work of her reign. The heir to the Throne opened the Exhibition officially. The Prime Minister postponed a cabinet council to make a speech at its close. With all that the Exhibition was a failure. It was so in a financial sense, as the final accounts produced at the close showed a deficit of some 1,500l.; but even more than this, it was a failure in an industrial sense. It failed to induce the body of men for whose benefit it was designed to come forward to support it. Containing, as it did, some good native productions, of which the country might well be proud, it relied almost entirely for its attractive power upon foreign contributors,—Italy, Denmark, India, and Austria. Subtracted the products of these countries, and there was but little to repay a visit to the Agricultural Hall. And then these very contributors were worth to the last degree at the company, or, rather, lack of company, in which they found themselves, and scrupled not to complain that they had been induced to go to an expense which was in no way repaid by either the quantity or the quality of the publicity which they obtained. It is true that all these shortcomings may be explained. But they are none the less obnoxious for that fact. They show that neither integrity, benevolence, devotion, nor any similar qualities can insure success, in the absence of the genius of organisation and the trained habit of rule.

Undeterred by the failure at Islington, by foreign war, or by domestic alarm, South Kensington has pressed forward its preparations for again inviting the world as its guest; indeed, this time it seems rather to be asking for its company as its lodger. While almost every large manufacturer you meet shakes his head as he tells you that the time of Great Exhibitions is passed, Kensington declares that it has only just arrived, and that, having so arrived, it is to be perpetual. We shall look with no little interest to the issue. As far as the future can be gathered from the present, we should anticipate, from the small area, but excellent arrangement and substantial structure of the galleries built on either side of the northern half of the Horticultural Gardens, together with the French annex, that we shall obtain a sort of chapel of

ease to the Museum itself. The stern and wise resolve not to allow the Loan Courts of South Kensington to be made available for advertising purposes has, no doubt, excluded a large amount of contemporary production, at the same time that it has very much enhanced the value of the class of objects exhibited. Without being in any way admitted to the councils of an administration that seems to prosper and hold its own, looking on in serene and unconcerned composure, while ministries fall, parties struggle, and newspapers comment, we yet think it possible that the main aim of the perpetual exhibition may be to obtain a certain amount of support from manufacturers, affording them the equivalent of free advertisement, without in any way detracting from the high, non-commercial character of the display in the Loan Courts. It may also not have been lost sight of that the best way to render future Great Exhibitions impossible would be a proposal to make such a gathering perpetual.

In its own wide and fully-acknowledged walk, the South Kensington Museum has had the advantage of offering to the public access to some of the chief treasures of two of the most select and most charming picture galleries to be found within the four seas. The most famous pictures of the Marquis of Westminster have a notoriety which is as wide as the love of art itself. The treasures of Lord Elcho are less generally known, but are not less valuable. The public owe no little gratitude to both the owners and the exhibitors of these grand old paintings.

The Art Exhibition of the year 1870 opened with unusual éclat by the display, on the walls of Burlington House, of more than 230 pictures by ancient masters, and by English painters not unworthy to be named along with them. The permanent value, and true pictorial dignity, of portraiture, was especially illustrated from the easels of Vandyke, Gainsborough, Titian, Velasquez, Rubens, and Sir Joshua Reynolds. The new British Institution attracted favourable notice. In the rival water-colour exhibitions a very parallel rank of merit was attained. Later in the year the exhibition of some water-colour drawings, of the old, true style, but of unrivalled excellence, by the Spanish artist, Fortuny, gave a lesson to our own draughtsmen of which we need see no tridling results in the spring of 1871. The Burlington Fine Arts Club offered a noble contribution to the educational exhibitions of the year, in the highest and grandest walks of art, by the display of original drawings by Raffaele and Michelangelo, of *fac simile* reproductions of those invaluable originals by a process in which photography has a share, and of some of the finest engravings known to connoisseurs in that all but extinct art. Too much attention cannot be directed to the great boon to the art student which is afforded by the heliotype process. Towards the close of the year the exhibition of the Photographic Society showed that the excellence attained by the leading practitioners of this art is still on the increase.

No very noted triumphs of the civil engineer have been recorded in England in the past year. On the contrary, almost the only sign that the profession may be expected to emerge from under the cloud which has settled on Great George-street is the fact, that the Institution has directed attention to the vital question of professional education. At the commencement of the year public attention was still turned to the fall of the girder-roof at King's College, and to the external fractures in the granite columns of the Holborn Viaduct. In April the fall of an arch on the Subterranean Railway at Blackfriars, a more inexorable disaster than either of the former, attracted comparatively little notice. Attempts to secure public support to the illusory and undesirable projects of railway communication with the Continent, whether by a 30-mile tunnel through the chalk, by an iron-cased subway, by a floating tube, or by any other equally impractical method, were characterised in our pages as they deserved, and have passed quietly into oblivion. 1870 has made us all the more content with our watery girdle. It is curious to observe how the fallacy of two plans, on which the supporters of one of these schemes appealed from our practical verdict to the less professionally educated readers of the daily press, has been illustrated by the events of the year. The increased, and apparently irresistible power of torpedo attack has been brought into full evidence; and the idea of political guarantee for physical conditions has been shown to be altogether inapplicable to the nineteenth century. The plan, always advocated by ourselves, of

a channel ferry, has been brought forward in a more serious manner, although still without any due appreciation of the magnitude of the questions, that require experimental solution before it will be wise to commence the outlay of any large sum for this purpose. "When we were debating on the most rapid mode of reaching Paris, regardless of expense, we little thought that within a few months our only communication with the French capital would be by balloon! Later in the year the failure of the civil engineers of the country to assume the status, influence, and responsibility properly belonging to the profession, was evinced by the most terrible calamity that the English navy has experienced since the loss of the *Royal George*. The daily press, in its long discussion of this sad event, has illustrated in a remarkable manner the defective character of ordinary English education, as evinced by the general absence of even the rudiments of mechanical knowledge among those who are considered competent to guide and inform public opinion. It is from the constructors of America that the most pertinent response to our own remarks on the subject has emanated, in the telling comparison between the structure of the *Captain*, and the "placing a lifebuoy under the feet instead of under the arms of a drowning man."

Our two great provinces of danger, our subterranean and our aquatic dominions, have continued to furnish the usual *quotidians* of fatal disasters. 1,116 lives have been lost during the year covered by the last returns in our coal-mines, being at the rate of one life for every 93,777 tons of coal raised, or rather more than one death to every eight hours' shift of labour throughout the year. The wrecks and casualties at sea, reported in Lloyd's List, for the corresponding period of time, have been 10,972, exceeding the average total of the three preceding years by 415. Of these casualties, 3,316 have involved total loss or great damage. The ascertained loss of life in these casualties, during the first half of the year only, amounts to 3,346 souls. The returns for the second half-year are incomplete, and the crews of missing ships are not included. This tribute of 7,000 lives is not, however, borne by British commerce alone, out of the 40,000 sailors of our Royal, and the 196,000 of our mercantile, navy, but by that of the whole world, as far as our returns extend.

The foggy season of November and December has been marked by an unusually large number of fatal collisions on railways. In a single fortnight three of these occurrences caused twenty-six deaths, beside numerous injuries. The influx of traffic, gratifying as it is in one respect to all those interested in railways, appears to have reached the limit of the capacity of several of the most frequented narrow gauge lines. The construction of separate tracks for passenger and for merchandise traffic is a necessity that can only be ignored, in many cases, to the great danger of the public. In the meantime the steady neglect of the simple and valuable advice to diminish the large damages paid for casualties by making every railway ticket a policy of insurance, is one of those things which show with how little wisdom, or true economy, Boards are in the habit of administering the affairs of their constituents.

The attention of both the administration and the legislature of the country has been directed, during the past year, in an unusual degree, to the subject of education, both as regards the primary teaching of the hitherto utterly neglected children of the poor, and that superior degree of traditional culture which should characterise the members of liberal professions. It would have been better for the future of the country, as well as for the credit of public men, if any intelligible idea of public duty, or of the real import and bearing of the word education, had been manifest as controlling and ennobling the unworthy tactics of party politics. A great fight took place in the Lower House of Parliament on the subject of the general and compulsory education of the rising generation. The honest earnestness of the vice-president of the Committee of Council of Education carried, substantially the measure which he proposed, in face of a many-coloured opposition, each shade and section of which seemed possessed by the idea that an education decreed by any religious sect except its own, was worse than any amount of neglected ignorance. But the failure of the measure to provide for any such organisation of the local boards, as should impart to the more torpid and unlettered parts of the island the

stimulus to be derived from association with the more active and cultured portion of the community,—a failure which can only be attributed to disastrous political reasons,—bids fair to neutralise some of the good result desired by the supporters of the measure. Unfortunately, we are never likely to have the means of measuring the amount of this loss of available power. When the Bill comes next, after the usual mode of our legislation, to be tinkered and patched, we shall merely be told, with a sort of helpless frankness, that the measure did not work as well as was expected. As we write we receive the intelligence that this neglect of a well-arranged organisation is about to be remedied, as far as possible, by the extension of abominable centralisation,—the invariable sequel of all theoretic attempts to reverse the natural conditions of Government.

Coincident with the attempt (not leading, but following, the opinions of the working classes) to commence a general system of elementary tuition, has been an attack upon not only eminent professional men, but upon the courtesy and custom of the architectural profession, which has proved that no wise or thorough views of the importance of high culture and superior education have animated certain members of the Government. The attack upon Mr. Barry, rendered more noteworthy by the offensiveness of its manner, springs from a system that tends at the same time to increase the expenditure of the country, to paralysise its defence, and to destroy its finest monuments. The mode of increasing the long delay that has already occurred in the completion of the Wellington monument is another fruit of the same tree. Nor should we dismiss, as irrelevant, the persistent attempts made in official and quasi-official quarters to substitute military men for educated architects and engineers, and to represent the functions of the civil architect as reducible to those of a bettermost house painter and decorator. It is true that any attempt to perform the duties of a specially educated class of men, as it always arises from ignorance of their distinctive nature, proverbially brings its own chastisement. But it is none the less humiliating to see such attempts sanctioned—whether actively or tacitly it little matters—by the Queen's servants.

Some light has been thrown, in the way of collection and publication of facts, upon the vitally important questions of sanitary and of agricultural engineering. The stamping out of typhoid fever by the operations of the engineer has become an ascertained possibility. The alleviation, if not the elimination, of phthisis by the drying of wet subsoil, attendant on drainage operations, is also proved. Some little progress has been made in the delineation of maps of health and of disease, of life and of death; and a diminution of the rate of mortality, and a corresponding prolongation of the mean term of human life, have been proved to lie within the power of science. The inordinate length of time during which the Sanitary Commission has been sitting without present result is commented on, and no wonder.

In agriculture, as elsewhere, the steam-engine is gradually but certainly effecting a mighty revolution. The grand leading features of the scientific cultivation of the country—the collection and store of our ample rain supply, the arrangement of a good system of irrigation and of drainage, the general utilisation of sewage, the defecation, banking, and stocking of our rivers, and the systematic provision of artificial methods for drying the ingatherings of a wet August and September, have been little more than indicated, and that chiefly in our own columns. But the spreading use of the steam plough, the application of ingenious modes of economising labour, the increased cleansing of land, and removal of weeds (even to the loss of the picturesque beauty of the scarlet chequering of our cornfields by the poppy); the economy of time, no less than of cost, in ploughing, in sowing, in reaping, in stacking, and in thrashing; the extension of new and lucrative crops, as that of beet (which in France produced a return of nine millions sterling in the year 1869); the economy of seed, and the selection of the better qualities of grain for reproduction,—all these improvements are silently making way. A sum fully equal to the national expenditure might, within a few years, be freely added to the annual income of those who live on and by the land, by the free employment of available means.

We cannot close these notes, which touch but a part of our province, without a word of refer-

ence to the all-important subject of the organization of the industrial classes. The rapid growth among us of the large body of operatives, whose sole occupation is that part of the work of the factory which the human hand can perform more deftly than our present machinery, but into which human skill, properly so called, does not enter, is the most unprecedented feature of modern times. It is the introduction of a new element into internal policy. No ancient human institution ever contemplated the occurrence of so portentous a phenomenon. No modern institution has yet been framed to provide for its consequences. During the present rapid development of machinery, this vast army hangs dubiously between the progress of science, and the existing forms of civilisation; ready, on occasion, to declare war against either. By a wise and benevolent education, guided by men who are neither deaf to the great lessons of history, nor blind to the signs of the times—men who study not so much the worst as the best elements of human nature, and who are profoundly convinced that permanent national welfare depends far more intimately on the condition of the deakest, than on that of the brightest group of the members of the community, in a word, by special effort to bind the operative class to the common weal by the strong tie of sensible benefit, great peril and great disaster can alone be avoided for the future. If the lessons taught by the events of the past decade do not induce us to set our own house in order, our children may have to write—*Anglia fuit*.

Or the part we have ourselves played, in our small but earnest way, during the past year, we will say nothing here. *Scripta manet*. What is writ is writ. But we will venture to add a dozen lines as to the future. After an experience extending over more than a quarter of a century, our readers will need no fresh promises, but they may be willing to hear that no endeavours will be wanting on our part to obtain for the arts of architecture and construction the widest appreciation, to extend the usefulness and comprehensiveness of the *Builder*, and to attain increased excellence in its various departments of literature, science, and art. We are not ashamed to point to the past as evidence for the future; and upon that past we raise our scaffold for further advance. Apart from our narrower professional and business purpose, we have ever been animated with an earnest desire to advance the general welfare, to induce regard for honesty and truthfulness, to spread abroad a love of art, to increase the means of wholesome enjoyment, to improve the homes of the people, and to lengthen life by implanting sanitary knowledge. This desire continues to animate and prompt us; and to the extent to which it may be successful we shall consider, when the race is run, that we have not striven in vain.

GEORGE GODWIN.

ARCHITECTURAL SKETCHING.

WE offered the other day to our readers some considerations with regard to architectural drawings, their right use and employment, and the various methods of execution employed in producing them. A few words as to architectural sketching will perhaps be accepted, by our younger readers especially, as a not unappropriate sequel to our former remarks.

Young students of architecture are constantly exhorted to lose no opportunity of sketching; a recommendation which is generally, almost universally, taken to signify that they should visit as many monuments of ancient, especially Mediæval architecture, as possible, and fill their sketch-books with details from those buildings, or remains of buildings, or occasionally with views embracing the whole of a structure. We have no special quarrel with this general reading of the precept; in the main, it is certain that most buildings in Europe of the Mediæval period are better worth sketching than most modern ones, or than any others, perhaps, except the Greek remains of architectural art, which are, unfortunately, beyond very easy reach for most students. There is a double interest, too, in an old building, arising from its historical associations, and from the fact that in many instances it is a monument in a precarious state

of existence, *cito perituro*, and of which, therefore, some memorial is the more to be desired. But it would perhaps be as well if the objects of architectural sketching, and the *modus operandi* to be preferred, were a little more definitely indicated than they sometimes are. Indeed, doctors differ so much on this point, that learners may well be a little puzzled. One recommends rapid and rough, what is called "effective" sketching, which is often very idle work; and however effective it may seem to amateurs, only shows to the professional eye that its author has shirked the task of getting correctly the precise outline and proportions of the feature sketched, as well as the mechanical trouble of making clean and precise lines. This kind of rough-and-ready sketching is of no use whatever to the student, as the sketch is no faithful representation of anything, and the process of producing it has only assisted to confirm him in a slovenly habit of using the pencil. A counter heresy set up a little time since by a small knot of young architects was, that as the only object of sketching is to collect materials (which is certainly a very honest way of putting it), therefore there was nothing like a small photographic apparatus, which would secure you any number of details twenty times as fast as you could sketch them, and much more correctly, besides saving an immense amount of time. We do not believe the theory gained many supporters; and if it were worth refuting, what we have to say a little further on would be sufficient refutation. In contradistinction again to this, the oracular advice was uttered by a talented architect, in lecturing to some of his junior brethren "measure much, sketch little, and keep your fingers out of chemicals"; a comprehensive dogma involving of course, the condemnation, more or less, of all sketching by eye, and the substitution of measured memoranda (rather than sketches) to be drawn out afterwards. Such contradictory opinions on the subject indicate, at least, that there are various ways of looking at architectural sketches; and that they have quite a different kind of value in regard to the special object with which they are made.

Now, there are three different objects which may be aimed at in architectural sketching: the practice of the hand and eye in perspective drawing, and in acquiring the power of rapidly and correctly representing on paper any architectural feature which it is desired so to illustrate; the education of the mind with regard to the process of architectural design, as exhibited and preserved in the greatest monuments of the art; or, thirdly, the mere collection and recording of facts and forms for illustrative or archaeological purposes. Now, for the first-mentioned end, the practice of drawing from existing objects is of the greatest importance to the young student, as it gives him a power over the art of perspective sketching which nothing else can so well give; and for this it is manifest that only the habit of drawing and estimating proportion truly by the eye, without any assistance from measurement, will tend towards the desired result, and confer at once the power of representing original conceptions on paper, and of forming, in so doing, a ready estimate as to the relation between actual proportion in a design and the apparent proportions assumed by the same design when foreshortened in perspective. And for this purpose the nature of the buildings copied is of less consequence than in other cases. It is, no doubt, much pleasanter to sketch from fine specimens of architecture than from mere commonplace buildings; but if the former are not at hand, almost equally good practice, so far as mere power of drawing is concerned, may be made in copying any objects which offer something for perspective to do in producing a correct representation of them. The second object, that of gaining a knowledge of, and catching the spirit of, the finest and most picturesque styles of architecture, of course pre-supposes that the student has first placed himself within reach of what is really worth sketching with this object. And when tours or expeditions are planned for this purpose, it is well to select a district marked by its own architectural character and peculiarities, which will thus be more readily grasped than when the student wanders, without rule, from one district, and from one class of building, to another; and it is not unimportant to mark such peculiarities of different neighbourhoods, and study them conjointly, since any features that are found to characterise the buildings of a special locality will almost always owe their existence to something in the materials, the climate, or the

popular customs of the locality, which has, directly or indirectly, influenced the architectural character of its buildings; and by studying such local variations of type en masse we often get interesting and valuable hints, capable of being further expanded, as to the relation of design to material and to extraneous circumstances. The pursuit of sketching, with the object of self-education, may well include both sketching by eye and measuring. The former method will best train the eye in the characteristics and peculiar feeling of the style studied; the latter,—viz., the making of measured sketches just sufficiently detailed to be drawn out afterwards,—will serve the double purpose of self-instruction as to the method by which the effect of the building, or ornamental feature is produced, and the history (so to speak) of its design, and of a record of this for future reference, when required. We should not recommend either method to be pursued to the exclusion of the other; for, while, on the one hand, there is no doubt that any one who has measured and drawn out an architectural feature correctly to scale, and with details and sections of moldings, knows more about its construction and intention than any sketch of the eye only, however careful, will give him; on the other hand, a sketch carefully made on the spot, and with the object before the eye, will often give more of the real spirit and appearance of the feature sketched than a drawing finished afterwards at home, from however accurate measurements; especially in regard to the effect of light and shadow, which is too important a matter to be entrusted to memory. But no one with the true feeling of an architect will omit, in making a sketch by the eye, to copy also, even if but roughly, the sections of the various parts and moldings, &c., since these are the framework of all architectural design, and an architectural sketch without such indications is worth little or nothing for reference. When, however, the student is compelled to pass hastily over an interesting building, where there is no time for careful sketching, valuable details may often be secured in a very short space of time, by correct indication of the leading lines and proportions of the feature sketched, accompanied by one or two measurements and sections which can be sufficiently got by means of a 2-ft. rule. But, under favourable circumstances, we believe that making careful sketches on the spot, with the building before him, is the best practice for the young sketcher, and ensures, moreover, a complete representation of the architectural effect of what is sketched; while it sometimes happens that measured memoranda, taken with the intention of drawing them out afterwards, never get completed at all, other engagements intervening, and the completion of such sketches being deferred, as work that can be done at any time, until the interest in, and recollection of, the original has nearly faded from the memory; and when the draughtsman does bethink himself of drawing them out, he may find that he is fain to draw a little on his imagination also, for measured skeletons of sketches can seldom be safely completed unless the general aspect of the original object is pretty fresh in the memory: every architect's pupil who has measured a building for additions and alterations knows this. As to drawings made for the purpose of preparing illustrations for publication, or as a basis for archaeological research, those, of course, must include, in the full extent, all that careful sketching and accurate measurement combined can effect; but this kind of work scarcely comes under the head of what is generally understood by sketching, and is never entrusted, or never should be, but to experienced hands.

As to the mode of sketching, and the materials and medium to be used, tastes and habits are of course very various, and the style of manipulation which will suit one sketcher will often be irksome and unsatisfactory to another of equal but different ability. A consideration of the peculiar object of the sketcher ought, however, to govern his choice of material to some extent. Distinctness and precision of line is one of the first desiderata in architectural sketching, and this at once points to the employment of paper with a comparatively smooth surface, especially if pencil is used; the granulated surface of such paper as is usually made into "block" sketchbooks will continually wear down the point of the pencil and necessitate constant waste of time in cutting it, besides increasing the difficulty of producing a firm, definite outline. The sketchbooks filled with tinted paper with tones of drab and grey, &c., are perhaps about

the best to use for pencil sketching; the paper, however, does not bear the use of india-rubber very well. We have seen very good and effective sketches made in an ordinary "indelible" note-book, the strong lines and shadows done with a common drawing-pencil, and the more delicate shading, to indicate contour of surface, put on with the metallic pencil; this gives a very pretty and delicate finish, and is very durable. The best working pencil for the sketcher, if he use, as we recommend, rather a smooth paper, is one of about the quality of those lettered "H. B.," by Messrs. Winsor & Newton, which can be made equally available for outline and shading. But though a pencil is the most ready, convenient, and portable sketching tool that can be carried about with one, and offers great advantages from the equal facility with which it works in every direction, there are certain advantages also in the use of pen and ink not to be overlooked. In the first place, the sketch thus executed is at once indelibly fixed; whereas pencil always becomes more or less obliterated in time, and it is often found necessary to put a pencil sketch in with ink afterwards, to preserve it. The character of the masonry or woodwork of a building, again, can be better given with the fine strokes of a pen than with any pencil; and the practice of working with a material which cannot readily be obliterated is most advantageous to a young sketcher, as it obliges him to draw with consideration and to know fully what he is going to do with a line before he draws it. Of course, in sketching with a pen, it is necessary, for anything but small details, to observe carefully the general proportions of the object first, and dot in lightly the principal points as a guide to the eye in putting in the lines; and this also is an excellent discipline to the eye. As to the medium to be used, there are various nostrums more or less suitable: Indian ink, of course, is the best known to architects, and very good sketches may be made therewith; but it is somewhat too cold in tone to be pleasant to the eye. A slightly warmer material is that known as British ink, sold in casks like other water-colours, and which can be rubbed up and carried in a bottle for use. It works very freely and pleasantly, and has the recommendation also, that if any serious mistake is made, a damp sponge will take the lines out much more easily than would be the case with Indian ink. Then there is the fluid sold in bottles under the title of "Proust's brown," a warm, indeed rather heated, brown, which imparts, however, a very good tone to a sketch lined in with it; but it should be diluted with nearly an equal quantity of water, for the mixture, as sold, is too thick for free use, and has a tendency to clog the pen. One of the best pens for sketching is the white steel pen made by Perry & Co., under the title of the "Classical" pen: the sort marked F being the most serviceable. With these, which are not too sharp in the point, a fine yet firm line can be obtained, while they work very easily and pleasantly over the paper. Let the student, when sketching, above all things guard against the tendency fostered sometimes by the idea that a "sketch" is necessarily something rough and hasty, to put in his lines in a dashing, hap-hazard manner, and then amend them by "painting" them over again in thicker strokes. This is a very vicious habit that young draughtsmen often fall into, and which, once acquired, it is very difficult to eradicate. Every line should be drawn clearly and sharply, as if the draughtsman were quite decided what he meant to do, not as if he were trying to get at it by a happy chance. When a long straight line has to be drawn, the best process is to draw it in sections, as much as can be done at a stroke without changing the position of the hand; it will better be got strictly vertical in this way than by moving the hand down the page, which is almost certain to result in an unsteady line; and the slight breaks left in the lines may often be made very effective in giving the jointed character of the masonry. As to using a ruler in sketching, there is nothing radically immoral in doing so, as some architects seem to think; it may in some cases produce the desired result with less time and trouble; but a parallel ruler, however small, cannot be used very well except on a rather large book or sketching-block, and is very much in the way in pen-sketching. The disadvantage of using a ruler is that those who use it get into the habit of trusting to it, and find themselves somewhat helpless when they unexpectedly wish to make a sketch without the

accustomed aid; and we suspect that most practised sketchers will bear us out in the remark that, with the hand once properly trained, a ruler on the sketch-book is rather a nuisance than a help. In a general way, larger sketch-books are to be recommended than are commonly used by architectural sketchers; a little book that can be always carried about is very well as a preparation for all emergencies, but those who are setting out to sketch "of malice aforethought" (as the lawyers have it), will do well to give themselves plenty of paper to expatiate upon; and a large-sized sketch is much more favourable to accuracy of detail. Let the sketcher not be too much bitten with a desire for dainty ornamental detail, but make a habit also of sketching entire buildings, observing carefully their proportion and composition, and noting specially any happy effect produced purely by the balance and contrast of line, independently of ornament; for these are the most durable sources of architectural effect, and the most difficult to originate successfully. A sketch of a single group of building will often suggest a great deal in architectural composition, beyond what actually meets the eye. Let the sketcher also never omit to give in his sketches careful indications of the character and jointing of the masonry or other material, and the way it is put together, upon which a great deal of the expression of every really architectural building depends; and in getting sections of mouldings, always mark in what part of the moulding the jointing occurs; get, in fact, the construction of the feature sketched, as well as its mere appearance.

Above all, it is well to trust nothing to memory, and not to finish up sketches afterwards from recollection (except, of course, from measurements). A great part of the value and spirit of a sketch always depends upon its having been done with the object before the eyes; a sketch so done, as far as it goes, is of far more worth than even an elaborate drawing cooked up from sketches; and it is probably to this process of cooking drawings afterwards that we must trace the curious variations in published representations of the same buildings, and the fact that in many cases, when we come for the first time to see a building previously known through some book of architectural illustrations, we find the reality so exceedingly different in its effect, and even in its outline and facts of detail, from what we have been accustomed to accept as an authorised and authentic representation.

One word as to the use to be made of an architect's sketches. Probably no practice is more pernicious, or has done more to promote odd vagaries and discrepancies of architectural design among us, than that of using a book full of sketches as a reservoir to draw upon for new buildings. Some of our readers may remember how, on one occasion, a well-known architect, exhorting his professional brethren as to the desirability of spending a part of every year in sketching, in order to gain new ideas in composition, added the solemn injunction, never to look at the sketches afterwards, but rather to burn them; and how an old member of the Institute seized the opportunity for an adroit compliment, suggesting that, "if Mr. —, instead of burning his sketches, would make him a present of them, he might rest assured he should never see them again." We should say, preserve carefully every sketch you make; but the advice not to look at them too much afterwards is perfectly reasonable. It is not thus that the real advantage of a sketching tour is reaped. It may often be useful to refer to a sketch to refresh the memory as to facts, as well as to judge where the weak points of execution are, and how they may be improved upon in future. But the real gain from a series of sketches, carefully and intelligently made, lies in the additional practice given to the hand, and in the numberless suggestions as to effect, construction, grouping, ornament, which remain in the mind afterwards; and these are far more likely to be well and usefully amplified into new ideas in architectural treatment, if what they suggest is thought over again, and designed anew, as it were, by the architect, than if he deliberately sit down, sketch-book before him, and drag into his own buildings, wantonly and without purpose, the details "bagged" during an omnivorous sketching tour, from the works of his predecessors of another age or country.

Works of the Old Masters.—The Exhibition at Burlington House will be opened to the public on Monday next.

COMPLETION OF THE MONT CENIS TUNNEL.

THE completion of the Mont Cenis Tunnel is a great triumph of engineering art. It is the longest tunnel, in so far as we know, that has been driven from the opposite ends, with the two borings meeting with precision. We have not before us the full particulars of the meeting of the two approaches, but may expect to have them on an early day. Meantime, it may be interesting to recall some of the principal facts in connexion with this work. In 1852, a plan for a tunnel to connect Savoy and Piedmont was proposed by Chevalier Maus. This plan fell to the ground; and in 1856 another was projected by M.M. Grandis, Grattoni, and Sommeiller. This is, in its main features, the scheme that has been carried out. It was determined that the line should not follow the route of the Great Napoleon road across the Alps, but to save distance by a cut to the south-west. Near Modane, or rather at Fournaux, a hamlet on the banks of the Aro, on the Savoy side of the Alps, the tunnel was to be begun; and on the Italian side at Bardonnèche, about twenty miles from Susa, from which there is railway communication with Turin, the Italian peninsula, and the eastern railway of Europe. The one village is 3,445 ft. above the level of the sea, and the other 4,225 ft.; so that there had to be an ascent of 780 ft. to be encountered. It was determined to lay out the tunnel in two inclines, each descending from a summit level, but with a sharper descent on the northern than on the southern side. From the great height of superincumbent matter over the tunnel, it was impossible to sink shafts according to the ordinary mode, so that the ventilation had to be effected from the two ends of the tunnel. The boring-machines were put to work in 1861. The tunnel is over 13,000 yards, or about 7½ miles in length, and is 26 ft. 3 in. wide, by 19 ft. 9 in. high, which affords space for two lines of rails. The excavations were for nearly two-thirds of the distance through schist, the remainder being through limestone and very hard quartz, which caused great trouble, and occupied a comparatively long period, particularly during the latter portion of the time employed. The perforating machinery was skillfully contrived, and very beautiful in operation, being a combination of hydraulic and pneumatic power. Large reservoirs, considerably higher than the entrances to the tunnel collected water from the streamlets, and from rainfall on the Italian side. The water was sent down to a lower level by large iron pipes, supplying, in the descent, the power required for the boring operations,—the water pressure was equal to 26 ft. perpendicular. At Fournaux, we have seen the beautifully contrived air-compressing machines, the aerometers and receivers. The action of the water (pumped up from the arc) upon the aerometers set the compressors to work; these compressed the air so that it exercised a pressure of 95 lb. on the square inch. The compressed air worked the excavating machines, to which it was conveyed by strong 8-in. iron pipes. The excavating machine took out a drift 12 ft. wide by 8 ft. high; the remainder of the work was executed by blasting, or hand-labour in the ordinary methods. The boring machine was mounted upon wheels, and was forwarded upon a tramway. It had ten perforators, acted upon by two flexible tubes, the one conveying compressed air, and the other water. The jumpers each made its own hole, and had a rapid to-and-fro motion, and change of angle by the action of the power applied. The jumpers only bored for blasting, and, when the rock was ready, the boring machine was withdrawn, secured behind folding doors, and the fuse was lighted. A blast of compressed air was then sent in to clear the smoke and sweeten the tunnel, and the miners proceeded to finish, with their picks, what the boring machine had so well begun for them. In ordinary limestone, the boring machine made about a yard an hour, but the progress through the quartz was much slower. The holes were bored to about 2 ft. 3 in. deep. The jumpers gave three blows per second under an impulse of about 180 lb., and turned on their axis at each blow. In boring through limestone, a jumper was equal to six or seven yards of work, but acting upon quartz, six or seven blows destroyed the points.*

* Some accounts of the works after personal examination will be found in earlier volumes of the *Builder*.

The Mont Cenis Summit Railway, with which the late lamented Mr. Thomas Brassey had a good deal to do, was a spirited enterprise that ought to have succeeded, but has not done so. The new route is exposed, both at the Savoy and Piedmont ends, to avalanches and Alpine floods, from the powerful action of which we hope it may be protected, and prove in its usefulness all that has been hoped for concerning it.

THE CHINESE SYSTEM FOR THE UTILISATION OF SEWAGE.

In discussing the very important question, what is the best system to adopt for the disposal of the sewage of our towns? we ought to be able to obtain very considerable information and assistance from other countries; but I may venture to assert there is no country in Europe where there is anything like our systems of underground sewers, together with the extensive application of water to closets, and for all other purposes connected with cleanliness. It is true that our more immediate neighbours, the French, just commenced such a system, under the auspices of the Emperor, but it is too recent an experiment for us to judge of the results. In all Germany there are but a few futile attempts to utilise the refuse of the towns.

The Hungarians have so little notion of the importance of regenerating the land with the best fertiliser within the reach of all nations, that they positively pile up near their houses the faeces of their ancestors, which they regard with a sort of religious veneration.

And if we go on farther, and through all the cities both of Europe and America, we find chiefly only the old barbarous mode of cesspools and bog-holes, impregnating their wells and other water supply so much that they use the same water several times over, a system quite as much open to obloquy as the practice in Hungary. Indeed, all over three-quarters of the globe there is very little that can throw a light upon this apparently difficult and unsolvable scientific problem.

Turn we then to the remaining quarter of the world, Asia (for although we have not mentioned the poor inheritance of the sons of Ham, Africa, there we fear all is barren for our subject, since the days when the mother of arts and sciences, Egypt, was overrun by the followers of Mahomet), and here we find the elucidation.

The following statements are compiled chiefly from notes taken during a botanical tour through the central and north-western provinces of China, the botanical portion of which only has hitherto been made public. In all the works that have been written respecting this, the oldest constituted nation, and the most densely populated country on the face of the earth, alleged to contain one-third of the whole living human race, we have never met with a description of their method of collecting and disposing of the sewage of most of their cities and towns; and as it appears to us to combine all the advantages of long experience, together with the best and most salient points of every other scheme with which we are acquainted, and the working is very simple and most remunerative, we propose to give a sketch of the *modus operandi* practised by a people we are often disposed to consider as only half civilised.

The difficulty of access for Europeans to this, which has been called the Celestial Empire, must be the reason why this method has not been reported before, there having been so few scientific travellers allowed there, and these few bent only upon one or two particular subjects, and the so-called missionaries who seem to consider their mission as entirely confined to the spiritual and future state of mankind, and the exclusion of their comfort or well-being in this life.

The Chinese are unquestionably the best agriculturists of any people, every one being an excellent gardener; for they all cultivate some kind of plants or other, and their whole country, so far from being worn out or exhausted, like many of the countries of antiquity, is as productive now as it was in the days of Confucius, a few thousand years ago; and this, there is no doubt, proceeds from their system of replenishing the soil with its best and most natural pabulum.

Well may this be called also the Flowery Land, for every foot of land, rock, and even the water, sparkles with blossoms and flowers at certain seasons of the year; for a Chinaman would no more think of pouring filth into a river than he would of fetching his manure some

thousand miles from the ends of the earth. Consequently their streams are generally as pure as the mountain torrent from which they take their rise.

China possesses within its boundaries every specimen of the animal, vegetable, and mineral kingdoms that is to be found in any other country, and many more peculiar to itself. It is where the natives assert our first parents were started into life, and where, indeed, there exists the appearance of all we can fancy Eden was, with everything to delight the eye and to please the taste.

It is in this favoured region, which, from the above extracts, can be no mean authority as to salubrity, that men practise the following system of disposing of their dejecta membra.

The whole of the matter which we waste and flood away they collect, either by means of open watercourses or underground drains. This is carried to some vacant space, either in the vicinity of the town or oftentimes to a considerable distance, according as the land may be obtained or may be available for irrigation, after the other operations. On being conducted into a kind of sump prepared for it, steined round with gypsum, it is then either pumped or lifted by more primitive means (such as a kind of turbine, wherein the outfall of the sewer gives the power to work the machinery for the raising, and several other simple contrivances, something like what we call the Persian wheel, and a sort of chain-pump) into two or more reservoirs, which have been formed either by digging out and throwing up the earth to form the banks, or else by other materials brought to the spot for the same purpose. After the sewage has been discharged into one of these receptacles, until it is entirely full, it is left to settle or subside; then the same process is carried on with the next, and so on to as many as the quantity of matter or size of the town requires.

By the time the last is full the water on the top of the first that was charged is let off, to irrigate either the surrounding lands, or conveyed to any distance that may be required or available.

This course is repeated to the remaining reservoirs; in the meantime the first is filled again and again, until the solid matter has collected sufficiently to require removing; then the surface water is drained off as much as possible, and in a short time the remainder is dry enough to remove away in carts and wagons: this is done by breaking down the side, or anywhere most convenient. It is then re-constructed and again made fit for use; the same to the other reservoirs in succession. The sides of these are lined with either gypsum or chalk, and where these are abundant or easily obtainable, the banks are formed of them, and great quantities are also thrown in the reservoir during the time of filling.

These banks at first will allow of the water to ooze through; but as they are usually upon the same land which is afterwards irrigated, this is of very little consequence, and they very shortly become silted up with the substances suspended, and get eventually water-tight.

Except in exceedingly wet seasons, a very small quantity of water ever reaches the river, and when it does so, it is as pure as the stream into which it flows.

These reservoirs are of all manner of sizes and shapes, some round, some square, but are mostly oblong, about 60 yards long by about 40 yards broad; but this is entirely discretionary and immaterial as to the efficiency; the same with the depth, which varies from 12 ft. to 20 ft. It will be noticed that we have been treating of a case where it has been compelled to raise the sewage; but where the fall of the land is such as not to require any lifting, there is often a continuous line of these receivers, and on many lands these have certainly been in existence for ages. Then in other instances, they are moved about on the same estate; but the same principle is carried out in each.

The small from these works is scarcely perceptible, which may be attributed to the absorption of the ammonia by the gypsum and chalk, of which great quantities are drawn away and spread upon the land; also all kinds of ashes are brought to the neighbourhood and incorporated with the other matters in these receivers.

The expense and management of these systems are generally undertaken by the owner of the land which is treated with the manure, and for which payment is made to the authorities of the town; but in many instances they are conducted by the town functionaries themselves, and the produce sold. In large towns it is not

all conveyed to one locality, but often in opposite directions, or wherever it will command the highest price.

Having thus endeavoured briefly to describe the system pursued for this desirable object by the most ancient nation in the world, we may next inquire whether this plan is not capable of being adapted to the requirements of our Legislature? And is it not wise to insist upon some such method being enforced in this country?

Are there not quantities of land lying almost waste from the poorness of the soil in the vicinity of nearly every town in the kingdom? Look at the tracts round London. Why does that barren waste, called Barnes-common, on the South-Western Railway, remain in its present uncouth condition? The same with all the other commons? And many parts of the country have wastes far more desirable for our purpose than these instances; but they all require a better soil, a more fertilizing power. Many are gravelly, or sandy, which are just the geological materials required for our purpose; but, at any rate, all would make the best deodorizer that can be found, if the sewage water were made to trickle over it after the grosser portions had been deposited in reservoirs.

Then, again, is it not monstrous that nearly all this precious commodity that is collected from the largest metropolis in the world should be absolutely poured away into one of the finest rivers in the world, either killing or deterring the fish from entering it, and often flowing back to the spot it originally started from, poisoning the inhabitants with its pestilential odours, breeding typhus fever and all the other ills that flesh is heir to, from the defecations of our ancestors through not attending to this matter, and utilising these substances which nature seems to force us to do, or neglect at our peril?

The circumstance that the drainage of every place is conducted to one particular point or line, which is usually the bank of the nearest stream, renders the construction of an intercepting sewer along its side a plain way of carrying off the proceeds to wherever it may be decided to convert it into not only the finest fertilising agent in existence, but the most remunerative production for the outlay.

GEORGE BURCHETT.

INSTITUTE OF PAINTERS IN WATER-COLOURS.

It is of very little use saying, with such weather as this, that a number of very agreeable sketches, studies, and pictures, will be found as a Winter Exhibition in the galleries of the Institute of Painters in Water-Colours. Locomotion is difficult, and light insufficient, to say nothing of the apathetic frame of mind cold dark weather brings. No wonder that nothing great comes from the frigid or the torrid zone. What poor creatures of climate, circumstances, parentage, and education we are!

Nevertheless, if a gleam of light be taken advantage of, the landscapes of Mr. Bennett, Mr. Mole, Mr. Hine, Mr. Jas. Fahey, Mr. Mogford, Mr. H. Pidgeon, Mr. Skinner Prout, Mr. Collier, and several others will be found enjoyable, and, if one could handle fire by thinking of the frosty Caucasus, would serve to restore those delights which the season denies. Works by Mr. Bromley and Mr. Small should not be overlooked. Mr. H. Tidey sends some clever landscapes in lieu of his usual figure-subjects; and Mr. B. R. Green continues his series of accurate representations of ancient buildings in England, which, if kept intact, must be by this time of considerable extent and value.

"LIGHT AND DARKNESS."

THE flood of typographical novelties of all kinds which Christmas-tide always brings, suggests to some thousands of persons, the members of the Art-Union of London, to inquire what form the annual work of that institution is to assume for the current year.

We have just received an impression of the plate for 1871, a large and important subject, with the above title, from the burin of Mr. W. Ridgway, after the original by Mr. Geo. Smith. The subject is of a rather more domestic character than those hitherto produced by the Society. It is a kind of pictured sermon—a sort of compound of Hogarth and Wilkie. A blind girl is seated, holding in her lap a Bible, printed in that raised type which confers so great a blessing on those who are deprived of sight, and

from this, by the aid of her rapidly tracing fingers, she is pouring out to a listening company of cottagers words of warning, of reproof, of hope, of consolation, "to give light to those that sit in darkness."

The wrapt attention of the children, and the awakening interest of the father of the family, who sits in the midst, regardless of his extinguished pipe, are well expressed; but the chief point of the story centres in the struggle evidently going on in the mind of the younger man in the left-hand corner, who is divided between an inclination to remain and profit by the words of the reader, and a disposition to accompany a boon-companion to the fair, the distant tents of which are seen through the open window.

The figure of the tempter is judiciously kept somewhat in the background; and though he is no doubt rather elevated, and reminds us a little of one of the figures in Mulready's "Fair-time," we are not so disagreeably impressed as by that picture. To second the influence of the reader, a boxum lass, evidently the eldest daughter of the family, looks up appealingly in her brother's face, and touches his arm with persuasive action, while his wife, holding the baby in her arms, anxiously watches the struggle. Let us hope that "light" will prevail, and mingle with "sweetness" in an evening of domestic happiness. It must be allowed that the story is plainly told, and this is an important element in the fitness of a work of art which is intended to interest and elevate large numbers. It is full of suggestion, and not without pictorial beauty, and we have no doubt it will be popular with the subscribers, and will carry its lesson to every quarter of the globe.

CAUDEBEC LADY CHAPEL.

I THINK I can afford your correspondent, Mr. J. B. Cohen, some indisputable information respecting the construction of the great pendant of this chapel which may set his doubts at rest. I, with Mr. Talbot Bury, and others of Mr. Augustus Pugin's pupils, many years ago accompanied that gentleman, and assisted him by sketching and measuring the various portions of buildings published by him in his work, entitled "Specimens of the Architectural Antiquities of Normandy."

I have a most vivid recollection of the intense interest which the elder Pugin felt in the construction of the remarkable pendant of this chapel. I can answer for it, that there is nothing in his illustration of it as shown in Plate 64 but what is perfectly correct. An opening being made through the tuft of the groining at the top, some of us got in, and no little trouble was it to get out again; but, with a light, there was no difficulty in ascertaining the sizes of the voussours resting upon the huge key-stone of the groining, a monolith of upwards of 17 ft. long. There may probably be some conjecture as to the sizes of the voussours built into the external angular buttresses, but in all probability they would correspond with those visible to the eye.

The striking feature, however, of the lady chapel, both in execution and effect, is this surprising pendant: its appearance looks quite perilous, and until Pugin, with his wonted energy, had a hole made, and found out the exact nature of the construction, all sorts of notions were prevalent, many believing that iron suspension-rods, &c., were employed.

A careful description of the construction ought to have accompanied the plan and sections. Britton, who never even saw this chapel, or any of the buildings he describes, could only give meagre accounts, wholly insufficient to exhaust the constructional interest which attaches to them. This was through no fault, but an unexpected illness which prevented his accompanying Pugin. BENJ. FERREY, F.S.A.

THE SANCHI TOPE: AGE OF INDIAN BUILDINGS.

THE answer of your correspondent "Asiatic" to my letter regarding the date of the Sanchi Tope is more ingenious than ingenuous. The public were not invited to inspect a cast of the Tope itself, whatever its date may be, but a cast of one of its gateways, which, it is now acknowledged, was erected in the first century after Christ.

Supposing the object exhibited had been a cast of the screen recently erected, under Mr. Scott's auspices, in Ely Cathedral, would it have

been correct to describe it as a cast of the reredos in Ely Cathedral, erected between the years 1083 and 1342 A.D.? So far as I understand the English language, such a statement would have been incorrect, and decidedly misleading.

At a proper time and place I shall be quite prepared to discuss with General Cunningham the question whether his date or mine is the most probable for the age of the Tope itself. Indeed, I am anxious to take up this among other questions of a like nature, as I perceive that Lieut. Cole, improving on an early work of the General's, has recently published a work on Kashmir, in which he has affixed erroneous dates to almost every building he describes, and in several instances to the extent of 1,000 years and more. It is this that makes me nervously sensitive regarding the dates of Indian buildings as propounded by the Science and Art Department; for I feel that unless some one protests in time, they will pass as accepted facts into popular belief, and all that has been gained by the study of Indian archaeology during the last thirty or forty years may be thrown back into its primitive confusion. JAS. FERGUSSON.

A CREWKERNE HOLLA!

WE find the following remarks in the *Crewkerne Weekly News*—

"The advantage of going from home to hear home news, and be informed about home matters, is exemplified in the *Builder*, when has lately taken upon itself the abuse of country towns and their belongings. Lately Glastonbury was impudently lectured. Now the lash descends upon Yeovil. The town council never can survive. The town itself will collapse, as sure as fate, unless the *Builder* condescends to be merciful. The Board of Guardians will open wide their eyes on reading their own likeness, and I have only space this week to extract what is written thereon, reserving other matters, from the fear of the awful effects of the whole dose being administered at once."

What the *Crewkerne* critic or his worthy Yeovil coadjutor means by speaking of our "abuse of country towns," or "impudently" lecturing, we do not pretend to know, as we are conscious that the *Builder* has never yet stooped to Billingsgate, however great the cause of indignation. Instead of expressing their obligations to us for pointing out, with an imperative pen, sore sanitary needs and phases of frightful social neglect and moral degradation, more than one of the Devon, Dorset, or Somerset journals have met our stubborn facts in a similar fashion to the above. This last *Crewkerne* shout is rather ill-timed, as we have not yet touched upon that town internally, the outlying villages alone having been probed. If the Yeovil magnates are able to impugn our statements, the sooner they do so the better. We deal with localities upon their merits, and if *Crewkerne* should come in for passing notice, we pledge our word that the lecture we will present, sanitary, social, and otherwise, will be a "striking likeness."

ST. JUDE'S CHURCH, SOUTH KENSINGTON.

On the 23rd inst. this church was consecrated by the Lord Bishop of London. At page 547 of our present volume will be found an exterior view and a brief description of the building. The management of the double transepts there described has the desired effect of bringing a considerably larger proportion of the congregation near to the pulpit and reading-desk than would have been the case had the nave been extended.* The ventilation is aided by Moon's louvre ventilators, fitted into three openings at the east and the same number at the west end, as well as by the ordinary swing and hopper ventilators in the windows.

The east and a portion of the side walls of the chancel are lined with encaustic and majolica tiles. Above the altar-table three panels are introduced in mosaic, the centre containing the monogram I. H. S., with the Alpha and the Omega on either side. The flooring is also laid with encaustic tiles; the whole by Messrs. Minton. A fine window at the east end, the gift of Captain Gunter, on whose estate the church stands, has been executed by Messrs. Clayton & Bell. Another benefaction to the church in the shape of a large organ, has been made by Mrs. Powell.

The gasfittings, including a corona in the chancel, were supplied by Mr. Shrivell. Messrs.

* We will give the plan of the church and a view of the interior hereafter.

Cox have executed the pulpit, prayer-desk, and font (a separate provision), from the designs of the architects. The stone carving generally was done by Messrs. Horley & Abbey.

The church, exclusive of the tower, has been erected to meet particular circumstances, in about nine months, the contract having been signed only on the 25th of March last; and, considering the accommodation is for 1,600 persons, and includes a large lecture-room below capable of holding between 300 and 400 persons, with retiring-rooms, and so forth, attached, Messrs. Myers & Sons, who were the contractors, deserve some praise for the satisfactory manner in which they have carried out the works, and have brought to bear the appliances of their large establishment. Mention is merited by the two foremen of the firm engaged on the building, one at the commencement, the other towards the close—Mr. H. Sills and Mr. D. Sargeant. Messrs. George & Henry Godwin were the architects.

METROPOLITAN WATER SUPPLY.

ABORTIVE attempts have been recently made to provide, by legislative enactment, a better supply of the prime necessities of gas and water for the inhabitants of the metropolis. It is to be hoped that the Board of Trade may succeed in carrying the Water Bill that they are to present to Parliament in the coming session. The new Bill will require the companies to afford a constant supply, and will oblige owners and occupiers of houses to provide proper cisterns, stopcocks, taps, and other appliances, to prevent an undue waste and fouling of water, and to take water at a price to be fixed in the Bill. In this Bill there will be provisions for regulating and improving the quality of the water to be supplied; for altering and reducing the companies' charges, and for other purposes, including a limitation of dividends, and to repeal power to apply surplus profits in augmentation of previously declared dividends. The Bill contemplates the amalgamation of all, or some of the existing water companies, or, if need be, to dissolve some of them, and incorporate a new company, or companies, in their place. The Bill includes powers for the Metropolitan Board of Works, the Sewers Commission of the City of London, or the Corporation, jointly or separately, or other bodies, to purchase compulsorily, or by agreement, the property of the water companies, and to enter into contracts with them, or with other companies or persons, for supplying the metropolis with water. The Bill is, in short, to give all necessary powers for affording a better and cheaper water supply. This recommendation of constant supply is not new. It is discreditable to the metropolis that it should lag so far behind many of the second- and third-rate towns in the kingdom.

THE INSTITUTION OF CIVIL ENGINEERS, GENERAL MEETING.

On the 20th inst. Mr. Hawksley, V.P., in the chair, the fifty-third annual general meeting was held. The report stated that during the past session there had been a net effective increase of 44 members, 70 associates, and 35 students. There were on the books on the 30th of November last, 16 honorary members, 699 members, 983 associates, and 173 students, together amounting to 1876, as against 930 ten years ago.

The nominal or par values of the funds under the charge of the Institution were,—1. General funds, 10,656l. 1s. 8d.; 2. Trust funds, 12,119l. 15s. 8d.; and 3. Cash balance, 369l. 17s. 5d., together amounting to 23,145l. 14s. 9d., as against 19,775l. 17s. 4d. at the date of the last report. Of these funds a sum of 10,163l. 17s. 4d. was invested in Government stocks, and the remainder, for the most part, in 4 per cent. debenture stock of some of the leading railway companies.

The abstract of the receipts and payments for the past year, as certified by the auditors, showed that on the 1st of December, 1869 there was a balance in the hands of the treasurer of 265l. 9s. 6d., and there had been received since (including the Appold bequests of 1,800l.) 9,653l. 10s., making together 9,919l. 19s. 6d. The disbursements had amounted to 6,553l. 6s. 10d., while 2,968l. 15s. 6d. had been invested, leaving a balance of 369l. 17s. 5d. Although a larger sum than usual had been expended in publications, yet out of the ordinary revenue

1,168l. 15s. 6d. had been invested, and the present cash balance exceeded the former one by 101l. 7s. 8d.

The following gentlemen were elected to fill the several offices in the Council for the ensuing year:—Charles Blacker Vignoles, President; Thomas Hawksley, Joseph Cabot, Thomas Elliot Harrison, and George Wiltonghy Hemans, Vice-Presidents; John Murray, George Robert Stephenson, Nathaniel Beardmore, William Henry Barlow, James Abernethy, John Frederic Bateman, James Boulton, Joseph William Bazalgette, Frederick Joseph Bramwell, and Edward Woods, Members; and James Joseph Alport and Major William Palliser, C.B., Associates.

FLORENCE.

Wonderful changes have been taking place in Florence during the last four years. The handsome boulevards are being built; the roads of some already made; the streets well paved, well lighted; public conveyances are excellent; the draining is improved; and streets are widened. The Florentines like to finish one thing at a time, so that many useful improvements are waiting to be carried out. It is to be hoped this change may not deter the companies from continuing the improvements begun.

Frulini, the eminent sculptor in wood, has just finished two exquisite wardrobes for the Marquis of Westminster. Foliage, flowers, fruit, birds, cover the whole surface on a gold ground, producing a very rich effect. The elegance of the designs and great finish of this artist are unsurpassed.

THE NEW MARKET HALL, NEWTOWN, MONTGOMERYSHIRE.

This new market-hall has been opened. The entire length of the market is 180 ft., by an internal width of 50 ft., the walls being 19 ft. from floor to wall-plate, and 28 ft. to the ridge.

The east and west sides of the market are fitted up with commodious shops for different trades; two large rooms, 20 ft. square each, for the sale of grain by sample and in sacks, being provided at the High-street end. Standings for the sale of fruit and vegetables are also arranged towards High-street in the centre of the market, the remaining space being devoted to the sale of butter, eggs, and other like produce in baskets. A refreshment-room for the accommodation of those attending the market, with a dwelling-house attached, for the market superintendent is arranged towards Horsemarket-street, on the same of land forming the roadway to the Sun Inn.

The roof, which is of iron and glass, and broken into two spans, is supported by girders divided into two bays the entire length of the market, resting upon iron columns, the roof and columns being decorated in colours. The elevations towards High-street and Horsemarket-street are executed in "Edward's light yellow patent brick," with terra-cotta decorations, the style being Lombardic. The front towards High-street contains a pediment for a clock, flanked on either side by a balustrade, with small shafts, and enriched caps and bases.

The contractors employed were:—For the general building, Mr. Evan Williams, of Llanidloes; ironwork for roof, &c., Messrs. Howarth, Rochdale; and for market fittings, Messrs. Black & Readdie, of Liverpool. The entire building (which is the largest for market purposes in the principality) being erected from the plans and under the superintendence of Mr. David Walker, of Liverpool and London.

TAUNTON IMPROVEMENTS.

THE Taunton Town Bridge is to be widened early in the new year. It is narrow and inconvenient, and totally insufficient for the amount of traffic by which it is burdened. It is thought that between 300l. and 400l. will be about the sum required for its improvement. This amount will be hardly sufficient to allow for more than a very plain and unornamental alteration. The county is expected to contribute about half, it being a county bridge. A memorial, with plan and estimates, will be presented at next Quarter Sessions. The Turnpike Trusts will agree to give 100l. towards the alteration.

Last summer we called attention to the defective drainage of the town, and the very bad state of the river Tone, which is little less than an elongated cesspool for a considerable distance. A good opportunity now presents itself to the townspeople and the Local Board of Health to carry out a double improvement by the purification of the river and the

utilisation of the town sewage. We lately passed through both wings of the Taunton Union; men's, women's, and the sick and infirm wards, and in justice we must say that everything we examined therein on the day of our visit was fairly satisfactory; and, unlike some other Somerset workhouses, cleanliness and comfort were observable.

YEOVIL COTTAGE HOSPITAL COMPETITION.

THE report of the sub-committee appointed to select a design for the Cottage Hospital was approved by the general committee on Thursday, 22nd. The motto of the design chosen out of twenty-eight sent in is "Well Considered," the author being Mr. J. Johnson, of London. The ground plan shows men's ward for six beds, and an accident ward for four beds, with bath-room ward, scullery, lavatories, &c., adjoining. Near the entrance is the matron's room, with small window for overlooking the ward. The out-patients' waiting-room, medical officer's examination-room, and the dispensary, are on the Leicester road side of the site; and on the Preston road side is a small dining-room, kitchen, scullery, store, closets, pantry, wash-house, laundry, coal-shed, &c.

On the first floor are wards containing the same number of beds as those on ground floor, the nurse's room being over the matron's; a servants' bedroom, and clean linen and clothes stores are also provided.

ARCHITECTURE AND GARDENING.

THAT architecture and gardening were allied from the earliest times none can doubt who are conversant with the course of history. Even Scripture furnishes evidence of the fact, in the case of Solomon, and the early Eastern nations which flourished are not scant of material wherewith to supply us with examples. Among the Persians, the Babylonians, the Greeks, and the Romans, we have the authority of many writers, whose works are still in existence, to prove that gardening on a large scale was associated with architecture in embellishment, and to add grace and beauty to their massive and magnificent buildings. In the early Christian period we have sufficient examples of the same, and also in the Middle Ages.

Venantius Fortunatus, a bishop in the sixth century, writes to his mother and sister that he sends them some chestnuts in a basket woven by his own hands, and also some wild plums, which he gathered in the forest. Now this was a present which it may be said that one savage might send to another. Yet this bishop author was a man of rank, and a resident in the court of the French kings. But, again, our author celebrates the perfection of the garden of Ultragote, wife of Childbert, king of Paris. "One sees in it," says our author, "the fields enamelled with flowers, with roses, vines, and fruit-trees. These trees were planted by the monarch himself, and the hand that planted them, no doubt, added to the excellence of the fruit."

Charlemagne's captives, with all his splendor and magnificence, show us what little progress gardening had made in the ninth century. It had large orchards, with kitchen gardens in which were flowers. Here is a list of them. The plants were mostly medicinal, and included marsh-mallows, savin, rue, dittany, colicquintida, squills, &c.; or aromatic, such as anise, caraway, sage, fennel, mint, &c.; or for salad, as cresses, endive, lettuce; or for the kitchen, as beet, leeks, carrots, cabbage, &c.; or legumes, as peas, beans, kidney beans, &c. The flowers consisted of the simple lilies, poppies, roses, rosemary, southernwood, staveacre, flower-de-luce, and turnsole. The fruits were the service apple, filberts, almonds, medlars, walnuts, figs, chestnuts, pears, peaches, plums, and wall fruit. The above detail is worth recording, but we have been unable to find anything like it in this country for some centuries later.

On the continent of Europe gardening, however, did not assume much importance until the fifteenth or sixteenth century. An impulse was given to it in Italy by the Medici family, and after that time it became more prominently associated with architecture. With slight success, the British, French, and Dutch cultivated the art down to the seventeenth century, and from this date may be reckoned the uprise of successful gardening in connexion with architecture on the Continent and in Great Britain and Ireland.

Speaking of gardening in this respect, Lord Bacon remarks, "A man shall ever see that when ages grow to civility and elegance, men come to build stately sooner than to garden finely; as if gardening were the greater perfection." As far as Great Britain and Ireland are concerned, we fear the illustrious English philosopher spoke as well as prophesied the truth. In the British Isles it must be allowed that architecture advanced to its highest phase almost, while gardening remained in its cradle. In the days of Elizabeth, in England and Ireland, each monastery had an orchard in connexion with it, but it appears by inquiries taken in the sister kingdom during the reigns of Henry VIII. and Elizabeth, these gardens only consisted of one or two acres, devoted almost exclusively to the growth or cultivation of culinary herbs. There were certainly some indications of a vineyard in connexion with these monastic gardens. Valancy, the antiquary, possessed an Irish almanac of the fourteenth century, in which was mentioned the season for gathering the grapes, and drinking the mud (or new wine).

A garden was attached to Cahir Castle, and, as the castle was situated on an impregnable rock, it was no doubt a protection for the garden, which was represented in the report to the Queen as capable of containing 300 men. The castles of the chieftains, their principal pride and care, were in constant danger from raids and forays of neighbouring chiefs, and, under these circumstances, cultivated gardens had no chance to escape from plunder and spoliation. The Church, even, in either England or Ireland, does not appear to have taken any particular pains to facilitate the progress of improved gardening operations until a very late period in our history. In those curious codes of national justice in Ireland, called the "Brehon Laws," we find these early law-givers the Brehons, laying down certain fines, or *erics*, for the injury to the trees. The introduction of the elm into Ireland for the garniture of avenues and walks is ascribed to settlers from this country, and dates from the seventeenth century. All monastic gardens had the appendages of dove-houses and pigeon-houses, but these do not appear to have been very artistic.

Inigo Jones, Sir Christopher Wren, Campbell (Vitruvius Britannicus), Webb, wherever these architects had to do with the designing of houses for the nobility of England, the provision for and the laying-out of gardens on a large scale were with them matters of importance and careful thought. But especially with the edifices and mansions of Jones we find that a well-planned and tastefully laid-out garden, with all its appendages, is to be found. Even where he was called in to make alterations and additions, we find him adding a garden-front to gentlemen's seats. In Surrey, Kent, Middlesex, and in Wilts, Somerset, and other of the western and south-western counties, Jones added garden-fronts to pre-existing mansions, and designed others, always with remarkable facts, but we do not wonder at them, because the great architect was a master of landscape as well as architecture. We find nothing at all approaching to modern gardening much earlier than the reign of Elizabeth. Extensive parks and groves and groves were certainly laid out, and ponds and lakes were formed, but the physic garden and the vegetable garden had the preponderance over the flower-pot.

Extensive orchards for several centuries were common to England, and we find vineyards here and there through the country were cultivated, some hundred of years previously to any mention of a flower-garden, or of even a garden, ordinarily speaking. In the sixteenth century the flower-garden began to noticeably crop up, and care and taste began to be displayed. During the seventeenth century great progress was made, and before the middle of the eighteenth century, the majority of the nobility of England had large well-laid out (though often fantastic) ornamental gardens, to which architecture and architects lent an invaluable help.

With modern gardening we can pretty clearly trace the association of the architect, more or less through the sixteenth, seventeenth, and eighteenth centuries. During the present century, indeed, we may pretty firmly state, even during the eighteenth century the architect has been inseparably connected with the science and art of gardening in all that contributes to embellishment, economy, and sanitary purposes.

We find mention of a nursery in Ireland as early as 1338, in connexion with the Priory of

Kilmainham, Dublin. In the bardic legends and poetry of the early Irish we find no mention of a garden. The wild flower, untouched in its cultivation by art, is alluded to; but no simile occurs where the word garden or the beauty associated with it in imagery is used. In connexion with the care and protection of bees the word garden occurs in one part of the Brehon Code. We will transcribe that allusion as the one of interest. Bees were considered a most valuable portion of the property possessed by the Celts, and it was enacted, "Whoever plunders or steals bees out of a garden or fort is subject to a like penalty as if he steal them out of a habitation."

Fynes Moryson, a rather close observer, who travelled through Ireland in the reign of Elizabeth, says in his "Itinerary,"—"I observe the best sort of flowers and fruits are much rarer in Ireland than in England, which is, notwithstanding, to be more attributable to the inhabitants than to the sky" (air). It was certainly not owing to the air or the soil. We may notice here, however, that it was at this period that Sir Walter Raleigh introduced cherries into Ireland. This was their first introduction. He planted them in a garden at Aflane, in the county of Waterford. Cider was first made in Ireland,—in Waterford also. In the town of Youghal, in the county of Cork, the potato was first planted in Ireland by that worthy, but unfortunate knight. The house he resided in is still pointed out.

The red-streaked apple, from which the cider in Waterford was first made, was brought from Herefordshire, by a Mr. Reeves, of Torree, in the seventeenth century. The above facts are of some interest in the annals of British gardening.

One of the most succinct accounts of early English ornamental gardening we find relates to the magnificent palace built at Ewell, in Surrey, by Henry VIII. This palace was afterwards given to the Duchess of Cleveland, the favourite mistress of Charles II. The duchess, who appeared to be more fond of money than flowers, and of court life than country life, had the palace pulled down, and sold the materials. This beautiful seat in Surrey was called Nonsuch, and we are able to get some idea of its gardening grandeur from a description written of it by one Heutzer, a German, who visited England in 1689. Walpole published the itinerary of this traveller. "One would imagine," says Heutzer, "that everything in the power of architecture to perform had been employed in this work. There were in every place so many statues that seemed to breathe, so many miracles of art that seemed to rival the finest pieces of Roman antiquity, that it might with great propriety be called Nonsuch. It was encompassed with parks filled with deer, delightful gardens ornamented with the greatest profusion, and walks so embowered with trees that it seemed a place pitched upon by pleasure to dwell along with health. In the gardens were many columns and pyramids of marble, two fountains spouting water, one of which had a pyramid whereon small birds perched, whilst the water streamed out of their bills; the other fountain was in a grove called Diana's, where Actæon was represented turned into a stag as he was sprinkled by the goddess and her nymphs. Besides this there was another marble pyramid filled with concealed pipes, which sprinkled all that came within their reach."

Herr Heutzer does not state the style or size of the palace, but we may guess pretty accurately the possible grandeur of the place, as architecture and the other arts were beginning to revive in the reign of Henry VIII.

In the works of Leland and Camden, we have mention of gardens in different parts of the kingdom where they travelled. Leland was born in the beginning of the sixteenth century, and died in 1552. Camden lived a century later. Botanic gardens existed, or were established in England, at a much earlier period than is generally supposed. Within a short distance of Somerton, in Somersetshire, at a place called Lyte's Cary House, the ancient family-seat of the Lytes, a botanic garden was established by Henry Lyte. He was the author of one of our first works on scientific botany, in 1578. Ray, the eminent English botanist, contributed much by his writings and journeys over the kingdom to give an impetus to gardening and the cultivation of new or neglected shrubs and plants. His labours belong to the seventeenth century.

The name of John Evelyn, author of "Sylva; or, a Discourse on Forest Trees," may be here mentioned as one who improved horticulture much, and who introduced into notice many rare exotics. He, too, belonged to the seventeenth century. A rather singular and curious description of his garden at Sayes Court may be found in some of the "Philosophical Transactions." He was a native of Surrey, a county of beautiful landscape, and always and still famous in the annals of gardening in connexion with old and beautiful residences.

We find very little evidence of early gardening in Scotland, except that sort which belonged to priories and monastic institutions. Not until the eighteenth century do any respectable attempts at modern gardening appear to have been made across the Border.

Apple plantations, or orchards, comprised but a few species of fruit, interspersed with some common kind of pruniferous trees, plum and damson, but more particularly and extensively the black cherry. Cherry orchards and nut plantations, however, have been long common in England and Ireland; parks and deer parks, fir and oak plantations, artificial lakes, wells, physic or medicinal gardens, we find in connexion with some of the Scottish palaces, religious houses, and universities, but at a much later date than in the sister kingdom.

That order of shrubs or trees that come under the class called evergreens was not brought until recent times. We only find mention of them in a detached way in any of our early chronicles; but flowers, flowering shrubs, hot-houses, and exotics, and the building appliances necessary for their cultivation, are of recent introduction.

"The Carse of Gowrie," once esteemed the most beautiful spot in Scotland, and "a perfect garden," is merely an elongated plantation extending for several miles on the north side of the River Tay, between Dundee and Perth. The word "Carse," which is Scotch, signifies low, flat, fertile land. What it was centuries ago, we have no evidence to show, but at the present day in the summer time, nature bestows on it more attractions than man. At a place called Drumlanrig, north of Dumfries, the Duke of Queensbury's mansion had in the last century something approaching Chatsworth, in Derbyshire. It was adorned with grand avenues, gardens, and terrace walks. Haunting gardens were there out out of the rock down to the river, adorned with waterworks, and grottoes, with plantations of oak several miles in length. The extravagances of some of the eighteenth century poets in England were imitated both in Ireland and Scotland, and Hales Owen, in Shropshire, the seat of Shenstone, was the model that many of our eccentric grotto-and-garden-mad innovators followed.

Nymphs, syrens, centaurs, phoenixes, antediluvian beasts and birds, and other nondescript and extinct mammals; molluscs, fossils, and petrifications, were pressed into service, with twisted snake fountains, and twisted trees, and surrounding alcoves, and gods and goddesses doing penance in their rudity. This gardening monomania continued down to the beginning of the present century, until sober architectural sense stepped in and put a flat upon it.

This brings us down to the period of scientific and practical gardening in connexion with improved dwellings and ornamental and artistic appendages and surroundings; in fact, architecture and gardening more closely allied, and its scope in the present century, and even prospectively.

The construction of greenhouses, conservatories, forcing-houses, hot-houses, orangeries, pineries, &c., attached to or apart from dwelling-houses, calls in these days for the special assistance of the architect, not only in their design and embellishment, but in their sanitary aspects—of heating, ventilation, water supply, and position.

It may be seen that the requirements of the modern architect are widening yearly, and his practical and professional duties enlarging. Taking a broad view, as far as possible, into the future, with the light of present tendencies, we can foresee no cause for jealousies of one profession with another. Each profession is indispensable to each, and the knowledge that is necessary to build is also necessary to beautify, whether it is connected with a garden, a building, or a nation.

Conservatories and hot-houses which in modern

days have to receive some attention at the hands of the architect, at least in their design and construction, were of late introduction into the country.* Barrington, who writes of the subject, thinks there were no hot-houses in England earlier than 1667. In Ireland it is reported that fruit was forced in hot-houses in the reign of James II., in the town of Blessington. We must add that these gardens were laid out by an English gentleman of Byfleet, in Sussex. He fled to Ireland to escape the persecution of Cromwell, and we have further learned from Irish authorities and personal investigations, that pineapples were first grown in Dublin by a Mr. Bullon, a native of Westmoreland. Bullon settled in the vicinity of Dublin, in the reign of Queen Anne, and traces of his gardens were still to be seen at the top of New-street. Many years ago Bullon cultivated a nursery, which was formerly held by a person named Rowe, apparently another Englishman, and he was extensively patronised by the nobility and gentry in laying out their gardens.

Frequent mention is made in English histories of bowers and grottoes. These accounts date back for several centuries; such, for instance, as Rosamond's Bower at Woodstock. Sometimes these were mere mazes or labyrinths; at other times they were vaults or caves; a little grotto-work or excavation within, and a headress of foliage, rockwork, and interlaced branches without. The geometric and architectural style of gardening cultivated in Italy flourished for awhile in France, and was imitated in England with some success; but what was called the English or more natural style superseded it in the eighteenth century. Arboriculture, as we have previously remarked, received attention first in this country, and we are inclined to believe it was so from the earliest times in other countries. Several parks in Great Britain bear traces of being laid out on a geometric plan; the roads or avenues by which they are intersected comply us with the theory we advance, as well as with the fact. Greenwich, which is a very old park, dating back to the time of Edward I., shows lines of trees intersecting it, contradicting to one or more points.

Isa ancient lines of chestnuts, many of which, we doubt not, shaded Elizabeth or her predecessors, converged centrally in parallel rows. Evidence of a like arrangement are also, or were, traceable in Richmond and other English parks whose names we just now forget, but which we remember to have seen.

Some of the Roman roads in Great Britain were planted with parallel rows of trees. One remarkable instance occurs to our mind in the town of Dorchester. The Romans were given to the plantation of trees, in connexion with their architectural edifices, and trees of different odours were mixed. It would appear that they were also chosen for their assimilation of colours, as well as perfumes. The Romans studied effect in their plantations, as well as their buildings; and their gardens, as well as our own of the present day, were cultivated to give a rich charm to the site of many of their buildings. Alexander Pope, at Twickenham, and Joseph Addison, at Bilton, near Rugby, were among the first who, on a small scale, showed successful examples of modern gardening in England in connexion with their residences. It would exceed the scope of this article to give a detail of the different places throughout England where gardening was successfully carried out from the commencement of the eighteenth century. The first modern attempt at decent gardening in Ireland was, we believe, made by Dr. Delany, the friend of Swift, at Delville, near Glasnevin, Dublin. Swift gives a humorous and inimitable description in one of his poems of Delany's little garden. Addison, when Secretary in Ireland, was fond of gardening; and, if we mistake not, the Botanical Gardens at Glasnevin, famous once as the resort and haunt of Swift, Addison, Delany, Sheridan, Parnell, and Tickell, all poets, were the rudiments or beginning of this now celebrated botanic garden. Dr. Smith, in his "History of Waterford," mentions that at Listerne "There is a large and beautiful canal, at the further end of which is a *jet d'eau*, that casts up water to

* According to Pliny, it would appear that Lotheds were known and used in his time. We learn from him that hotbeds were made on frames which were kept turned to the different aspects of the sun during the change of the season. The gardeners of the Emperor Tiberius supplied him with these means with cucumbers all the year round; and we learn that the emperor was extremely fond of this sort of fruit.

a considerable height." Here was the principle of our modern fountains at play in the eighteenth century. We have another account of a very old garden that existed in the county of Cork. "It consisted of fourteen acres enclosed with a high wall; two acres were appropriated to a nut-grove. It had a large fishpond, a bathing-house, monstrously high yew hedges and some laurel ones; these were cut into fantastical forms, obscuring the rays of the sun. Here were also large grass plots in various figures." In Thomastown, in Kilkenny, there were hanging gardens (pensile) which were laid out in the time of Charles II. They were formed into terraces upon the side of a hill, and were ornamented with statues. A fishpond lay under, and "a verdant theatre," or large even space, was provided for dramatic entertainments. In the reign of Charles I. gardens began to receive the attention of the Legislature. An Act was passed in this monarch's reign to protect gardens and their productions. This Act was entitled "An Act to avoid and prevent divers Misdemeanors in idle and lewd Persons, in Barking of Trees," &c. This Act did some little good for both countries. Joseph Cooper Walker, an Irish writer of note in the last century, furnishes us in his essay on "The Rise and Progress of Gardening in Ireland," some interesting particulars. In an unedited account of a tour through Ireland, written by some anonymous traveller in 1634, and which was in Mr. Walker's possession, the following account of Lord Chichester's garden at Carrickfergus appears:—"The only grace of this town (said the MS.) is the Lord Chichester's house, which is a very stately house, or rather like a prince's palace, whereunto belongs a stately gate-house and graceful terrace and walks before the house, as is at Denton, my Lord Fairfax's house. A very fine hall there is, and a stately staircase, and faire dining-room, carrying the proportion of the hall. Fine garden, and mighty spacious orchards, and they say they have good store of fruit. I observed on either side of this garden there is a dove-house, placed opposite to the other in the corner of the garden, and twixt the garden and orchards. A most convenient place for apricots, or some such tender fruit, to be placed against the dove-house wall, that by the advantage of the heats thereof they may be rendered more fruitful, and come sooner to maturity; but this use is not made thereof." Hot-houses, it would appear, had not yet been introduced into Ireland, or Lord Chichester would probably have availed himself of their advantages. In Sir Hans Sloane's preface to a "Voyage to Madeira and to Barbadoes, St. Christopher, and Jamaica," we have further particulars of the use of modern gardening in England and Ireland. Sir Hans Sloane brought a great variety of plants to England, and his example induced Sir Arthur Rawson to send out a gardener to those islands to collect a variety. This being successfully accomplished by a man named Harlowe, they were planted at Moira, in Ireland, and flourished. Then Mr. Harlowe built a stove at the seat of Lord Moira, and many tender exotics and flowering plants and shrubs were cultivated. A colony of Huguenots, who settled in Dublin, established a Florists' Club, for the purpose of furthering the cultivation of flowers in Ireland. They gave premiums to the members who raised the most beautiful specimens. They met at stated times at a tavern called the Rose Tavern, in Dorset-street (then Drumcondra-lane). This club continued in existence until the close of the reign of George II. These Huguenots certainly spread abroad a great taste for flowers, and we must forgive their fantastic extravagances in view of what they did. The Huguenots introduced, and their followers plied the shears with a vigour and a vengeance. Box borders, yew trees, all trees, hedges, and shrubs, were cut into fantastic shapes and figures. High walls were built, and streams and ponds were twisted into conic sections, and made to play all sorts of vagaries. The French and Italian mode of gardening, which was practised for long years in England, was introduced by the English into Ireland, and it lasted down until the arrival of William III. in Ireland. Then what is called the Belgic style began. An example of this kind flourished for some years in the Royal Gardens once existing at Chapellizod, near Dublin. Early in the eighteenth century an overseer was appointed for these gardens, and he was considered dignified enough to be placed upon the civil establishment with a salary of 120*l.* per annum. The successors of the Huguenots, King William's followers, we have shown cut strange

evolutions in gardening. They cared not for sunk fence or fence: enclosures more like prison walls than ought else hid from the sight of the poor all sight of their demences and gardens. This was hardly associating gardening with architecture. Whatever little love of the beautiful was in their souls was of a rather selfish kind, but the days of public parks and botanical gardens were in the womb of time. A good time was coming for the people at large and God's poor.

The way to harmonise gardening and arboriculture with architecture is not by cutting trees or twisting them into monstrous and fantastic figures and forms, such as men with their arms in various positions, out in yew and box and the figure of a colossal goose in the latter. This was to be seen in the last century in Dublin, and in a garden in the county of Meath, the representation of a large cock with bristled feathers out in yew; or, again, in Dublin, a hare-hunt and a boar-hunt in box. At Bishop Fisher's Palace, in Drogheda, at a far earlier date, we have mention made of the following words:—"O man, remember the last great day." The bank where the letters appeared was bare; the proportion, it was said, of the letters was framed and cut in grass. At the present day, at many railway stations over England and Scotland, the traveller may observe little cultivated patches of garden, on which the station-master or his assistants exert their powers, prosaic and poetic, in forming borders, or tracing in large letters the name of the station. Sometimes it is in shell-work, flints, or stones; more often in flowers, or flowering plants. We mention these instances as a proof how strong the love of flowers and ornamentation is in the British mind.

Proper gardening requires the exercise of a cultured taste; and to harmonise it with architecture no fantastic tricks must be played. Plants and flowers, trees and shrubs, must be helped to grow where they are not; but no silly or violent contortions of bastard cultivation should be allowed to reign. Beautiful arrangement and combination are allowable in garden, park, or pleasure lawn, guided by a good taste, and an appreciation of the true harmony of nature's colours. The natural assimilation and fitness of things must be studied in dealing with nature as with art, or incongruity and a revulsion of taste and feeling will be the result experienced by the cultured mind.*

Gardening as an art deserves a fuller recognition from mankind than it has ever yet received. An English writer of the eighteenth century, Wheatley, says,—"Gardening is entitled to a place of considerable rank among the liberal arts. It is superior to landscape painting as a reality to a representation."

Speaking on the pure association of architecture with gardening, Lord Napier in his recent lecture "On Architecture in India," says,—"A feature in the Saracenic architecture, peculiarly attractive, is the sympathetic manner in which it associates itself with gardens and trees, and with all the forms of natural scenery. For parterres, of the regular kind, the geometrical patterns peculiar to the style, supply an exquisite framework, while the cypress and the plane, the types of aspiring and spreading vegetation, appear to be repeated with a sort of rhythmical concord in the minaret and cupola. It is not in the power of all to admire these harmonies beneath the rushing torrent of the Bosphorus, or on the shores of the Bythinian Olympus, at Cairo, where the caliphs sleep between the city and the desert, or where the dust of Shah Jehan and Mountaza Mahal rests under an incomparable canopy, near the waters of the Jumna; but go to the fruit-garden at Seringapatam, go to the grove of tamarinds and palms beneath the rocks of Vellore, where the funeral repose is accompanied by the muttered Koran, and the murmur of waters from the well. There you will still feel how the voices of nature and art, of beauty, and divinity, and death, are blended by the Mussulman builders."

Since 1800 gardening has made a rapid advancement in England and Ireland, and the

* The names of English architects who appear to have paid more or less attention to gardening wants and purposes in designing their buildings are Inigo Jones, Webb, Sir Christopher Wren, Sir John Vanbrugh, Sir William Chambers, John Campbell, Nash, and some others whose life and labours belong to our own time. Perhaps we should be remiss in not adding here two other names, that of Loudon and Lindley, an Englishman and a Scotchman, and co-labourers. Though not architects, but practical and scientific gardeners and botanists, they have raised their profession above reproach, reflected honour upon their country, and linked gardening to architecture by their labours.

establishment of flower and horticultural shows in several of the principal towns in the kingdom has given it a powerful impetus. The architect, too, has become more of the gardener, and one art has become a great assistant to the other. Gardening has been, through the architect, a sanitary agent, and architecture has assisted gardening to cultivate with more precision and to greater perfection. Warming and ventilation, water supply and drainage, are now parts of the study of the architect as well as the gardener, and in arboriculture as well as horticulture the foresight and judgment of both the architect and landscape-gardener may be profitably employed. The growth of useful timber is a consideration that ought not to be neglected. The gardener may know of their slow or rapid growth, and of their paying value when fit for felling. The architect knows, or ought to know, their building value for architectural and mechanical purposes. Some timber is only required for temporary building purposes; others for permanent uses. Scaffolding timber includes one sort; carpentry or joinery materials another. Besides these, there are other sorts used in mechanism, tools, vehicles, and various farming and domestic uses. Native-grown timber is, however, at present rather circumscribed in its building uses, owing to the almost inexhaustible forests still existing abroad. The architect, it may be seen, if he be true to his mission, must of necessity, as the world progresses, be more than a designer of houses. It will not do to have only a perfect acquaintance with styles and orders, but he must be more or less conversant with the order of Nature. "To build" has a wide signification; it may apply to the elevation of an art, a science, or a nation. It is a component part of civilisation and progress, and it must therefore comprise the true accompaniments of architecture.

We might, if it were desirable, enumerate several instances of modern natural English gardening where it has been associated with architecture, and where both in conjunction truly harmonised; the gardens and landscape adding beauty to the architectural structure, and it, in its turn, reflecting the charm of site and surroundings, being at the same time the central and primal object. The examples of artistic modern gardens may be instance, as those at Claremont, Stowe, Esher, Woburn Farm, and others. Of botanic gardens, there are many good examples that might be pointed to in the kingdom. Kew, of course, Eaton Hall, Chatsworth, Trentham, and some smaller ones. Her Majesty's gardens at Frogmore are instances of well-cared-for and well-arranged forcing and kitchen gardens, where the latest improvements have been advantageously carried out.

One other point may be alluded to;—the rise and growth of window-gardening in cities. This is an art that the architect should commend and aid, particularly in overcrowded cities. Flower-pots, in the windows of the poor, filled with flowers and breathing a rich perfume in many of our courts and alleys, is not only a pleasing and exhilarating sight to the pallid and weary-worn worker, but it is without doubt a useful disinfectant. Window gardening should be encouraged among our working classes, and every facility should be given to the growth of flowers. The life of flowers in the dwellings of our people is human care and human purity. If these conditions exist not, window gardening is not only a failure, but a nuisance; for the neglect of flowers, like the neglect of the poor man's children, will end in disease and decay.

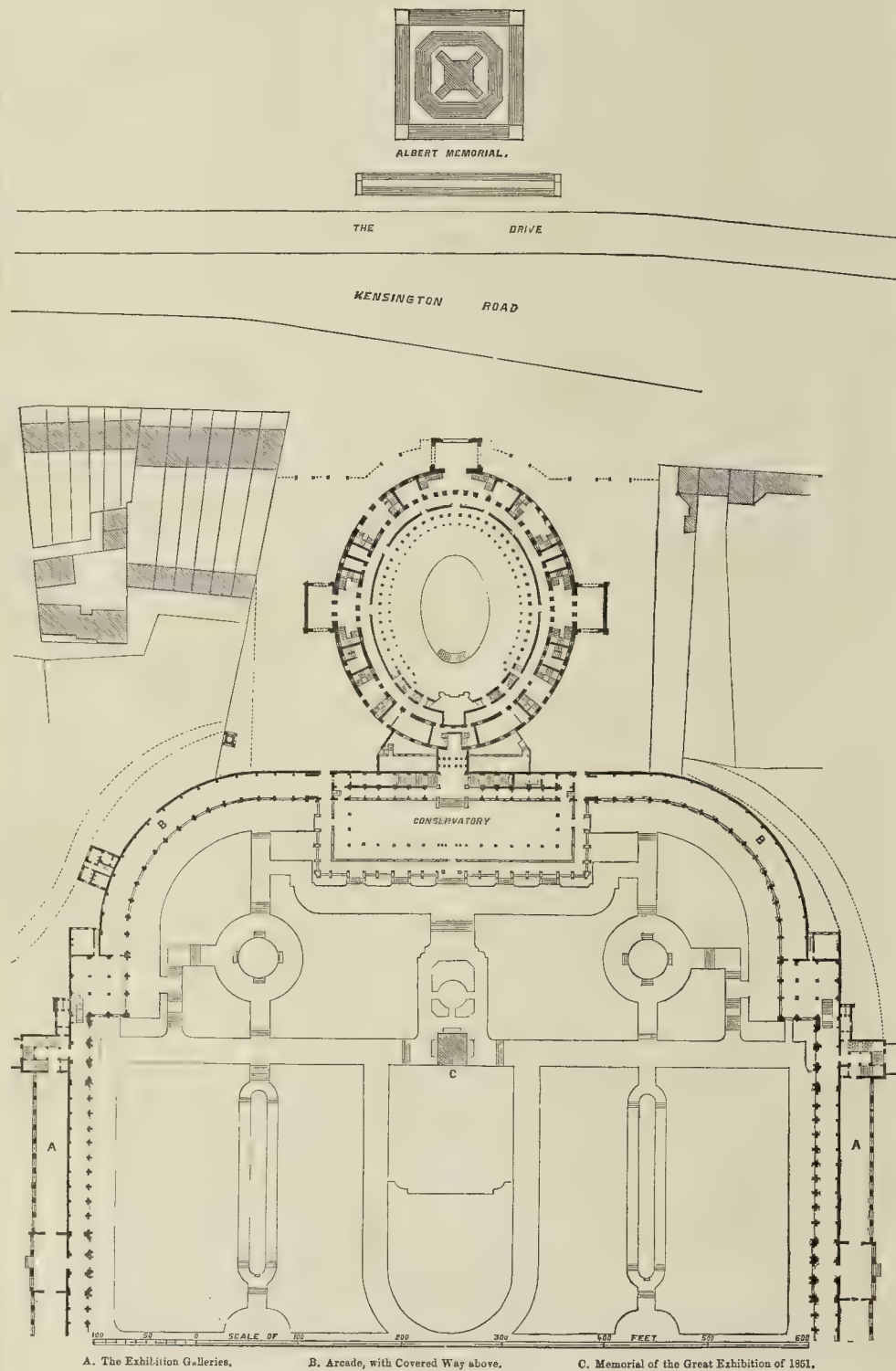
In the interest of human happiness and sanitary science we sincerely trust that the love of flowers may always exist, and that the art of gardening in all its branches, from the landscape to the window-cill, will grow and blossom, and bear further fruit in its honourable association with the future of architecture.

ALBERT HALL AND THE INTERNATIONAL EXHIBITION BUILDINGS.

WE supplement our recent notice of the Albert Hall of Arts and Sciences and the new Buildings for the International Exhibition of 1871* with a plan, showing part of the latter, and their connexion by means of the Conservatory of the Royal Horticultural Society with the Albert Hall. The new buildings, as we stated, are at the back of the arcades, on each side of the Horticultural Gardens.

* See p. 977, ante.

PLAN OF THE ALBERT HALL, SHOWING CONNEXION WITH THE BUILDINGS
FOR INTERNATIONAL EXHIBITIONS AND THE HORTICULTURAL GARDENS, SOUTH KENSINGTON.





THE REVENUE BOARD BUILDINGS, MADRAS.—MR. R. F. CHISHOLM, ARCHTCT.

THE REVENUE BOARD BUILDINGS IN MADRAS.

THE Revenue Board Buildings in Madras stand adjacent to the old palace of the Nawabs of the Carnatic. The latter structure, which is now used as a college, is constructed in the mixed Hindoo-Mahomedan style so common in the south of India; and although much of the detail is meaningless, and much objectionable, the general effect of the exterior (which is coloured dark red and white), is more pleasing than that of many buildings subsequently erected by Anglo-Indians. The Government found it necessary to make extensive alterations and additions, and, by the desire of his excellency Lord Napier, these works have been carried out so as to assimilate the Revenue Board buildings with the older adjacent structure. Mr. Chisholm, the Government architect, while keeping to the general lines of the old structure, has taken his details and many forms from purer types of the style, and superior materials have enabled him to adopt a much lighter form of construction. When the offices have been completed, the outlay will scarcely be felt, as the amount of rent now paid by Government for private offices represents capital equal to the expenditure involved.

The material is the fine polished chunam of this coast, which is too well known to need further description.

The building finds favour in the locality; both Europeans and natives seem to take a general interest in its progress, and Lord Napier, in a lecture delivered there some time back, and to which we referred, makes the following allusion to it.

"The Government has endeavoured, with the advice of an accomplished architect, to exhibit in the improvements at the Revenue Board an example of the adoption of the Mussulman style to contemporaneous use. Mr. Chisholm would be the first to disclaim and condemn the material which has been forced upon him by necessities to which we are still subjected, but his design will be a practical demonstration of the views which I have here advocated. He has paid the first tribute to the genius of the past; he has set the first example of a revival in native art which I hope will not remain unappreciated and unfruitful."

ON "THE STUDY OF PHYSICAL SCIENCE," BY PROFESSOR KINGLEY.

A LARGE audience, including almost all the clergy and ministers of the town, assembled at the Townhall, Reading, to hear a lecture by the Rev. Professor Kingley, Rector of Eversley, Canon of Chester, and Chaplain to the Queen. The well-known ability of the lecturer, as well as the interesting subject of the lecture, combined to make the occasion more than usually attractive; and although the lecture was rather brief, it was throughout full of eloquence, originality, and learning. The lecture was given in connexion with the Parochial Associations of St. Mary, St. Giles, and St. Lawrence, Reading, and is reported in the local *Mercury*, from which we quote.

Professor Kingley said,—I am exceedingly glad to hear from Mr. Cust that you are making a move in the direction of Physical Science and Physical Science Classes; for the longer I live and the older I grow, the more convinced I am that physical science should be taught not only to men, but also to women. If I had the choice, I would rather teach it to women than to men, for reasons which I cannot now stop to give. And why do I say this? Simply to get people into a scientific habit of mind, which I hold to be, next to moral worth, the most important element in human nature. If anybody says, I want amusement: work is very dull, and I want something to excite my imagination and my sense of humour; I want poetry, a good laugh, or a good game of play, I fully agree with him. There is no better medicine for the hard-worked body and mind than a good laugh, but there is really nothing in the study of physical science and natural history to interfere with genial hilarity. Some serious persons used to accuse us, of the British Association, and especially us of the Red Lion Club, with lashing our tails and roaring rather too much, and of being somewhat too fond of fun after the abstruse papers of the day were over; but as a harmless amusement, I know of no study to be compared with natural history, as I have found it. I have

known working men who, in the most smoky of cities, have got their minds elevated and their hearts enlarged by going into the country to make collections of plants and birds and other specimens of natural history. I should recommend that to the wise men in this town. It does seem strange to me that people who will only live here a few years live as monks or nuns: it does seem strange to me—and stranger the longer I live,—that people should be so careless of the constitution of this planet, and of those laws on which depend the health of themselves and their children. Now I know some persons will say, what need is there for us to study science? we shall be sure to profit by the discoveries of others. I reply, that to profit by other men's discoveries when you do not pay for them is not a very noble or generous state of mind. It may be compared to a fattening ox, who allows the farmer to house and feed him, provided he may lounge in his stall and not be disturbed. There is, however, this difference in the two cases,—the farmer may repay himself by eating the ox, whereas the scientific man cannot repay himself by eating you. As to mankind thriving by common sense, that is too old a cant for me to listen to any more, because mankind has never used that common sense regulated by science. In no age or country has mankind been guided by the sense of which they have talked. Nonsense, not sense, conceit and mad infatuation have led mankind to crimes, misery, wars, famine, poverty, disease, waste of life, labour, capital, soil, manure, till, as in the Levant, whole countries have been ruined for ever. All because man will not obey the physical laws of the universe, which are all around us like walls of iron or adamant, or like some vast mass of machinery, the wheels of which, if we English people cannot stop to study, will crush us, as they have done other nations, to powder. Very difficult to calm is outraged nature. Very true are the words of Scripture, "It is a fearful thing to fall into the hands of the living God." As the poet has said,—

"Though the mills of God grind slowly
Yet they grind exceeding small;
Though with patience He stands waiting,
With exactness grinds He all."

"Visiting the iniquities of the fathers upon the children unto the third and fourth generation of them that hate Me, and showing mercy unto thousands of them that love Me and keep my commandments." Now it is, I believe, one of the most hopeful signs of the times that the world is learning more and more the importance of physical science, and learning to live according to the laws of physical science, or, as Bacon has said, "to the voice of God revealed in facts." Oh! that I could see every young mother in this hall taught the rudiments of physical science, the science of sanitary reform on which you good people of Reading have been working very honestly of late, to get your town cleansed in order to try to prevent disease,—a question of importance beyond our highest conception. The mineral wealth of the world is not exhausted and I believe that not one-tenth of the vegetable wealth of the world is yet known. Supposing any of you should be bound to spend all your lives here in Reading, and never know anything but the hedgerow plants between here and Pangbourne, if you had a knowledge of botany you would see a great deal more in that hedgerow than you do now. The microscope will reveal wonders which will first amuse you, then surprise, and then, I hope, awe you, when you see that smallness interferes in no way with development; or, as it has been said, that "nature is the greatest in that which is least." Then, if you go on and select the mosses, the lichens, the fungi, or even look into your own water-butt after a week's drought, and try what the microscope will reveal to you there, and those wondrous atoms which seem to defy all investigation, will you not have gained some sort of wisdom?

NEW MARKETS AND TOWN-HALL, ABERGAVENNY.

THE New Markets and Town-hall at Abergavenny are in the Early English style of architecture. The building is erected in the native stone, with Bath stone dressings, the Corn Exchange, &c., being built of red brick. The ground plan, at the rear of the building, is devoted to the purposes of the general markets, approached by a spacious entrance from Cross-

street, and also at the rear from Market-lane, with a central gangway and stalls on each side, and also butchers' and fish stalls at the side. On the right-hand side there is a space for earthenware, with lock-up stalls, stands for unloading vegetables, stores for goods in sacks, &c., with separate entrance to same, collector's office, &c. On each side of the entrance to the markets are two shops. There is also a third smaller shop, with entrance from Market-lane. The roof over the markets is of iron. The upper part of the building is arranged as offices, with a large hall or assembly-room on the upper floor. The chief entrance is from Cross-street, through a doorway 112 ft. high to the apex, surmounted with a clock tower. Ascending the chief staircase, which is of stone and amply wide, there are collector's, over-seer's, Excise, and clerks' offices, large county club-room, commissioners' room, and reading-room, with communication from the over-seer's office to the Corn Exchange. The assembly-room over the offices is 75 ft. by 45 ft., and 35 feet high, with coved ceiling.

The entire cost of the building will be about 7,000l. It is being carried out under the superintendence of Messrs. Wilson & Wilcox, architects, London and Bath, whose design was chosen from amongst others in a public competition. Mr. Moreland, of Gloucester, is the contractor; and Mr. Edwin Hind the clerk of the works.

The market portion of the building was opened on the 23rd of December, 1870, and its entire area is 18,730 superficial feet.

The Corn Exchange will, in all probability, be used as a Freemasons' hall.

INAUGURATION OF THE NEW TOWN HALL, MELBOURNE, AUSTRALIA.

THE erection of the Melbourne new Town-hall, the foundation-stone of which was laid by the Duke of Edinburgh on his first visit to the colony of Victoria, is now complete, and the inauguration has been celebrated with great éclat.

The attention of the city council was drawn in 1862, '63, and '64, to the fact that the fragment of a building which during the ten previous years had served the purposes of a town-hall was too small.

The council thereupon adopted resolutions to the effect that premiums should be offered for designs for the completion of the then existing building, at a cost of 25,000l.

The design considered the best of those submitted was by Messrs. Reed & Barnes, of Melbourne, architects, to whom the first prize of 200l. was awarded. The next in order of merit was by Mr. John Michael Barry, of Melbourne, architect, who received the second prize of 50l.

These designs, however, although treated as complying with the condition that the completion of the structure should not exceed a cost of 25,000l., made evident the facts,—1. That that sum was inadequate; and 2. That the building, if completed upon the land then owned by the corporation, would still be insufficient for the requirements of the city. The council thereupon turned its attention to extending the area of ground forming the original Crown grant for the purposes of a town-hall, and partly by arrangement with her Majesty's Government, and partly by purchase, the site was increased from a quadrangle, with a frontage of 158 ft. 3 in. to Swanston-street, by 118 ft. to Collins-street, to one of 180 ft. 3 in. to the former street, by 148 ft. 10 in. to the latter, or nearly two-thirds of an acre; and upon this it was resolved to erect an entirely new building. Principally with a view of providing funds for this purpose, the borrowing powers conferred by law upon the corporation were exercised by the negotiation of a loan for 100,000l. upon debentures, bearing interest at 6 per cent. per annum. Messrs. Reed & Barnes were retained as architects, and on September 30, 1867, a tender to erect the present building, according to designs prepared by them, and for the sum of 62,500l., was received from Messrs. Lawrence & Cain, and accepted.

The building, as to its architecture, is a Renaissance treatment of the Classic. It consists of a principal order of Corinthian columns standing on a high basement, and surmounted by an attic of irregular outline. The principal order is divided into two stories, making, with the basement and attic, four stories in all.

The main front to Swanston-street comprises five architectural divisions, a centre and two end pavilions, and two flanks; the flanks of three-quarter attached columns, and the pavilions

THE ABBEY MILLS PUMPING STATION.

At the meeting of the Metropolitan Board of Works, on Friday, the 23rd inst.,—

Upon the Finance Committee recommending payment of 3,360*l.* 18*s.* 6*d.* to Mr. Webster, as balance of his bill for the erection of Abbey Mills Pumping Station, Mr. Rogers made some lengthy observations upon the value of the contract which was selected and carried out. He did not think it was right that such a large contract as was involved in the construction of the superstructure at this station, amounting to 225,000*l.*, should have been given upon a schedule of prices. The promise that induced the Board to consent to such a contract had not been fulfilled, for the works were not completed by the end of a year from their commencement. Several of the items appeared to him to be particularly extravagant. He found that a two-stall stable had been built at a cost of 6*l.*,—for whom was not known,—and without any order of the Board. The sum of 2,394*l.* for the engineer's house was extravagant in a high degree. There was a clause in the contract that the contractor should himself furnish the necessary machinery; yet he here found a charge of 362*l.* for a steam engine, and 1,000*l.* for charges for pumps and some other articles. 21,000*l.* for a reservoir seemed a very large amount; the measurement and specification of these were a matter of easy execution, and so the matter might well have been tendered for. He also found 2,361*l.* put down for surveyor's charges. There was no authority for this, and it was a fact that the first item under that head had been cancelled. He contended that any surveyor for measuring up works should be in the employment and pay of the Board, and not be the servant of the contractor. In conclusion, he hoped the Board would not again give away large contracts unless after advertisement and tenders.

Mr. Fowler did not wish it to go forth that the impressions sought to be conveyed by Mr. Rogers were correct; he thought that the Board, and the country, and he had no reason to be dissatisfied about them. He contended, however, with Mr. Rogers, that it was better to have tenders for such works, and that the measurements should be checked by the Board's officers.

Mr. Freeman defended the cost. The handsome structure was a fitting conclusion to the millions' worth of work burned under the ground; and the labourers' cottages had been built to harmonise with the general structure.

The payment was then agreed to.

THE INSTITUTE BLOWING HOT AND COLD.

Sir,—The satire in the fable was wonderfully astonished at the man who blew hot and cold. I suppose it must be a new fable, or a new man, or a new rule to express the fact that Professor Donaldson, honorary secretary to the Institute, should at a recent meeting declare the rules and regulations put forth by that body as "incapable of proof, illegal and unreasonable" and in a recent number of your journal quote from those very rules for the enlightenment of a very innocent inquirer. If the Institute rule about property in the drawings is of no force, by what authority is an architect to be "bound to furnish one set of drawings, and one set of tracings, with duplicate specification," and who need care what license can exact from builders for copies or for quantities? I have every inquirer under present circumstances to make his own terms with his clients, taking proper care of number one, but in clauses in the conditions of contract to secure his own interests as well as those of the building and employing him, and he will then have a "special contract" to rely upon of more value to him than all the rules and usages which the very men who drew them up are afraid to maintain.

The members of the London Builders' Society have shown the simple and practical way of dealing with similar matters. Having drawn up or agreed on a proper set of conditions, they agree not to tender for any work in competition, or sign any contracts, that do not conform to them. And that no contract shall be undertaken by any member that has been declined by another builder on account of non-compliance with the conditions. But it will take half a century, at least, before the members of the Institute of British Architects will learn to act in this vigorous and straightforward manner.

F. R. I. D. A.

CONTINUATION OF LUDGATE HILL TO CHEAPSIDE, NORTH OF ST. PAUL'S.

As London increases, with its population and commerce, the necessity for straight and open main thoroughfares becomes more pressing and important; and this, the line of the Strand to the Bank, may be considered the main arterial duct of the City.

It is now many years since the opening out of the causeway by St. Paul's Churchyard, north of the cathedral, which would be nearly in a direct line to the Bank, was suggested in the *Builder*;—the abatement of the iron screen which disfigures Sir Christopher Wren's grand architectural achievement; and the substitution of an equally designed plateau, fenced by a less obstructive railing or balustrade, and leaving a grand open piazza in the centre of the City.

The distance to be saved by avoiding the circuit of St. Paul's would be over 170 yards; and at this point, where so many great leading streets concentrate, the relief given to excessive traffic would be immense; whilst at the same time the removal of the heavy iron barricade would effect a wondrous improvement on the cathedral, which might stand on a plateau, raised above the surrounding routes of intercourse. The outside space left free for public use would, as in all such instances, give dignity to the structure; and the royal statue in the western front might be inclosed by a railing, bowed outward to receive it; or it might be fenced round, like that of Charing-cross, or any of our other monuments.

There are no tombs on any but the north side; and, as in similar cases, these and the mortal remains might be transferred to a mausoleum, for which there is ample scope in the extensive north-east angle of the ancient inclosure.

It is satisfactory to find that these suggestions, given so long back, and reiterated in the *Builder* in the year 1867, should have at last found favour from public authorities, and that there is now some hope of letting St. Paul's stand upon a suitable platform, open to view and to access, and unobstructive of public convenience.

The persistent purpose of the Corporation to widen Ludgate-hill is steadily advancing, and will, when complete, render the easement of St. Paul's north Churchyard route the more essential; and now that the Dean and Chapter incline to grant concession, the opening out of a grand causeway might be effected before the ensuing Christmas.

QUONDAM.

THE STRENGTH OF SLATE.

Sir,—If not troubling you too much with another letter, I wish to say that I arrive at quite a different conclusion to that of "C. S."

Taking my last illustration as a basis of calculation, the breaking weight of a slab 5 ft. 6 in. wide 2 in. thick, and with a 5 ft. 6 in. bearing (the size given by "A Mason"), but resting only at each end, should not be less than 9 tons 8 cwt. Now, the fact of the slab being circular would not, I think, make it less strong, but having a support all round must give an immense accession of strength. The hole in the centre weakens the slab undoubtedly, but, on the other hand, this precludes the possibility of weighting it in the middle, which is, of course, the point of greatest leverage.

ALFRED BRABY.

ARCHITECTURAL QUANTITIES AND ESTIMATES.

I HAVE read with considerable interest the recent correspondence in the *Builder* in reference to the subject of quantities and estimates, as to the responsibilities attending them, and the best mode of securing accuracy to the satisfaction of all parties concerned. It appears to me that, whilst in some quarters there has been an unblinking desire to secure the emoluments without taking any responsibility, there has been, on the other hand, a timidity in dealing with the subject, as if there was something mysterious and dangerous about it, which the pure-minded architect could scarcely venture to touch without soiling his delicate fingers.

I may state that I am an architect retired some years from general practice. I have therefore no longer any personal interest in the question; but as, during a professional life of over thirty-five years, I have had much to do with quantities, both in buildings erected by myself and others, probably a reference to my own experience, as well as to the general principles involved, may not be without some little use.

Now, to begin at the beginning, what are quantities? Are they not simply an admeasurement before the work is done, in the same way as a measurement bill is an admeasurement after the work is completed? What is there in the nature of things which should lead to different treatment in the one case from the other?

An architect prepares a design for a building, which his client wishes should be executed by contract. For this purpose a bill of quantities is necessary, founded upon the plans and specification. Now, an architect in large practice taking the aesthetic and constructive part into his own hands could not personally take out the admeasurements himself, and it becomes necessary either to have a duly-qualified person on his staff, or to hand over the task to an outside professional quantity-taker. There are, however, many architects not so over-burdened with commissions as to prevent their taking out the quantities with their own hands. In any of these cases I contend that it is for the interest of all parties that the architect should identify himself with the quantities, and make them his own. I am, of course, supposing the necessary skill and common honesty on the part of the practitioner. If he has not the former, he will most likely burn his own fingers; and if he has not the latter, he will burn the fingers of other people. None can be so competent to determine how all the details, many of which it is impossible exactly to set forth either in the drawings or specification, ought to be carried out. Going over the quantities also is an excellent résumé of the progress of the works opening out the points of construction, and finding out the weak places, thus giving an opportunity for correcting and revising before commencing operations.

I would go so far as to make the bill of quantities a part of the contract. Depend upon it, if the builder knew that for every cubic foot of wood and stone he puts into a building he is sure to get value received, it would be a strong inducement to reduce his tender to the lowest figure possible. In winding up and adjusting the accounts, an authorised and priced bill of quantities is a wonderful aid in preventing disputes and producing a satisfactory result.

What, then, are the objections to a plan, as I think, so simple and rational? The main objection—at least the one most frequently urged, is this. Blunders and mistakes will arise, and somebody must be responsible for them. The client will expect his contract to be fulfilled to the letter, and if the architect takes out the quantities he will, under such circumstances, try to escape by collusion with the builder in saving the amount of the mistake in some other way, if he does not submit to pay the deficiency out of his own pocket. Let us see what force there is in the case thus stated, and how far the evil would be remedied by a different course.

I have said that in reasoning out the matter we must assume ordinary skill in the architect. If he has not, he had better refer the quantities to somebody who has. If he is competent, no doubt there is risk of mistakes as there is in all human affairs, but generally speaking a little deficiency in one item is balanced by a little excess in another, and so the balance is preserved. The cases are exceedingly rare in which any serious deficiency exists in quantities taken out by a skilled person. Even if it were so, if the client, for instance, has got ten squares of flooring where the quantities only specify five, no right-minded person would take advantage of an accident of that kind, and rob the contractor of materials and labour through a mere technicality.

If a similar mistake occurred in a measurement bill of work actually executed, the amount would be at once allowed. I confess I cannot see any difference in principle between the two.

In order to shield themselves from demands for deficiencies, a clause has lately been introduced by some surveyors at the foot of the bill of quantities, that they do not warrant their correctness, which the party tendering may have the opportunity of testing at his own expense and risk. Anything more mean and shabby than this course can hardly be conceived. If the quantities are tested, they must be taken out afresh; and if so, what is the use of the first set? It is a dishonest device of incompetency to gain the reward which is due only to skill.

In my own practice I have found great advantages in having an authorised bill of quantities agreed to between architect and contractor, even where it does not form part of the contract. Many a dispute or complaint is immediately so

LIABILITY OF LANDLORDS FOR SMOKY CHIMNEYS.

A CASE of some importance to owners and occupiers of houses has been tried before Mr. Magness, the judge, and a jury, at the Leeds County Court. Mr. Wm. Banks, late of Hewart, near York, and Mr. John Jagger, the latter lord of some houses in Northfield-square, for the recovery of the sum of 13*l.* 13*s.* 6*d.* for alleged loss and damage arising from a chimney's fault. The case was, that in March last Mr. Banks inspected a new house in Northfield-square, belonging to Mr. Jagger, who said that it did not smoke. Mr. Banks agreed to take the house at a yearly rent of 2*l.* 10*s.* and was to take possession in April. When the fire in the front kitchen was lighted, every room in the house was filled with smoke, and in the end it was found impossible for two persons to go each out. Mr. Jagger said, "for, and he tried to remedy it, but, as the plaintiff said, 'It did not do a penny worth of good.' Plaintiff's family found it impossible to live in the house, and about six weeks' occupancy they were compelled to remove. In fixing up the premises the plaintiff had incurred considerable expense, and by his forced removal he sustained loss and damage by injury to furniture, &c. An examination of the house was made by Mr. Hainworth, the Corporation Buildings Inspector, and it was his opinion that, owing to the smoke it was not fit to live in. For the defence, evidence was given to the effect that recent premises during the same season, burning of fires did not reveal any smoke. The judge, summing up, said the real question was whether the premises were fit for human habitation.—The jury gave a verdict for the plaintiff for 13*l.* 13*s.* 6*d.* The judge allowed costs.

at rest by reference to the bill, and in the case of deductions or substitutions the benefit must be obvious.

Now let us see how the present system works. Where a building is important enough to warrant the employment of two surveyors, one chosen by the architect and the other by the competing contractors, the mode is fair and reasonable, though I think that even then it would be better that the quantities should be adopted and recognised by the architect. This, however, is only the case in very large works. In smaller ones sometimes the quantities are taken out by different surveyors, and the tenders are then framed upon no settled or agreed basis; sometimes by the architect, who shirks all responsibility, but who, nevertheless, pockets the commission. In some cases the builder or his clerk takes his own quantities: hence the enormous and discredited differences which we sometimes see in tenders. Now, in all these instances, the prudent builder, who wishes to pay his way, and avoid ruin, is obliged to add a certain percentage for risk and contingencies, which, when it is not really required, is so much taken out of the pocket of the client without return.

To sum up all, I think it will be found, in the long run, in this as in most other cases, that mutual distrust, suspicion, and attempt to over-reach frustrate their own object, and that the interests of client, contractor, and architect will be best served by a spirit of fairness, honour, and mutual good feeling. J. A. P.

BLOOMSBURY.

THE large stone statue on the top of St. George's Church, Bloomsbury, of the king who was made "the head of the steeple," recently showed such unmistakable signs of being unsafe that scaffolding has now been erected round the spire, so that its security may be seen to.

A few weeks ago one of the angle "acorns" from amongst the dentils of the Ionic cornice of the British Museum fell to the ground; since then scaffolding has been erected from the ground at each angle, so that the security of the other acorns may be attended to. We should have thought a hanging scaffold from the top of the cornice would have been sufficient without the expense of a high scaffold from the ground at every angle.

SCULPTURE AND LEARNING.

MR. RUSKIN, as Slade Professor at Oxford, has been lecturing on sculpture. He maintained that the world has only twice seen a perfect school of sculpture,—in the fifth century before Christ in Athens, and in the fifteenth century of the present era in Florence. He said,—

The real secret of the success of the Greek and Florentine artists is, that they were gentlemen, in the best sense. In England we have a theory that the clown should produce art, and the gentleman look at it. The rule of all really good art is exactly the reverse of this. The true artist must be a cultivated gentleman; in fact, the special characteristics which tended to develop the schools of Greece and Florence, are those which principally raise and cultivate the mind of man:—

1. The capability of enthusiasm, and the recognition of it as the highest state of manhood. This element was one which shone forth prominently alike in Greek and Mediæval gentlemen.
2. Obedience to seen and unseen authority. The love of law, the submission to those set over them, was strong in Greek times, and still stronger in the Middle Ages.

3. Habitual living in the presence of death, and of death regarded as the end of life, not as the beginning of a new existence. Death was accepted as an evil, but it was regarded without horror.

4. Purity of the pattern of love. In this respect the Florentine school was far in advance of the Greek; for, although the Greeks dwelt on the sanctity of domestic love, yet the absolute necessity of purity in the highest love was an essentially Christian idea.

5. Imaginative or actual dwelling in the presence of pure spirits. The Greek pictured to himself the gods dwelling among men; to the Christian his belief was a living and a present reality. But the Greek had no idea of receiving from these spirits pardon and the forgiveness of his sins; so that hope and humility were impossible to him. Here again the Florentine

school was at an advantage. In Giotto's "Hope" we have a typical representation of the first of these virtues; in Filippo Lippi's "Annunciation," of the second.

It was vexatious to hear Mr. Ruskin, in the midst of eloquence, teaching such pernicious rubbish as this,—that men who come to the University for the sake of lucrative knowledge, and set before themselves in their studies a desire to learn what is practically useful in life, and what enables them to rise above their neighbours, are not lovers of true honour or of true learning.

GRANT MEMORIAL SCHOOL, LITCHBOROUGH.

At a public meeting held at Towcester, it was resolved to carry into effect an object which the late Mr. Grant had for some years contemplated—the erection of a parochial school at Litchborough, for which he had, indeed, reserved a site. A committee of noblemen and gentlemen in the neighbourhood of Towcester was formed for the purpose, and the building is now completed and ready for use. The site is near the church and the rectory, at the intersection of the Towcester and Farthingstone roads with that leading to Northampton. The building is constructed of red ironstone. It is in the Gothic style, of the Early English period. The windows are pointed, and filled with casements which open wide for ventilation; the gables overhang, and are fitted with ornamental barge boards and finials. Over the principal or boys' porch is a stepped gable and bell-turret; and in the centre of the front elevation is another gable, containing the inscription engraved on white Mansfield stone. A doorway and porch are provided for the girls' entrance at the opposite end of the building. The schoolroom has an open roof, ceiled at the level of the collar-beam, the part above being constructed for ventilation. The interior is divided into three bays, and the trusses have ornamental ribs springing from stone corbels in the wall. The walls have a lining, 4 ft. high from the floor, of deal, stained and varnished, which is continued all round the room. The fittings are the patent folding desks and seats, supplied by Sidebotham, of Manchester. The works have been carried out by Mr. Joseph Johnson, builder, Bugbrock, and the designs and under the direction of the architect, Mr. T. Heygate Vernon, of London. The school is calculated for seventy children, and the total cost, including architect's commission and incidental expenses, will be about 350*l*.

DHULEEP SINGH'S NEW RESIDENCE.

ELYDON HALL, Suffolk, the seat of his Highness Prince Dhuleep Singh, has been rebuilt, and is now sufficiently advanced towards completion to admit of the Maharajah occupying it. The exterior of the edifice is of red brick with stone dressings, in the Italian style, but the interior, by the Prince's wish, has been finished in the Indian style. The elaborate ornaments being as yet devoid of colour and gilding do not show to full advantage. The entrance-hall, of ample size, is surrounded with an arcade. The arches, cupped, and columns are profusely ornamented, the arch spandrels being filled with rosettes and foliage; and the soffits of arches with similar elaborate work. The ceiling is divided into compartments by means of beams which are richly panelled, and supported by corbels. The several compartments of the ceiling are covered with raised ornament, the designs being varied. The chimney-piece, not yet fixed, is of elaborate design in white marble. Across the hall, and forming a lobby thereto, is a glazed screen of fanciful character, the glass in it being frosted, and embossed with a flowing characteristic Indian pattern. The centre part of the floor is boarded (to be covered with an Eastern carpet), round which is a margin 3 ft. 6 in. wide, of marble and richly coloured encaustic tiles, made expressly for this hall.

Adjoining the entrance-hall is the grand staircase of polished marble, inlaid, the rises of steps having a leaf ornament sunk upon them. The soffits of steps are moulded, and those of the landings have sunk panels and flower ornaments. The stair balustrade is of cast iron. This staircase goes up to the second floor, and on each story are enriched cusped archways, leading to the corridors, &c. The dining-room is of ample dimensions, and the ceiling is formed into panels of many shapes and sizes, but making a general

uniform design, with connective foliage in relief, the lesser ones having small convex mirrors (of which there are about 400) in the centre. This room has also a rich cornice. The chimney-piece is of inlaid white marble, but the room is at present in an unfinished state.

The drawing-room ceiling is divided by beams, enriched with panelling on soffits, and has large cusped Indian panels with floriated ornaments, but as yet has much unoccupied space to be presently filled in by a peculiar Indian mode of decoration, for which probably artists will have to be procured from the East. The walls of this room will be covered with Indian embroidery, let into moulded panels, similar to the adjoining library.

The boudoir is the only one which preserves the character of the exterior of the mansion. The decorations of the ceilings, &c., are in Carton Pierre, by Bookbinder. The modelling alone of the ornaments in the apartments described is said to have cost 8,000*l*. The upper part of the house will be dependent mostly on coloured decoration, and most of the rooms are already richly furnished in the Oriental style.

The works have been executed under the superintendence of Mr. Norton, architect, by Cubitt & Co., of Gray's-inn-road. Mr. G. Wall is clerk of the works, Mr. Bush superintending on the part of the contractors, and Mr. Thacker is the surveyor.

CHURCH-BUILDING NEWS.

Barnard Castle.—St. Mary's Church has been restored and re-opened for divine service. The tower, which seemed to be the worst part of the whole fabric, is still left untouched, and must remain so until sufficient funds can be raised for its entire reconstruction. In its present state, propped up with crutches, it has such an ill effect with the other part of the building, that this alone is a sufficient incentive to the inhabitants of the town to provide the requisite sum for that purpose; because, until this is done, the peal of eight bells will be of very little use, as they cannot be rung on account of the instability of the steeple. The foundations of the body of the church have been for the most part reconstructed or underpinned, and a channel made round the outside to carry off the water into a drain, and the churchyard on the north side partially lowered, whilst that on the south has been levelled and laid out. The west wall of the nave, which contained the principal entrance-door, has been entirely rebuilt; a large window inserted, and the door reconstructed in the original south porch entrance. The ponderous west gallery, and that which occupied the upper part of the north transept, have been pulled down, and open benches of American pine fixed in the body of the church, with which arrangement there will be but very little loss, as the former were calculated to seat about 669, whilst the present arrangement will seat 623 adults, allowing 20 in. to each. The whole of the vaults inside the church have been removed, the floor lowered a few feet (in doing which some loads of bones and skulls, supposed to have been buried inside the church during the progress of the former restoration were discovered), and covered 8 in. thick with concrete, over which encaustic tiles have been laid; and in the place of the old warming-apparatus two patent Gill air-stoves and the requisite air-flues in connexion therewith have been fixed. In place of the elliptical arch at the east end of the north arcade, two semicircular arches have been built, to correspond with the others. The east wall of the chancel has been entirely rebuilt, and a window inserted, similar to the one destroyed in 1815, together with two smaller ones in the south wall, similar in design to the east and west windows. The greater part of the outer south transept wall has also been rebuilt, and a stained-glass window, procured by public subscription, has been erected in memory of the late Rev. Canon George Dugard, perpetual curate of the parish. An organ-chamber has been constructed at the east end of the north transept, adjoining the north part of the chancel, and an organ, built by Mr. Brindley, of Sheffield, has been fixed in place of the old one. The surplised choir now occupy the chancel, for whom oak benches have been provided by Mr. Snaith, of Darlington. The flooring is of encaustic tiling; whilst that inside the brazen communion-rail is glazed. It was found necessary to re-roof the whole place, the timbers being found very rotten in certain parts, and

the leading, which, by injudicious repairing, was rendered almost useless for turning water, has been relaid. The church is lighted by gas, supplied by brass standards. The contract for the mason's work was obtained by Mr. B. Lepworth, of Barnard Castle. The plumber, gasfitter, and glazier's work was given to Mr. Simpson, of Staindrop. The carpenter and joiner's work was executed as follows:—Roofs, Mr. Armistage, of Darlington; vestry and south door, Mr. Adamson, of Egglestone; flooring and seating, Messrs. MacAdam, of Alston; and the tiling by Messrs. Minton, Hollins, & Co., of Stoke-upon-Trent.

Hastings and St. Leonard's.—St. Andrew's Church has been consecrated. Miss M. J. Sayer, besides granting the site for the church, subscribed 1,000*l.* towards its erection; and a further sum of 1,250*l.* in connexion with the endowment and repairs. Somewhere about eighteen months since Mr. Brook (Habershon & Brook) prepared plans for the new Gothic church; and the tender of Mr. John Howell, at something like 3,000*l.*, was accepted. The total cost of the erection will be 3,600*l.*; and of this amount 1,000*l.* remain to be raised. The church stands in St. Andrew's-road, adjacent to the large retort-house of the gasworks. It consists of nave, south aisle, and apse chancel, having seat accommodation for 450 persons.

Eltham.—The foundation-stone of a church, to be dedicated to St. Peter, situated in the Eltham-road, Lee, has been laid by Lady Louisa Mills. The new building, which is to be Early Gothic in style, will be constructed of brick, with stone columns and window tracery. It will consist of a nave, north and south aisles, chancel, and organ-chamber. The west end of the nave will terminate in a tower and spire, the basement of which will form the principal entrance. The cost of the church and part of the tower at present in progress will be 3,950*l.*, of which sum there are still about 2,000*l.* to be raised. The structure will be erected from the designs of Messrs. Newman & Billing, architects, Southwark, by Messrs. Dove, Brothers, of Islington.

Ravensham (Sheffield).—The parish church has been reopened, after being put in repair. For a considerable time before the work of restoration was begun, many people considered that the old tower was in a very unsafe condition, whilst others were of a contrary opinion. However, about two years ago it was resolved that the tower and the interior of the church should be entirely restored, and efforts were made to raise the necessary funds. The work of rebuilding the tower was let to Mr. J. Harper, of Rotherham, for 700*l.* The interior of the church has been cleansed, and the nave has been opened out into the tower, thus making an addition to the available space within the church. Mr. Blackmoor, architect, has had the direction of the work, and a new pulpit and reading-desk placed in this church as of his design. The cost of the whole of the work of restoration is about 1,000*l.* Mr. Knapton, of Raw Marsh, has presented to the church two new bells, at a cost of 80*l.*, thus making a complete peal of eight bells.

Ipswich.—It has been resolved, at a public meeting, to make an effort to build a new church in St. Margaret's parish; and a committee has been appointed, and subscriptions promised.

St. Michael-at-Thorn.—The Church of St. Michael-at-Thorn, according to the *Norfolk Chronicle*, has been re-opened. The north aisle, which was a source of danger from its dilapidated condition, has been entirely rebuilt, and enlarged by 6 ft., so as to provide additional accommodation to the extent of some eighty sittings. The chancel has been restored, the carved oak reredos having been converted into a screen which divides an entirely new double vestry, one for the clergy and the other for the choir, from the main building. The choir vestry serves as an organ-chamber, the organ having been removed from its former position on the south side of the church to the north side of the chancel. The organ has been supplied with a new case. The east wall has been refaced, and that at the west end entirely rebuilt. Throughout, the church has been cleaned, and warmed and ventilated, Gidney's apparatus being employed for the warming. It is also lighted by crocets of gas-jets surrounding the capitals of the pillars of the aisle, and a row of jets being affixed to the south wall at certain intervals. All the seats have been varnished and the old lectern restored. The same may be said of the old Norman doorway at the south

porch. The old brick wall, which hid the church and churchyard from view, has given place to iron rail next the road. The alterations were carried out from plans prepared by Mr. W. L. Fawcett, of Cambridge; and Mr. J. Downing was the contractor, Mr. Childs being sub-contractor for the stonework; Mr. Harrison, for the carpentry; Mr. Love, for the glazing; and Mr. Pank, for the gasfittings. About 1,000*l.* have been expended.

Oxford.—The foundation stone of a new church for the Osney district of Oxford has been laid. The erection of the church, which will be dedicated to St. Frideswide, has been undertaken by Messrs. Honor & Castle, at the contract price of 2,900*l.*; and the architect is Mr. S. S. Teulon. The church will be built to accommodate 370 people, its interior length being 105 ft., and the width of the nave 25 ft., and the transept, 18 ft. 6 in. The depth of the chancel is 11 ft. 6 in., which will be lighted by fifteen windows. Besides these, there will be twelve windows in other parts of the church (nine in the nave and three in the north transept). The tower will be 54 ft. high, and the spire 40 ft. The walls are to be built of local stone, with Bath stone dressings, and the roof Staffordshire tile; the seating and roofing inside of deal, oiled and varnished. The organ-loft will be over the vestry in the south transept, and the principal entrance will be on the north side, facing the turnpike road. The church is to be completed by the 1st of October next. Mr. H. Howes is the clerk of the works.

Cheltenham.—A new apse to St. John's Church has been consecrated. The apse has been erected to afford 150 additional free sittings for the poor. The expense of the new building is already defrayed. A pulpit (executed by Boulton, of Cheltenham) has been presented by Mrs. J. L. Armitage; a reading-desk, by Mrs. Sitwell; gas-standards and communion-rail (executed by Lethers & Randle, Cheltenham), by Colonel Hodson; carved chairs, &c., by Miss Hodson; and the organ, which has been removed from the gallery to the apse, has been enlarged and improved by Nicholson, of Worcester. The windows were done by Messrs. Dancy, Bros., of Gloucester, from designs by the architect, Mr. Muller. The whole of the wood and stone carving have been executed by Boulton. A subscription has been set on foot to raise a sum of 1,200*l.*, the estimated cost of the necessary external and internal alterations. The dilapidated state of the building requires that it should be re-roofed, the outer walls be cased in by stone, and the present windows be superseded by others more in harmony with those of the new apse. A stained-glass window has been presented by Mrs. Kenshaw, and another by Capt. Ford.

DISSENTING CHURCH BUILDING NEWS.

Ongar.—The Congregational chapel has just undergone alteration and improvement, and has been re-opened. The internal fittings are entirely new. Narrow, high-backed pews have given way to open benches, in stained deal, the models for which were found in the restored cathedral of Lichfield. A new gallery, with panelled front, has been erected. At the other end of the building stands the pulpit, which is of Italian design, with arches in front supported by oak columns, having decorated capitals; in the rear of the pulpit are seats for the deacons, and in front is the reading-desk, the whole being surrounded by a communion-rail. On the wall behind the pulpit is an entablature, in three bays, containing Scriptural texts, which are wrought in letters of scarlet and gold on what appears to be a lavender ground. The architect under whom these improvements have been carried out, was Mr. C. Gilbert, of Nottingham, and the work has been executed by Mr. Noble, of Ongar, builder. The total cost is about 500*l.*

Hipperville.—The new Wesleyan Chapel here has been opened for divine service. It is a Gothic edifice, situated at the junction of the Denholme Gate-road with the Leeds and Whitehall road. It has been erected from the plans of Messrs. R. Ives & Sons. The total cost will be about 2,200*l.*

Criminal Instinct.—The builder of a church now in course of construction, when the tenant of his health was given, rather enigmatically replied that he was more fitted for the scaffold than for public speaking.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Stockton.—The church dedicated to St. Mary has been re-opened. This church was originally designed by Augustus Welby Pugin. It was left incomplete by him, and now, after a lapse of many years, has been finished, except in its belfry and spire, and this was the event celebrated by the re-opening of the church. The work was done under the superintendence of Mr. Goldie, the architect of the Roman Catholic Cathedral at York; Mr. Salt was the clerk of the works; and Mr. J. P. Cragg, of Stockton, the builder. The new work consists of an apsidal chancel, 28 ft. deep, with an arcade running round its walls, pierced with lancet windows, and filled with stained glass, by Mr. Barnett, of Newcastle. The roof is arched and ribbed in wood, the floor is of tiles, and an altar of sculptured stone rises in the midst. The organ-gallery has been remodelled, and the organ, which was comparatively worthless, renewed and improved by Messrs. Foster & Andrews, of Hull. The improvements have cost 3,000*l.*

SCHOOL-BUILDING NEWS.

Carrington.—The memorial stone of new Baptist schools has been laid here. Mr. W. Webster, of Basford, is the architect and builder, and the estimated cost of the new building, including the site, will be 350*l.* The dimensions of the rooms will be as follow:—Large room, 40 ft. by 25 ft., and 13 ft. high; infants' room, 18 ft. by 11 ft. There will be two class-rooms partitioned off for class-rooms for adult scholars. The building will be heated by Messrs. of Loughborough's new patent heating pipes.

STAINED GLASS.

Beverley Minster and St. Mary's.—These churches have had additions of stained-glass windows made to them. In St. Mary's Church, one of the windows in the south aisle of the nave has been filled in by Mr. T. Shepherd, solicitor, of this town, to the memory of his parents. In the Minster, the window in the west face of the south tower has been filled in by subscription, to commemorate John T. Cleaver, son of Mr. G. Cleaver, of this town, who died two years ago. Mr. Shepherd's window is in three lights, each of which contains Scriptural subjects. The Cleaver window describes a scene well known to readers of early Church history, namely, the Market-place in Rome, where Gregory, afterwards St. Gregory the Great, is bargaining for three British youths who are there offered for sale. Messrs. Hardman, of Birmingham, supplied both the windows.

FROM SCOTLAND.

Edinburgh.—During the past three months considerable alterations have been effected in the interior of Broughton-place United Presbyterian Church. The alterations have been carried out from plans prepared by Mr. John Paterson, architect. In the treatment of the interior the architect has adopted the Romanesque style of architecture. The pews in the area and gallery have been lowered, the doors removed, and the whole provided with new copings and benches of modern design. The new pulpit is of larger dimensions than the former one, and takes the form of a dais or platform, with an ornamental front. The back design or screen, which is erected against the wall immediately behind the platform, and rises high above it, consists of panelled pilasters set on pedestals, and finished with carved capitals supporting consoles, the whole being surmounted by a pediment. Between the primary and secondary pilasters the wall is decorated with carved ornaments. The whole is executed in yellow pine and American walnut, stained in suitable shades. The pillars supporting the gallery have been ornamented with enriched capitals, and the soffit and beam have been reconstructed with ornate panelled and moulded work. The gallery front has also been elaborately treated. The panels are filled with an arched balustrade, continuously carried round the whole front and brought forward to the pulpit design. The windows have been filled with stained glass similar to the cathedral grisaille glass, which is composed mainly of light neutral shades, containing pieces of blue, ruby, gold,

green, &c., interspersed like gems throughout, as recommended in some recent articles in the *Builder*. The six windows towards the pulpit are contributed by six members of the church, and the remaining twelve in the side walls by the congregation. These windows have been designed and executed by Messrs. Ballantine & Son. The painting and painted decoration have been designed and executed by Mr. William Paxton. The design of the ceiling is the chief feature of the painted decoration. The original panelling of the ceiling has been enriched with stencilled ornament in various colours. The ground of the panel is finished in blue, and lighted up with gold. The walls are finished with a brown hue, and the wall linings and the seating of the church are stained dark, to accord with the style of architecture. The cost altogether of the alterations, including the stained glass, will be about 1,800l. The contractors were Messrs. Bell & Scott, for joiner work; Stewart & Campbell, for plaster work; and Hugh Paterson & Co. for furnishings. The foundation-stone of a new hall for Lodge "journeymen" was to be laid this week. The site of the new building is at the foot of Blackfriars-street. A serious accident has occurred in High-street, in the fall of the gable of one of the old houses at present being demolished in connexion with the improvement of Blackfriars' Wynd, whereby one of the persons engaged in the hazardous work, a joiner, in the bloom of manhood, was almost instantaneously killed, and two labourers were severely injured.

Books Received.

Wonders of European Art. By LOUIS VIARDOT. London: SAMPTON LOW & Co. 1871. Some time ago we mentioned a book issued by the same publishers, entitled, "Wonders of Italian Art," a translation of the first part of the "Merveilles de la Peinture," by M. Viardot. The book now before us is a translation of the second series of the "Merveilles," and forms a companion volume, just the thing for a gift at this giving time. It is very agreeable and instructive reading, and is richly illustrated with reproductions of known engravings (why not from the paintings themselves?) by the Woodbury Permanent process and wood blocks.

We might well be excused if we spoke harshly of the original author. The French school, the German school, the Flemish, the Dutch, are all set forth and commented on, the best modern, even living, artists of the several schools being mentioned. Not one word, however, is there concerning the English school or English painters,—they are all utterly and entirely ignored. In the list of painters given we look in vain for Reynolds, Gainsborough, Hogarth, Turner, Eddy, Stanfield, Maclean. Is this the result of ignorance or prejudice? M. Viardot may take his choice.

Still, this shall not be allowed to damage in our eyes the issue of the English publisher. It is a charming little volume, so far as it goes, and has our warm commendation.

The Young Mechanic: a Book for Boys. Containing Directions for the Use of all Kinds of Tools. By the Author of "The Lathe and its Uses." London, 1871. Tribner & Co.

This is a capital book for boys, and, indeed, for some men, for we can imagine it proving very valuable to many in our colonies. However, it is addressed specially to boys; and, while interesting and amusing them will give a power and facility which may be found useful in after-life. The second illustration, by the way, must not be taken as a sample of the accuracy of the book throughout, for that shows a 2-ft. rule with 13 in. on each side of the central joint, a little slip which may be forgiven, though awkward for one who insists, as the author rightly does, on precision in measurement.

Post Office Directory of the Engineers and Iron and Metal Trades throughout England, Scotland, and Wales. KELLY & Co. 1870.

The "Post Office Directory of the Engineers and Iron and Metal Trades for England, Scotland, and Wales," just now published by Messrs. Kelly, differs from the London and country directories hitherto published, inasmuch as being a class directory, a more thorough division of

trades is attempted than would be possible in a general directory. Thus, the manufacturers of particular articles are given, as,—

Steam Engine Makers—Poulton, pp. 194 and 794.
Steam Engine Makers—Portland, pp. 194 and 794.
Steam Engine Makers—Tracton, pp. 194 and 794.
Steam Hammer Makers, pp. 195 and 800.
Steam Road Roller Makers, pp. 195 and 800.

And so on. Usually these trades have been included under the title of Engineers; but in the present volume they are detailed in a manner never before attempted. Pains have evidently been taken to insure correctness, and the resulting volume will be found valuable by a large body of persons. This and their fellow volume, on the Building Trades would afford materials, if carefully examined, for some curious and interesting deductions.

VARIORUM.

At the head of the almanacs that have reached us, we must place, as of old, the "British Almanac and Companion." The essays forming the latter are very interesting, notably "Masters and Men," by Mr. William E. A. Axon; the Squares of London, by Mr. Robinson; Metropolitan Locomotion, by Mr. Smiles; and one descriptive of the National Portrait Gallery. Architecture and Public Improvements are treated of by Mr. James Thorne.—The neat little "Art-Union of London Almanac" gives a large amount of information on matters connected with the fine arts, not to be found collectively elsewhere.—Dietrichsen & Hannay still publish their "Royal Almanac."—As Messrs. Blackwood do their "Shilling Scribbling Diary." The rough maps of large towns in the latter for 1871 are useful.—A set of cheap "Boys and Girls' Reading Books" form part of Cassell's Primary Series. "The Poetical Reader," from the same publishers, for more advanced scholars, is preceded by some useful hints on reading.—"The Mason's Home," by Mary Beighton (Book Society, Paternoster-row), is a little story in verse, directed against the evil of drunkenness, and likely to do good among the class specially referred to. Its pathos and air of reality give it force.—The fact that "The Telegraph Handbook," by R. Bond (Lookwood & Co.), is dedicated to Mr. Scudamore, with permission, and has reached a third edition, shows it is to be depended on. Any young persons who wish to fit themselves for the post of telegraph clerk, will find the study of it a good beginning.—"Art, Past and Present: a Word to English Artists on the State of Art in this Country" (Ridgway), seems to have for chief, though hidden motive desire to show that the Reformation "infected" all sorts and conditions of things, and that the abandonment of Popery "was fatal to the true artistic spirit!"—"Ten Thousand Miles against Five Thousand; or, What is the best Gauge for the new Indian Railway?" London: Johnson & Co., Fleet-street, Bombay: Times of India Office. In this pamphlet, "C. E." advocates the formation of narrow gauge lines and light rolling stocks for India, being of the Times of India's opinion that, "judging by all English examples, it is perfect madness to construct them on the received system, which means ruinous expenditure and dead loss."

Miscellanea.

New Institute, Pendlebury.—At Pendlebury, a populous mining and manufacturing district, midway between Manchester and Bolton, there has just been erected and inaugurated a building, the chief object of which is to afford the means of recreative entertainment and amusement to the working population of the neighbourhood. The premises comprise reading-room, library, large billiard-room, bagatelle, chess, and smoking room, an assembly-room to seat 600 persons, committee, ante and retiring rooms, a gymnasium, a hall-keeper's residence, lavatory, and other accessory offices, and generally appliances rarely to be found except in a gentlemen's club. The buildings and premises have been planned and designed by Mr. W. Williamson, architect, and erected by Messrs. Thos. Olney & Sons. The architecture may be described as somewhat semi-Gothic in style. The front gate contains an illuminated clock, the gift of a lady in the neighbourhood. The total cost, including fittings and furniture, will be about 8,000l., the larger proportion of which sum has been taken up in shares by the inhabitants.

Preservative Coating for Walls.—By the invention of Mr. P. Pimont, Ronen, 1,000 lb. of potter's earth is mixed with a suitable quantity of water, and made into a paste, similar to ordinary mortar. To this is added a mixture of 20 lb. of common oil and 4 lb. of fish oil, and the whole is stirred. Then a separate mixture is made of 12 lb. of archis, balls of lime, or other similar plant, in a suitable quantity of water to form a paste, and this is spread over that previously obtained. Then there are pulverised separately 8 lb. of vegetable or animal charcoal, or any suitable animal or vegetable black, and this powder is distributed over the whole mass of paste, and the whole is well stirred. After having previously beaten 24 lb. of coarse hair, in order to open it well, the filaments are strewn in small portions over the paste, at the same time agitating the material in all directions, in order to produce the homogeneous mass-like mortar, and which is similarly applied to the surfaces required to be covered with it.

Improved Oil Lamps.—A paper "on a method of lighting towns, factories, or private houses, by means of vegetable or mineral oils," has been read at the Society of Arts, by Mr. A. M. Silber, of Wood-street. By means of an improved burner and special mode of dispensing and consuming the oil, he proposes to light cities, factories, or private houses, by supplying the oil, whether petroleum or paraffine, coals, or other oil, through tanks and pipes to the lamps or burners,—not a very promising project, we fear. The more complete combustion of the oil, however, by means of improved burners is a much-wanted desideratum; and if Mr. Silber solves this problem satisfactorily, without attempting to compete with gas,—bad as it too often is,—by means of tanks and supply-pipes, he will confer a great benefit on the public, and improve the gas supply also, which stands greatly in need of such improvement, in dwelling-houses especially, as a good rival light without the stench of ill-consumed paraffine, might soon effect.

Improvements in Durham Cathedral.—Two large gas-standards have been erected within the altar rails. The standards are about 12 ft. high, of polished and moulded brass work, in accordance with the architecture of the screen, ornamented with chasing and crystals, and mounted on moulded bases of polished Friesian marble. Each standard has forty-one lights. The Bishop's Throne and the stalls have also each received additional ornamentation, brass brackets having been affixed to each, in place of the common iron rods which formerly supported the curtains. The new curtain rods on the Throne are supported at the back by brackets, bearing shields charged with the arms of Bishop Hatfield, and in the front by slender shafts bearing figures of angels, one holding a crozier and book, the other a mitre. The whole of the brass work has been made by Messrs. Hart, Son, Peard, & Co., of London and Birmingham, from the designs of Mr. C. Hodgson Fowler, architect.

Accident at Castleford Waterworks.—An accident of a serious character has taken place at these works. The reservoir, which is situated on Redhill, about a quarter of a mile from the town, was completed two or three months ago by the contractors, Messrs. Slinger & Naylor, under the superintendence of Mr. Fillerit. It is constructed to hold 375,000 gallons, a three day's supply. The covering of the reservoir is of brick arches, carried on cast-iron girders spanning from pillar to pillar, the latter also of cast iron: the arches are built in cement, over which are 12 in. of earth to keep the water from contamination. This covering, has nearly all fallen in, and the reservoir has now the appearance of a complete wreck. The damage will amount to a few hundred pounds. This accident is attributed to the ground being hollow under the reservoir.

Civil and Mechanical Engineers' Society. The opening address of this society, for the session 1870-71, was delivered by the President, Mr. James B. Walton, Assoc. Inst. C.E., on Friday evening, the 16th inst. The address dwelt at length upon the education, present position, and future prospects of young engineers. The programme for the session is one of considerable interest. The meetings are held at the Board-room, No. 4, Westminster-chambers, Victoria-street, commencing at 7.30, and are open to members of the engineering and architectural professions.

The New Bridge over the Tees.—At the invitation of the North-Eastern Railway Company, the members of the Tees Conservancy, the Stockton Corporation, the Middlesbrough Corporation, and a number of gentlemen from South Stockton, Middlesbrough, and Redcar, visited the swing-bridge at Goole, in order that they might see the working of the bridge, which, to a great extent, is the model upon which the railway company propose to construct the bridge across the Tees. Mr. Harrison, the engineer to the company, explained the construction of the bridge. It consists of eight spans in all, the third and fourth of which from the eastern bank of the Ouse are formed by the swing bridge, which has a total length of 220 ft., or 20 ft. shorter than the proposed swing-bridge over the Tees near Newport. The movable portion weighs about 650 tons, but it is so balanced that it is swung round with the utmost smoothness. The central pillar on which the swing revolves is a massive structure, resting on foundations sunk 70 ft. below the bed of the river, and the accumulators for hydraulic power are sunk to a similar depth. The management of the bridge is effected by powerful hydraulic rams, worked by donkey engines, all placed within the body of the bridge just over the central pier, and all in duplicate to provide against accidents. The movable portion of the bridge and machinery were constructed by Sir W. Armstrong & Company, Elswick Works, and bear date 1868. The other portions of the bridge were constructed by a firm at Staningley, near Leeds, the late Mr. Brassey being the contractor for the whole.

Leeds Ladies' Sanitary Association.—The sixth anniversary of the Leeds Branch of the Ladies' Sanitary Association has been held in the library of the Leeds Philosophical and Literary Society. The Rev. Canon Woodford, D.D., presided. A report on the sanitary condition, and other kindred subjects, was read and adopted, and it was resolved that, as the mortality of the borough continues unduly high, and its reputation is injuriously affected thereby, it becomes the bounden duty of all classes to unite with the local authorities in adopting practical measures to improve its sanitary condition; that as the objects of the Ladies' Sanitary Association are the promotion of sanitary measures, the diffusion of sanitary knowledge, and especially the encouragement of cleanliness in the homes and families of the poor and ignorant, it merits the general support of the public; and that the thanks of the meeting be given to the supporters of the Leeds Branch, and to all district visitors, Bible women, and others who have aided and taken part in the sanitary improvement of the homes of the people.

New Church for Bow.—A new church is about to be erected at Bow, which, with its increasing population, stands much in need of the addition. It is proposed to erect the building upon the small field at the south-east corner of Victoria Park. The bishop has sanctioned the project, her Majesty's Commissioners of Woods and Forests have granted the site, and subscriptions to the amount of £231 have been obtained. It is expected that this sum will be largely increased by grants from the Bishop of London's Fund; and the public, especially the local public, are invited to contribute. The new church is to cost about 4,000*l.*, and its erection will be commenced as soon as the amount of funds in hand will justify that step.

New Law on Rent.—On Thursday, at the Sheriff's Court, Red Lion-square, in an action in one of the superior courts, "Kelly v. Simmons," among other items was one to recover a half-quarter's rent. Mr. McLeod, as counsel for the plaintiff, cited the 33rd and 34th Vict., c. 35, passed last August, by which rent, annuities, and dividends could be recovered in like manner as interest on money lent "as accruing from day to day." Mr. Under-Sheriff Burchell referred to the new law, and was of opinion that a portion of a quarter's rent could be recovered. The jury included half a quarter's rent in their verdict.

The Wood Engravers of Clerkenwell.—The annual festival of the wood engravers of London took place on Thursday evening, 22nd inst., at the St. John's Gate Tavern, Clerkenwell, and was more numerous attended than of recent years. This was partly owing to the presence of several French engravers who have come to London in consequence of the siege of Paris.

Proposed Tunnel under Scarborough.—The Scarborough town council, at the last monthly meeting, remitted to a committee a proposal from Mr. J. F. Fairbank, C.E., to unite the North sands with the South Bay by a tunnel under the town. The report of the committee recommends that the council grant the application on receipt of plans and guarantee of subscription of capital, on condition that the work is completed in two years from the 1st of January, 1871, that indemnity against damage and loss be given, and that an annual consideration,—at first 10*s.*,—be also given.

Institution of Surveyors.—At the ordinary general meeting, held on Monday, December 12, a paper was read by Mr. William Mathews, jun., entitled "The Valuation of Annuities and Reversions dependent upon Terms of Certain Duration." A short discussion ensued, and the further consideration of the paper was adjourned to a future meeting. The next meeting will be held on January the 16th, when a discussion will be opened by Mr. Edmund Rushworth, "On the Proposal for making the Owners of Lands and Houses pay a portion of the Local Taxation."

Boiler Explosion in a Chapel.—The heating apparatus of the boiler at Hollywalk Congregational Chapel, Leamington, exploded recently whilst being prepared for the morning service. The front of the boiler was blown out, several windows in the building were smashed to atoms, and the large entrance-doors forced off their hinges; the attendant narrowly escaped being killed, and the explosion, which shook the adjoining premises, caused great alarm in the neighbourhood. The accident arose from the water in the pipes being frozen.

Institute of Accountants.—The organisation of the Institute of Accountants in London is being proceeded with, and the council will issue for general information the rules and regulations so soon as they have been definitively settled under legal advice. Mr. Quilter has been appointed the first president of the council; Mr. Tarquand, vice-president; Mr. Henry Markby, solicitor; and Messrs. Fuller, Banbury, Nix, & Mathieson, bankers.

TENDERS.

For passenger station at Tealy, on the Pembroke and Tealy Railway. Stone, lime, and sand provided. Messrs. Szlumper & Aldrich, architects:—

Jones & Johns	£215 0 0
Davies	700 0 0
Thomas	695 0 0
Allen	690 0 0
Rogers (accepted)	680 0 0

For passenger station at Pembroke Dock. Stone, lime, and sand provided. Messrs. Szlumper & Aldrich, architects:—

Jones & Johns	£280 0 0
Davies	680 0 0
Rogers	600 0 0
Thomas	493 0 0
Allen (accepted)	484 10 0

For Teyford Hall, Caledonian-road. Messrs. Lander & Beddoe, architects. Quantities supplied:—

Dove, Brothers	£1,155 0 0
Williams & Son	1,145 0 0
Aldford	1,115 0 0
Beaves	1,113 0 0
Webber	1,067 0 0
Mann	1,045 0 0

For villa residence, Holmwood, Dorking, for Dr. F. Bird. Mr. E. B. J. Knox, architect. Quantities supplied by Messrs. Cotterley:—

	Allow for Old Materials.
Lynn & Dudley	£2,850
Putney	2,735
Shoeburys	2,761
Gannon	2,397
Bags & Ramsay	2,355
Shermer	2,444

For St. Anne's Infants' School, Ancoats, Manchester. Mr. Herbert E. Tjonn, architect:—

Turley	£403 0 0
Gerard	395 0 0
Ward	390 0 0
Herd & Eadie	368 0 0
Thompson (accepted)	363 0 0

N.B. Plastering and painting not in this contract.

For cleaning, distemper, repairing, &c., at St. James's National School, Netley-street, Hampstead-road:—

Butcher	£25 0 0
Rouse	25 0 0
Fukins	18 0 0
George	17 10 0
Kvera	17 0 0
Barton	15 0 0
Taylor (accepted)	15 0 0
Hollyman	14 10 0
Gilliepy	14 0 0
Frings	14 0 0

* Offered to open after tenders were opened, for 12*l.*, but it was declined by the committee.

For re-building the first portion of Butler's Wharf, Shad Thames, to be known as Brander's Wharf, exclusive of foundations, vaults, river walls, and platform, for Messrs. Brander, Brothers, Messrs. Toley & Dale, architects:—

Aird & Sons (accepted)	£29,180 3 9
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The foundations, vaults, river walls, platform, &c., to be executed under a schedule of prices.

For a villa residence at Eltham, for Mr. R. T. Fleming, of Lloyd's. Messrs. Toley & Dale, architects:—

Howard	£2,300 0 0
Baby	2,100 0 0
Blake (accepted)	1,960 0 0

TO CORRESPONDENTS.

The *Life Mr. J. P. Jones*.—We have a number of this distinguished architect's name next number.

W. E. J. F. M. P. T. R. W. T. W. A. J. J. A. B. T. W. G. W. B. J. E. W. W. Messrs. L. T. A. D. M. & M. M. V. M. H. M. C. (will receive a proof)—Inquirer there is no published work which would make it safe for "an ordinary smith" to be dealing with boiler and hot-water tubes, and boiler live—Mr. C. (in type).

For a notice of Mr. Ballant's Statue, Kensington, for "Miss R. Kent," read "U. K. Carr."

We are compelled to decline pointing out to us and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

N.B.—The responsibility of signed articles and papers read at public meetings, rests, of course, with the authors.

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[ADVERTISEMENT.]

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(Signed) J. M. DRAGO,
Treasurer of the National Government.
JOSE TOMAS ROJO,
JUAN M. ALVAREZ.

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